

CABBAGEFIELD ROW, LEIGH PARK, HAVANT

ECOLOGICAL IMPACT ASSESSMENT

Final Document (Revision 1)

January 2023

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

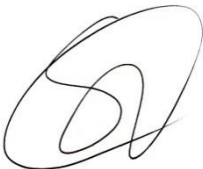
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ECOLOGICAL IMPACT ASSESSMENT

Table of Contents

EXECUTIVE SUMMARY	1
1.0 INTRODUCTION	3
1.1 Background.....	3
1.2 The Site	3
1.3 Aims and Scope of Report.....	3
1.4 Site Proposals.....	4
2.0 PLANNING POLICY CONTEXT	5
2.1 Introduction	5
2.2 National Policy	5
2.3 Local Policy.....	6
2.3.1 <i>Havant Core Strategy</i>	6
2.3.2 <i>Havant Local Plan 2036</i>	7
3.0 METHODS.....	10
3.1 Introduction	10
3.2 Zone of Influence	10
3.3 Scoping	10
3.4 Desk Study	10
3.4.1 <i>Biological Records Centre</i>	10
3.4.2 <i>Multi-Agency Geographic Information for the Countryside</i>	11
3.4.3 <i>Other Sources of Information</i>	11
3.4.4 <i>Desk Study Limitations</i>	12
3.5 Field Survey.....	12
3.5.1 <i>Survey Methods</i>	12
3.5.2 <i>Survey Details</i>	12
3.5.3 <i>Field Survey Limitations</i>	13
3.6 National Vegetation Classification Survey.....	13
3.6.1 <i>Survey Methods</i>	13
3.6.2 <i>Survey Details</i>	13
3.6.3 <i>Survey Limitations</i>	13
3.7 Bat Survey	14
3.7.1 <i>Survey Methods</i>	14
3.7.2 <i>Survey Details</i>	17
3.7.3 <i>Survey Limitations</i>	22
3.8 Hazel Dormouse Survey.....	23
3.8.1 <i>Survey Methods</i>	23
3.8.2 <i>Survey Details</i>	24
3.8.3 <i>Survey Limitations</i>	24
3.9 Bird Survey	25
3.9.1 <i>Survey Methods</i>	25
3.9.2 <i>Survey Details</i>	26
3.9.3 <i>Survey Limitations</i>	26
3.10 European nightjar Survey	26
3.10.1 <i>Survey Methods</i>	26
3.10.2 <i>Survey Details</i>	26
3.11 Reptile Survey	27
3.11.1 <i>Survey Methods</i>	27
3.11.2 <i>Survey Details</i>	27
3.11.3 <i>Survey Limitations</i>	28

3.12	Invertebrate Survey	28
3.12.1	Survey Methods.....	28
3.12.2	Survey Details.....	28
3.12.3	Survey Limitations	28
3.13	Criteria used to Assess Ecological Value	28
4.0	BASELINE ECOLOGICAL CONDITIONS AND EVALUATION	30
4.1	Introduction	30
4.2	Statutory and Non-statutory Designated Sites	30
4.2.1	Baseline Ecological Conditions	30
4.2.2	Evaluation	33
4.3	Habitats.....	33
4.3.1	Baseline Ecological Conditions	33
4.3.2	Evaluation	38
4.4	Bats.....	38
4.4.1	Baseline Ecological Conditions	38
4.4.2	Evaluation	47
4.5	Otter.....	47
4.5.1	Baseline Ecological Conditions	47
4.6	Badger	48
4.6.1	Baseline Ecological Conditions	48
4.7	Hazel Dormouse.....	48
4.7.1	Baseline Ecological Conditions	48
4.7.2	Evaluation	49
4.8	Water Vole.....	50
4.8.1	Baseline Ecological Conditions	50
4.9	Birds.....	50
4.9.1	Baseline Ecological Conditions	50
4.9.2	Evaluation	54
4.10	Reptiles.....	54
4.10.1	Baseline Ecological Conditions	54
4.10.2	Evaluation	55
4.11	Great Crested Newt.....	56
4.11.1	Baseline Ecological Conditions	56
4.12	Invertebrates.....	57
4.12.1	Baseline Ecological Conditions	57
4.12.2	Evaluation	65
4.13	Other Relevant Species.....	65
4.13.1	Baseline Ecological Conditions	65
4.14	Summary of Baseline Ecological Conditions.....	66
5.0	ASSESSMENT OF ECOLOGICAL EFFECTS AND MITIGATION/COMPENSATION/ ENHANCEMENT MEASURES	68
5.1	Introduction	68
5.2	Scheme Design	68
5.3	Designated Sites	68
5.3.1	Potential Impacts and Effects	68
5.3.2	Mitigation Measures.....	69
5.3.3	Significance of Residual Effects	71
5.3.4	Compensation.....	71
5.3.5	Enhancement.....	71
5.3.6	Monitoring	71
5.4	Habitats.....	71
5.4.1	Potential Impacts and Effects	71
5.4.2	Mitigation Measures.....	72
5.4.3	Significance of Residual Effects	72
5.4.4	Compensation.....	72
5.4.5	Enhancement.....	72
5.4.6	Monitoring	73
5.5	Bats.....	73

5.5.1	Potential Impacts and Effects	73
5.5.2	Mitigation Measures.....	73
5.5.3	Significance of Residual Effects	74
5.5.4	Compensation.....	74
5.5.5	Enhancement.....	74
5.5.6	Monitoring	74
5.6	Badger	74
5.6.1	Potential Impacts and Effects	74
5.6.2	Mitigation Measures.....	74
5.6.3	Significance of Residual Effects	75
5.6.4	Compensation.....	75
5.6.5	Enhancement.....	75
5.6.6	Monitoring	75
5.7	Hazel Dormouse	75
5.7.1	Potential Impacts and Effects	75
5.7.2	Mitigation Measures.....	75
5.7.3	Significance of Residual Effects	76
5.7.4	Compensation.....	76
5.7.5	Enhancement.....	76
5.7.6	Monitoring	76
5.8	Birds.....	77
5.8.1	Potential Impacts and Effects	77
5.8.2	Mitigation Measures.....	77
5.8.3	Significance of Residual Effects	77
5.8.4	Compensation.....	77
5.8.5	Enhancement.....	78
5.8.6	Monitoring	78
5.9	Reptiles.....	78
5.9.1	Potential Impacts and Effects	78
5.9.2	Mitigation Measures.....	79
5.9.3	Significance of Residual Effects	79
5.9.4	Compensation.....	80
5.9.5	Enhancement.....	80
5.9.6	Monitoring	80
5.10	Invertebrates.....	80
5.10.1	Potential Impacts and Effects	80
5.10.2	Mitigation Measures.....	80
5.10.3	Significance of Residual Effects	80
5.10.4	Compensation.....	80
5.10.5	Enhancement.....	81
5.10.6	Monitoring	81
5.11	Other Relevant Species.....	81
5.11.1	Potential Impacts and Effects	81
5.11.2	Mitigation Measures.....	81
5.11.3	Significance of Residual Effects	81
5.11.4	Compensation.....	81
5.11.5	Enhancement.....	81
5.11.6	Monitoring	82
6.0	CONCLUSIONS	83
6.1	Conclusion.....	83
6.2	Updating Site Survey	83
7.0	REFERENCES	85
Map 1	Site Location Plan	
Map 2	Designated Sites Plan	

- Map 3** Phase 1 Habitat Map
- Map 4** Ground Level Tree Assessment
- Map 5a.** Bat Transect Survey – April 2019
- Map 5b.** Bat Transect Survey – June 2019
- Map 5c.** Bat Transect Survey – July 2019
- Map 5d.** Bat Transect Survey – August 2019
- Map 5e.** Bat Transect Survey – September 2019
- Map 5f.** Bat Transect Survey – October 2019
- Map 6** Bat Automated Detector Survey
- Map 7** Bat Trapping Surveys
- Map 8** Hazel Dormouse Survey
- Map 9** Breeding Bird Survey
- Map 10** Reptile Survey
- Appendix 1** Proposed Site Layout
- Appendix 2** Sites Designated for Nature Conservation
- Appendix 3** Relevant Legislation
- Appendix 4** Protected and Notable Species Appraisal Methods
- Appendix 5** Appraisal Criteria for Bats
- Appendix 6** Assessment Criteria for Roosting Bats
- Appendix 7** Automated Detector Settings
- Appendix 8** Statutory Designated Sites within the Desktop Study Area
- Appendix 9** Ecology and Landscape Plan

EXECUTIVE SUMMARY

Ecological Survey and Assessment Ltd (ECOSA) have been appointed by Portsmouth City Council to undertake an Ecological Impact Assessment to support a planning application for the redevelopment of Cabbagefield Row, Havant. The site is located on the outskirts of Havant and comprises an area of grassland and scrub, bordered on three sides by woodland. The proposals entail the construction of 150 dwellings.

The main findings of the Ecological Impact Assessment are:

- Four statutory designated sites (three of European – International importance and one of county importance) and eight non-statutory designated sites of county importance lie within the sites Zone of Influence;
- The site is of county level importance for woodland habitat, hazel dormouse and slow-worm, up to county level importance for semi-improved grassland, and terrestrial invertebrates, local importance for adder and common lizard, and site level importance for bats, breeding birds and European hedgehog;
- Unmitigated, the proposals have potential to result in adverse effects on designated sites, notable grassland and woodland habitats, bats, hazel dormouse, breeding birds, reptiles and terrestrial invertebrates. Adverse effects may result as a result of direct impact/harm during construction, habitat loss, recreational pressure and disturbance;
- Mitigation measures including protection of retained habitats during construction, sensitive timing of works and working methods and buffering of adjacent habitats from the built development have been proposed, however, some residual effects will remain in order to facilitate the proposals. Therefore further compensatory measures including enhancement of existing habitat, particularly the grassland in the north of the site which is designated as a SINC, and creation of new, high quality habitat which will be valuable for a range of species is also proposed. The delivery of this habitat will be both on site and off site, it is anticipated that the location of off-site compensation will be agreed with the local authority through ongoing liaison during the planning process. The long-term management of these habitats will ensure an overall enhancement of the site over the current baseline;
- In order to undertake activities that would otherwise represent a legal offence due to the presence of hazel dormouse, a European Protected Species Mitigation licence will be sought from Natural England in relation to this species;

- Post-development, monitoring of notable habitats and hazel dormouse monitoring will be undertaken to ensure the success of the proposed mitigation;
- Given the impacts identified, and the mitigation, compensation and enhancement measures proposed it is considered that the proposals accord with all relevant local and national planning policy.
- If the planning application boundary changes or the proposals for the site alter, a re-assessment of the scheme in relation to ecology may be required. Given the mobility of animals and the potential for colonisation of the site over time, updating survey work may be required, particularly if development does not commence within 12 months of the date of the most recent relevant survey.

1.0 INTRODUCTION

1.1 Background

Ecological Survey & Assessment Limited (ECOSA) have been appointed by Portsmouth City Council to undertake an Ecological Impact Assessment to support a planning application for the development of Cabbagefield Row, Swanmore Road, Leigh Park, Havant, Hampshire, PO9 4EX (hereafter referred to as the site).

1.2 The Site

The site is located immediately north of the settlement of Leigh Park, which forms the northern edge of the town of Havant in Hampshire, centred on National Grid Reference (NGR) SU 7066 0958 (**Map 1**). The Phase 1 habitat map (**Map 2**) depicts the boundary of the site.

The site consists of grassland and scrub, bordered on three sides by woodland. Immediately south of the site is Swanmore Road which forms the northern edge of Leigh Park. Further north and east from the site lies open countryside dominated by woodland and grassland associated with Havant Thicket and Staunton Country Park. To the west, the A3(M) road corridor passes approximately 700 metres away in a north-south direction, and to the west of this road is the town of Waterloo. Further south of the site is the town of Havant.

1.3 Aims and Scope of Report

The information within this report is based on a field survey and desktop study and relevant species-specific surveys carried out between 29th July 2019 and 19th May 2020. The report describes the habitats and species (hereafter referred to as ecological features) within the site's Zone of Influence (Paragraph 3.2), and provides a detailed assessment of potential ecological effects of the proposed development of the site. It identifies the need for any measures to avoid, mitigate or compensate for significant adverse effects¹ ecological features and outlines enhancements to the site's ecology to be implemented as part of the development. The objectives of the assessment are:

- To provide baseline information on ecological features within the site's Zone of Influence and determine the importance of these features;
- To assess, characterise and quantify the effects on ecological features, including cumulative effects, and identify significant effects in the absence of any mitigation;

¹ For the purposes of this assessment a 'significant' adverse effect is one which will have an adverse effect on the ecological feature at the site level or higher.

- To set out measures to avoid, mitigate and compensate for significant ecological effects in accordance with the 'mitigation hierarchy'²;
- To provide an assessment of the significance of any residual effects;
- To outline opportunities for enhancement in order to achieve a net gain for biodiversity; and
- To set out the requirements for any post-construction monitoring.

1.4 Site Proposals

The proposed development entails the construction of 150 residential units in the south of the site. Access will be gained from two locations on Swanmore Road through the southern site boundary. A significant area in the north of the site is proposed to be retained as open space.

The Ecological Impact Assessment is based on the proposals plan produced by PDP Architecture, dated May 2021 (Drawing No. 28079-PD111 Rev. D) (**Appendix 1**).

Planning permission is being sought during mid-late 2021 with construction proposed to commence soon after permission has been granted.

² In accordance with CIEEM Ecological Impact Assessment guidance (CIEEM, 2018) a sequential process is adopted to address impacts on features of ecological interest, with 'Avoidance' prioritised at the top of the hierarchy and Compensation/Enhancement' at the bottom. This is often referred to as the 'mitigation hierarchy'.

2.0 PLANNING POLICY CONTEXT

2.1 Introduction

This section summarises the planning policy in relation to ecology and biodiversity within the Havant Borough Council administrative area. This information is then used to assess the compliance of the scheme in relation to relevant planning policy and where necessary make recommendations for mitigation, compensation and enhancements (see Section 5.0).

2.2 National Policy

The National Planning Policy Framework (NPPF) sets out the government's requirements for the planning system in England. The original document was published in 2012 with a revised NPPF published in February 2019. A number of sections of the NPPF are relevant when taking into account development proposals and the environment. 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 the plan or project will not adversely affect the integrity of the habitats site."*

The NPPF sets out that development proposals should 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 and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures..."*.

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 habitats³, including ancient woodland⁴. Where loss to irreplaceable habitats occurs planning permission would normally be refused unless there are wholly exceptional reasons and an adequate compensation strategy is in place. Paragraph

³ The NPPF defines irreplaceable habitats as *"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."*

⁴ Natural England defines ancient woodland as *"An area that has been wooded continuously since at least 1600 AD. It includes ancient semi-natural woodland and plantations on ancient woodland sites (PAWS)."*

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 SPAs, SACs and Ramsar sites or acting as compensation for SPAs, SACs and Ramsar sites, should receive the same protection as habitat sites.

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”*. 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 Project Development, is established before planning permission is granted”*.

2.3 Local Policy

Local planning policy within Havant is provided by Havant Core Strategy, which was adopted in 2011 and Havant Site Allocations Plan, adopted in 2014. The Havant Local Plan 2036 is currently at Pre-Submission stage.

2.3.1 Havant Core Strategy

Two policies within the existing Core Strategy refer in part ecology and biodiversity:

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

Policy CS11 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 DM9 - Development in the Coastal Zone

Policy DM9 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 and Local Nature Reserves.

2.3.2 Havant Local Plan 2036

Four policies within the Havant Local Plan 2036 refer to ecology and biodiversity that is relevant to the proposed development:

Policy E14 - The Local Ecological Network

Policy E14 states that all development in Havant Borough is expected to protect, conserve and enhance the Borough's Local Ecological Network. Planning permission will only be granted where:

- a. The development of one dwelling or more or a new commercial building results in biodiversity net gain;
- b. The development avoids the fragmentation of the Local Ecological Network;
- c. 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
- d. Any necessary mitigation plan includes provision for ongoing management and maintenance;
- e. In addition to the above, priority habitats in the Borough are afforded protection by specific nature conservation designations. Development proposals which could affect a designated site will need to consider the impact and respond appropriately.

International Nature Conservation Designations;

- f. Development which has the potential to have an impact on an international nature conservation designation will be subject to a Habitats Regulations Assessment and, if necessary, an Appropriate Assessment, to determine the potential for likely significant effects. Development that is likely to have an adverse effect, either alone or in combination with another project/plan, on the integrity of an international site will not be permitted unless it can be demonstrated that:
- g. Necessary avoidance or mitigation is secured such that in combination with other development there will be no adverse effects on the integrity of the designated sites; or
- h. There are no alternative sites for the proposal, there are reasons of overriding public benefit/interest and compensatory provision is secured.

In addition to criteria a) to d), planning permission will only be permitted on or adjacent to a local nature conservation designation where:

- i. The value of the designation is retained and, where possible, enhanced in line with its original criteria for designation through avoidance and/or mitigation measures; or

- j. The benefit of the development can be shown to clearly outweigh the substantive nature conservation value of the site, and where the impact cannot be avoided nor mitigated, compensation is provided.

Policy E15 - Protected Species

Policy E15 identifies that development proposals which are likely to affect protected species, and/or their supporting habitats, must undertake appropriate surveys to establish their presence/likely absence. In using the findings of such surveys, proposals should, in the first instance, avoid an impact on a protected species. If this is not possible, planning permission will only be granted where:

- a. A Mitigation Plan, or if this is not possible a Compensation Plan, is provided to the satisfaction of the Council; and
- b. A Monitoring and Review Plan is put in place.

The policy includes a specific need for the protection of sites where Bechstein's bat may be present.

Policy E16 - Solent Special Protection Areas

Policy E16 recognises that planning permission will be granted for new dwellings that mitigate the likely significant effect on the Solent SPAs. This mitigation can be provided through either:

- a. A financial contribution consistent with the Solent Recreation Mitigation Strategy (SRMS); or
- b. A developer provided package of measures associated with the proposed development supported by evidence that it will avoid or mitigate any likely significant effect on the SPAs; or
- c. A combination of measures in (a) and (b) above.

Where these measures cannot be provided development proposals will be refused, unless the applicant can show, subject to meeting the tests of the Habitats Regulations, that there would not be a likely significant effect on the Solent SPAs either alone or in combination with other plans or projects.

Policy E18 - Trees, Hedgerows and Woodland

Policy E18 states that development affecting trees, hedgerows and woodlands will only be permitted where it adequately protects existing trees and hedgerows including their root systems prior to, during and after the construction process; and will not result in the loss or deterioration of ancient woodland and ancient or veteran trees. The Council will refuse planning permission for proposals that threaten the retention of important trees, hedgerows, and woodland, unless the need for, and benefits of development in

that location clearly outweigh the impact of the proposal. Provision of new trees are expected as part of development proposals for new homes and commercial floorspace.

Strategic Allocation

Within the Site Allocations document and the emerging Local Plan, Cabbagefield Row is identified as a strategic allocation for housing development.

Policy UE6a

Policy UE6a of the adopted Allocations Plan identifies that an Ecological Assessment will be required to support a planning application to assess the impact on the adjacent SINC. Any impacts, including permanent fragmentation of priority habitats, will need to be mitigated and implemented through a Management Plan on the adjacent SINC designations or other measures.

Policy H34

Policy H34 of the emerging local plan includes a requirement for the site to include protection of the on-site SINC and retention of trees and hedgerows.

At present these policies are provisional (along with nature conservation policies within the Pre-Submission Plan), however they provide an indication of likely requirements.

3.0 METHODS

3.1 Introduction

This section details the methods employed during the Ecological Impact Assessment. Any significant limitations to the assessment are also considered.

3.2 Zone of Influence

To define the total extent of the study area for this assessment, the proposed scheme was reviewed to establish the spatial scale at which ecological features could be affected⁵. The appropriate survey radii for the various elements of the assessment (i.e. desktop study, field survey and species-specific surveys) 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 assessment, its surroundings and the nature of the proposals.

3.3 Scoping

Protected species considered within the Ecological Impact Assessment are those species/species groups considered likely to be encountered given the geographical location and context of the site. Where the site was found to be suitable to support these species/species groups, and adverse effects cannot be avoided from the outset, further species-specific surveys are undertaken. These are discussed within the results section (Section 4.0) of the current report. Where such a species is unlikely to be present on site a justification for likely absence is provided. Species considered likely absent from the site are not then considered in the assessment of ecological effects and mitigation/compensation measures section (Section 5.0) of this report.

3.4 Desk Study

3.4.1 Biological Records Centre

Hampshire Biodiversity Information Centre (HBIC) was consulted on 29th July 2019 for the following data:

- Records of non-statutory designated sites (Sites of Importance for Nature Conservation (SINCs)) within one kilometre of the site boundary. See **Appendix 2** for details;
- Records of legally protected and notable species (flora and fauna) within one kilometre of the site boundary, including Species of Principal Importance (**Appendix 3**); and

⁵ 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 (CIEEM, 2018).

- Records of bats within two kilometres of the site boundary. Bat species are highly mobile and therefore the search radius is increased for this species group.

3.4.2 Multi-Agency Geographic Information for the Countryside

The Multi-Agency Geographic Information for the Countryside (MAGIC) database (DEFRA, 2019) was reviewed on most recently on 7th May 2020 to establish the location of statutory designated sites located within the vicinity of the site. This included a search for all internationally and nationally designated sites such as Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Wetlands of International Importance (Ramsar sites), Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs) within one kilometre of the site. See **Appendix 2** for details. Where appropriate, the desk study search area has been extended to take account of any appropriate statutory designated sites which need consideration in terms of potential in-direct effects and which support particularly mobile species, particularly those specifically mentioned in local planning policy. The Impact Risk Zones (IRZ) were also obtained from MAGIC, which are used to help guide and assess planning applications for likely effects on SSSIs.

Sites within two kilometres of the site boundary where European Protected Species Mitigation (EPSM) licences have been granted were reviewed. This information allows a greater understanding of the potential for European protected species to be present in the local area.

3.4.3 Other Sources of Information

Online mapping resources, at an appropriate scale, were used to identify the presence of habitats such as woodland blocks, ponds, watercourses and hedgerows, in the vicinity of the site. These habitats may offer resources and connectivity between the site and suitable habitat in the local area, which may be exploited by local species populations.

The presence of ponds or other waterbodies within a 500 metre radius of the site in particular are noted in relation to great crested newt. The 500 metre radius is a standardised search radius to assist in the assessment of the suitability of a site and its surrounding habitat to support this species, based on current Natural England guidance (English Nature, 2001).

The site is located in the vicinity of Havant Thicket, where an extensive suite of surveys has been undertaken by ECOSA in support of a separate application for the development of a new reservoir (ECOSA, 2020). The findings of these surveys have been discussed in this report where relevant.

3.4.4 Desk Study Limitations

Areas of ancient woodland shown on plans as part of the HBIC consultation only include areas over two hectares and therefore smaller areas of ancient woodland may not be identified.

HBIC do not currently hold species information for certain taxonomic groups. The main datasets which have been included in the HBIC consultation were provided, however, the specific taxonomic groups omitted from the consultation were not.

3.5 Field Survey

3.5.1 Survey Methods

The field survey broadly followed standard Phase 1 habitat survey methodology (JNCC, 2010) and included a search for evidence of, and an assessment of the site's suitability to support, protected and notable species as recommended by CIEEM (CIEEM, 2017). The field survey covered all accessible areas of the site, including boundary features. Habitats described in Section 4.0, have been mapped (**Map 3**) and photographs provided, where relevant. For ease of reference, Target Notes (TN) depict locations of particular ecological interest or features which are too small to map.

Phase 1 Habitat Survey

An assessment was made of all areas of vegetation within the site based on the standardised Phase 1 habitat survey methodology (JNCC, 2010). This involved identification of broad vegetation types, which were then classified against Phase 1 habitat types, where appropriate. A list of characteristic plant species for each vegetation type was compiled and any invasive species⁶ encountered as an incidental result of the survey recorded.

Protected and Notable Species Appraisal

A preliminary appraisal of the site's suitability to support legally protected and notable species was carried out. Specific methods for species/species groups considered during the appraisal are provided in **Appendix 4**.

3.5.2 Survey Details

The field survey was carried out by Graeme Down, Senior Ecologist of ECOSA on 11th April 2019. The weather conditions were sunny with approximately 0-25% cloud cover, an ambient temperature of 3-12°C and no wind. During the survey, the surveyor was equipped with 8x42 binoculars, a high powered torch and a digital camera.

⁶ Plant species included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). The survey was not specifically aimed at assessing the presence of these species and further specialist advice may need to be sought.

3.5.3 Field Survey Limitations

Ecological surveys are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. The field survey has therefore not produced a complete list of plants and animals and in the absence of evidence of any particular species should not be taken as conclusive proof that the species is absent or that it will not occur in the future.

Online mapping resources provide an indication of habitat features present in the wider area, but do not provide a detailed assessment of habitat types.

3.6 National Vegetation Classification Survey

3.6.1 Survey Methods

The general aims of the National Vegetation Classification survey are as follows:

- To record and map the vegetation of the site to NVC level where appropriate;
- To obtain preliminary data on species composition and species richness of the vegetation, in order to identify areas of higher ecological value;
- To record the locations of any rare, scarce, county notable or other species of recognised conservation status; and
- To record any 'invasive non-native plants' listed on Schedule 9, Part 2 of the Wildlife & Countryside Act 1981, as updated April 2010.

Vegetation types are assigned to NVC community or sub-community level where possible, generally by making a visual assessment of species composition, vegetation structure and any apparent management. A species list of plants is compiled, and their abundance estimated using the DAFOR scale⁷. The boundaries of vegetation types are marked onto printed aerial photographs and later mapped digitally using a GIS application.

3.6.2 Survey Details

The NVC survey was undertaken on 18th July 2019, by Graeme Down, Senior Ecologist of ECOSA. The weather was dry and sunny, with an ambient temperature of 22°C, 100% cloud cover and no wind.

3.6.3 Survey Limitations

There were no significant limitations to the NVC survey.

⁷ 'DAFOR' is a scale of species frequency/cover commonly used in botanical surveys, as follows:
D = dominant A = abundant F = frequent O = occasional R = rare

3.7 Bat Survey

3.7.1 Survey Methods

Ground Level Tree Assessment

The ground level tree assessment was undertaken in line with current best practice guidelines (Collins, 2016). An assessment was made of the suitability of the trees on the site and trees within approximately five metres of the site boundary⁸ (**Map 4**) to support roosting bats based on the presence of Potential Roost Features such as holes, cracks, splits, loose bark and ivy cladding. The assessment of the potential for trees on the site to support roosting bats is based on a four-point scale as detailed in **Appendix 5**.

Bat Emergence/Re-entry Survey

The bat emergence/re-entry survey was undertaken in line with current best practice guidelines (Collins, 2016). In accordance with guidelines for trees assessed as having suitability to support roosting bats a single dusk emergence survey and a single dawn re-entry survey was undertaken for trees assessed as having medium suitability for roosting bats, and two dusk emergence surveys and a single dawn re-entry survey were undertaken for trees with high suitability to support roosting bats in order to ascertain the presence/likely absence of roosting bats from within the trees. Where the presence of roosting bats is confirmed the data also allows for an assessment of the status of the roost present. The status of roosts (where appropriate) has been based on standard terminology as detailed in **Appendix 6**.

The dusk emergence surveys commenced approximately 15 minutes before sunset until approximately two hours after sunset. The dawn re-entry surveys commenced approximately two hours before sunrise until just after sunrise.

The surveys were carried out by one or two experienced ECOSA surveyors per tree, positioned at previously identified vantage points. These vantage point locations allowed a sufficient coverage of the Potential Roosting Features identified on the trees impacted by the proposals.

During the surveys surveyors recorded the time, species, location and direction of flight for each bat encountered, with particular attention paid to establishing bat access/egress locations to any roosts within the trees.

Bat Transect Survey

Bat transect surveys were undertaken in line with current best practice guidelines (Collins, 2016). Given that the site has been assessed as having moderate suitability

⁸ This is the distance at which it was determined that any trees may be directly affected at the time of survey.

for supporting foraging and commuting bats a single survey visit was undertaken on a monthly basis between April and October 2019 to allow an assessment of the status and importance of foraging/commuting bats at the site to be made.

A team of two surveyors walked a pre-determined transect route across the site on each occasion (**Map 5a** to **Map 5f**), walking the same transect route on each survey. The transect route ensured that the surveyors visited key areas of foraging and commuting habitat within the site, such as woodland edges, as well as less suitable habitats. The dusk transects surveys commenced at sunset and lasted for at least two hours depending on the level of bat activity recorded whilst the dawn transect survey commenced two hours before sunrise and lasted until sunrise. A single dusk and dawn transect survey was undertaken in the same 24 hour period. The transect route was split into equal sections and was walked at a steady speed so that the activity levels on each section and from each survey are comparable.

At the end of each transect survey, data was downloaded and then analysed using BatExplorer (Version 2.0). This program is designed to analyse bat call data by identifying key call characteristics such as call shape, call length, call 'distance' (i.e. the time period between two consecutive calls) and peak frequency,

The species calls were subsequently checked manually by a suitably qualified ecologist using the spectrogram feature of BatExplorer to verify their identities. Where suitable recordings were obtained, bats were identified to species level. For some groups, notably long-eared bat species⁹ and *Myotis*¹⁰ bat species, specific identification was not always possible.

The GPS feature of the Batlogger M allows the location of the surveyor at the time of each bat call registration to be recorded. This data is exported to BatExplorer and used to create a 'heat map' of activity at the site for each bat species recorded.

The GPS feature shows the location of the surveyor when the registration was recorded, not the location of the bat. Where bats were heard but not seen it has been assumed that they are flying in the vicinity of the surveyor. Where bats were seen some distance from the surveyor the locations of these bats were noted.

9 There are two species of long-eared bat, the brown long-eared bat *Plecotus auritus* and the grey long-eared bat *Plecotus austriacus*. These species can only be separated by examination of physical characteristics and Phylogenetic Analysis Identification of bat droppings. Unless confirmation of identification has been made by visual identification the two species shall be referred to in this report as long-eared bat. The brown long-eared bat is the commonest of the two species typically being found roosting within large roof voids although small voids and trees are also utilised. The grey long-eared bat is rare and confined to southern England and like the brown long-eared typically roosts in roof voids.

10 There are seven species of *Myotis* bats in Britain. *Myotis* bats are very difficult to identify specifically, this can generally only be done by examination of physical features and Phylogenetic Analysis Identification of bat droppings. Many of these bats are common and will utilise buildings for roosting often occupying small and inaccessible voids. For the purpose of this report all species shall be referred to as *Myotis* bats unless a specific identification has been possible.

Bat Automated Detector Survey

In addition to the transect surveys automated detector surveys were undertaken in line with current best practice guidelines (Collins, 2016) between April and October 2020 inclusive.

Two Wildlife Acoustics Song Meter 4 (SM4 FS) detectors with SMM-U2 microphones were deployed at the site for five consecutive nights each month between April and October 2020.

The automated detectors were secured in suitable habitat with the microphone positioned to face towards the nearest open space. The devices were programmed to record between 30 minutes before sunset, until 30 minutes after sunrise the following morning on each night they were deployed. The settings utilised on the automated detectors are provided in **Appendix 7**.

The detectors were deployed at alternating locations during each survey period in order to allow a determination of the levels of activity at the site in each survey period. The locations at which the automated detectors were deployed are provided in (**Map 6**).

At the end of each automated survey period, the remote bat detectors were retrieved from the site, data was downloaded and then analysed using Kaleidoscope Pro® (Version 3.1.4B). This program is designed to analyse large volumes of bat call data using an automated classifier (Bats of United Kingdom Version 3.1.3). More information on the settings used for the conversion process are provided in **Appendix 7**.

The species calls were subsequently checked manually by a suitably qualified ecologist using the Kaleidoscope software, to verify their identities. Sonobat® (v2.9.7) was used to confirm the species identity for ambiguous bat calls. Where suitable recordings were obtained, bats were identified to species level. For some groups, notably long-eared bat species and *Myotis* bat species, specific identification was not always possible.

The data was then exported to Microsoft Excel for detailed analysis (i.e. counts of bat registrations) of various parameters.

The number of registrations recorded is not a measure of the number of bats present on site; the number of registrations provides a quantitative assessment of the level of bat activity at a particular location (i.e. the greater the number of registrations, the greater the level of bat activity). The data cannot differentiate between, for example, a single bat passing the detector 10 times or 10 bats passing the detector on a single occasion. The detectors were programmed to count each two second call as a single bat pass.

In order to standardise the number of bat calls recorded the data was then used to calculate an “Activity Index” for various different parameters to be assessed. This involved dividing the number of registrations by the number of nights which detectors were deployed. This data is then represented as number of registrations per night.

Bat Trapping Survey

Surveyors used a combination of mist nets and a harp trap to capture bats during the sessions, using two teams at different locations. On each night survey teams initially focussed on a particular location, where bats had previously been successfully captured, but then switched to a ‘roving’ trapping technique whereby surveyors set up a single mist net in likely habitat for 30 minutes or less, using a lure to attract Bechstein’s bat. Locations of trapping sites are provided in **Map 7**.

All bats caught were identified to species level, sexed, aged and breeding status was determined e.g. breeding female, non-breeding female, sexually active male etc

Bats were released immediately following examination.

3.7.2 Survey Details

Ground Level Tree Assessment

The ground level tree assessment was carried out during the field survey by Graeme Down, Senior Ecologist of ECOSA on 11th April 2019. The weather conditions were sunny with approximately 0-25% cloud cover, an ambient temperature of 3-12°C and no wind.

Bat Emergence/Re-entry Survey

The bat emergence/re-entry surveys were undertaken between July and September 2019 on trees target noted in **Map 4**. **Table 1** provides details of each emergence/re-entry survey.

Table 1: Bat emergence/re-entry survey details

Survey Date	Tree No.	Survey Type	Survey Timings	Weather Conditions	Sunset/Sunrise Time
18 th July 2019	TN1	Emergence	Start: 20:53 End: 23:10	General conditions: Dry Start temp: 19°C End temp: 19°C Cloud Cover: 0 Wind Speed: Calm	21:10
24 th August 2019	TN1	Re-entry	Start: 04:00 End: 06:26	General conditions: Dry Start temp: 11°C End temp: 13°C Cloud Cover: 0 Wind Speed: Gentle breeze	06:03

Survey Date	Tree No.	Survey Type	Survey Timings	Weather Conditions	Sunset/ Sunrise Time
19 th September 2019	TN1	Emergence	Start: 18:55 End: 21:10	General conditions: Dry Start temp: 17°C End temp: 13°C Cloud Cover: 0 Wind Speed: Gentle breeze	19:10
18 th July 2019	TN3	Emergence	Start: 20:55 End: 23:10	General conditions: Dry Start temp: 19°C End temp: 19°C Cloud Cover: 0 Wind Speed: Calm	21:10
24 th August 2019	TN3	Re-entry	Start: 04:06 End: 06:21	General conditions: Dry Start temp: 11°C End temp: 13°C Cloud Cover: 0 Wind Speed: Gentle breeze	06:03
19 th September 2019	TN3	Emergence	Start: 18:54 End: 21:09	General conditions: Dry Start temp: 17°C End temp: 13°C Cloud Cover: 0 Wind Speed: Gentle breeze	19:10
15 th August 2019	TN4	Re-entry	Start: 03:52 End: 06:03	General conditions: Dry Start temp: 16°C End temp: 16°C Cloud Cover: 90 Wind Speed: Light breeze	05:52
19 th September 2019	TN4	Emergence	Start: 18:54 End: 21:09	General conditions: Dry Start temp: 17°C End temp: 13°C Cloud Cover: 0 Wind Speed: Gentle breeze	19:10
26 th September 2019	TN4	Emergence	Start: 18:45 End: 20:53	General conditions: Dry Start temp: 21°C End temp: 16°C Cloud Cover: 90 Wind Speed: Moderate breeze	18:53
15 th August 2019	TN5	Re-entry	Start: 03:52 End: 06:07	General conditions: Dry Start temp: 16°C End temp: 16°C Cloud Cover: 90 Wind Speed: Light breeze	05:52
19 th September 2019	TN5	Emergence	Start: 18:55 End: 21:10	General conditions: Dry Start temp: 17°C End temp: 13°C Cloud Cover: 0 Wind Speed: Gentle breeze	19:10

Survey Date	Tree No.	Survey Type	Survey Timings	Weather Conditions	Sunset/ Sunrise Time
27 th August 2019	TN8	Re-entry	Start: 04:15 End: 06:24	General conditions: Dry Start temp: 17°C End temp: 15°C Cloud Cover: 35 Wind Speed: Calm	06:09
19 th September 2019	TN8	Emergence	Start: 18:55 End: 21:10	General conditions: Dry Start temp: 17°C End temp: 13°C Cloud Cover: 0 Wind Speed: Gentle breeze	19:10

During the bat emergence/re-entry surveys the surveyors were equipped with Pettersson D240x time expansion or Batlogger M bat detectors. The Pettersson detectors were connected to Edirol R-05 recorders for the full duration of the survey. Recordings made with the detectors were later analysed using Sonobat (v2.9.7) or BatExplorer (v2.1) to confirm the identity of any species encountered. For some potential roosting features, where features were at a significant height and therefore more difficult to monitor in the dark staff were equipped with Bushnell night vision goggles.

The bat emergence/re-entry surveys were coordinated by Graeme Down, Senior Ecologist of ECOSA assisted by suitably qualified and experienced ECOSA surveyors.

Bat Transect Survey

The bat transect surveys were undertaken between April and October 2019 with a total of five dusk bat transect surveys and a single dusk pre-dawn survey. **Table 2** provides details of each survey.

Table 2: Bat transect survey details

Survey Date	Survey Type	Duration	Weather Conditions	Sunset/ Sunrise Time
April 2019	Dusk	20:13 – 22:13	9°C, Dry, 70% cloud cover and no wind	20:13
June 2019	Dusk	21:24 – 23:24	18°C, Dry, 90% cloud cover and no wind	21:24
July 2019	Dusk	21:04 – 23:04	20°C, Dry, 5% cloud cover and a light breeze	21:04
July 2019	Dawn	03:36 – 05:16	17°C, Dry, 0% cloud cover and no wind	05:21

Survey Date	Survey Type	Duration	Weather Conditions	Sunset/ Sunrise Time
August 2019	Dusk	20:11 – 22:11	16°C, Dry, 0% cloud cover and no wind	20:11
September 2019	Dusk	19:13 – 21:13	16°C, Dry, 0% cloud cover and a light breeze	19:13
October 2019	Dusk	17:54 – 19:54	12°C, Dry, 65% cloud cover and a light breeze	17:54

The bat transect surveys were co-ordinated by Graeme Down, Senior Ecologist of ECOSA assisted by suitably qualified and experienced ECOSA surveyors.

Bat Automated Detector Survey

The automated detector surveys were undertaken between April and October 2019 with a total of 35 nights recording undertaken. **Table 3** provides details of each recording period.

Table 3: Automated detector survey details

Survey Period	Date	Weather Conditions ¹¹				Sunset	Sunrise
		Temperature (°C)		Wind (km/h)	Precipitation (mm)		
		High	Low				
April 2019	24 th	18	9	4	0.0	20:13	05:51
	25 th	19	7	4	0.0	20:15	05:49
	26 th	16	3	8	0.6	20:16	05:48
	27 th	15	8	15	0.0	20:18	05:46
	28 th	17	6	6	0.0	20:19	05:44
May 2019	21 st	25	9	4	0.0	20:54	05:07
	22 nd	27	8	2	0.0	20:56	05:06
	23 rd	24	5	3	0.0	20:57	05:04
	24 th	22	10	3	0.0	20:58	05:03
	25 th	23	13	5	0.0	20:59	05:02
June 2019	25 th	28	16	2	2.1	21:21	04:51
	26 th	27	17	7	0.0	21:21	04:51

¹¹ Weather data is sourced from online weather data (Weather Underground, 2019)

Survey Period	Date	Weather Conditions ¹¹				Sunset	Sunrise
		Temperature (°C)		Wind (km/h)	Precipitation (mm)		
		High	Low				
	27 th	32	14	4	0.0	21:21	04:52
	28 th	32	14	4	0.0	21:21	04:52
	29 th	36	16	3	0.0	21:21	04:53
July 2019	24 th	26	26	5	0.0	21:01	05:18
	25 th	35	18	0	0.0	21:00	05:19
	26 th	25	19	0	0.0	20:58	05:21
	27 th	23	16	0	0.0	20:57	05:22
	28 th	26	14	7	0.0	20:56	05:23
August 2019	19 th	21	12	8	0.0	20:17	05:56
	20 th	23	8	3	0.0	20:15	05:58
	21 st	25	8	2	0.0	20:13	05:59
	22 nd	24	8	5	0.0	20:11	06:01
	23 rd	31	11	1	0.0	20:09	06:03
September 2019	17 th	23	11	4	0.0	19:14	06:41
	18 th	24	7	3	0.0	19:12	06:43
	19 th	26	7	2	0.0	19:09	06:44
	20 th	25	10	4	0.0	19:07	06:46
	21 st	26	14	3	0.0	19:05	06:47
October 2019 ¹²	24 th	14	9	2	0.0	17:54	07:41
	25 th	17	9	8	0.0	17:52	07:43
	26 th	16	7	11	0.0	17:50	07:44
	27 th	14	2	1	0.0	16:48	06:46
	28 th	11	2	5	0.0	16:46	06:48

¹² Clocks changed during this survey

The automated detectors were deployed by Lucy Bartlett, John Hunt, Graeme Down, Ciara Askin and Olivia Walton. The detector programming and data analysis was conducted by Olivia Walton.

Bat Trapping Survey

Table 4 provides details of the bat trapping survey visits.

Table 4: Bat trapping survey details

Survey Date	Weather Conditions	Sunset/ Sunrise Time
22 nd July 2019	Start temp: 22°C End temp: 16°C	21:04
2 nd September 2019	Start temp: 16°C End temp: 16°C	19:48
19 th May 2020	Start temp: 14°C End temp: 10°C	20:52

During the trapping survey, the surveyors were equipped with mist nest and harp traps in combination with acoustic bat lures.

The trapping surveys were undertaken by Paul Hope and Colleen Hope, Directors of Ecological Consultancy Services Ltd., with assistance from ECOSA staff.

3.7.3 Survey Limitations

Some bat species, e.g. long-eared bats *Plecotus* species, generally emerge from their roosts in total darkness and do not produce strong echolocations, and therefore these bats can be difficult to observe and record during bat surveys, leading to under-recording.

No transect survey was undertaken in May 2019 and therefore there is no qualitative data to support the automated detector survey findings for this month.

Unseasonably low temperatures in April and rain on 25th June 2019 may have affected regular bat activity recorded by automated detectors during these months.

During the bat trapping surveys trespassers on dirt bikes were regularly encountered on site. As a health and safety precaution, traps were located away from well-worn paths created and used by the dirt bikes. For this reason the traps could not be optimally located in areas of suitable habitat.

The quality of both hand-held and automated bat detector recordings is based, to a large extent, on the proximity of a bat to the detector's microphone. Obstructions such as vegetation or environmental variables such as rainfall and wind noise from vegetation will all influence the quality of sound reaching the microphone and thus

some bat echolocation recordings are of insufficient quality for specific identification. Bats routinely alter their echolocations in relation to behaviour and their environment. It is not always possible to make a robust identification of every bat recording.

The use of bat detectors is likely to result in the under-recording of a percentage of bats present, such as those flying at height (Collins & Jones, 2009), which would be out of the recording range for the detectors.

3.8 Hazel Dormouse Survey

3.8.1 Survey Methods

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

The hazel dormouse survey involved the erection of 64 dormouse tubes within suitable dormouse habitat throughout the site at intervals of approximately 10-20m. The locations of these tubes are marked on **Map 8**. The nest tubes were subsequently checked for evidence of dormouse on a monthly basis between June and November 2019.

In accordance with survey guidance, a value is assigned to each month, which is weighted depending on the likelihood of finding evidence of dormouse in a given month. These scores are based on the erection of 50 dormouse nest tubes. The values for each month that the tubes are in place are then added together. In accordance with survey guidance, absence of dormouse should not be assumed for a search effort of less than 20 points¹³. **Table 5** shows points assigned for each month during the survey undertaken.

Table 5: Hazel dormouse survey Index of Probability scores

Month	Index of Probability Score
June	2
July	2
August	5
September	7
October	2
November	2
Total	<u>20</u>

¹³ Each month, between April and November, inclusive is assigned an index of probability score, based on optimum survey timings.

The level of survey effort carried out at site currently provides a search effort of 20, which allows a robust assessment of the likely absence of dormouse at the site to be undertaken.

3.8.2 Survey Details

The dormouse tubes were erected on 31st May 2019 with monthly visits undertaken between April to October 2019. **Table 6** provides details of each hazel dormouse survey.

Table 6: Hazel dormouse survey details

Survey Date	Weather Conditions
25 th June 2019	Dry, 21°C, 100% Cloud cover, light breeze
23 rd July 2019	Sunny, 24°C, 0% Cloud cover, light breeze
19 th August 2019	Showers, 17°C, 80% Cloud cover, light breeze
24 th September 2019 ¹⁴	Sunny, 18°C, 100% Cloud cover, light breeze
1 st October 2019	Heavy Showers, 18°C, 70% Cloud cover, moderate breeze
22 nd October 2019	Sunny, 17°C, 0% Cloud cover, calm
22 nd November 2019	Dry, 9°C, 100% Cloud cover, light breeze

The hazel dormouse surveys were co-ordinated and led by Graeme Down. The tubes were erected by Hugh Turner. Surveys were initially undertaken by Olivia Walton and Ciara Askin. Once dormouse presence was confirmed at the site, surveys were undertaken by Jack Medley and Samantha Munslow.

The survey was undertaken using 64 dormouse tubes comprising corrugated plastic tubes of standard dimensions (Bright, et al., 2006) with plywood insert secured in the relevant habitat with heavy duty garden wire.

3.8.3 Survey Limitations

There were no significant limitations to the dormouse survey.

¹⁴ During this visit, the first evidence of hazel dormouse was recorded. As the attending surveyor did not have a dormouse licence, the remainder of the survey was postponed and completed on the 1st October by a suitably licensed ecologist.

3.9 Bird Survey

3.9.1 Survey Methods

Breeding Bird Survey

Breeding bird transects surveys were undertaken using a modified version the British Trust for Ornithology (BTO) Breeding Bird Survey (Baillie, et al., 2012). Three visits were undertaken between April and June 2019. Surveys were split by approximately two weeks.

The bird surveyor walked a pre-determined transect route across the site, on each occasion walking the same transect route (**Map 9**). The transect route ensured that the surveyor visited key areas of habitat for breeding birds such as woodland, wetland and large expanses of grassland / arable land, as well as less suitable habitats. The transect was punctuated by pauses to scan and listen for territorial birds. The transect survey was always undertaken during the morning and began within one hour of sunrise. The route across the site was varied so that time-location bias was minimised. Surveys were undertaken in suitable weather conditions i.e. without strong winds or heavy rainfall.

The survey was aimed at recording the presence of notable and protected bird species and assessing the number of active territories of notable species within the site. Territorial activity was mainly defined by the presence of singing birds, however other evidence such as courtship and display, agitated behaviour, nest building, distraction display, recently fledged young, occupied nests and / or birds carrying food was also used.

On completion of the surveys evidence of territorial birds and confirmed breeding evidence was transferred onto a single map. Clusters of registrations on this map coincide with the activity of territory holding birds, although with some species this varies with biology. The maps were then analysed to determine the number of pairs of each notable breeding species present, a process open to subjectivity in interpretation, and requiring professional judgement.

The detectability of bird species and associated territorial activity is affected by a variety of factors including, but not limited to; species detectability, species abundance, temporal variations in activity, species phenology, habitat structure, survey effort and observer ability. During the breeding bird survey methods to reduce these potential impacts included; using experienced ornithologists and undertaking a robust number of surveys spread over the main breeding season. As a result, a comprehensive assessment of the breeding bird assemblage at the site was completed.

3.9.2 Survey Details

Breeding Bird Survey

A total of three survey visits were undertaken between May and June 2019. **Table 7** provides details of each breeding bird survey.

Table 7: Breeding bird survey details

Survey Date	Weather Conditions
21 st May 2019	Dry, 11°C, 25% cloud cover and a gentle breeze
7 th June 2019	Moderate rain late in survey, 12°C, 100% cloud cover and a gentle breeze
14 th June 2019	Dry, 14°C, 100% cloud cover and a gentle breeze

The breeding bird survey was carried out by Simon Colenutt and Graeme Down.

During the breeding bird survey the surveyors were equipped with either 10x40 or 8x42 Swarovski EL binoculars.

3.9.3 Survey Limitations

There were no significant limitations to the breeding bird survey.

3.10 European nightjar Survey

3.10.1 Survey Methods

The European nightjar survey followed national survey methodology (Conway, et al., 2007). Transects were walked at dusk and the locations of 'churring' males were recorded where encountered. Special attention was given to simultaneously churring males.

3.10.2 Survey Details

Two survey were undertaken at dusk between the last week of May and mid-July with at least three weeks between visits and at least one visit in June. **Table 7** provides details of each European nightjar survey.

Table 8: European nightjar survey details

Survey Date	Sunset	Duration	Weather Conditions
25 th June 2019	21:24	20:54-22:54	Humid, dry. 18°C. 90% cloud cover. No wind.
18 th July 2019	21:10	20:40-22:40	Warm, dry, calm. 19°C. 60% cloud cover. No wind.

The European nightjar survey was carried out by Graeme Down.

3.11 Reptile Survey

3.11.1 Survey Methods

The reptile survey was undertaken in accordance with current best practice guidelines (Froglife, 2015).

The reptile survey consisted of the laying bitumen felt mats approximately 500 millimetres x 500 millimetres in areas of suitable habitat on the site. Typically, this included areas of suitable habitat with good exposure to the sun. The mats were distributed in all areas considered to offer suitable reptile habitat. The locations of these mats are marked on **Map 10**.

The use of such refugia is an effective way of surveying for all species of reptile and current survey guidance states that seven inspections are sufficient to confirm presence/likely absence. Survey visits were undertaken in marginal weather conditions such as cold but sunny weather or hazy and somewhat overcast conditions, as this will maximise the thermal value of the refugia for basking reptiles.

During each visit surveyors also undertook a visual inspection survey of other suitable refugia in the site and other suitable basking locations. During the survey a note was also made of any suitable hibernation features present within the site.

3.11.2 Survey Details

A total of 150 reptile refugia were distributed on 28th May 2019 with seven inspection visits undertaken between 14th June 2019 and 2nd August 2019. **Table 9** provides details of each reptile survey.

Table 9: Reptile survey details

Survey Date	Air Temperature (°C)	Weather Conditions
14 th June 2019	15	Dry after earlier rain
28 th June 2019	18	Sunny
2 nd July 2019	15	Sunny
5 th July 2019	14	Cloudy
10 th July 2019	18	Cloudy
17 th July 2019	16	Clear
2 nd August 2019	16	Sunny

The reptile surveys were undertaken by Graeme Down, Olivia Walton, David Miller, Ciara Askin and Jack Medley.

3.11.3 Survey Limitations

There were no significant limitations to the reptile survey.

3.12 Invertebrate Survey

3.12.1 Survey Methods

Survey methods involved visual searching of nectaring sites and basking areas, the use of a hand net or pooter to capture individual species, sweeping vegetation, beating foliage and grubbing.

3.12.2 Survey Details

Dates and details of each invertebrate survey are provided in **Table 10**.

Table 10: Invertebrate survey details

Survey Date	Temperature	Weather Conditions
21 st June 2019	20	Sunny spells with a light breeze
11 th July 2019	25	Long sunny spells with a light breeze
13 th July 2019	19	Long sunny spells with a light breeze

The invertebrate surveys were carried out by Adam Wright, freelance entomologist.

3.12.3 Survey Limitations

There were no significant limitations to the invertebrate survey.

3.13 Criteria used to Assess Ecological Value

1.1.1 Where Important Ecological Features are identified on site, or within the site's Zone of Influence, these are evaluated in accordance with guidance set out CIEEM's Guidelines for Ecological Impact Assessment in the United Kingdom (CIEEM, 2016).

1.1.2 In accordance with this guidance, Important Ecological Features are assigned a level of importance based on a geographic scale ranging from features of importance at the site level, to those of importance at the international level. The criteria defined for each geographic level in relation to this site are provided in **Table 11**.

Table 11: Criteria for the evaluation of importance of ecological features at each geographic level

Geographic Scale of Importance	Criteria
International	Ecological Feature would be a qualifying criteria for a site to achieve Ramsar site status in line with criteria set out by Ramsar (Ramsar, 1971)

European	Ecological feature would be a qualifying criteria for a site to achieve SAC or SPA status in line with the criteria set out in ' <i>The Habitats Directive: Selection of Special Areas of Conservation in the UK</i> ' (JNCC, 2018) and ' <i>Selection guidelines for Special Protection Areas</i> ' (Stroud, et al., 2001) respectively.
National	Ecological feature would qualify a site for SSSI status in line with criteria set out in ' <i>Guidelines for the Selection of Biological SSSIs</i> ' (JNCC, n.d.).
County	Ecological feature would qualify a site for Site of Importance for Nature Conservation (SINC) status in line with criteria set out by Hampshire Biodiversity Information Centre (HBIC, 1996).
Local	Site represents a significant resource of/for an ecological feature within two kilometres of the site but is not sufficient to qualify for SINC status in line with criteria set out by Hampshire Biodiversity Information Centre (HBIC, 1996).
Site	Site represents a resource of/for an ecological feature that is unique within the site and/or would be difficult to replace in the short-term if lost, however, it does not form a significant proportion of that likely to be present in the local area (i.e. within two kilometres of the site).
Negligible	Site does not represent a significant resource of an ecological feature even at the site level, either due to its low quality or limited extent.

Important Ecological Features that have been identified solely because they are subject to legal protection from persecution or cruelty (under for example, the Protection of Badgers Act 1992 or Wild Mammals (Protection) Act 1996), rather than for reasons of conservation, these have not been subject to evaluation.

4.0 BASELINE ECOLOGICAL CONDITIONS AND EVALUATION

4.1 Introduction

This section details the results of the Ecological Impact Assessment undertaken for the site. It assesses the baseline ecological conditions of the site at the time the desktop study was completed and based on the findings of the field survey and subsequent protected species surveys. This section also provides an assessment of the ecological value of ecological features present at the site.

4.2 Statutory and Non-statutory Designated Sites

4.2.1 Baseline Ecological Conditions

Statutory Designated Sites

There is one statutory designated site of nature conservation interest situated within one kilometre of the site boundary. This is:

- Hazleton Common (LNR) - Located approximately 1.7 kilometres north of the site and designated for its lowland heathland and woodland habitats as well as the presence of reptiles, notable invertebrates and great crested newt.

The Solent Recreation Mitigation Strategy (Bird Aware Solent, 2017) recommends mitigation is required for proposals that result in an increase in residents within 5.6 kilometres of the Chichester and Langstone Harbours SPA, as there is evidence that 75% of coastal visitors live within 5.6 kilometres of the coast. As such, the Zone of Influence has been specifically extended to include both the Chichester and Langstone Harbours SPA and other coastal statutory designated sites that could be impacted by residential use within this distance. In addition, the site lies within the catchment of the Solent and therefore output wastewater will also ultimately reach these sites. The sites that lie within the extended Zone of Influence are:

- Chichester and Langstone Harbours (Ramsar site) – Located approximately four kilometres south of the site. Designated for its important wetland habitats.
- Chichester and Langstone Harbours (SPA) – Located approximately four kilometres south of the site and designated for its notable over wintering and breeding bird populations;
- Solent Maritime (SAC) – Located approximately four kilometres south of the site and designated for its notable coastal habitats and the presence of Desmoulin's whorl snail *Vertigo moulinsiana*;

Further details of the statutory designations listed above are provided in **Appendix 8**.

Non-Statutory Designated Sites

There are also 23 SINC's situated within the Zone of Influence (**Map 2**). Details are provided in **Table 12**.

One of these, Dunsbury Hill Grassland 2 SINC, forms part of the site and is designated for its semi-improved grasslands which retains a significant element of unimproved grassland. Three (Bell's Copse SINC, Cabbagefield Row SINC and Dunsbury Hill Wood SINC) lie adjacent to the site on the northern, eastern and western boundaries respectively.

Four of the SINC's (Middle Clearing, Thicket Lawn, Thicket Bottom Woods & Lake, and Thicket Bottom) are associated with Staunton Country Park and are therefore publicly accessible. A further three (Meadow by Bells Copse, Havant Thicket (South-West Corner) and Havant Thicket) are areas of 'open access land'¹⁵ and are therefore also publicly accessible.

One of the SINC's is Waterloo Golf Course and, therefore, while publicly accessible, it is assumed that any increase in visitors would be controlled by membership of the golf course.

All remaining SINC's have no public access.

Table 12: Non-Statutory Designated Sites Located Within the Desktop Study Area

SINC Name	Area (ha)	Reason for Designation
Hurst Wood, Havant	2.03	Designated for supporting ancient semi-natural woodland habitat
Outhurst/Inhurst/Beech Woods	10.75	Designated for supporting ancient semi-natural woodland habitat
Neville's Park Areas 2 & 3	14.16	Designated for supporting agriculturally unimproved grassland
Cherry Tree Row	1.93	Designated for supporting ancient semi-natural woodland habitat
Beech Wood East	2.85	Designated for supporting ancient semi-natural woodland habitat and other woodland where there is a significant element of ancient semi-natural woodland surviving.
Bushy Lease	6.40	Designated for supporting ancient semi-natural woodland habitat
Dunsbury Hill - Areas 5 & 6	2.16	Designated for supporting agriculturally unimproved grassland
Dunsbury Hill - Area 1	1.68	Designated for supporting agriculturally unimproved grassland

¹⁵ The Countryside and Rights of Way Act 2000 (CROW Act) normally gives a public right of access to land mapped as 'open country' (mountain, moor, heath and down) or registered common land. These areas are known as 'open access land'. People can normally access open access land on foot. There's a general rule that visitors using their open access rights must keep dogs on a short lead of no more than 2 metres between 1 March and 31 July each year (except in the coastal margin) and at all times near livestock.

Waterlooville Golf Course	30.05	Designated for supporting ancient semi-natural woodland habitat, semi-improved grasslands which retain a significant element of unimproved grassland, and areas of heathland vegetation.
Meadow by Bells Copse	4.94	Designated for supporting agriculturally unimproved grassland
The Warren, Havant	5.04	Designated for supporting woodland where there is a significant element of ancient semi-natural woodland surviving and woodland that comprises important community types of restricted distribution in the county.
Dunsbury Hill Wood	6.70	Designated for supporting woodland that comprises important community types of restricted distribution in the county.
Bell's Copse	33.29	Designated for supporting ancient semi-natural woodland habitat and other woodland where there is a significant element of ancient semi-natural woodland surviving.
Dunsbury Hill Grassland 2	3.52	Designated for supporting semi-improved grasslands which retain a significant element of unimproved grassland.
Cabbagefield Row	2.04	Designated for supporting ancient semi-natural woodland habitat
Blendworth Common (South)	19.19	Designated for supporting agriculturally unimproved grassland
Blendworth Common (North)	8.38	Designated for supporting agriculturally unimproved grassland
Havant Thicket (South-West Corner)	8.52	Designated for supporting woodland where there is a significant element of ancient semi-natural woodland surviving and for supporting areas of heathland which are afforested or have succeeded to woodland but retain significant remnants of heathland vegetation which would enable their recovery
Middle Clearing	2.18	Designated for supporting ancient semi-natural woodland habitat and for supporting brown long-eared bat <i>Plecotus auritus</i> .
Havant Thicket	96.48	Designated for supporting the following notable habitat: - woodland where there is a significant element of ancient semi-natural woodland surviving; - other semi-natural woodland which comprises important community types of restricted distribution in the County, such as yew woods and alder swamp woods; - pasture woodland and wooded commons, which are of considerable biological and historical interest; - Semi-improved grasslands which retain a significant element of unimproved grassland; - Areas of heathland which are afforested or have succeeded to woodland but retain significant remnants of heathland vegetation which would enable their recovery; and - Fens, flushes, seepages, springs, inundation grasslands etc. that support a flora and fauna characteristic of unimproved and waterlogged (seasonal or permanent) conditions. Also designated for supporting the following notable species: - Purple emperor <i>Apatura iris</i>; - Silver-washed fritillary <i>Argynnis paphia</i>;

		▪ Rush <i>Juncus effusus</i> x <i>conglomeratus</i> = <i>Juncus x kern-reichgeltii</i>; ▪ Scarce Merveille du Jour <i>Moma alpium</i>; ▪ Hazel dormouse <i>Muscardinus avellanarius</i>; ▪ Bechstein's bat <i>Myotis bechsteinii</i>.
Thicket Lawn	10.56	Designated for supporting semi-improved grasslands which retain a significant element of unimproved grassland, and fens, flushes, seepages, springs, inundation grasslands etc. that support a flora and fauna characteristic of unimproved and waterlogged (seasonal or permanent) conditions.
Thicket Bottom Woods & Lake	15.72	Designated for supporting ancient semi-natural woodland habitat
Thicket Bottom	7.89	Designated for supporting pasture woodland and wooded commons which are of considerable biological and historical interest.

4.2.2 Evaluation

Chichester and Langstone Harbours Ramsar site is designated for features of importance at the international level. Chichester and Langstone Harbours SPA and Solent Maritime SAC are designated for features of importance at the European level. Local nature reserves and SINCS are designated for their features of importance at the county level.

4.3 Habitats

4.3.1 Baseline Ecological Conditions

Desktop Study Results

Consultation of the MAGIC database identifies grassland in the northern half of the site as good quality semi-improved grassland, which is the reason for the designation of the Dunsbury Hill Grassland 2 SINCS. This area is also designated as core non-statutory habitat within the Hampshire Ecological Network.

The MAGIC database also identifies lowland mixed deciduous woodland on the northern, eastern and western boundaries of the site. The woodland to the east and north of the site is also identified as ancient semi-natural woodland. The woodland to the west is the reason for designation of the Dunsbury Hill Wood SINCS, the woodland to the north is the reason for designation of the Bell's Copse SINCS and the woodland to the east is the reason for designation of the Cabbagefield Row SINCS. These areas are also designated as core non-statutory habitat within the Hampshire Ecological Network.

Consultation with HBIC also revealed areas of lowland mixed deciduous woodland, wet woodland, lowland meadows and lowland dry acid grassland within one kilometre of the site. These are all Habitats of Principal Importance.

Habitats within a narrow margin along the western site boundary are designated as network opportunity habitat within the Hampshire Ecological Network.

Field Survey Results

Habitats within the site are shown on the Phase 1 Habitat Map (**Map 3**). Target Notes and photographs have been provided as appropriate, Target Notes are cross referenced to **Map 3**. Habitats are described in general terms using standard Phase 1 habitat survey terminology, with reference to dominant, characteristic and notable species in each vegetation type. The main habitats recorded on site during the Phase 1 habitat survey were as follows:

Broadleaved Semi-Natural Woodland

Immediately adjacent to the site boundary to the west, north and east is mature semi-natural broadleaved woodland, dominated by pedunculate oak *Quercus robur* (**Figure 1**), with ash *Fraxinus excelsior* also present. The shrub layer is composed of hazel *Corylus avellana*, and is dense in places. Hawthorn *Crataegus monogyna* was also noted. Other species typical of the canopy or shrub layers comprised Scots pine *Pinus sylvestris* and holly *Ilex aquifolium*. A varied herb layer is present including wood anemone *Anemone nemorosa*, bramble *Rubus fruticosus* aggregate, ivy *Hedera helix*, butcher's broom *Ruscus aculeatus*, tufted hair grass *Deschampsia cespitosa*, lesser celandine *Ficaria verna*, wood sedge *Carex sylvatica*, bluebell *Hyacinthoides non-scripta*, wood speedwell *Veronica arvensis*, soft rush *Juncus effusus*, wood sorrel *Oxalis acetosella*, lords and ladies *Arum maculatum*, common dog violet *Viola riviniana* and pendulous sedge *Carex pendula*.

In the east of the site, an area of young woodland is present (**Figure 2**) in association with a telecommunications mast. This woodland grades into mature woodland to the east, outside of the site boundary, and contains reasonably dense goat willow *Salix caprea* and blackthorn *Prunus spinosa* vegetation.

A narrow margin of woodland is present along the southern site boundary.



Figure 1: Woodland immediately beyond the northern boundary of the site



Figure 2: Willow and blackthorn copse in east of the site

Dense Scrub and Scattered Scrub

The southern half of the site contains dense bramble dominated scrub (**Figure 3**), with occasional cut pathways and natural clearings. Other species present include silver birch *Betula pendula*, and cocksfoot *Dactylis glomerata* is dominant in clearings and pathways. There is evidence of regular motorbike use through this area.



Figure 3: Dense scrub (left of image) typical of southern half of the site

In the north-western corner of the site dense scrub is present bordering woodland that lies immediately beyond the site boundary whilst scattered scrub comprising pockets of goat willow, blackthorn, bramble and common nettle *Urtica dioica* is present within grassland in the northern half of the site.

Semi-Improved Neutral Grassland

Semi-improved neutral grassland occurs (**Figure 4** and **Figure 5**) interspersed with dense scrub in the south of the site, but as the dominant habitat type in the northern half. The grassland is tussocky in nature and occupies a plateau in the southern half of the site that then drops away on a moderate slope toward the northern site boundary, where it meets woodland. The grassland is not obviously managed and in the northern half of the site the habitat forms Dunsbury Hill Grassland 2 SINCC, for which the citation includes that a significant element of unimproved grassland remains. At the time of

survey, the full floral diversity was not apparent, however, the site was noted as being subject to human pressure including off-road biking and dog walking. Species present include birds foot trefoil *Lotus corniculatus*, cocksfoot, tufted hair grass, hard rush *Juncus inflexus*, ribwort plantain *Plantago lanceolata*, vetch species, clover species *Trifolium* species, gorse *Ulex europaeus* and knapweed species *Centaurea* species.



Figure 4: Semi-improved neutral grassland looking south, upslope, from the northern site boundary



Figure 5: Grassland, looking north-west from the centre of the site

Tall Ruderal

Immediately north of willow and blackthorn woodland in the east of the site is an area of tall ruderal vegetation comprising bracken *Pteridium aquilinum* and common nettle (**Figure 6**). A similar patch of habitat is present amongst dense scrub in the west of the site.



Figure 6: Area of tall ruderal vegetation in the east of the site

National Vegetation Classification Survey Results

The results of the two quadrats surveyed are presented in **Table 13**.

Table 13: NVC Survey Results

Area	Area 1				
Quadrat Area	2 x 2m				
Aspect	10° slope to north downhill				
Layer	100% herb layer				
Species	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5
Common knapweed <i>Centaurea nigra</i>	4	4	-	-	-
Silverweed <i>Argentina anserina</i>	6	8	4	3	6
Yorkshire fog <i>Holcus lanatus</i>	6	4	4	2	4
Tufted vetch <i>Vicia cracca</i>	2	-	3	2	4
Common ragwort <i>Jacobaea vulgaris</i>	1	4	3	3	4
Ribwort plantain <i>Plantago lanceolata</i>	3	-	1	4	4
Lesser stitchwort <i>Stellaria graminea</i>	3	4	1	1	4
Red fescue <i>Festuca rubra</i>	6	4	4	4	4
Cocksfoot <i>Dactylis glomerata</i>	-	3	4	4	2
Meadow vetchling <i>Lathyrus pratensis</i>	-	3	7	-	-
Bird's foot trefoil <i>Lotus corniculatus</i>	-	-	5	5	-
Creeping/common bent <i>Agrostis stolonifera/Agrostis capillaris</i>	-	-	4	3	-
White clover <i>Trifolium repens</i>	-	-	3	-	-
Meadow buttercup <i>Ranunculus acris</i>	-	-	-	1	-
Common chickweed <i>Stellaria media</i>	-	-	-	2	-
Sweet vernal grass <i>Anthoxanthum odoratum</i>	-	-	-	-	4
Red clover <i>Trifolium pratense</i>	-	-	-	-	2
False oat grass <i>Arrhenatherum elatius</i>	-	-	-	-	4
NVC Type					
MG11 <i>Lolium perenne</i> sub-community					

Area	Area 2				
Quadrat Area	2 x 2m				
Aspect	10° slope to north downhill				
Layer	100% herb layer				
Species	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5
False oat grass <i>Arrhenatherum elatius</i>	9	9	9	10	10
Lesser stitchwort <i>Stellaria graminea</i>	3	-	-	-	-
Common ragwort <i>Jacobaea vulgaris</i>	3	-	-	-	-
Tufted vetch <i>Vicia cracca</i>	-	2	-	-	-
Ribwort plantain <i>Plantago lanceolata</i>	-	2	-		-
NVC Type					
MG1 <i>Arrhenatherum elatius</i> grassland					

4.3.2 Evaluation

All woodland bounding the site has been designated as a SINC due to the presence of ancient woodland, remnant ancient woodland or woodland that comprises important community types of restricted distribution in the county. Therefore woodland habitats are of importance at the county level. It should also be noted that ancient woodland is classified as an 'Irreplaceable Habitat' in the National Planning Policy Framework.

Although the grassland on site is designated as a SINC for retaining a significant element of unimproved grassland, a recent NVC survey identified that there is no significant element of unimproved grassland remaining. It is assumed that the condition of the grassland has deteriorated since the designation was assigned and therefore, although the grassland is currently designated as a SINC, it does not now meet the criteria for designation. As a precaution, given the grassland's designation as a SINC the site has been assigned importance at the county level, although in reality it may now be of lower value. It should also be noted that this habitat is located within the Hampshire Ecological Network.

Other habitats are considered to be of negligible importance.

4.4 Bats

4.4.1 Baseline Ecological Conditions

Desktop Study Results

Consultation with the MAGIC database produced one record of an EPSM licence for bats within two kilometres of the site. This licence (EPSM 2013-5591) was granted for

the destruction of a resting place for common pipistrelle *Pipistrellus pipistrellus* and brown long-eared bats *Plecotus auritus* 1.9 kilometres to the west of the site in urban Waterlooville, and was in place from 21st March 2013.

Consultation with HBIC revealed records of : common pipistrelle, soprano pipistrelle *Pipistrellus pygmaeus*, brown long eared bat, Brandt's bat *Myotis brandtii*, Daubenton's bat *Myotis daubentonii*, whiskered bat *Myotis mystacinus*, Natterer's bat *Myotis nattereri*, noctule *Nyctalus noctula*, as well as Bechstein's bat *Myotis bechsteinii* which has additional protection under Annex II of the Habitats Directive.

Between 2008 and 2018 ECOSA undertook, on behalf of Portsmouth Water, bat trapping, radio-tracking, vantage point, transect and static detector surveys have been undertaken at Havant Thicket, located immediately to the east of the site. A total of at least thirteen species have been recorded here including Bechstein's bat and barbastelle *Barbastella barbastellus* which is also afforded additional protection under Annex II of the Habitats Directive.

The assessment of bat use of Havant Thicket identified that the site lies within the potential core sustenance zone of two brown long-eared bat maternity colonies. Maternity roosts were recorded at NGR: SU 71375 10123 and SU 71558 09880.

Bat trapping and radio tracking surveys did not record Bechstein's bats making use of habitat in the vicinity of the site.

Field Survey Results

The woodland and scrub on the boundaries of the site provide suitable habitats likely to be used by foraging and commuting bats. The habitats within the site are likely to support invertebrates that will offer a feeding resource for foraging bats. The on-site and boundary habitats are connected to suitable foraging and roosting habitat in the local area, in particular areas of woodland. Trees within the woodland are also suitable for roosting bats.

Bat Ground Level Tree Assessment Results

The results of the Ground Level Tree Assessment are provided in **Table 1**. Details of locations of trees with moderate and high suitability to support roosting bats are provided as target notes on **Map 4**. No trees within the redline boundary of the site were identified as having suitability to support roosting bats. Trees within approximately five metres of the site boundary were included in a Ground Level Tree Assessment for their suitability to support roosting bats. Four trees have high suitability for roosting bats, whilst a further six were assessed as having moderate suitability.

Table 1: Ground level tree assessment results

Target Note	Species and Description	Description of Features	Suitability for Bats
TN1	Oak - mature	Multiple woodpecker holes on east side, on a narrow limb at 10 metres height. Two holes on north side at 10 metres height. Holes on south side at seven metres height.	High
TN2	Oak - mature	Woodpecker hole at three metres height at south side. Fractured limb at four metres height on south side	High
TN3	Scots pine	Woodpecker hole east side at 10 metres height.	High
TN4	Oak - mature	Two woodpecker holes at 10 metres height on western side	High
TN5	Oak - mature	Broken limb on south-west side at 10 metres height. Hollow in trunk at four metres height on eastern side.	Moderate
TN6	Oak - mature	Hole in branch on west side of tree, facing east.	Moderate
TN7	Oak - mature	Split at ten metres height on eastern side, maybe quite shallow.	Moderate
TN8	Scots pine (dead)	Holes in trunk at three metres height on south side, but cluttered around these.	Moderate
TN9	Oak - mature	Hole on western side at five metres height, but cluttered with surrounding scrub.	Moderate
TN10	Oak - mature	Trunk split on western side, extending for two to three metres, but appears potentially shallow for much of this length.	Moderate

Bat Transect Survey Results

The locations of the bat activity recorded are provided on **Map 5a to Map 5f** with a qualitative description of the findings of each survey provided in **Table 14**.

Table 14: Bat activity recorded during transect surveys

Survey Date	General Bat Activity at the Site
24 th April 2019	During the survey, two species were recorded: <i>Myotis</i> species and common pipistrelle, with the majority of registrations attributable to common pipistrelle. Bat activity levels were highest on the eastern boundary of the site, along the woodland edge.

Survey Date	General Bat Activity at the Site
25 th June 2019	During the survey, four species were recorded: <i>Myotis</i> species, soprano pipistrelle, noctule and common pipistrelle with the majority of registrations attributable to common pipistrelle. Bat activity levels were highest at the northern end of the site, (along the woodland edges) and the south-west corner (along the scrub/woodland boundary).
24 th July 2019	During the survey, five species were recorded: <i>Myotis</i> species, brown long-eared bat, soprano pipistrelle, serotine and common pipistrelle with the majority of registrations attributable to common pipistrelle. Soprano pipistrelle and <i>Myotis</i> species made up much of the remaining activity. Bat activity levels were more evenly spread than previously, though there was still high activity around the north end of site (along woodland edges). There was also high activity in the woodland to the east of the site, particularly for soprano pipistrelle.
22 nd August 2019	During the survey, four species of bat were recorded: common pipistrelle, soprano pipistrelle, noctule and serotine, with the majority of registrations attributable to common pipistrelle. Bat activity levels were highest in the south of the site in this occasion, with the highest diversity of bats recorded in the south.
17 th September 2019	During the survey, three species were recorded: <i>Myotis</i> species, soprano pipistrelle, and common pipistrelle, with the majority of registrations attributable to common pipistrelle. Bat activity levels were highest along the southern and eastern boundaries (along the scrub/woodland boundaries).
24 th October 2019	During the survey, there was only a single registration of a <i>Myotis</i> species in the south western corner of the site (along the scrub/woodland boundaries).

Bat Automated Detector Survey Results

The locations of the bat automated detectors are provided on **Map 6** with a quantitative analysis of the findings of each survey provided in the sections below.

Activity by Species

Table 15 shows the number of registrations and proportion of recorded bat activity at the site by species.

Table 15: Number of registrations and proportion of bat activity from each species

Species	No. Registrations	% Registrations
Common pipistrelle	9736	86.29%
Noctule	687	6.09%
<i>Myotis</i> species	418	3.70%
Soprano pipistrelle	273	2.42%
Nathusius' pipistrelle	99	0.88%
Serotine	23	0.20%
Natterer's bat	15	0.13%
Long-eared bat species	10	0.09%

Whiskered/Brandt's bat	8	0.07%
Daubenton's bat	7	0.06%
Leisler's bat	4	0.04%
Barbastelle	3	0.03%
Grand Total	11283	100.00%

Species Activity by Month

Table 16 provides the number of registration of each species recorded within each month.

Table 16: Number of registrations of each month split by species

Period	Species	No. Registrations	Activity Index
April 2019	Common pipistrelle	140	14.0
	<i>Myotis</i> species	4	0.4
	Noctule	6	0.6
	Soprano pipistrelle	3	0.3
	Serotine	1	0.1
	Nathusius' pipistrelle	2	0.2
	Barbastelle	1	0.1
	Long-eared bat species	1	0.1
April 2019 Total		158	15.8
May 2019	Common pipistrelle	2,974	297.4
	<i>Myotis</i> species	351	35.1
	Noctule	548	54.8
	Soprano pipistrelle	41	4.1
	Serotine	9	0.9
	Nathusius' pipistrelle	26	2.6
	Barbastelle	1	0.1
	Long-eared bat species	1	0.1
	Natterer's bat	13	1.3
	Daubenton's bat	3	0.3
	Whiskered/Brandt's bat	6	0.6
May 2019 Total		3,973	397.3
June 2019	Common pipistrelle	3,969	396.9
	Leisler's bat	3	0.3
	<i>Myotis</i> species	13	1.3
	Noctule	82	8.2
	Soprano pipistrelle	44	4.4
	Serotine	5	0.5
	Nathusius' pipistrelle	38	3.8
	Daubenton's bat	2	0.2

June 2019 Total		4,156	415.6
July 2019	Common pipistrelle	1,476	147.6
	<i>Myotis</i> species	17	1.7
	Noctule	41	4.1
	Soprano pipistrelle	161	16.1
	Serotine	3	0.3
	Nathusius' pipistrelle	3	0.3
	Natterer's bat	2	0.2
July 2019 Total		1,703	170.3
August 2019	Common pipistrelle	268	26.8
	Leisler's bat	1	0.1
	<i>Myotis</i> species	3	0.3
	Noctule	4	0.4
	Soprano pipistrelle	11	1.1
	Serotine	3	0.3
	Barbastelle	1	0.1
August 2019 Total		291	29.1
September 2019	Common pipistrelle	880	88.00
	<i>Myotis</i> species	30	3.00
	Noctule	4	0.40
	Soprano pipistrelle	12	1.20
	Serotine	1	0.10
	Nathusius' pipistrelle	21	2.10
	Whiskered/Brandt's bat	2	0.20
September 2019 Total		950	95.00
October 2019	Common pipistrelle	29	2.90
	Noctule	2	0.20
	Soprano pipistrelle	1	0.10
	Serotine	1	0.10
	Nathusius' pipistrelle	9	0.90
	Long-eared bat species	8	0.80
	Daubenton's bat	2	0.20
October 2019 Total		52	5.20
Grand Total		11,283	161.19

Activity Levels at Locations

Table 17 shows the number of registrations recorded at each individual location throughout the survey period.

Table 17: Activity Recorded at Each Location

Location	Period	Species	Count of Species	Activity Index
East	April 2019	Common pipistrelle	70	7.00

		Myotis species	2	0.20
		Noctule	5	0.50
		Soprano pipistrelle	3	0.30
		Serotine	1	0.10
	June 2019	Common pipistrelle	3,241	324.10
		Myotis species	11	1.10
		Noctule	58	5.80
		Soprano pipistrelle	13	1.30
		Serotine	4	0.40
		Nathusius' pipistrelle	28	2.80
		Leisler's bat	2	0.20
		Daubenton's bat	2	0.20
	July 2019	Common pipistrelle	395	39.50
		Myotis species	15	1.50
		Noctule	39	3.90
		Soprano pipistrelle	32	3.20
		Serotine	2	0.20
		Nathusius' pipistrelle	2	0.20
		Natterer's bat	2	0.20
	August 2019	Common pipistrelle	180	18.00
		Noctule	4	0.40
		Soprano pipistrelle	6	0.60
		Serotine	1	0.10
	October 2019	Common pipistrelle	7	0.70
		Soprano pipistrelle	1	0.10
		Serotine	1	0.10
		Nathusius' pipistrelle	8	0.80
		Long-eared bat species	2	0.20
		Daubenton's bat	1	0.10
	East Total			4,138
North	May 2019	Common pipistrelle	2,448	244.80
		Myotis species	347	34.70
		Noctule	5	0.50
		Soprano pipistrelle	9	0.90
		Serotine	3	0.30
		Nathusius' pipistrelle	11	1.10
		Barbastelle	1	0.10
		Natterer's bat	13	1.30
		Daubenton's bat	1	0.10
		Whiskered/Brandt's bat	6	0.60

	Sep 2019	Common pipistrelle	348	34.80
		Myotis species	15	1.50
		Soprano pipistrelle	1	0.10
		Nathusius' pipistrelle	1	0.10
North Total			3,209	160.45
South	May 2019	Common pipistrelle	526	52.60
		Myotis species	4	0.40
		Noctule	543	54.30
		Soprano pipistrelle	32	3.20
		Serotine	6	0.60
		Nathusius' pipistrelle	15	1.50
		Long-eared bat species	1	0.10
		Daubenton's bat	2	0.20
	Sep 2019	Common pipistrelle	532	53.20
		Myotis species	15	1.50
		Noctule	4	0.40
		Soprano pipistrelle	11	1.10
		Serotine	1	0.10
		Nathusius' pipistrelle	20	2.00
Whiskered/Brandt's bat	2	0.20		
South Total			1,714	85.70
West	April 2019	Common pipistrelle	70	7.00
		Myotis species	2	0.20
		Noctule	1	0.10
		Nathusius' pipistrelle	2	0.20
		Barbastelle	1	0.10
		Long-eared bat species	1	0.10
	June 2019	Common pipistrelle	728	72.80
		Myotis species	2	0.20
		Noctule	24	2.40
		Soprano pipistrelle	31	3.10
		Serotine	1	0.10
		Nathusius' pipistrelle	10	1.00
		Leisler's bat	1	0.10
	July 2019	Common pipistrelle	1,081	108.10
		Myotis species	2	0.20
		Noctule	2	0.20
		Soprano pipistrelle	129	12.90
		Serotine	1	0.10
Nathusius' pipistrelle	1	0.10		

	August 2019	Common pipistrelle	88	8.80
		Myotis species	3	0.30
		Soprano pipistrelle	5	0.50
		Serotine	2	0.20
		Leisler's bat	1	0.10
		Barbastelle	1	0.10
	October 2019	Common pipistrelle	22	2.20
		Noctule	2	0.20
		Nathusius' pipistrelle	1	0.10
		Long-eared bat species	6	0.60
Daubenton's bat		1	0.10	
West Total			2,222	44.44
Grand Total			11,283	161.19

Bat Trapping Survey Results

The results of the trapping surveys are presented in **Table 18** and shown on **Map 7**.

Table 18: Trapping Survey Results

Visit 1					
Time	Species	Sex	F/arm (mm)	Weight (g)	Status
21:55	Natterer's bat	F	38	6	Juv
22:18	Natterer's bat	F	37.5	6.5	Juv
00:05	Natterer's bat	F	39.2	8.5	Adult (Lactating)

Visit 2						
Time	Species	Sex	F/arm (mm)	Weight (g)	Status	Location
20:40	None					SU 70670 09807
21:30	None					SU 70732 09677
22:40	None					SU 70729 09472
20:30	None					SU 70530 09440
21:30	None					SU 70618 09610
22:45	None					SU 70535 09733

Visit 2						
Time	Species	Sex	F/arm (mm)	Weight (g)	Status	Location
20:30	None					SU 70706 09545

22:30	None					SU 70536 09591
23:33	Whiskered bat	M	34.5	5.5		SU 70564 09768
00:30	None					SU 70695 09813

4.4.2 Evaluation

Roosting Bats

- 1.1.3 The site does not support breeding bats and therefore does not meet the criteria for county importance (HBIC, 1996). Whilst the site has some value to roosting bats, given the extensive high quality roosting habitat in the surrounding landscape, in the form of ancient and semi-natural woodland, the site is considered to be of importance at the site level for roosting bats.

Foraging and Commuting Bats

Bat foraging and commuting habitat is not listed as a criteria for SINC designation and therefore it is assumed that such habitat is not of county level importance in isolation. The woodland edge and grassland habitat is unlikely to represent a significant resource for foraging and commuting bats, given the prevalence of high quality habitats like ancient woodland and standing water. Therefore the site is of importance at the site level for foraging and commuting bats.

4.5 Otter

4.5.1 Baseline Ecological Conditions

Desktop Study Results

Consultation of the MAGIC database produced no records of granted EPSM licences in respect of otter *Lutra lutra* within two kilometres of the site, however, this does not confirm the absence of the species in the local area.

Consultation with HBIC did not reveal any records of otter, although it is not clear whether they hold records for this species (Paragraph 0).

During ecological surveys undertaken by ECOSA, on behalf of Portsmouth Water, immediately east of the site, during 2018, no field sign of otter was encountered.

Field Survey Results

There is a small stream running north-south through woodland to the west of the site which is located approximately 30 metres to the west of the site boundary. However, this stream does not connect to larger flowing bodies of water where otters are likely to

be present. As otter rely on watercourses and undisturbed riparian habitat for foraging, commuting and holt provision, the site is considered unsuitable for otter.

4.6 Badger

4.6.1 Baseline Ecological Conditions

Desktop Study Results

During ecological surveys undertaken by ECOSA, on behalf of Portsmouth Water, immediately east of the site, during 2018, field signs of badger *Meles meles* was recorded.

Consultation with HBIC did not reveal any records of badger, although it is not clear whether they hold records for this species (Paragraph 0).

Field Survey Results

No sign of badger was noted during the field survey. The habitats on and adjacent to site provide suitability in the form of woodland edge and scrub for sett creation, foraging and commuting.

4.7 Hazel Dormouse

4.7.1 Baseline Ecological Conditions

Desktop Study Results

Consultation of the MAGIC database produced two records of granted EPSM licences in respect of hazel dormouse *Muscardinus avellanarius* within two kilometres of the site. One licence (2014-456-EPS-MIT), located 700 metres to the south-west of the site was granted for the destruction and damage of a breeding and resting site and is in place from 8th May 2014 to 31st October 2020. A second licence, 750 metres south-west of the site (2016-21182-EPS-MIT) covers damage to a breeding site and damage and destruction of a resting site and was in place from 11th March 2016.

Consultation with HBIC revealed a single record of hazel dormouse within one kilometre of the site in 2015. The location of the record is sensitive.

Ecological surveys undertaken by ECOSA for Portsmouth Water in 2008-2009 confirmed hazel dormouse presence within The Avenue, Havant Thicket and Staunton Country Park woodlands that lie within one kilometre to the east of the site, and provide woodland connectivity to the site.

Field Survey Results

The woodland and scrub on site and woodland immediately adjacent to the site provides suitable structure for hazel dormouse and a diversity of plants that would

provide a food resource for this species throughout the year. The site is connected to suitable dormouse habitat in the wider area through areas of well-connected large block of woodland to the west, east and north.

Hazel Dormouse Survey Results

The hazel dormouse survey confirmed the presence of dormouse within the site. The results of the hazel dormouse survey are presented in **Table 19**. Locations of the dormouse records are provided on **Map 8**.

Table 19: Hazel dormouse survey results

Survey Date	Results
25 th June 2019	No evidence of hazel dormouse recorded
23 rd July 2019	No evidence of hazel dormouse recorded
19 th August 2019	No evidence of hazel dormouse recorded
24 th September 2019	2 Adult hazel dormouse were recorded with a nest in tube 63
1 st October 2019	A total of 5 hazel dormouse individuals were recorded during the survey. A single sub-adult was recorded with a nest in tubes 31, 64 and 75. An adult and a sub-adult were recorded with a nest in tube 63. In addition, active nests were recorded in tubes 3, 6, 20 and 39.
22 nd October 2019	A total of 2 hazel dormouse individuals were recorded during the survey. A single adult was recorded with a nest in tubes 13 and 14. In addition, active nests were recorded in tubes 3, 15, 31, 39, 40, 53, 56, 57, 60 and 63. Potentially old nests were recorded in tubes 4, 6, 16, 20 and 24.
22 nd November 2019	A total of 7 hazel dormouse individuals were recorded during the survey. A single adult and two juveniles were recorded with a nest in tube 17. A single male juvenile was recorded with a nest in tube 22. Two adult males were recorded with a nest in tube 29. A single male adult was recorded with a nest in tube 47 In addition, active nests were recorded in tubes 9, 14, 20, 40, 49, 53, 56, 58, 60, 63, 64, 69, 70 and 75. Old nests were recorded in tubes 13 and 57.

4.7.2 Evaluation

Hazel dormouse breeding sites are listed as a reason for designation of SINC in Hampshire (6A Sites which support one or more notable species) (HBIC, 1996). As such the site is of importance at the county level for hazel dormouse.

4.8 Water Vole

4.8.1 Baseline Ecological Conditions

Desktop Study Results

During ecological surveys undertaken by ECOSA, on behalf of Portsmouth Water, immediately east of the site, during 2018, no field sign of water vole *Arvicola amphibius* was encountered.

Consultation with HBIC did not reveal any records of water vole, although it is not clear whether they hold records for this species (Paragraph 0).

Field Survey Results

There are no watercourses suitable for water vole on or in the vicinity of the site. There is a small stream 30 metres to the west of the site, however this lacks marginal vegetation suitable for water vole and is separated from the site by mature woodland which water vole are unlikely to traverse.

4.9 Birds

4.9.1 Baseline Ecological Conditions

Desktop Study Results

Consultation with HBIC revealed records of 53 notable and protected bird species within one kilometre of the site, including a number of notable 'county rare', 'county scarce' and 'county interest' species, Hampshire BAP species, 'Red listed' species, and Species of Principal Importance, 17 species protected under Schedule 1 of the Wildlife and Countryside Act and 11 species protected under Annex I of the Birds Directive, including European nightjar *Caprimulgus europaeus*.

During ecological surveys undertaken by ECOSA, on behalf of Portsmouth Water, immediately east of the site, during 2018, breeding birds of conservation concern were recorded, including ground nesting species; skylark *Alauda arvensis* and meadow pipit *Anthus pratensis*. In addition, European nightjar was recorded breeding in Havant Thicket woodland to the north of the site.

Field Survey Results

During the field survey, 25 bird species were recorded on or immediately adjacent to the site. These included birds that are listed of being of conservation concern¹⁶, namely

¹⁶ **Birds of Conservation Concern Red List:** The UK's birds are split in to three categories of conservation importance - red, amber and green. Red is the highest conservation priority and include species which are: globally threatened; have been subject to historical population decline in UK during 1800–1995; are in severe (at least 50%) decline in UK breeding population over the last 25 years, or longer-term period, or; subject to severe (at least 50%) contraction of UK breeding range over the last 25 years, or longer-term period.

red listed song thrush *Turdus philomelos*, linnet *Carduelis cannabina* and starling *Sturnus vulgaris*, amber listed dunnock *Prunella modularis* and bullfinch *Pyrrhula pyrrhula*.

The scrub habitat on site and woodland immediately adjacent provide nesting opportunities for breeding birds. The open grassland habitat surrounded by mature oak woodland may be suitable for foraging European nightjar.

The site lacks open grassland with unobstructed views and wetland habitat that would be of value to notable wintering bird assemblages such as waterbirds, waders and gulls. Therefore, wintering birds are not considered further in this report.

Breeding Bird Survey Results

Table 20 provides a list of red and amber listed bird species recorded within the site with locations recorded provided on **Map 9**.

Birds of Conservation Concern Amber List: Amber list criteria include species which are: in unfavourable conservation status in Europe; subject to historical population decline during 1800–1995, but recovering; subject to moderate (25-49%) decline in UK breeding population or contraction of UK breeding range over the last 25 years, or the longer-term period; subject to moderate (25-49%) decline in UK non-breeding population over the last 25 years, or the longer-term period; rare breeders (1–300 breeding pairs in UK); rare non-breeders (less than 900 individuals), or; internationally important species with at least 20% of European breeding or non-breeding population in the UK .

Table 20: Summary of bird survey results

Common name	Scientific name	Breeding On-Site	Estimated Number of Territories	Notes
Red Listed Species				
Linnet	<i>Carduelis cannabina subsp. autochthona/cannabina</i>	Yes	1	The territory is associated with scrub to the east of the site.
Song thrush	<i>Turdus philomelos subsp. clarkei</i>	Yes	1	The territory is associated with woodland to the east or west of the site.
Yellowhammer	<i>Emberiza citrinella</i>	Yes	1	The territory is associated with scrub habitats in the east of the site.
Amber Listed Species				
Bullfinch	<i>Pyrrhula pyrrhula</i>	Yes	1	The territory is associated with woodland and scrub habitats in the east of the site.
Dunnock	<i>Prunella modularis subsp. occidentalis</i>	Yes	2	The territories are associated with scrub habitats in the south and east of the site.
Meadow pipit	<i>Anthus pratensis</i>	No	-	
Stock dove	<i>Columba oenas</i>	No	-	
Green Listed Species				
Blackbird	<i>Turdus merula</i>	N/A	-	
Wren	<i>Troglodytes troglodytes</i>	N/A	-	
Coal tit	<i>Periparus ater</i>	N/A	-	
Robin	<i>Erithacus rubecula</i>	N/A	-	
Bearded tit	<i>Panurus biarmicus</i>	N/A	-	
Chiffchaff	<i>Phylloscopus collybita</i>	N/A	-	
Brambling	<i>Fringilla montifringilla</i>	N/A	-	
Woodpigeon	<i>Columba palumbus</i>	N/A	-	
Blue tit	<i>Cyanistes caeruleus</i>	N/A	-	

Common name	Scientific name	Breeding On-Site	Estimated Number of Territories	Notes
Long-tailed tit	<i>Aegithalos caudatus</i>	N/A	-	
Great tit	<i>Parus major</i>	N/A	-	
Greenfinch	<i>Carduelis chloris</i>	N/A	-	
Nuthatch	<i>Sitta europaea</i>	N/A	-	
Jackdaw	<i>Corvus monedula</i>	N/A	-	
Magpie	<i>Pica pica</i>	N/A	-	
Whitethroat	<i>Sylvia communis</i>	N/A	-	

European nightjar Survey Results

No evidence of European nightjar activity was recorded during the surveys. European nightjar are therefore not considered to be breeding on or adjacent to the site.

4.9.2 Evaluation

The number of individuals and breeding territories of each notable species recorded on site do not meet the threshold levels to qualify for SINC designation under criteria 6A¹⁷, 6B¹⁸, or 6C¹⁹ (HBIC, 1996), and therefore the site is not considered to be of importance at the county level. The habitat used by the notable species recorded, woodland and scrub, is highly prevalent in the local area, given the presence of Havant Thicket adjacent to the eastern site boundary. Therefore the site is of importance at the site level for breeding birds.

4.10 Reptiles

4.10.1 Baseline Ecological Conditions

Desktop Study Results

Consultation with HBIC revealed a single record of slow-worm *Anguis fragilis* within one kilometre of the site, near the A3(M) in 2010.

All four common species, slow-worm, grass snake *Natrix helvetica*, common lizard *Zootoca vivipara* and adder *Vipera berus* are known to be present in grassland habitats immediately east of the site through results of surveys undertaken by ECOSA, on behalf of Portsmouth Water.

Field Survey Results

The site provides a mosaic of grassland and scrub habitats that are likely to be of value to reptiles at all life stages including hibernation, with the potential for all four common species, slow worm, grass snake, common lizard, and adder to be present. The geographic range of the rare smooth snake *Coronella austriaca* and sand lizard *Lacerta agilis* means that they are considered to be absent from the site.

Reptile Survey Results

A summary of the reptile surveys at the site is provided in **Table 21** and on **Map 10**.

¹⁷ Sites which support one or more notable species

¹⁸ Sites which regularly support a significant population of a species that has a restricted distribution or has substantially declined in population or range. Such sites may be used seasonally or for only one part of a species life-cycle.

¹⁹ Sites which support an outstanding assemblage of species.

Table 21: Summary of reptile survey results

Survey Date	Number of Individuals Recorded							
	Slow-worm		Common Lizard		Adder		Grass Snake	
	Adult	Juv.	Adult	Juv.	Adult	Juv.	Adult	Juv.
14 th June 2019	38	20	1	0	0	1	0	0
28 th June 2019	35	11	0	0	0	0	0	0
2 nd July 2019	24	7	0	0	1	1	0	0
5 th July 2019	29	0	2	0	0	0	0	0
10 th July 2019	57	9	0	0	1	0	0	0
17 th July 2019	27	5	0	0	0	0	0	0
2 nd August 2019	48	15	0	0	3	1	0	0
Peak Count	57	20	2	0	3	1	0	0

4.10.2 Evaluation

Population Class Size Assessment

Table 22 shows the current guidance (Froglife, 1999) for assessing the population size of reptiles based on a refugia density of 10 per hectare. A density of 15 refugia per hectare was used at the site and therefore the population size assessment has been adjusted accordingly.

Table 22: Criteria for population size assessment based upon a refugia density of 10 per hectare

Species	Low Population	Good Population	Exceptional Population
Slow-worm	<8	8-30	>30
Common lizard	<8	8-30	>30
Adder	<8	8-15	>15

Given the peak count of 57 adults, the site can be said to support an exceptional population of slow-worm.

Given the peak count of 2 adults, the site can be said to support a low population of common lizard.

Given the peak count of 3 adults, the site can be said to support a low population of adder.

Although grass snake have been recorded in proximity to the site, no individuals were recorded during the reptile surveys. This is likely to be due to this species preference for wetter habitats, which are present in the wider area, but not present on or in the immediate vicinity of the site.

Evaluation

HBIC criteria state that sites supporting more than 50 adult slow worm, qualify for SINC status under criteria 6B²⁰ (HBIC, 1996). On this basis the site is of importance at the county level for slow-worm.

HBIC criteria state that sites supporting more than three adult adder or 15 adult common lizard, qualify for SINC status under criteria 6B²⁰ (HBIC, 1996). Given the prevalence of closed canopy woodland and urban development in the local area, and likely management of much of the remaining agricultural land, the unmanaged grassland/scrub habitat matrix on site is likely to represent a significant proportion of the local resource for these species. On this basis the site is of importance at the local level for adder and common lizard.

4.11 Great Crested Newt

4.11.1 Baseline Ecological Conditions

Desktop Study Results

Consultation of the MAGIC database produced one record of a granted EPSM licence in respect of great crested newt within two kilometres of the site, this licence (EPSM 2009-795) is located 1.6 kilometres north of the site and was granted for damage and destruction of breeding and resting habitats between 26th June 2012 and 1st October 2018.

Consultation of online mapping resources shows three ponds within 500 metres of the site, which are located approximately 170 metres and 400 metres west of the site and 230 metres to the north. The ponds to the west of the site are separated from the site by flowing water.

During ecological surveys undertaken by ECOSA, on behalf of Portsmouth Water, immediately east of the site, during 2018 the ponds 400 metres to the west of the site and to the north of the site were subject to eDNA survey, but were found to be negative. The pond 170 metres to the west of the site was assessed as being unsuitable for great crested newt. In 2018 and 2019, great crested newt eDNA was found in three ponds in Havant Thicket woodland located over 500 metres to the north-east of Cabbagefield Row. Further surveys of these waterbodies and others in the immediate vicinity did not record any further great crested newt. No other evidence of great crested newt was recorded.

²⁰ Sites that regularly support a significant population of a species that has a restricted distribution or has substantially declined in population or range.

Field Survey Results

There are no waterbodies on site and therefore the site does not provide breeding habitat for great crested newt. The grassland on site is not heavily managed and does provide cover for the species, as does the dense scrub on site. However, given the lack of connectivity to suitable waterbodies nearby, and absence of the species in recent surveys undertaken of ponds within 500 metres, this species is likely absent and is not considered further in this report.

4.12 Invertebrates

4.12.1 Baseline Ecological Conditions

Desktop Study Results

The HBIC consultation revealed records of 71 notable and protected species of *Lepidoptera* including a number of notable species including 'county rare', 'county scarce' and 'county interest' species, Hampshire BAP species, Species of Principal Importance and a single nationally scarce species, rosy-striped knot-horn *Oncocera semirubella*.

During ecological surveys undertaken by ECOSA, on behalf of Portsmouth Water, immediately east of the site, during 2018, a total of four Red Data Book species, eight Nationally Scarce species, three Species of Principal Importance and one Hampshire BAP species were recorded.

Field Survey Results

The unmanaged more diverse grassland in the north of the site, the dense scrub, and the surrounding mature oak woodland, provide habitat that could be used by notable invertebrates.

Invertebrates Survey Results

During the invertebrate survey it was noted that favoured foraging resources for insects in the grassland in the north of the site are patchily distributed. Plant species recorded which are particularly favoured by insects are black knapweed *Centaurea nigra*, white clover *Trifolium repens*, common bird's-foot trefoil *Lotus corniculatus*, meadow vetchling *Lathyrus pratensis*, tufted vetch *Vicia cracca*, common fleabane *Pulicaria dysenterica* and ragwort *Senecio jacobaea* and red bartsia *Odontites vernus*.

A full list of invertebrate species recorded during the invertebrate survey is provided in **Table 23**.

Table 23: Invertebrate species recorded during the invertebrate survey

Order	Family	Scientific Name	English Name	Status	Date
ORTHOPTERA (Grasshoppers & Crickets)		<i>Chorthippus brunneus</i>	Field grasshopper	Common Widespread	13/08/2019
		<i>Chorthippus parallelus</i>	Meadow grasshopper	Common Widespread	21/06/2019, 11/07/2019
		<i>Metrioptera roeselii</i>	Roesel's bush cricket	Common Widespread	21/06/2019, 11/07/2019, 13/08/2019
		<i>Omocestus viridulus</i>	Common green grasshopper	Common Widespread	21/06/2019, 11/07/2019
HEMIPTERA (True Bugs)	Coreidae (Squash Bugs)	<i>Coreus marginatus</i>	Squash bug	Common Widespread	11/07/2019, 13/08/2019
	Pentatomidae (Shield Bugs)	<i>Aelia acuminata</i>	Bishop's mitre	Common Widespread	21/06/2019, 13/08/2019
		<i>Dolycoris baccarum</i>	Sloe bug	Common Widespread	13/08/2019
	Scutelleridae (Tortoise Bugs)	<i>Euygaster testudinaria</i>	Common Tortoise Bug	Common Widespread	11/07/2019, 13/08/2019
ODONATA (Dragonflies & Damselflies)	Aeshnidae (Hawkers)	<i>Anax imperator</i>	Emperor dragonfly	Common Widespread	21/06/2019
	Libellulidae (Skimmers & Darters)	<i>Sympetrum striolatum</i>	Common dater	Common Widespread	13/08/2019
LEPIDOPTERA (Butterflies & Moths)		<i>Apatura iris</i>	Purple emperor	Hampshire BAP	11/07/2019
		<i>Aphantopus hyperantus</i>	Ringlet	Common Widespread	11/07/2019
		<i>Argynnis aglaja</i>	Dark green fritillary	Local Widespread	11/07/2019
		<i>Aricia agestis</i>	Brown argus	Common Widespread	13/08/2019
		<i>Coenonympha pamphilus</i>	Small Heath	UK BAP (Research only)	13/08/2019
		<i>Maniola jurtina</i>	Meadow brown	Common Widespread	21/06/2019, 11/07/2019, 13/08/2019

Order	Family	Scientific Name	English Name	Status	Date
		<i>Melanargia galathea</i>	Marbled White	Common Widespread	21/06/2019, 11/07/2019
		<i>Neozephyrus quercus</i>	Purple hairstreak	Common Widespread	11/07/2019
		<i>Ochlodes faunus</i>	Large Skipper	Common Widespread	21/06/2019, 11/07/2019
		<i>Pieris brassicae</i>	Large white	Common Widespread	11/07/2019
		<i>Pieris rapae</i>	Small white	Common Widespread	11/07/2019, 13/08/2019
		<i>Polyommatus icarus</i>	Common blue	Common Widespread	21/06/2019, 13/08/2019
		<i>Pyronia tithonus</i>	Gatekeeper	Common Widespread	11/07/2019, 13/08/2019
		<i>Thymelicus lineola</i>	Essex Skipper	Common Widespread	11/07/2019
		<i>Thymelicus sylvestris</i>	Small skipper	Common Widespread	21/06/2019, 11/07/2019
		<i>Vanessa atalanta</i>	Red Admiral	Common Widespread	21/06/2019, 13/08/2019
		<i>Vanessa cardui</i>	Painted Lady	Common Widespread	13/08/2019
		<i>Euclidia glyphica</i>	Burnet companion	Common Widespread	21/06/2019
		<i>Scotopteryx chenopodiata</i>	Shaded broad - bar	Common Widespread	11/07/2019
		<i>Synanthedon andrenaeformis</i>	Orange - tailed clearwing	Nationally Scarce Nb	11/07/2019
		<i>Synanthedon vespiformis</i>	Yellow - legged clearwing	Nationally Scarce Nb	11/07/2019
		<i>Tyria jacobaea</i>	Cinnabr moth	UK BAP (Research only)	13/08/2019
		<i>Zygaena filipendulae</i>	Six - spot burnet	Common Widespread	21/06/2019, 11/07/2019

Order	Family	Scientific Name	English Name	Status	Date
		<i>Zygaena trifolii</i>	Five - spot burnet	Common Widespread	21/06/2019
DIPTERA (True Flies)	Rhagionidae (Snipe flies)	<i>Rhagio tringarius</i>		Common, Widespread	11/07/2019, 13/08/2019
	Tabanidae (Horse flies)	<i>Haematopota pluvialis</i>		Common Widespread	11/07/2019
	Asilidae (Robberflies)	<i>Leptogaster cylindrica</i>		Common Widespread	21/06/2019
	Dolichopodidae (Long – headed flies)	<i>Dolichopus virgultorum</i>		Nationally Scarce N	11/07/2019
	Syrphidae (Hoverflies)	<i>Chrysotoxum bicinctum</i>		Common Widespread	21/06/2019, 13/08/2019
		<i>Chrysotoxum festivum</i>		Common Widespread	21/06/2019, 13/08/2019
		<i>Episyrphus balteatus</i>		Common Widespread	21/06/2019, 11/07/2019, 13/08/2019
		<i>Eristalis pertinax</i>		Common Widespread	11/07/2019, 13/08/2019
		<i>Eristalis tenax</i>		Common Widespread	13/08/2019
		<i>Eumerus ornatus</i>		Local Widespread	21/06/2019
		<i>Eupeodes luniger</i>		Common Widespread	13/08/2019
		<i>Helophilus pendulus</i>		Common Widespread	11/07/2019, 13/08/2019
		<i>Melanostoma mellinum</i>		Common Widespread	11/07/2019, 13/08/2019
		<i>Melanostoma scalare</i>		Common Widespread	13/08/2019
		<i>Myathropa florea</i>		Common Widespread	21/06/2019, 13/08/2019

Order	Family	Scientific Name	English Name	Status	Date
		<i>Paragus haemorrhous</i>		Common Widespread	21/06/2019, 11/07/2019
		<i>Platycheirus albimanus</i>		Common Widespread	21/06/2019
		<i>Sphaerophoria scripta</i>		Common Widespread	21/06/2019, 11/07/2019, 13/08/2019
		<i>Sphaerophoria taeniata</i>		Common Widespread	13/08/2019
		<i>Syritta pipiens</i>		Common Widespread	11/07/2019, 13/08/2019
		<i>Syrphus ribesii</i>		Common Widespread	11/07/2019, 13/08/2019
		<i>Syrphus vitripennis</i>		Common Widespread	21/06/2019
		<i>Volucella bombylans</i>		Common Widespread	21/06/2019
		<i>Xanthogramma pedisequum</i>		Common Widespread	21/06/2019
		<i>Xylota segnis</i>		Common Widespread	11/07/2019
	Conopidae (Thick – headed flies)	<i>Conops ceriaeformis</i>		Common Widespread	13/08/2019
		<i>Physocephalus rufipes</i>		Common Widespread	11/07/2019
		<i>Sicus ferrugineus</i>		Common Widespread	21/06/2019, 11/07/2019
	Tephritidae (Picture-winged flies)	<i>Acanthiophilus helianthi</i>		Nationally Scarce N	11/07/2019, 13/08/2019
		<i>Acinia corniculata</i>		Endangered RDB 1	11/07/2019, 13/08/2019
		<i>Campiglossa malaris</i>		Endangered RDB 1	11/07/2019, 13/08/2019

Order	Family	Scientific Name	English Name	Status	Date
		<i>Chaetorellia jaceae</i>		Common Widespread	21/06/2019, 11/07/2019, 13/08/2019
		<i>Merzomyia westermanni</i>		Nationally Scarce N	13/08/2019
		<i>Myopites inulaedyssentericae</i>		Rare RDB 3	13/08/2019
		<i>Sphenella marginata</i>		Common Widespread	13/08/2019
		<i>Tephritis divisa</i>		Common Widespread	13/08/2019
		<i>Tephritis formosa</i>		Common Widespread	13/08/2019
		<i>Tephritis neesii</i>		Common Widespread	13/08/2019
		<i>Terellia serratulae</i>		Common Widespread	13/08/2019
		<i>Uropjhora jaceana</i>		Common Widespread	11/07/2019
		<i>Urophora quadrifasciata</i>		Common Widespread	21/06/2019, 11/07/2019, 13/08/2019
		<i>Urophora stylata</i>		Common Widespread	11/07/2019
	Sciomyzidae (Snail – killing flies)	<i>Limnia unguicornis</i>		Common Widespread	11/07/2019
	Tachinidae (Tachinid flies)	<i>Eriothrix rufomaculatus</i>		Common Widespread	13/08/2019
		<i>Gymnosoma rotundatum</i>		Rare RDB 3	13/08/2019
		<i>Phasia pusilla</i>		Common Widespread	21/06/2019
HYMENOPTERA (Bees, Wasps, Ants and Relatives)	Eumenidae (Potter & Mason wasps)	<i>Ancistrocerus gazella</i>		Common, Widespread	13/08/2019
	Vespidae (Social Wasps)	<i>Vespa crabro</i>	Hornet	Local Widespread	11/07/2019
		<i>Vespula vulgaris</i>	Common wasp	Common Widespread	13/08/2019
	Crabronidae (Digger Wasps)	<i>Lindenius albilabris</i>		Common Widespread	11/07/2019

Order	Family	Scientific Name	English Name	Status	Date
	Colletidae (Mining & Yellow faced bees)	<i>Hylaeus communis</i>		Common, Widespread	11/07/2019, 13/08/2019
	Andrenidae (Mining Bees)	<i>Andrena dorsata</i>		Common, Widespread	11/07/2019, 13/08/2019
		<i>Andrena flavipes</i>		Common Widespread	11/07/2019
		<i>Andrena fulvago</i>		Nationally Scarce Na	11/07/2019
		<i>Andrena minutula</i>		Common Widespread	21/06/2019
	Halictidae (Mining & Cuckoo Bees)	<i>Lasioglossum leucozonium</i>		Common Widespread	21/06/2019, 13/08/2019
		<i>Lasioglossum malachurum</i>		Nationally Scarce Nb	21/06/2019, 13/08/2019
		<i>Lasioglossum pauxillum</i>		Nationally Scarce Na	13/08/2019
		<i>Lasioglossum zonulum</i>		Common Widespread	21/06/2019, 13/08/2019
	Melittidae (Mining bees)	<i>Melitta tricincta</i>		Nationally Scarce Nb	13/08/2019
	Megachilidae (Solitary bees)	<i>Megachile centuncularis</i>		Common Widespread	13/08/2019
	Anthophoridae (Flower & Nomad bees)	<i>Nomada flavoguttata</i>		Common Widespread	21/06/2019
		<i>Nomada fucata</i>		Nationally Scarce Na	11/07/2019, 13/08/2019
	Apidae (Social & Cuckoo Bees)	<i>Apis mellifera</i>	Honey bee	Common Widespread	21/06/2019, 11/07/2019, 13/08/2019
		<i>Bombus hypnorum</i>	Tree bumblebee	Common Widespread	21/06/2019
		<i>Bombus lapidarius</i>	Red-tailed bumblebee	Common Widespread	21/06/2019, 11/07/2019, 13/08/2019

Order	Family	Scientific Name	English Name	Status	Date
		<i>Bombus lucorum</i>	White-tailed bumblebee	Common, Widespread	21/06/2019
		<i>Bombus pascuorum</i>	Common carder bee	Common, Widespread	21/06/2019, 11/07/2019, 13/08/2019
		<i>Bombus lucorum/terrestris worker</i>	A bumblebee	Common, Widespread	11/07/2019
COLEOPTERA (Soldier Beetles)	Cantharidae (Soldier Beetles)	<i>Cantharis rustica</i>		Common, Widespread	21/06/2019
		<i>Rhagonycha fulva</i>		Common Widespread	11/07/2019
	Cerambycidae (Longhorn Beetles)	<i>Rutpela maculata</i>	Spotted longhorn beetle	Common Widespread	21/06/2019
	Coccinellidae (Ladybirds)	<i>Coccinella 7 - punctata</i>	Seven spot ladybird	Common, Widespread	21/06/2019, 11/07/2019, 13/08/2019
		<i>Harmonia axyridis</i>	Harlequin Ladybird	Common Widespread	21/06/2019
	Malachiidae (Pollen Beetles)	<i>Malachius bipustulatus</i>		Common Widespread	21/06/2019
	Oedemeridae (Oedemerid Beetles)	<i>Oedemera nobilis</i>		Common, Widespread	21/06/2019, 11/07/2019
ARACHNIDA (Spiders)	Argiopidae	<i>Orb web spiders</i>			
		<i>Argiope bruennichi</i>	Wasp spider	Nationally Scarce Nb	13/08/2019

4.12.2 Evaluation

In order for a site to meet Criteria 6A⁶ for SINC designation, the site must have confirmed or probably post-1990 breeding populations of any notable species (HBIC, 1996). As at least two notable species, orange-tailed clearwing, and the cinnabar moth have been recorded breeding on site, the site meets this criteria and is therefore of importance at the county level for Lepidoptera.

Hampshire SINC criteria is only provided for Lepidoptera and therefore the evaluation methodology set out in this report cannot be used to determine a geographic level of importance for the invertebrate assemblage as a whole. However, it is the conclusion of the ECOSA's entomological specialist, that the site has 'considerable local entomological importance', based on the presence of four Red Data Book species and ten Nationally Scarce species of insect (A Wright 2019, personal communication, 25th October).

Based on this information the site is considered to be of importance at up to county level for invertebrates as a whole.

4.13 Other Relevant Species

4.13.1 Baseline Ecological Conditions

Desktop Study Results

Consultation with HBIC did not reveal any records of brown hare, European hedgehog although it is not clear whether they hold records for this species.

Consultation with HBIC revealed a single record of common toad within one kilometre of the site, within Havant Thicket in 2018.

Common toad were recorded in six of the 14 ponds within Havant Thicket as an incidental result of great crested newt surveys during May and June 2018. These ponds are clustered in the north of the Havant Thicket site and the nearest pond lies approximately 1.5 kilometres north-east of the site.

Consultation of MAGIC identified a further four waterbodies closer to the site than those where common toad were recorded as part of the Havant Thicket surveys. Two of these lie west of the site and are separated from the site by approximately 170 metres and 400 metres. The remaining two ponds lie east of the site within Havant Thicket land; Upper Lake lies approximately 700 metres east of the site and a small pond lies 1.1 kilometres north east of the site. These ponds had negative eDNA results and therefore were not included in the Havant Thicket great crested newt survey.

Field Survey Results

The open grassland on site represents suitable habitat for brown hare, with adjacent woodland providing potential winter shelter. However, there is a relatively limited availability of agricultural land in the vicinity of the site, with the landscape being predominantly characterised by urban development and woodland. The site therefore provides suboptimal habitat for this species.

The grassland on site provides foraging and sheltering opportunities in summer and scrub habitats provide hibernation opportunities in winter. The adjacent broadleaved woodland is likely to provide an ample resource of deciduous leaves for nesting material.

There are no waterbodies on site and therefore the site does not provide breeding habitat for common toad. The grassland on site is not heavily managed and does provide cover for the species, as does the dense scrub on site. Although the site lies within migratory distance of a number of ponds and is known to be present in the area, all suitable ponds are surrounded by high quality woodland habitat and lie more than 400 metres from the site. It is therefore considered unlikely that common toad would travel these distances to make use of the suboptimal habitat offered by the site itself. There is also direct connectivity between the ponds to the east and west of the site via woodland to the north, while common toad may migrate through the site on occasion, the site itself is unlikely to represent a key element of their migratory habitat.

4.14 Summary of Baseline Ecological Conditions

Table 24 provides a summary of the ecological features of value at the site. Ecological features considered during the appraisal but concluded to have no ecological value have been omitted from this summary.

Table 24: Summary of Baseline Ecological Conditions at the Site

Ecological Feature		Level of Importance
Designated Sites	Solent Maritime Statutory Designated Sites	European-International
	Hazleton Common LNR	County
	SINCs (on and adjacent to the site and publicly accessible in the wider area)	County
Habitats	Woodland	County
	Semi-improved grassland	Up to county
Bats	Roosting	Site
	Foraging and Commuting	Site

Badger		N/A ²¹
Hazel Dormouse		County
Birds	Breeding	Site
Reptiles	Slow-worm	County
	Other widespread reptiles (adder and common lizard)	Local
Invertebrates		Up to county
European hedgehog		Site

²¹ Important Ecological Feature on the basis of legal protection only, rather than conservation importance.

5.0 ASSESSMENT OF ECOLOGICAL EFFECTS AND MITIGATION/COMPENSATION/ENHANCEMENT MEASURES

5.1 Introduction

This section assesses the ecological effects of the proposed development scheme on the identified ecological features as identified in Section 4.0. Methods for addressing potential impacts on ecological features have been approached in accordance with the mitigation hierarchy²² with avoidance of impacts prioritised where possible. Where significant adverse effects cannot be avoided other forms of mitigation are prioritised over compensation. Enhancement measures have been detailed, where relevant, in order to not only minimise the impacts on biodiversity but also to provide enhancement in accordance with Paragraph 170 of the NPPF (Paragraph 2.2). It is anticipated that mitigation, compensation and enhancement measures will be secured through the planning process.

5.2 Scheme Design

The proposed development entails the construction of 84 houses and 28 flats in the south of the site, with access vehicular access and pedestrian access from Swanmore Road, through the southern site boundary. Vehicular access will be established through the existing gateway, however a small number of trees will be removed to facilitate the pedestrian access. The north of the site will remain undeveloped as open space. A 15 metre buffer will be maintained between the built development in the south of the site and the adjacent woodland to the west.

The potential ecological impacts and effects of these proposals, in the absence of mitigation, are described for each ecological feature below. For each ecological feature, measures to mitigate and/or compensate for significant effects are described.

5.3 Designated Sites

5.3.1 Potential Impacts and Effects

The increase in residents has the potential to result in increased recreational pressure on the Chichester and Langstone Harbours Ramsar site and SPA. The increase in recreational visitors can result in disturbance to the bird population/assemblage that these sites are designated for, and this disturbance can result in decreased survival, as birds expend more energy avoiding the disturbance.

In addition, the development will result in an increase in nitrogen output from the site, in the form of increased leaching as a result of change of land use from open space to

²² In accordance with CIEEM Ecological Impact Assessment guidance (CIEEM, 2018) a sequential process is adopted to address impacts on features of ecological interest, with 'Avoidance' prioritised at the top of the hierarchy and Compensation/Enhancement' at the bottom. This is often referred to as the 'mitigation hierarchy'.

urban development, and through increased wastewater generation. A Nutrient Budget Calculation undertaken by Syntegra concluded that the proposals would result in a net increase in nitrogen output of 161.3 kilograms per year (Syntegra Consulting, 2021). As the site lies within the catchment of the Solent, this nitrogen will eventually make its way into the Chichester and Langstone Harbours Ramsar site and SPA and Solent Maritime SAC, potentially resulting in adverse effects on the wetland habitats these sites are designated for as a result of eutrophication.

The Dunsbury Hill Grassland 2 SINC located in the north of the site and will be retained as part of the development proposals, therefore no direct impacts are anticipated. Unmitigated the SINC may be subject to degradation through trampling, dog fouling, littering or fire starting as a result of public access.

Although areas of ancient woodland adjacent to the site, and their associated local designations, are proposed to be retained, the proposals still have potential to result in adverse effects as a result of accidental damage during construction (through direct impact, root compaction or pollution events) There is also potential for habitat deterioration due to anthropogenic impacts (trampling, dog fouling, littering, arson etc.) as a result of informal access to the woodland surrounding the site.

The increase in residents has the potential to result in increased recreational pressure on the Hazelton Common LNR and 12 publicly accessible SINCS. The increase of recreational visitors has potential to result in deterioration of habitats which are the reason for designation, or support species which are the reason for designation, through trampling, dog fouling and littering.

There are no anticipated impacts on other SINCS within the desk study area as these are more distant from the site and are not accessible to members of the public.

5.3.2 Mitigation Measures

A financial contribution will be made to the Bird Aware Solent Strategy (Bird Aware Solent, 2017) to mitigate for the effect of recreational pressure on the Solent Maritime sites. Based on contributions from 1st April 2020, the anticipated contribution is calculated in Table.(12 x 1-bed properties at £356, 33 x 2-bed properties at £514, 75 x 3-bed properties at £671, 27 x 4-bed properties at £789 and 3 x 5-bed properties) are as follows:

No. of Bedrooms per Property	No. of Dwellings in Proposed Scheme	Value of Contribution	Total
1	12	£356	£4,272
2	33	£514	£16,962
3	75	£671	£50,325

4	27	£789	£21,303
5	3	£927	£2,781
Total	150	-	£95,643

It is anticipated that the financial contribution will be secured via a s106 agreement.

Mitigation measures for the increased output of nitrogen as a result of the proposals are set out in the Nitrates Statement and Nutrient Budget Calculation produced by Syntegra (Syntegra Consulting, 2021). This will take the form of a financial contribution to Portsmouth City Council of £1,241 per kilogram. It is anticipated that this will be secured by Section 106 or Grampion condition.

Heras-type fencing will be established along the 15 metre buffer of undeveloped land adjacent to areas of ancient woodland associated with Bell's Copse SINC, Cabbagefield Row SINC and Dunsbury Hill Wood SINC, and pollution control measures will be set out in a Construction and Environmental Management Plan (CEMP) prior to commencement of works. It is anticipated that the CEMP will be secured by a pre-commencement condition.

In addition to the ancient woodland buffers on the northern and eastern boundaries, the root protection zone of woodland in the west of the site will also be protected. This will also preserve the identified Ecological Network Opportunity area along the site boundary in accordance with Policy E 14 of the Havant Local Plan 2036.

The woodland buffers will be planted with dense, thorny scrub in order to deter residents from accessing the adjacent areas of woodland. In addition, approximately two metre high deer-proof fencing will be installed within the woodland buffers to further deter access. As this fencing is primarily to deter residents, discrete gaps will be established at the base of the fencing, hidden from view by scrub planting, to continue to allow animals to access the site.

The provision of open greenspace in the north of the site is likely to mitigate for any significant increase in recreational pressure on other publicly accessible SINC's in the local area. As the open greenspace coincides with the Dunsbury Hill Grassland 2 SINC, this will need to be carefully managed to prevent degradation of the grassland for which the SINC is designated. This will include provision of interpretation boards to make residents aware of the value of the SINC, provision of litter and dog bins to reduce littering, clearly demarcated mown footpaths to reduce trampling of other areas of grassland, and regular visits to monitor increases in littering or incidents of fire starting. In addition, the grassland within the SINC appears to have deteriorated since the site's original designation, therefore positive management will improve the quality of the

grassland when compared to the current baseline situation, which will also offset any potential effects as a result of increased recreational pressure.

The details of the long-term management of the green open space will be provided in a Landscape and Ecological Management Plan (LEMP). It is anticipated that the LEMP will be submitted as part of the reserved matters application.

5.3.3 Significance of Residual Effects

Following mitigation measures, no significant residual effects are anticipated.

5.3.4 Compensation

As no significant residual effects are anticipated, no compensation measures are required.

5.3.5 Enhancement

The Dunsbury Hill Grassland 2 SINC will be managed to increase the diversity of the existing semi-improved grassland, with the objective of meeting or exceeding the criteria for which the grassland was originally designated as a SINC. This will be achieved through positive management (i.e. cutting at after flowers have set seed and arisings removed) to reduce competitiveness of more common species and allow less common species already on site to develop more within the sward. This work will be undertaken by Portsmouth City Council's 'Green and Clean' management team. Detailed management measures will be set out in the LEMP.

5.3.6 Monitoring

The Dunsbury Hill Grassland 2 SINC will be monitored annually for five years post-development to ensure that measures set out in the LEMP are successful. The measures in the LEMP will be reviewed and amended as necessary following the findings of each monitoring visit.

5.4 Habitats

5.4.1 Potential Impacts and Effects

The proposals will result in the loss of dense scrub, tall ruderal vegetation and a limited extent of semi-improved grassland that lies outside of the Dunsbury Hill 2 SINC designation. This impact is considered to be of negligible significance, when considering the habitats in isolation, as none of these habitat types are of specific conservation significance. However, unmitigated this will result in a net loss of biodiversity value at the site as calculated using a biodiversity metric, which uses habitats as an indicator (ECOSA, 2022) and will have significant effects on notable and protected species which make use of these habitats.

The proposals have potential to result in adverse effects on woodland on site boundaries and semi-improved grassland habitat of county importance in the north of the site as a result of accidental damage during construction (through direct impact, root compaction or pollution events). There is also potential for habitat deterioration due to anthropogenic impacts (trampling, dog fouling, littering, arson etc.) as a result of informal access to the woodland surrounding the site.

As the semi-improved grassland on site is associated with the Dunsbury Hill 2 SINC, impacts associated with this habitat have been addressed in Paragraph 5.3.1.

5.4.2 Mitigation Measures

The root protection zone of the woodland on the western site boundary will be protected with Heras-type fencing during construction. This will also preserve the identified Ecological Network Opportunity area along the site boundary in accordance with Policy E 14 of the Havant Local Plan 2036.

The retained root protection zone will be planted with dense, thorny scrub in order to deter residents from accessing the woodland.

As the semi-improved grassland on site is associated with the Dunsbury Hill 2 SINC, mitigation measures associated with this habitat have been addressed in Paragraph 5.3.2.

5.4.3 Significance of Residual Effects

Following mitigation measures, there will remain an overall net loss in biodiversity value at the site.

5.4.4 Compensation

A Biodiversity Net Gain Assessment has been completed (ECOSA, 2022) and concludes that the creation of modified grassland, a new SUDS pond, a traditional orchard and mixed scrub, as well as the enhancement of the semi-improved grassland within the Dunsbury Hill 2 SINC will result in an overall net gain in biodiversity value at the site.

5.4.5 Enhancement

Enhancement of retained semi-improved grassland associated with Dunsbury Hill 2 SINC is set out in Paragraph 5.3.5. This in combination with new habitat creation post-development (Paragraph 5.4.4) will result in an overall net gain in biodiversity value at the site, using habitats as an indicator (ECOSA, 2022).

5.4.6 Monitoring

Monitoring will be undertaken to ensure successful establishment of the landscaping proposals over a period of 30 years. Further details will be provided in the LEMP which will be submitted as part of the reserved matters application.

5.5 Bats

5.5.1 Potential Impacts and Effects

All trees identified as having bat roost potential, including the ash tree identified as supporting a brown long-eared day roost, will be retained. However, accidental damage to these trees during construction has potential to result in loss of bat roosts and killing and injury of bats, and construction works have potential to result in disturbance of bats, which would constitute an offence under Regulation 43 of the Habitats Regulations and Section 9(4) of the Wildlife and Countryside act.

Key foraging and commuting habitats (woodland edge habitat and unmanaged grassland) will be predominantly retained. Any external lighting strategy associated with the development has potential to result in disturbance to foraging and commuting bats, as light-averse species may avoid areas subject to significant light spill, reducing the habitat resource available to this species group and potentially fragmenting woodland-edge commuting habitat.

5.5.2 Mitigation Measures

The protection of woodland set out in Paragraph 5.4.2 will ensure construction works are distant enough from potential roosting features to avoid physical and disturbance impacts during construction.

The maintenance of buffers between the woodland edges and built development will establish dark corridors along the boundary, maintaining this habitat resource. A detailed lighting plan has been produced in order to ensure that there is no significant light spill on key areas of foraging and commuting habitat (WSP, 2022). The lighting strategy sets out sensitive lighting measures both during construction and operation and includes modelling of the eastern boundary to demonstrate that light levels are likely to fall below the limitations outlined in ILP GN08:2018 (Bat Conservation Trust and Institute of Lighting Professionals, 2018).

Positive management of the grassland as recommended in Paragraph 5.3.5 will improve the habitat for terrestrial invertebrates, and this is likely to compensate for the minor loss of grassland habitat as a bat foraging resource through an increase in availability of invertebrate prey.

5.5.3 Significance of Residual Effects

Following mitigation measures, no significant residual effects are anticipated.

5.5.4 Compensation

As no significant residual effects are anticipated, no compensation measures are required.

5.5.5 Enhancement

Proposed enhancements for invertebrates (Paragraph 5.10.5) will provide an enhanced prey resource for bats.

Integrated bat roost units (such as Vivara Pro Build-in Woodstone Bat Tube or similar) will be incorporated into all of the new buildings (**Appendix 9**) to provide enhanced roosting opportunities within the site.

5.5.6 Monitoring

No monitoring is proposed in relation to bats.

5.6 Badger

5.6.1 Potential Impacts and Effects

Although no badger setts have been recorded at the site, badger are a highly mobile species and may colonise the site prior to the commencement of construction. If a badger sett is present at the time of commencement of works, construction has potential to result in the damage of the sett and killing or injuring of badger, which would constitute an offence under the Protection of Badgers Act 1992.

5.6.2 Mitigation Measures

Within 12 months prior to site clearance, a walkover survey be carried out to determine the presence of any active setts.

The retention of the woodland buffers will reduce the risk of any badger setts present within adjacent woodland being impacted.

If a badger sett is discovered, if works must be undertaken within 30 metres of a badger sett, they will be undertaken with light machinery or hand tools, depending on the proximity of works to the sett. If more intrusive works are required, it may be necessary to close the sett. If this is necessary, a protected species licence will be sought from Natural England to allow works to be undertaken that would otherwise constitute a legal offence. The application for a licence will be supported by a suitable mitigation strategy, likely to include installation of one way gates on sett entrances, monitoring setts to confirm badger exclusion and destruction of setts under the supervision of a suitably qualified ecologist.

5.6.3 Significance of Residual Effects

Following mitigation measures, no significant residual effects are anticipated.

5.6.4 Compensation

As no significant residual effects are anticipated, no compensation measures are required.

5.6.5 Enhancement

No specific enhancement measures in relation to badger are proposed.

5.6.6 Monitoring

No specific monitoring is proposed in relation to badger are proposed.

5.7 Hazel Dormouse

5.7.1 Potential Impacts and Effects

Removal of scrub habitat to facilitate the development has potential to result in disturbance, killing and/or injury of dormouse and destruction of breeding sites and resting places. This constitutes an offence under Regulation 43 of the Habitats Regulations and Section 9(4) of the Wildlife and Countryside. Accidental damage of retained woodland habitats could also result in these impacts.

Unmitigated, the proposals would fail to accord with Policy E15 of the Havant Local Plan 2036.

5.7.2 Mitigation Measures

To facilitate the proposals, it is not possible to avoid impacts on hazel dormouse. Therefore a European Protected Species Mitigation (EPSM) licence will need to be sought from Natural England in order to undertake an otherwise illegal activity, in accordance with Regulation 55 of the Habitat Regulations and Section 16 of the Wildlife and Countryside Act.

In order for the licence to be granted, the licence application will need to be supported by a suitable mitigation strategy that demonstrates that the favourable conservation status of the species will be maintained. The mitigation strategy will include clearance of vegetation to ground level (15-30 centimetres) over winter (November to March) by (or under the supervision of) a hazel dormouse licenced ecologist. The clearance will be undertaken using hand tools in a methodical manner. It will be essential to retain the roots undisturbed as any hazel dormouse present will be hibernating at ground level over the winter. The remaining vegetation, such as stumps and root balls, will be removed under the supervision of a suitably experienced and licensed ecologist once hazel dormouse have left hibernation in May allowing them to disperse to retained habitat within the site.

Alternatively, clearance may be undertaken in April/May or September/October using a single stage clearance methodology. This would entail single stage clearance of the habitat using hand tools (wherever possible) with no more than 50 square metre strips cleared each day to allow active hazel dormouse to move into adjacent habitat persuading them out of the construction area.

5.7.3 Significance of Residual Effects

Although protection of retained habitat and sensitive timing and method of works will prevent harm to hazel dormouse, the net loss of suitable habitat cannot be mitigated and represents a significant residual effect.

5.7.4 Compensation

The proposed scrub planting within the woodland buffer zones (Paragraph 5.3.2) will go some way to compensate for the loss of suitable habitat for hazel dormouse, however, there will still be an overall net loss of 2.11 hectares of scrub habitat suitable for hazel dormouse. There is no scope for on-site compensation as the south of the site is needed to facilitate the development and it is desirable to retain the grassland in the north of the site due to its SINC designation and the potential to create Lowland Meadow habitat through positive management. Therefore an off-site location will be agreed for the creation of at least 2.11 hectares of scrub to specifically offset the loss of this particular habitat type. A specific location has not yet been identified, however, Portsmouth City Council own a significant proportion of the land in the local area and will agree a suitable location with the Local Planning Authority during the planning process.

5.7.5 Enhancement

10 dormouse nest boxes will be installed within the newly planted scrub habitat to provide additional opportunities for hazel dormouse using retained habitat on the boundaries of the site.

5.7.6 Monitoring

As part of the granted licence, monitoring is likely to be required following completion of the development to assess the success of the mitigation. It is anticipated that monitoring will take the form of annual nest box checks for five years post-development.

5.8 Birds

5.8.1 Potential Impacts and Effects

The woodland habitat on the boundaries of the site which was used by the majority of breeding birds recorded will be retained as part of the development. Accidental damage of woodland habitats during construction could result in killing or injury of birds or damage to active nests. This would constitute an offence under Section 1 of the Wildlife and Countryside Act.

Although the species recorded have no specific legal protection from disturbance alone, if disturbance causes birds to abandon active nests, and this could also constitute an offence.

Breeding birds were also recorded making use of on-site scrub much of which will need to be removed in order to facilitate the development. Breeding birds (both widespread and notable species) are also likely to make use of the scattered trees proposed for removal to facilitate the access roads in the southern site boundary. This will result in a net loss in availability of nesting habitat for birds.

Once the development is occupied there may be an adverse effect on birds due to increased mortality as a result of cat predation.

5.8.2 Mitigation Measures

Retained habitat suitable for nesting birds on the boundaries of the site will be protected from accidental damage by Heras-type fencing as set out in Paragraph 5.3.2.

Scrub habitat which will be cleared in order to facilitate the scheme will be cleared outside of the main nesting bird season (March to August inclusive), or if unforeseen circumstances mean this must be undertaken during this period, a nesting bird check will be undertaken no more than 48 hours prior to removal of habitat to ensure no active nests are present prior to clearance. If an active nest is discovered, this will be left with a suitable buffer, determined by the attending ecologist, until young have fledged.

5.8.3 Significance of Residual Effects

Although protection of retained habitat and sensitive timing and method of works will prevent harm to nesting birds, the net loss of suitable habitat cannot be mitigated and represents a significant residual effect.

5.8.4 Compensation

The planting of scrub within the woodland buffer recommended in Paragraph 5.3.2 will provide some compensation for the loss of nesting habitat, however, there will still be an overall net loss of 2.11 hectares of scrub habitat suitable for nesting birds. There is no scope for on-site compensation as the south of the site is needed to facilitate the

development and it is desirable to retain the grassland in the north of the site due to its SINC designation and the potential to create Lowland Meadow habitat through positive management. Therefore an off-site location will be agreed for the creation of at least 2.11 hectares of scrub to specifically offset the loss of this particular habitat type. A specific location has not yet been identified, however, Portsmouth City Council own a significant proportion of the land in the local area and will agree a suitable location with the Local Planning Authority during the planning process. Integrated bird nesting units (such as Vivara Pro WoodStone House Sparrow Nest Box and CJ Wildlife WoodStone Build-in Swift Nest Box or units of similar design) will be incorporated into all of the new buildings (**Appendix 9**). The boxes will be installed at the height of the eaves, to protect nests from cat predation.

These measures will make the local bird assemblage more resilient to a potential increase in cat predation.

5.8.5 Enhancement

As well as compensating for the loss of the existing low diversity bramble scrub, the proposed scrub planting will comprise a greater diversity of species that will provide a more diverse food resource for birds.

As well as providing nesting opportunities out of reach of cats, the additional nest boxes will provide additional nesting opportunities within the site.

5.8.6 Monitoring

No monitoring is proposed specifically in relation to nesting birds.

5.9 Reptiles

5.9.1 Potential Impacts and Effects

The widespread reptile species recorded on site are likely to favour the rough open grassland habitats on site, particularly where scrub is adjacent for shelter, as opposed to areas of dense/continuous scrub where there are fewer basking opportunities. The majority of such grassland is proposed to be retained although some scrub-edge habitat and tall ruderal habitat, which may be used by reptiles, will be lost to facilitate the development.

During construction there is potential for the killing and injury of individual reptiles. This would constitute an offence under Section 9(1) of the Wildlife and Countryside Act 1981 (as amended).

Once the development is occupied there may be an adverse effect on reptiles due to increased mortality as a result of cat predation.

5.9.2 Mitigation Measures

In order to avoid killing and injury of reptiles, a translocation exercise will be undertaken. The retained grassland in the north of the site, measuring an area of approximately 2.60 hectares, will be used as the receptor area for translocated individuals.

Reptile proof fencing will need to be erected around the boundary of the construction area to prevent reptiles removed from the construction zone recolonising. The reptile translocation will be undertaken for a minimum of 90 daily visits to capture and remove reptiles from under artificial refugia distributed across suitable areas of habitat within the construction zone. This will be undertaken by a suitably qualified ecologist during the reptile active season of April to October. Although 90 daily visits is likely to be sufficient to clear the site of all reptiles, the translocation will continue until no reptiles are encountered on five consecutive visits.

Once the translocation is complete, a destructive search will be undertaken of the on-site habitat under supervision of a suitably qualified ecologist. This will entail the methodical removal of any suitable habitat within the site and will also be undertaken during the reptile active season. Any additional reptiles encountered as part of the destructive search will be captured by the ecologist and relocated to the receptor area. Once the destructive search has been completed, and all suitable reptile habitat has been removed from the site, the development work will be able to proceed.

The reptile fencing bounding the construction area will remain in situ until completion of the development to prevent recolonisation of potentially suitable habitats created within the construction zone. The reptile fencing will be monitored by on-site contractors and any damage repaired to remove the risk of reptile re-colonising at the site.

Following the completion of the development the reptile fencing will be removed under the supervision of a suitably qualified ecologist. Any reptiles encountered in the vicinity of the fence line will be removed to the receptor area.

The details of the measures outlined above will be provided in a Reptile Mitigation Strategy document, including fencing layout and proposed timescales.

Retained grassland in the north of the site will continue to be maintained with a long, tussocky sward to ensure it continues to provide suitable habitat for reptiles post-development.

5.9.3 Significance of Residual Effects

Although protection of retained habitat and sensitive timing and method of works will prevent harm to reptiles, the net loss of suitable habitat cannot be mitigated and represents a significant residual effect.

5.9.4 Compensation

The grassy margin and scrub planting recommended within the woodland buffer (Paragraph 5.3.2) will create the grassland/scrub interface preferred by reptiles and provide compensatory habitat for the loss of this habitat within the south of the site.

Small areas of scrub will be planted within the grassland in the north of the site to provide additional grassland/scrub interfaces (although this will be balanced against the objectives of grassland enhancement in this area).

The creation of two hibernacula and three deadwood log piles within the northern part of the site will provide an additional resource for reptiles and help to increase the carrying capacity of the retained area. This should help the reptile population become more resilient to a potential increase in cat predation.

5.9.5 Enhancement

The proposed increase in diversity of species within grassland and scrub habitats post-development will provide an enhanced invertebrate foraging resource for reptiles, over the current baseline.

5.9.6 Monitoring

No monitoring is proposed specifically in relation to reptiles.

5.10 Invertebrates

5.10.1 Potential Impacts and Effects

The semi-improved grassland is of greatest value to terrestrial invertebrates. The majority of this habitat will be retained. The limited extent of semi-improved grassland proposed to be lost is not considered to represent a significant adverse effect.

5.10.2 Mitigation Measures

As the minimal loss of semi-improved grassland is not considered to represent a significant adverse effect, no mitigation measures are required.

5.10.3 Significance of Residual Effects

As there are no anticipated significant adverse effects, there will be no significant adverse residual effects.

5.10.4 Compensation

As the minimal loss of semi-improved grassland is not considered to represent a significant adverse effect, no compensation measures are required.

5.10.5 Enhancement

The positive management of the grassland set out in Paragraph 5.3.2, will increase the diversity of plant species, and there will be a focus on food plant species of the notable invertebrates recorded during the terrestrial invertebrate survey. The grassy margin planting within the woodland buffer will provide an additional resource for terrestrial invertebrates. Deadwood created by the removal of the trees to facilitate the pedestrian access will be used to create three log piles in the north of the site, to provide an enhanced resource for saproxylic invertebrates.

5.10.6 Monitoring

No monitoring is proposed specifically in relation to invertebrates.

5.11 Other Relevant Species

5.11.1 Potential Impacts and Effects

- 1.1.4 European hedgehog is likely to be making use of woodland, grassland and scrub habitats on site. The proposals will result in the loss of a significant amount of scrub habitat, and a limited amount of grassland habitat, which represents a net loss in suitable habitat for European hedgehog.

5.11.2 Mitigation Measures

Scrub will be cleared by hand and a watching brief maintained during the works, if a European hedgehog is encountered, it will be moved with gloved hands into the nearest suitable area of retained habitat on the boundaries of the site.

5.11.3 Significance of Residual Effects

In order to facilitate the development, the loss of suitable habitat for European hedgehog cannot be avoided, this therefore represents a significant residual effect.

5.11.4 Compensation

Positive management of grassland and creation of additional grassland within the woodland buffer (Paragraph 5.3.2) will provide a compensatory foraging and summer nesting resource for this species. The planting of scrub within the woodland buffer (Paragraph 5.3.2) will provide compensation for the loss of sheltering habitat.

As European hedgehog will also make use of residential garden habitats, creation of gaps under any garden fences will allow European hedgehog access to these habitats as an additional compensatory habitat.

5.11.5 Enhancement

The proposed increase in diversity of species within grassland and scrub habitats post-development will provide an enhanced invertebrate foraging resource for European hedgehog, over the current baseline.

5.11.6 Monitoring

No monitoring is proposed specifically in relation to invertebrates.

6.0 CONCLUSIONS

6.1 Conclusion

The site is dominated by unmanaged grassland and scrub with limited areas of tall ruderal vegetation, and is surrounded by broadleaved semi-natural woodland and scattered trees. The site lies within the catchment of the Solent and in the vicinity of a number of designated sites. Important Ecological Features identified within the site's Zone of Influence are the Solent Maritime Sites Statutory Designated Sites, Hazleton Common LNR, SINC (on and adjacent to the site and publicly accessible), woodland, semi-improved grassland, bats, badger, hazel dormouse, European hedgehog, breeding birds, widespread species of reptile and terrestrial invertebrates.

Unmitigated, the proposals have potential to result in adverse effects on designated sites, notable grassland and woodland habitats, bats, hazel dormouse, breeding birds, reptiles and terrestrial invertebrates. Adverse effects may result as a result of direct impact/harm during construction, habitat loss, recreational pressure and disturbance;

Mitigation measures including protection of retained habitats during construction, sensitive timing of works and working methods and buffering of adjacent habitats from the built development have been proposed, however, some residual effects will remain in order to facilitate the proposals. Therefore further compensatory measures including enhancement of existing habitat, particularly the grassland in the north of the site which is designated as a SINC, and creation of new, high quality habitat which will be valuable for a range of species is also proposed. The long-term management of these habitats will ensure an overall enhancement of the site over the current baseline;

In order to undertake activities that would otherwise represent a legal offence due to the presence of hazel dormouse, a European Protected Species Mitigation licence will be sought from Natural England in relation to this species;

Post-development, monitoring of notable habitats and hazel dormouse monitoring will be undertaken to ensure the success of the proposed mitigation;

Given the impacts identified, and the mitigation, compensation and enhancement measures proposed it is considered that the proposals accord with all relevant local and national planning policy.

6.2 Updating Site Survey

If the planning application boundary changes or the proposals for the site alter, a re-assessment of the scheme in relation to ecology may be required. Given the mobility of animals and the potential for colonisation of the site over time, updating survey work

may be required, particularly if development does not commence within 12 months of the date of the most recent relevant survey.

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Map 1 Site Location Plan



**CABBAGEFIELD ROW, LEIGH PARK,
HAVANT**

ECOLOGICAL IMPACT ASSESSMENT

Map 1 - Site Location Plan

Client:	Portsmouth City Council
Date:	July 2020
Status:	Final

KEY
 Site Boundary



Source: Esri, DigitalGlobe,
GeoEye, Earthstar
Geographics, CNES/Airbus
DS, USDA, USGS,

Scale at A4: 1:10,000
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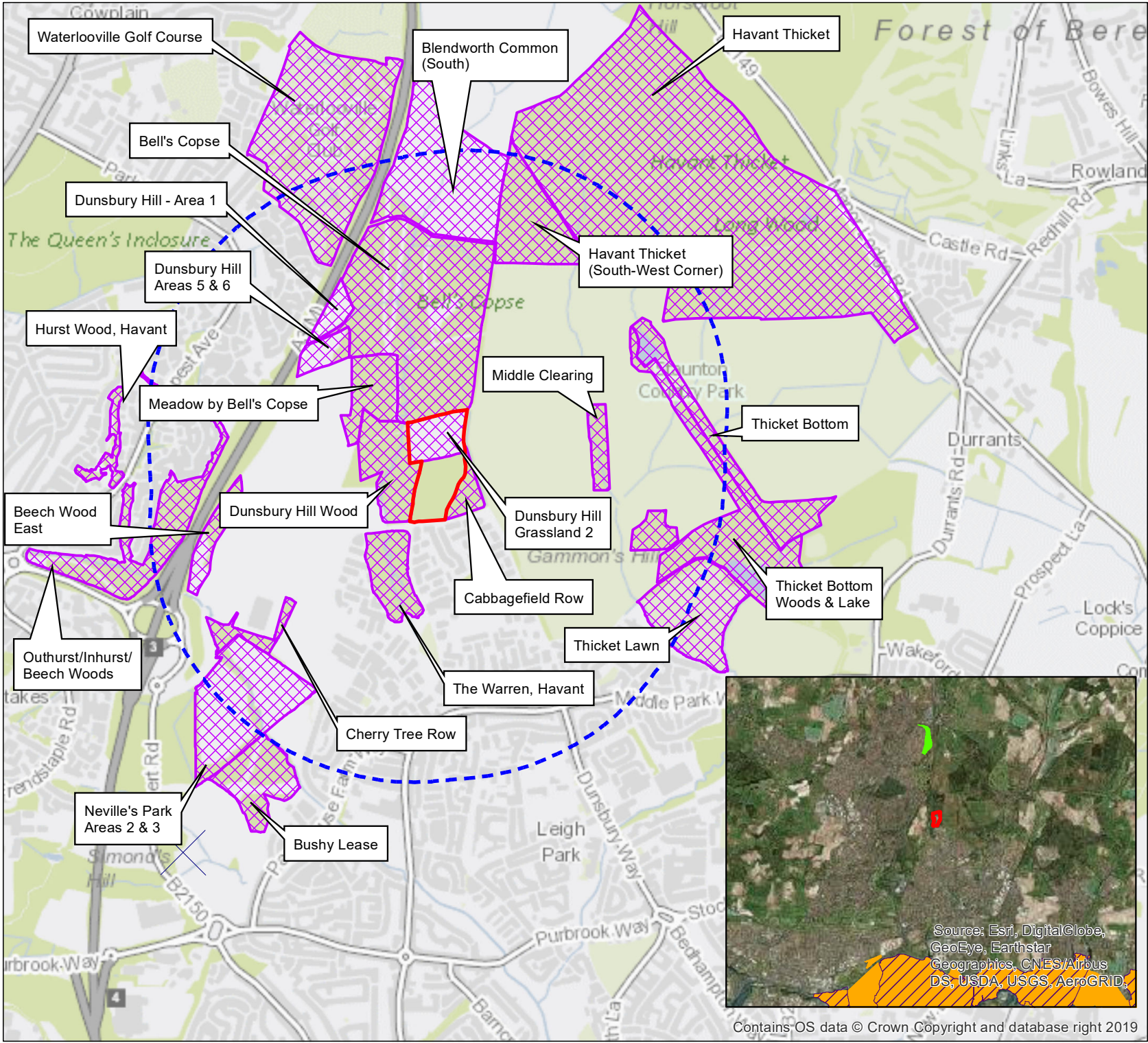
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Map 2 Designated Sites Plan



CABBAGEFIELD ROW, LEIGH PARK, HAVANT

ECOLOGICAL IMPACT ASSESSMENT

Map 2 - Designated Sites Plan

Client:	PDP Architecture LLP
Date:	July 2020
Status:	Draft

KEY

- Site Boundary
- Site Buffer (1km)
- SINCs within 1km of Site Boundary
- Chichester and Langstone Harbours Ramsar Site and SPA
- Solent Maritime SAC
- Hazelton Common LNR

Scale at A4: 1:20,000

0 200 400 800 Metres

N

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Map 3 Phase 1 Habitat Map

CABBAGEFIELD ROW, LEIGH PARK, HAVANT

ECOLOGICAL IMPACT ASSESSMENT

Map 3 - Phase 1 Habitat Map

Client: Portsmouth City Council

Date: July 2020

Status: Draft

KEY

- Site Boundary
- Bell's Copse SINC
- Cabbagefield Row SINC
- Dunsbury Hill Grassland 2 SINC
- Dunsbury Hill Wood SINC
- Scattered Trees
- X Scattered Scrub
- Broadleaved Semi-Natural Woodland
- Dense / Continuous Scrub
- Semi-Improved Neutral Grassland
- Tall Ruderal
- Track
- Telecommunications Mast
- TN1 Target Note

Scale at A4: 1:2,500

0 25 50 100 Metres

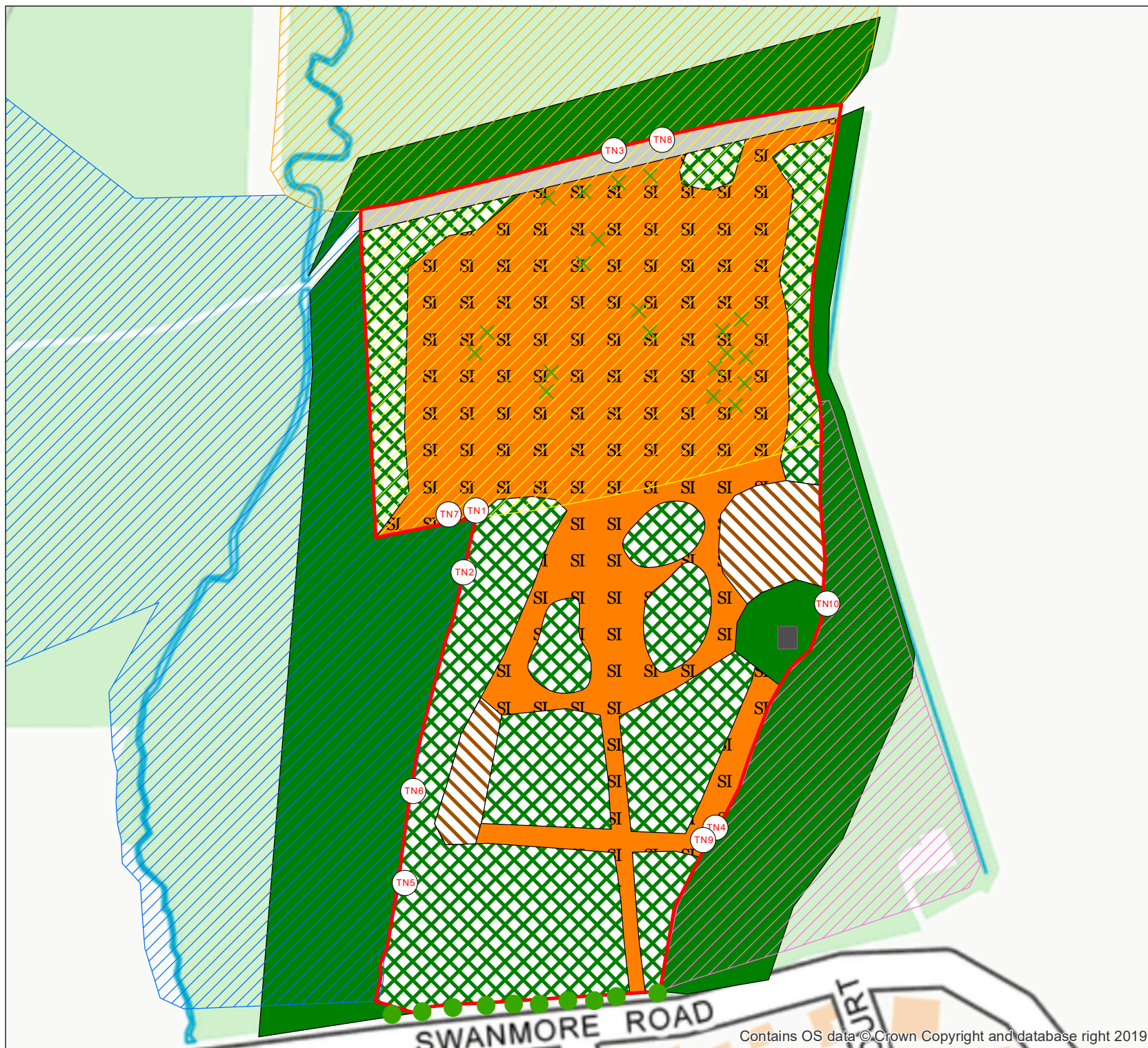
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Map 4 Ground Level Tree Assessment



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CABBAGEFIELD ROW, LEIGH PARK, HAVANT

ECOLOGICAL IMPACT ASSESSMENT

Map 4 - Ground Level Tree Assessment

Client: Portsmouth City Council

Date: July 2020

Status: Draft

KEY

 Site Boundary

Ground Level Tree Assessment Results 2019

Bat Suitability

-  High
-  Moderate

N.B. The ground level tree assessment was undertaken on 11th April 2019.

Scale at A4: 1:2,500

0 25 50 100 Metres



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Map 5a. Bat Transect Survey – April 2019



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ECOLOGICAL IMPACT ASSESSMENT

Map 5a - Bat Transect Survey: April 2019

Client: Portsmouth City Council

Date: July 2020

Status: Draft

KEY

- Site Boundary
- Bat Transect Route
- Common pipistrelle
- Myotis species

N.B. Points on map show the location of the surveyor when the registration was recorded, not the location of the bat.

Scale at A4: 1:2,500
0 25 50 100 Metres



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Map 5b. Bat Transect Survey – June 2019



**CABBAGEFIELD ROW, LEIGH PARK,
HAVANT**

ECOLOGICAL IMPACT ASSESSMENT

Map 5b - Bat Transect Survey: June 2019

Client: Portsmouth City Council

Date: July 2020

Status: Draft

KEY

- Site Boundary
- Bat Transect Route
- Common pipistrelle
- Myotis species
- Noctule
- Soprano pipistrelle

N.B. Points on map show the location of the surveyor when the registration was recorded, not the location of the bat.

Scale at A4: 1:2,500

0 25 50 100 Metres



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Map 5c. Bat Transect Survey – July 2019



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ECOLOGICAL IMPACT ASSESSMENT

Map 5c - Bat Transect Survey: July 2019

Client:	Portsmouth City Council
Date:	July 2020
Status:	Draft

KEY

- Site Boundary
- Bat Transect Route
- Brown long-eared bat
- Common pipistrelle
- Myotis species
- Serotine
- Soprano pipistrelle

N.B. Points on map show the location of the surveyor when the registration was recorded, not the location of the bat.

Scale at A4: 1:2,500

0 25 50 100 Metres



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Map 5d. Bat Transect Survey – August 2019



**CABBAGEFIELD ROW, LEIGH PARK,
HAVANT**

ECOLOGICAL IMPACT ASSESSMENT

Map 5d - Bat Transect Survey: August 2019

Client:	Portsmouth City Council
Date:	July 2020
Status:	Draft

KEY

- Site Boundary
- Bat Transect Route
- Common pipistrelle
- Noctule
- Pipistrelle species
- Serotine
- Soprano pipistrelle

N.B. Points on map show the location of the surveyor when the registration was recorded, not the location of the bat.

Scale at A4: 1:2,500
0 25 50 100 Metres



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Map 5e. Bat Transect Survey – September 2019



**CABBAGEFIELD ROW, LEIGH PARK,
HAVANT**

ECOLOGICAL IMPACT ASSESSMENT

Map 5e - Bat Transect Survey: September 2019

Client:	Portsmouth City Council
Date:	July 2020
Status:	Draft

KEY

- Site Boundary
- Bat Transect Route
- Common pipistrelle
- Myotis species
- Soprano pipistrelle

N.B. Points on map show the location of the surveyor when the registration was recorded, not the location of the bat.

Scale at A4: 1:2,500
0 25 50 100 Metres



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Map 5f. Bat Transect Survey – October 2019



**CABBAGEFIELD ROW, LEIGH PARK,
HAVANT**

ECOLOGICAL IMPACT ASSESSMENT

Map 5f - Bat Transect Survey: October 2019

Client:	Portsmouth City Council
Date:	July 2020
Status:	Draft

KEY

- Site Boundary
- Bat Transect Route
- Myotis species

N.B. Points on map show the location of the surveyor when the registration was recorded, not the location of the bat.

Scale at A4: 1:2,500
0 25 50 100 Metres



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Map 6 Bat Automated Detector Survey



**CABBAGEFIELD ROW, LEIGH PARK,
HAVANT**

ECOLOGICAL IMPACT ASSESSMENT

Map 6 - Bat Automated Detector Survey

Client:	Portsmouth City Council
Date:	July 2020
Status:	Draft

KEY

Site Boundary

**Bat Automated Detector Deployment
2019**

- April, June, July, August and October
- May and September

N.B. Two automated bat detectors were deployed at the site for five consecutive nights each month between April and October 2019.

Scale at A4: 1:2,500
0 25 50 100 Metres



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Map 7 Bat Trapping Surveys



**CABBAGEFIELD ROW, LEIGH PARK,
HAVANT**

ECOLOGICAL IMPACT ASSESSMENT

Map 7 - Bat Trapping Surveys

Client:	Portsmouth City Council
Date:	July 2020
Status:	Draft

- KEY**
- Site Boundary
 - Trapping Records 22nd July 2019
 - Bats Trapped
 - Trapping Records 2nd September 2019
 - No Bats Trapped
 - Trapping Records 19th May 2020
 - Bats Trapped
 - No Bats Trapped

Scale at A4: 1:2,500

0 25 50 100 Metres

N

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Map 8 Hazel Dormouse Survey



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CABBAGEFIELD ROW, LEIGH PARK, HAVANT

ECOLOGICAL IMPACT ASSESSMENT

Map 8 - Hazel Dormouse Survey Results

Client:	Portsmouth City Council
Date:	July 2020
Status:	Draft

KEY

- Site Boundary
- Location of Hazel Dormouse Tubes (x75)

Hazel Dormouse Survey Results

- ★ Hazel Dormouse Individual and Nest
- ★ Hazel Dormouse Nest

N.B. A total of 75 hazel dormouse tubes were distributed in suitable habitat during May/June 2019. Six survey visits were undertaken between June and November 2019, with both dormouse nests and individuals recorded at the site.

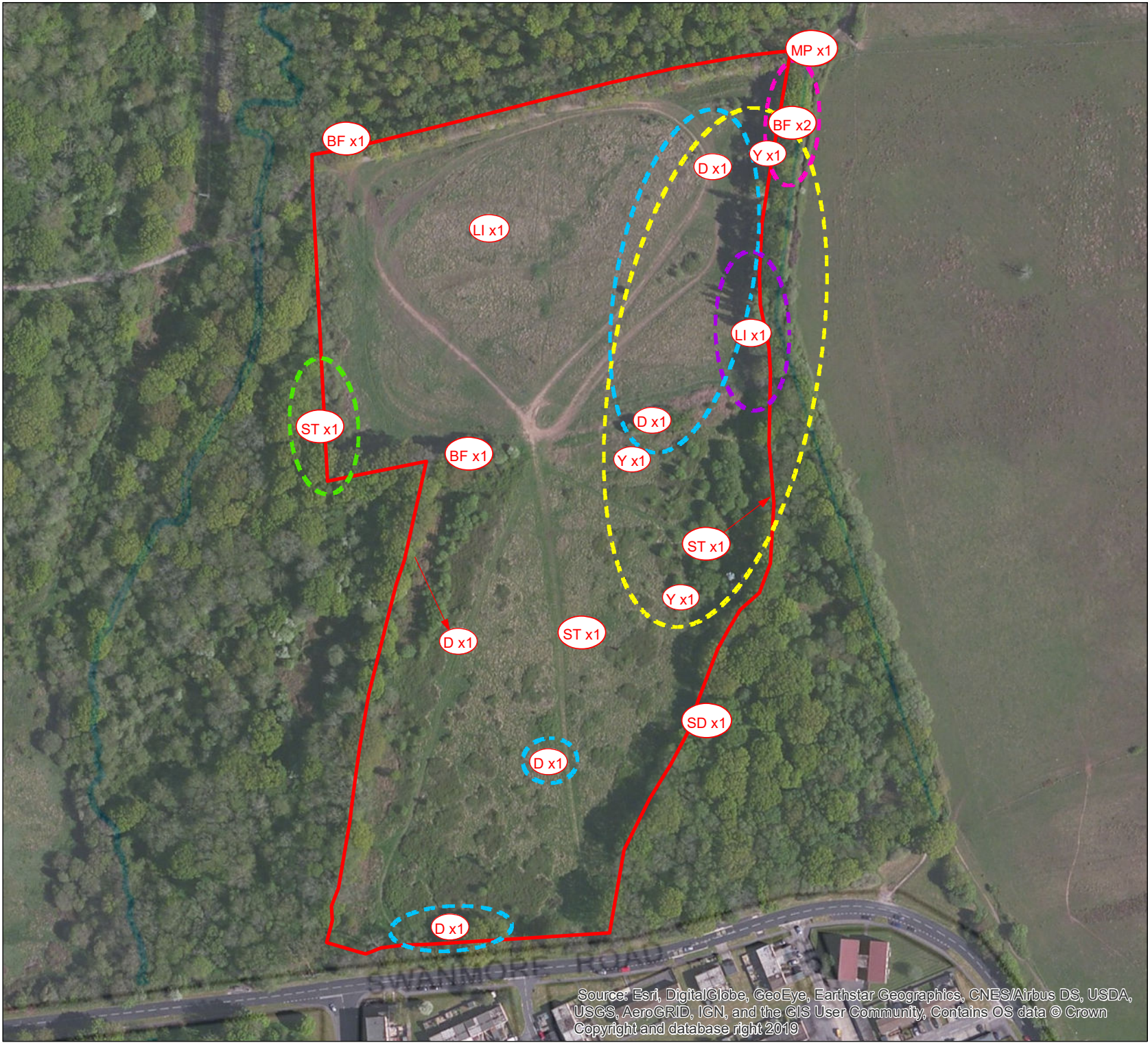
Scale at A4: 1:2,500
0 25 50 100 Metres

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Map 9 Breeding Bird Survey



**CABBAGEFIELD ROW, LEIGH PARK,
HAVANT**

ECOLOGICAL IMPACT ASSESSMENT

Map 9 - Breeding Bird Survey

Client: Portsmouth City Council

Date: July 2020

Status: Draft

KEY

Site Boundary

Direction of Flight (where species recorded in flight)

Bird Species Recorded

Bullfinch

Dunnock

Linnet

Meadow Pipit

Song Thrush

Stock Dove

Yellowhammer

Approximate Breeding Bird Territories Recorded

Bullfinch

Dunnock

Linnet

Song Thrush

Yellowhammer

N.B. A total of three survey visits were undertaken across May and June 2019. Only red and amber listed of species conservation concern are plotted on this map. The number of species recorded is indicated in the symbol.

Scale at A4: 1:2,500

0 25 50 100 Metres



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Map 10 Reptile Survey



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**CABBAGEFIELD ROW, LEIGH PARK,
HAVANT**

ECOLOGICAL IMPACT ASSESSMENT

Map 10 - Reptile Survey

Client:	Portsmouth City Council
Date:	July 2020
Status:	Draft

KEY

- Site Boundary
- Location of Reptile Refugia (x150)
- Area of Slowworm Records

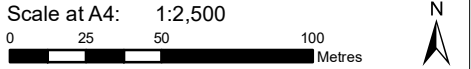
Adder Records

- ★ Adult male
- ★ Adult female
- ★ Juvenile

Common Lizard Records

- Adult male
- Adult, unsexed

N.B. A total of 150 reptile refugia were distributed in suitable habitat during June 2019. Seven survey visits were undertaken between June and August 2019. Slow-worm was recorded widely throughout the site, with a peak count of 57 adults and 20 juveniles recorded during the survey. Areas plotted on the map indicate where slow-worm were found. All records of adder and common lizard recorded during the reptile survey are plotted individually on the map. No other species were encountered.



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Appendix 1 Proposed Site Layout



notes

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all dimensions to be checked on site prior to commencement of construction works and the architect notified of any discrepancy.

figured dimensions are to be used in preference to scaled dimensions.

no deviation from this drawing will be permitted without prior consent of the architect.

all drawings are prepared subject to a full measured and structural survey of the buildings and site.

all structural work is subject to the appointment of a structural engineer to confirm and agree the structural proposals.

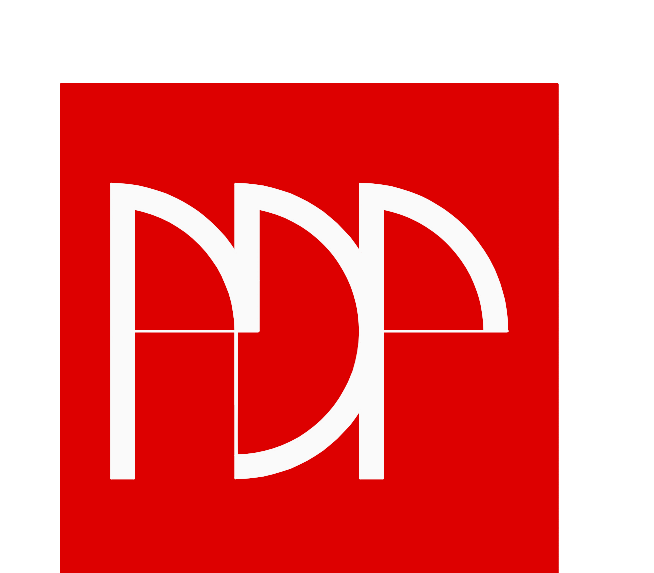
os promap licence no. 100020449.

health & safety:
exceptional risks involving specific methods of construction or exceptional maintenance issues can be found within the designers risk assessment.

scale width 50 mm @ a1 - 25 mm @ a3				
revision	notes	date	drawn	checked
A	Plan amended to revised layout	26.01.22	MAS	IR
B	Resubmission to planners	14.03.22	MAS	IR
C	Layout amended to Hampshire CC highways comments	18.08.22	MAS	IR
D	Parking amended to HCC Highways reqs	20.12.22	MAS	IR



PLANNING



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project	Proposed Development Cabbagefield Row Swanmore Rd, Leigh Park			
detail	Ecology, Soft Landscaping & Tree Plan			
drawn	MAS	checked	IR	
date	July 2021	status	Planning	
a1 scale	1:500	a3 scale	1:1000	rev 28079-PD122 D

Appendix 2 Sites Designated for Nature Conservation

Statutory Sites

Internationally Designated Sites - Ramsar Sites, Special Areas of Conservation and Special Protection Areas

Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) form a network of protected sites across the European Union and United Kingdom. In the United Kingdom the primary legislative protection is afforded to these sites under the Conservation of Habitats and Species Regulations 2017 (as amended).

Ramsar sites are designated as wetlands of international importance which are afforded similar legislative protection to SPAs and SACs.

SACs are sites which support internationally important habitats or internationally important assemblages or populations of species. SPAs are designated for supporting internationally important populations of birds. SACs, SPAs and Ramsar sites are generally also designated as Sites of Special Scientific Interest.

Under Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended) there is a legal requirement that competent authorities, such as local planning authorities, need to consider whether plans or projects are likely to have a significant adverse effect on SPAs, SACs or Ramsar sites, either alone, or in combination with other plans or projects. In the event that a likely significant effect cannot be ruled out, on the basis of objective information, then the competent authority must undertake an “Appropriate Assessment” to fully assess the plan or project against the site’s conservation objectives. Unless certain defined derogation tests can be met, the competent authority may not authorise nor undertake any plan or project which adversely affects the integrity of a SPA, SAC or Ramsar site.

Nationally Designated Sites – Sites of Special Scientific Interest and National Nature Reserves

Sites of Special Scientific Interest (SSSI) receive legal protection under the Wildlife and Countryside Act 1981 (as amended). Such sites are designated to protect specific areas of biological or geological interest of national importance. Such sites also generally receive strict protection through the planning system.

National Nature Reserves (NNR) are also usually designated as SSSIs and are specifically managed for their wildlife value. They receive legal protection through the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981 (as amended). As with SSSIs, these sites generally receive strict protection through the planning system.

Locally Designated Sites – Local Nature Reserves

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

Non-Statutory Sites

Locally Designated Sites

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

Appendix 3 Relevant Legislation

Bats

All UK bat species are listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Conservation of Habitats and Species Regulations 2017. They are afforded full protection under Section 9(4) of the Act and Regulation 43 of the Regulations. These make it an offence to:

- Deliberately capture, injure or kill any such animal;
- Deliberately disturb any such animal, including in particular any disturbance which is likely:
 - To impair its ability to survive, breed, or rear or nurture their young;
 - To impair its ability to hibernate or migrate;
 - To affect significantly the local distribution or abundance of that species;
- Damage or destroy a breeding site or resting place of any such animal;
- Intentionally or recklessly disturb any of these animals while it is occupying a structure or place that it uses for shelter or protection; or
- Intentionally or recklessly obstruct access to any place that any of these animals uses for shelter or protection.

In addition, five British bat species are listed on Annex II of the Habitats Directive. These are:

- Greater horseshoe bat *Rhinolophus ferrumequinum*;
- Lesser horseshoe bat *Rhinolophus hipposideros*;
- Bechstein's bat *Myotis bechsteinii*;
- Barbastelle *Barbastella barbastellus*; and
- Greater mouse-eared bat *Myotis myotis*.

In certain circumstances where these species are found the Directive requires the designation of Special Areas of Conservation (SACs) by EC member states to ensure that their populations are maintained at a favourable conservation status. Outside SACs, the level of legal protection that these species receive is the same as for other bat species.

Hazel Dormouse

This species is listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Conservation of Habitats and Species Regulations 2017. They are afforded full protection under Section 9(4) of the Act and Regulation 43 of the Regulations. These make it an offence to:

- Deliberately capture, injure or kill any such animal;
- Deliberately disturb any such animal, including in particular any disturbance which is likely, to impair its ability to survive, breed, or rear or nurture their young, to impair its ability to hibernate or migrate;
- To affect significantly the local distribution or abundance of that species;
- Damage or destroy a breeding site or resting place of any such animal;
- Intentionally or recklessly disturb any of these animals while it is occupying a structure or place that it uses for shelter or protection; or
- Intentionally or recklessly obstruct access to any place that any one of these species uses for shelter or protection.

Badger

The Protection of Badgers Act 1992 consolidates previous legislation (including the Badgers Acts 1973 and 1991 Badgers (Further Protection) Act 1991). It makes it an offence to:

- Kill, injure or take a badger;
- Attempt to kill, injure or take a badger; or
- To damage or interfere with a sett.

The 1992 Act defines a badger sett as 'any structure or place which displays signs indicating current use by a badger'.

Breeding Birds

With certain exceptions, all wild birds, their nests and eggs are protected by Section 1 of the Wildlife and Countryside Act 1981 (as amended). Therefore, it is an offence, to:

- Intentionally kill, injure or take any wild bird;
- Intentionally take, damage or destroy the nest of any wild bird while it is in use or being built; or
- Intentionally take or destroy the egg of any wild bird.

These offences do not apply to hunting of birds listed in Schedule 2 subject to various controls. Bird species listed on Schedule 1 of the Act receive further protection, thus for these species it is also an offence to:

- Intentionally or recklessly disturb any bird while it is nest building, or is at a nest containing eggs or young; or
- Intentionally or recklessly disturb the dependent young of any such bird.

Reptiles

The four widespread species of reptile that are native to Britain, namely common or viviparous lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, adder *Vipera berus* and grass snake *Natrix helvetica*, are listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are afforded limited protection under Section 9 of this Act. This makes it an offence to:

- Intentionally kill or injure any of these species.

The remaining native species of British reptile (sand lizard *Lacerta agilis* and smooth snake *Coronella austriaca*) receive a higher level of protection via inclusion under Schedule 2 of the Conservation of Habitats and Species Regulations 2017. They are afforded full protection under Section 9(4) of the Act and Regulation 43 of the Regulations (in England and Wales only) and the Wildlife and Countryside Act 1981 (as amended). The distribution of these species are restricted to only a few sites in England.

Species and Habitats of Principal Importance in England

The Natural Environment and Rural Communities (NERC) Act came into force on 1st October 2006. Section 41 (S41) of the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The England Biodiversity List is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 40 of the NERC Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal functions. There are currently 943 species of principal importance and 41 habitats of principal importance included on the England Biodiversity List.

Appendix 4 Protected and Notable Species Appraisal Methods

Bats

The survey conformed to current Bat Conservation Trust guidelines (Collins, 2016). An assessment was made of the suitability of trees on the site and immediately on the site boundary to support roosting bats based on the presence of features such as loose or missing holes, cracks, splits, loose bark and ivy cladding.

An assessment was made of the suitability of the site and the surrounding landscape to support foraging and/or commuting bat species. The assessment of the potential for the site to support roosting, foraging and commuting bat is based on a four-point scale as detailed in **Appendix 5**.

Otter

The otter appraisal was based on an assessment of the suitability of the habitat present within the site to support otter by reference to habitat type (such as rivers, streams, ditches, wetlands, reed beds, lakes, ponds and reservoirs), proximity of the site to freshwater and potential important feeding resources (such as fisheries), presence of habitat features which could provide opportunities for resting places and/or holts (such as tunnels, hollows at the base of trees and presence of dense, undisturbed habitat). During the survey attention was paid to the presence of evidence such as spraints, feeding remains, footprints and slides.

Badger

The survey involved a detailed investigation of the site to identify evidence of badger residence, foraging or territorial activity. Particular emphasis was placed on locating badger setts, paths, and signs of territorial activity such as latrine sites both on-site and within immediately adjacent areas where access was possible.

Hazel Dormouse

The appraisal for the potential of the site to support dormouse was based on an assessment of habitat features that may indicate that the species is present. This includes the presence of key food sources such as hazel and bramble, or plants used as nesting material such as honeysuckle and clematis. Additionally, the species requires a continuum of food supply so that habitat structure, diversity and connectivity to adjacent areas of woodland/scrub are important features in determining the potential presence of hazel dormouse.

Water Vole

The water vole appraisal was based on an assessment of the suitability of the habitat present within the site to support water vole by reference to habitat type (such as rivers, streams, ditches, wetlands, reed beds, lakes, ponds and reservoirs), bank structure and the bank side vegetation. Water voles generally require sloping banks in which to burrow and well-developed bank side vegetation to provide shelter and food. During the survey attention was paid to the presence of burrows, latrines, feeding remains, trails and footprints.

Birds

The appraisal of breeding birds on the site was based on the suitability of habitat present to support nesting bird communities, the presence of bird species that may potentially nest within the available habitat and evidence of nesting such as old or currently active nests.

The assessment of wintering birds was based on an assessment of the suitability of the habitat on site to support important wintering bird species and populations. Particular attention was paid to the potential for the site to support wintering farmland bird species, waders and wildfowl.

Reptiles

The reptile appraisal was based on an assessment of the suitability of the habitat present within the site to support a population of reptiles. Reptiles particularly favour scrub and rough grassland interfaces and the presence of these is a good indication that reptiles may be present on-site. In addition, reptiles may utilise features such as bare ground for basking, tussocky grassland for shelter and compost heaps and rubble piles for breeding and/or hibernating.

Great Crested Newt

The appraisal of the site to support great crested newt included establishing the presence of suitable aquatic habitats such as ponds, lakes or other waterbodies within or adjacent to the site and the presence of suitable terrestrial habitat. Waterbodies that are densely shaded, highly eutrophic or that contain fish are likely to be less suitable for this species. The suitability of on-site ponds and terrestrial habitat is considered in relation to the presence of ponds within the wider area, as identified within the desktop study (Paragraph 3.4.3), and their suitability to be used as a network.

Invertebrates

An assessment was made of the site for its potential value to support diverse communities of invertebrates. The assessment was based on the presence of habitat features which may support important invertebrate communities. These features include, for example, an abundance of dead wood, the presence of diverse plant communities, varied woodland structure, sunny woodland edges with a diverse flora, waterbodies and water courses and areas of free draining soil exposures. During the field survey there was no attempt made to identify species present as this is a more specialist area of ecological assessment reserved for targeted surveys.

Other Relevant Species

An assessment was made of site suitability for other notable species such as more rarely encountered protected species, Species of Principal Importance for the Conservation of diversity in England notified under Section 41 of the NERC Act 2006 and as listed in the England

Biodiversity List, and Local Biodiversity Action Plan (LBAP) species²³, specific to the study region.

Invasive Species

During the field survey any incidental records of invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were recorded. However, it should be considered that the survey was not specifically aimed at assessing the presence of these species and further specialist advice may need to be sought.

²³ LBAPs identify local priorities for biodiversity conservation by translating national targets for species into effective action at the local level and identifying targets for species important to the local area.

Appendix 5 Appraisal Criteria for Bats

The criteria used to assess the suitability of roosting and foraging/commuting habitat for bats is based on industry guidelines and outlined in **Table 25**²⁴.

Table 25: Criteria used to Assess Suitability of Roosting and Foraging/Commuting Habitat for Bats

Suitability	Description of roosting habitats	Commuting and foraging habitats
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.
Moderate	A structure of tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status.	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically/structure that does not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain potential roost features but with none seen from the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerows or un-vegetated stream, but isolated (i.e. not very well connected to the surrounding landscape by other habitat). Suitable, but isolated, habitat that could be used by small numbers of foraging bats such as a lone tree or a patch or scrub.
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.

²⁴ Table adapted from (Collins, 2016)

Appendix 6 Assessment Criteria for Roosting Bats

Roost types have been defined in accordance with Natural England and Bat Conservation Trust guidelines. Definitions are set out in **Table 26**.

Table 26: Bat roost types as defined by Natural England and the Bat Conservation Trust

Roost Type	Definition
Day Roost	A place where individual bats, or small groups of males, rest or shelter in the day but are rarely found by night in the summer.
Night Roost	A place where bats rest or shelter in the night but are rarely found in the day. May be used by a single individual on occasion or it could be used regularly by the whole colony.
Feeding Roost	A place where individual bats or a few individuals rest or feed during the night but are rarely present by day.
Transitional/Occasional Roost	Used by a few individuals or occasionally small groups for generally short periods of time on waking from hibernation or in the period prior to hibernation.
Swarming Site	Where large numbers of males and females gather during late summer to autumn. Appear to be important mating sites.
Mating Sites	Where mating takes place from late summer and can continue through winter.
Maternity Roost	Where female bats give birth and raise their young to independence.
Hibernation Roost	Where bats may be found individually or together during winter. They have a constant cool temperature and high humidity.
Satellite Roost	An alternative roost found in close proximity to the main nursery colony used by a few individual breeding females to small groups of breeding females throughout the breeding season.

Appendix 7 Automated Detector Settings

Automated Detector Settings

Automated detectors can be calibrated in a number of different settings which can result in the potential variations in the way that bat calls are recorded. **Table 27** details the standard settings used by ECOSA during automated detector surveys undertaken.

Table 27: Standard automated detector settings

Option	Basic Setup
Settings - Audio	
Sample rate	192000Khz
Channels	Mono L (left)
Compression	WAV
Gain Left	+0.00
Gain Right	+0.00
Settings - Audio Advanced	
Dig High Pass Filter (HPF) Left	Fs/12
Dig High Pass Filter (HPF) Right	Off
Digital Low Pass Filter (LPF) Left	Off
Digital Low Pass Filter (LPF) Right	Off
Trig Lvl Left	12SNR
Trig Lvl Right	Off
Trg Win Left	2.0s
Trg Win Right	2.0s
Trg Max Length	2s
Bits (Div Ratio)	16
Nap Trg Lvl	Off

Data Conversion Settings

In order to analyse the data efficiently the raw .wav files recorded on the automated detector are subsequently converted to zero crossing (.zc) files which are subject to automated classification by Wildlife Acoustics Kaleidoscope Pro. During the conversion process the data is filtered to remove noise files in line with Wildlife Acoustics recommended setting as provided in **Table 28**.

Table 28: Noise file filtering settings

Option	Basic Setup
Signal of Interest – Frequency	8 – 120 kHz
Signal of Interest – Call Length	2 - 500ms
Signal of Interest – Minimum Number of Calls	2
Advanced Signal Enhancement	On

All filtered noise files are kept and subsequently assessed for bat calls in order to ensure that no bat calls have been incorrectly classified as noise. The “Advanced Signal Enhancement” setting discards files which Kaleidoscope assessed as being insufficient quality. Any discarded files are subsequently not stored by Kaleidoscope and therefore, not subject to analysis by an ecologist.

Appendix 8 Statutory Designated Sites within the Desktop Study Area

Details of statutory designated sites within the desktop study area, as listed in Paragraph 4.2.1, are provided in **Table 29**.

Table 29: Statutory Designated Sites Located Within the Desktop Study Area

Site Name	Chichester and Langstone Harbours
Site Designation	Ramsar site
Approximate Relative Location	4.0 kilometres south
Reasons for Designation:	
Chichester and Langstone Harbours qualifies as a Ramsar site through: - Containing a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region; - Regularly supporting 20,000 or more waterbirds; and - Regularly supporting 1% of the individuals in a population of one species or subspecies of waterbird.	

Site Name	Chichester and Langstone Harbours
Site Designation	SPA
Approximate Relative Location	4.0 kilometres south
Reasons for Designation:	
Chichester and Langstone Harbours qualifies as a SPA through supporting over wintering: - Pintail <i>Anas acuta</i> (330 individuals); - Shoveler <i>Anas clypeata</i> (100 individuals); - Teal <i>Anas crecca</i> (1,824 individuals); - Wigeon <i>Anas penelope</i> (2,055 individuals); - Turnstone <i>Arenaria interpres</i> (430 individuals); - Brent geese (11719 individuals); - Sanderling <i>Calidris alba</i> (236 individuals); - Dunlin (44294 individuals); - Ringed plover <i>Charadrius hiaticula</i> (846 individuals); - Bar-tailed godwit <i>Limosa lapponica</i> (1,692 individuals); - Red-breasted merganser (297 individuals); - Curlew <i>Numenius arquata</i> (1,861 individuals); - Grey plover <i>Pluvialis squatarola</i> (3,825 individuals); - Redshank <i>Tringa totanus</i> (1,788 individuals); - Shelduck <i>Tadorna tadorna</i> (2,410 individuals) - An over wintering waterfowl assemblage of 93,230 individuals. Chichester and Langstone Harbours qualifies as a SPA through supporting breeding: - Little tern <i>Sterna albifrons</i> (100 pairs) - Common tern <i>Sterna hirundo</i> (33 pairs) - Sandwich tern <i>Sterna sandvicensis</i> (31 pairs)	

Site Name	Solent Maritime
Site Designation	SAC
Approximate Relative Location	4.0 kilometres south
Reasons for Designation:	
The SAC is designated for the following features.	

Annex I habitats that are a primary reason for selection of this site:

- Estuaries;
- Cord-grass swards;
- Atlantic salt meadows;
- Subtidal sandbanks;
- Intertidal mudflats and sandflats;
- Lagoons;
- Annual vegetation of drift lines;
- Coastal shingle vegetation outside the reach of waves;
- Shifting dunes with marram *Ammophila arenaria*.

Annex II species present a qualifying feature but not a primary reason for site selection:

- Desmoulin's whorl snail *Vertigo moulinsiana*

Site Name	Hazleton Common
Site Designation	LNR
Approximate Relative Location	1.7 kilometres north
Reasons for Designation:	
The site supports lowland heathland with copses. Plants include 26 ancient woodland species. All species of widespread reptile are known to occur on site. Regular butterfly transects since 1996 and species include Essex skipper <i>Thymelicus lineola</i> , small skipper <i>Thymelicus sylvestris</i> and grizzled skipper <i>Pyrgus malvae</i> . Good breeding populations of stonechat <i>Saxicola torquata</i> and the common is good for kestrel <i>Falco tinnunculus</i> , sparrowhawk <i>Accipiter nisus</i> and buzzard <i>Buteo buteo</i> . The common may be of county importance for its dragonflies. 43 species of spiders have been identified including three nationally notable and one not found in England before. The main pond has great crested newt (DEFRA, 2012).	

Appendix 9 Ecology and Landscape Plan

