

Havant Thicket Reservoir Project

Environmental Statement Volume 4 - Appendices

Appendix A9 Biodiversity

A9.5 Hazel Dormouse Survey Report

Portsmouth Water Ltd.



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

**APPENDIX 9.5
HAZEL DORMOUSE SURVEY REPORT**

Final Document (Revision 3)

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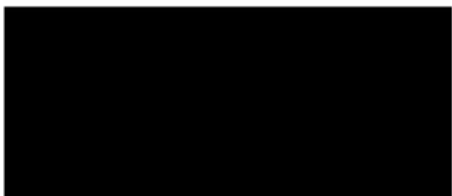
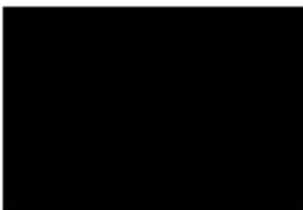
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ECOSA, Ten Hogs House, Manor Farm Offices, Flexford Road, North Baddesley, Hampshire, SO52 9DF
Tel: 02380 261065 Email: info@ecosa.co.uk Web: www.ecosa.co.uk

Registered Office: 3-4 Eastwood Court, Romsey, Hampshire, SO51 8JJ Registered in England No: 6129868
Ecological Survey & Assessment Limited is a Trinity Consultants Company

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Author:	 Simon Boswell MSc MCIEEM CEcol Principal Ecologist
Checked by:	 Samantha Munslow BSc (Hons) MCIEEM CEnv Company Manager/Principal Ecologist
Reviewed by:	 Simon Colenutt BSc (Hons) MCIEEM CEnv Principal Ecologist

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

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**HAVANT THICKET RESERVOIR,
ROWLAND'S CASTLE, HAMPSHIRE**

HAZEL DORMOUSE SURVEY REPORT

Table of Contents

1.0	INTRODUCTION	2
1.1	Background.....	2
1.2	Aims and Scope of Report.....	2
2.0	METHODS.....	4
2.1	Introduction	4
2.2	Zone of Influence	4
2.3	Desktop Study	4
2.3.1	<i>Biological Records Centre</i>	<i>4</i>
2.3.2	<i>Multi-Agency Geographic Information for the Countryside.....</i>	<i>4</i>
2.3.3	<i>Other Sources of Information</i>	<i>4</i>
2.4	Site Suitability Survey.....	5
2.4.1	Survey Methods.....	5
2.4.2	Survey Details.....	5
2.4.3	Site Suitability Survey Limitations.....	5
2.5	Hazel Dormouse Survey.....	5
2.5.1	Survey Methods.....	5
2.5.2	Survey and Desk Study Limitations.....	6
3.0	BASELINE ECOLOGICAL CONDITIONS.....	8
3.1	Introduction	8
3.2	Baseline Ecological Conditions	8
3.3	Discussion	11
4.0	CONCLUSIONS	13
4.1	Conclusion	13
5.0	REFERENCES	14
Map H1	Site Location Plan	
Map H2	Key Site Features	
Map H3	Hazel Dormouse Desktop Study Data	
Map H4	Hazel Dormouse Survey Results	
Map H5	Suitable Hazel Dormouse Habitat	

1.0 INTRODUCTION

1.1 Background

Ecological Survey & Assessment Limited (ECOSA) have been appointed by Portsmouth Water Limited (Portsmouth Water) to undertake a hazel dormouse *Muscardinus avellanarius* survey and report of their land at Havant Thicket, Rowland's Castle, Hampshire. The site is centred on National Grid Reference (NGR): SU 715 097 (**Map H1**).

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

At the time the surveys were undertaken the planning application red line boundary (see Figure 2.1 in ES Volume 3) had not been defined and therefore the Site Boundary (the site) and Ecological Enhancement Area (wider site) boundaries referred to in this report were provisional boundaries available at that time. Within this report where mention is made of 'the site' this refers to the reservoir footprint and other areas used for built development and habitat creation. This area is referred to as the 'Reservoir Footprint' in the Environmental Statement (as the Site includes the reservoir footprint, the pipeline corridor as well as land around the reservoir footprint being used for ecological mitigation and compensation). Where reference is made in this report to the 'wider site' this includes the reservoir and the area proposed for ecological enhancement within Forestry England's (FE) Havant Thicket woodland to the north and Bell's Copse to the west of the site and Staunton Country Park (SCP) to the south of the site. This area is similar to the area referred to as the 'Reservoir Site' in the Environmental Statement. The areas covered by 'the site' and 'wider site' in this report are shown in **Map H1** and the key ecological and landscape features mentioned in this report are shown in **Map H2**.

1.2 Aims and Scope of Report

The information within this report is based on a desktop study and hazel dormouse surveys carried out by ECOSA between 2005 and 2009. The report provides a detailed summary of the ecological survey work undertaken.

Survey data from 2005-2009 has been used as the habitats within the site have not altered significantly in the intervening period and therefore the species is still likely to be present within all suitable on-site habitats.

2.0 METHODS

2.1 Introduction

This section details the methods employed during the field survey and hazel dormouse surveys undertaken for the HTWSR site between 2005 and 2009 and updating walkover survey undertaken during 2018. Any significant limitations to the survey methods are also discussed.

2.2 Zone of Influence

To define the total extent of the study area for this appraisal (Zone of Influence¹), the proposed scheme was reviewed to establish the spatial scale at which hazel dormouse could be affected. The appropriate survey radii for the various elements of the appraisal (i.e. desktop study and field survey) have been defined in the relevant sections below. These distances are determined based on the professional judgement of the ecologist leading the appraisal, taking into account the characteristics of the site subject to appraisal, its surroundings and the nature and scope of the development proposals and the ecology of the species of focus within this report.

2.3 Desktop Study²

2.3.1 Biological Records Centre

Hampshire Biodiversity Information Centre (HBIC) was consulted on 30th April 2018 for records of hazel dormouse located within two kilometres of the site boundary.

2.3.2 Multi-Agency Geographic Information for the Countryside

The Multi-Agency Geographic Information for the Countryside (MAGIC)³ database was reviewed on 12th June 2018 to establish the location of statutory designated sites located within the vicinity of the site which were either designated for hazel dormouse or include hazel dormouse within their citation for a reason for designation. This included a search for all nationally designated sites such as Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs) within two kilometres of the site boundary.

2.3.3 Other Sources of Information

Online mapping resources, including aerial photography, at an appropriate scale, were used to identify the presence of habitats such as woodland blocks, treeline and hedgerows in the vicinity of the site. These habitats may offer resources and

¹ The Zone of Influence (Zoi), as defined by CIEEM, is the area over which ecological features may be subject to significant effects as a result of the proposed project and associated activities.

² Due to the age of this data an updated desk study has been undertaken in 2020 and details are included in Appendix 9.1.

³ www.defra.magic.gov.uk

connectivity between the site and suitable habitat in the local area, which may be exploited by hazel dormouse.

2.4 Site Suitability Survey

2.4.1 Survey Methods

A field site suitability survey was undertaken to reassess the proposed reservoir site's suitability to support hazel dormouse. The hazel dormouse appraisal was undertaken to confirm whether suitable hazel dormouse habitat was still present within the site.

Information on previous hazel dormouse surveys, particularly in relation to the habitat types and management regimes was also considered.

2.4.2 Survey Details

The updating suitability assessment was carried out by Simon Boswell Principal Ecologist of ECOSA on 24th July 2018. The weather conditions were hot and sunny, an ambient temperature of 22°C and no wind.

The Havant Thicket woodland field survey was carried out by Simon Boswell on 21st September 2018. The weather conditions were sunny, an ambient temperature of 12-18°C and a light breeze.

During the surveys, the surveyor was equipped with 10x40 binoculars, a digital camera and information on previous survey work undertaken at the site.

2.4.3 Site Suitability Survey Limitations

There were no significant limitations to the site suitability assessment.

2.5 Hazel Dormouse Survey

2.5.1 Survey Methods

Hazel Dormouse Tubes/Boxes

The hazel dormouse survey was undertaken in line with current best practice guidelines (Bright, et al., 2006).

In 2005, a total of 68 dormouse tubes and 96 dormouse boxes were erected during early June in locations that provided suitable habitat for hazel dormouse (**Map H4**). The boxes/tubes were placed in rows of six/eight, respectively through The Avenue area which bisects the site from north to south. In addition, three rows of 12 boxes were erected to the south of The Avenue within the SCP woodland. These boxes were inspected on four occasions in 2005. In 2006, the tubes and boxes were inspected on three occasions between May and October.

During 2007, a total of 200 dormouse tubes and 100 dormouse boxes were erected within woodland surrounding the site, including Havant Thicket to the north and the SCP woodland to the south, and within The Avenue. **Map H4** shows the areas where the survey tubes and boxes were erected, although the exact locations of each tube and box have not been plotted.

Due to previous problems with vandalism the boxes and tubes in 2007 were erected at a height of 2-3 metres so that they were less conspicuous and less easily disturbed. Boxes and tubes were erected in areas of trees and scrub considered suitable for the species. These areas were often those that had a good diversity of trees and shrubs with a dense structure allowing animals to move through the canopy. All dormouse boxes and tubes were inspected on two occasions in September and October 2007.

During 2008, the tubes and boxes previously installed were checked on four occasions on an incidental basis, when time permitted during other surveys. Tubes/boxes were inspected in June, August and October 2009. In early November 2009, all previously erected boxes and tubes that were still present on site, were inspected.

During 2009, all boxes and tubes within The Avenue were inspected on 5th June 2009. Tubes and boxes in additional areas were not surveyed in 2009.

Nut Searches

Hazel dormouse, when feeding, gnaw hazel nuts in a characteristic way leaving distinctive marks around the gnawed area. It is therefore possible to identify their presence by using this method. Where nuts had been eaten by rodent species, they were examined to assess whether they had been gnawed by hazel dormouse.

During 2005, nut searches were carried out in October. In 2006, a total of four nut searches were carried out during October and November, throughout The Avenue and the northern sections of Hammonds Lands Copse (SCP) and Havant Thicket woodland.

2.5.2 Survey and Desk Study Limitations

Due to the extended timescales of the surveys, few limitations occurred. Limitations that have been identified relate entirely to the heavy use by members of the public of parts of the site.

A combination of dormouse boxes and tubes were used during the surveys in 2005. Unfortunately, many of these boxes were either removed or vandalised by members of the public utilising the woodland. It was also apparent that a member of the public was regularly opening the boxes, as often the lids had been removed and were not refitted correctly. This level of disturbance is likely to have dissuaded hazel dormouse from

using the boxes. However, the erection of boxes and tubes at height in 2007 largely overcame this limitation.

In 2008 and 2009, the number of boxes present declined due to vandalism and 'natural' loss/degradation due to the elements. Through these years, lost boxes and tubes were not replaced. By 2009 approximately 60 boxes and 90 tubes remained.

In addition, the grey squirrel *Sciurus carolinensis* is a naturalized species that competes with the dormouse for hazel nuts. Grey squirrel are able to digest unripe hazel nuts and will strip a plant before hazel dormouse are able to utilise them as they require ripe hazel nuts. As well as preventing the dormouse from feeding up for hibernation, this problem also limits the effectiveness of hazel nut searches, because the number of nuts eaten by hazel dormouse is often very low in areas where grey squirrel is present. This can make hazelnuts eaten by dormouse almost impossible to locate.

Discussion Discussion of the hazel dormouse survey results is based on ECOSA's best professional judgement considering the following factors:

- **Habitat quality and connectivity** - The assessment of habitat quality is based on information within a number of publications including 'The dormouse conservation handbook' (Bright, et al., 2006) Online mapping resources are reference to assess the habitat quality and connectivity in the wider area.

3.0 BASELINE ECOLOGICAL CONDITIONS

3.1 Introduction

This section details the results of the hazel dormouse survey work undertaken for the HTWSR site between 2005 and 2009, along with survey data from previous years. It assesses the baseline ecological conditions of the site in respect to hazel dormouse at the time of the desktop study and field surveys. The baseline draws on a wealth of historical and present data, relevant data from historic surveys has been included in the report to increase the understanding of the site in terms of hazel dormouse.

3.2 Baseline Ecological Conditions

Desktop Study Results

Consultation with HBIC produced a number of records for hazel dormouse within two kilometres of the site, with the closest and most recent record from 2015, located approximately 900 metres south-west of the site associated with an area of woodland. The locations of hazel dormouse records returned from HBIC within two kilometres of the site are shown on **Map H3**.

The MAGIC search revealed the presence of three European Protected Species Mitigation (EPSM) licences in respect of hazel dormouse within two kilometres of the site. The nearest two licences are located approximately one kilometre south-west of the site in a similar location to the nearest HBIC record identified above (Natural England references 2016-21182-EPS-MIT and 2014-456-EPS-MIT). These were granted in 2014 and 2016 respectively. The third is located approximately 1.7 kilometres south-west of the site and appears to be associated with Littlepark Wood, immediately east of the A3 (Natural England reference 2014-3156-EPS-MIT). This licence was granted in 2014. A review of aerial imagery revealed that there is good connectivity between these habitats, and habitats located on or adjacent to the site, particularly via roadside vegetation along the A3.

Field Survey Results

During the 2018 field survey the habitat within the site comprised a combination of neutral grassland, rush pasture, woodland, stream corridors, ditches and boundary vegetation.

Woodland suitable for hazel dormouse was still present within The Avenue and this area has a well-developed understorey. The Corsican Pine Plantation along the northern boundary of the site has been thinned since the 2005-2009 surveys, this has resulted in a dense understorey of bramble which is of suitability for hazel dormouse. A proportion of the wooded stream corridors, especially those in close proximity to broadleaved woodland are also suitable for hazel dormouse (see **Map H5**).

Overall the on-site habitat with suitability for hazel dormouse has remained similar between 2009 and 2018 and as such the species is likely to still be present.

Havant Thicket woodland contains a variety of woodland stand types including a combination of broadleaved and coniferous woodland plantation. Since the previous surveys were undertaken Havant Thicket has been subject to limited woodland management. Furthermore, previously open areas and replanted woodlands have developed as dense birch *Betula* species thickets which are superficially suitable for hazel dormouse. Overall, the suitability of Havant Thicket woodland for hazel dormouse has not changed significantly and therefore the species is likely to be present throughout the area, although the habitat is suboptimal.

Hazel Dormouse Survey Results (2005-2006)

During the 2005 dormouse tube and box surveys undertaken within the site, no evidence of dormouse was recorded. However, on 18th July 2006 a dormouse nest was recorded within a box located in the centre of The Avenue. Unfortunately, when the nest was recorded the box had previously been tampered with and the lid removed, and as a result no animals were present. The nest consisted of a tightly woven ball of honeysuckle with fresh hazel leaves present; the nest filled the interior of the nest box.

During the course of the nut searches carried out during 2005 and 2006, no hazel nuts gnawed in the distinctive manner by the species were recorded. However, numerous gnawed hazel nuts that had been eaten by either grey squirrel or wood mouse *Apodemus sylvaticus* were recorded.

Hazel Dormouse Survey Results (2007)

In total, five boxes and 13 tubes were found to contain evidence of occupation by hazel dormouse in 2007. These records were as follows:

- Havant Thicket woodland to the north of the site where three boxes had been occupied;
- Bell's Copse to the west of the site where two tubes had been occupied;
- The Avenue where two tubes and two boxes had been occupied (**Figure H1** and **Figure H2** below); and
- SCP where nine tubes had been occupied.

Within The Avenue, two hazel dormouse were recorded in a tube, and three within a wooden nest box. In the tube with two individuals, both animals were adult, however, in the box where three animals were present two animals were juveniles of the year indicating breeding on site. All other tubes and boxes where evidence of hazel

dormouse was recorded either contained no animals when inspected or single individuals.



Figure H1: Hazel dormouse nest within tube from The Avenue which had two animals present



Figure H2: Hazel dormouse nest within box in The Avenue

Hazel Dormouse Survey Results (2008)

During the 2008 tube and nest box checks, the peak number of occupied tubes and boxes were as follows:

- in Havant Thicket woodland four boxes/tubes had been occupied;
- in The Avenue seven boxes/tubes had been occupied; and
- in SCP three boxes/tubes had been occupied.

During the 2008 survey work, there were no hazel dormouse located and the only evidence located was in the form of nesting material.

Summary of Results

Table H1 summarises the results of the dormouse surveys carried out at the site between 2005 and 2009 with the figure representing the number of tubes and boxes found to show evidence of occupation by hazel dormouse. **Map H4** provides a summary of the results of all dormouse surveys carried out.

Table H1: Summary of the results of the 2005 to 2009 hazel dormouse surveys

Area	2005	2006	2007	2008	2009
The Avenue	0	1	4	7	0
SCP	0	0	9	3	0
Havant Thicket	0	0	3	4	0
Bells Copse	0	0	2	0	0
Total	0	1	18	14	0

Whilst visiting the site on 6th May 2011, a ranger from Hampshire County Council's (HCC) Staunton Country Park, recorded a hazel dormouse asleep on the floor of the Corsican Pine Plantation, located immediately north-east of the tip of The Avenue (SU 716 102) (Photo H3). Typically, conifer plantations such as these would be considered to be suboptimal for the species due to the lack of diversity of species and subsequently food provided. The presence of this species in such habitat would suggest that the density of the species in the local area maybe sufficiently high that hazel dormouse are using suboptimal habitat for resting and feeding.



Photo H3. Hazel dormouse observed on 6th May 2011 in the Corsican Pine Plantation

3.3 Discussion

Given the results of the dormouse survey work carried out at the site between 2005-2009 it is evident that hazel dormouse are present throughout The Avenue, Round Wood, Middle Clearing, SCP and Havant Thicket woodland. In addition, it is considered probable that the species would be found to be present within all woodland and scrub connected to those areas surveyed. The presence of juvenile animals within The Avenue in 2007 would indicate that breeding occurs at the site.

The Avenue covers 6.87 hectares; current knowledge on dormouse population densities would indicate that within optimal habitat (defined as 'diverse deciduous woodland with abundant scrub and vigorous understorey') four to ten dormouse per hectare (numbers of pre-breeding adults) would be expected (Bright, et al., 2006). However, the vegetation within The Avenue is not considered optimal since the understorey is more open and the woodland heavily disturbed. Within an optimal area of habitat of equivalent size between 27 and 69 hazel dormouse would be expected to occur. Within The Avenue this would be expected to be less, perhaps 20-30 animals, however, this would indicate the presence of a viable population linked to the wider landscape.

Round Wood (1.99 hectares) and Middle Clearing (2.17 hectares) comprise young, semi-mature densely spaced pedunculate oak *Quercus robur* plantation with sparse shrub and field layers. The Corsican Pine Plantation (three hectares) is an area of pine

plantation thinned in the last five years with a narrow fringe of semi-natural species along the southern and northern edges. The shrub and field layer are sparse, although bramble is present throughout. All three of these areas are likely to support hazel dormouse, although they comprise relatively poor-quality habitat for the species lacking a dense shrub layer, understorey and diversity of species. As a result, hazel dormouse is likely to be present in these areas at lower densities compared to The Avenue. Therefore, the hazel dormouse population in these areas is considered to total no more than 10-15 individuals.

Woodland linkages between the four main woodland blocks within the site comprise mainly willow *Salix* species dominated tree lines that are unlikely to support a permanent population, however they are likely to be a functional part of the hazel dormouse population through their woody vegetation linkage between larger tracts of suitable habitat.

4.0 CONCLUSIONS

4.1 Conclusion

Survey work in 2005-2009 has shown that the site supports a population of hazel dormouse. An updating field survey undertaken in 2018 revealed that the on-site woody vegetation remains suitable for hazel dormouse and therefore the species is likely to still be present.

5.0 REFERENCES

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Map H1 Site Location Plan

Map H2 Key Site Features

Map H3 Hazel Dormouse Desktop Study Data

Map H4 Hazel Dormouse Survey Results

Map H5 Suitable Hazel Dormouse Habitat