

Dunsbury Business Park, Havant

Reserved Matters Application

Plot 4A Development

Ecological Impact Assessment

Portsmouth City Council

4th June 2020

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Non-technical Summary

Report purpose	This report describes the ecological baseline and evaluates the nature conservation importance of ecological features present within the zone of influence for the Proposed Scheme. The assessment identifies impacts (both positive and negative) on important ecological features, sets out agreed avoidance, mitigation, compensation and enhancement measures and provides details on the significance of effects for each important ecological feature.
Proposed Scheme	Reserved Matters Application (pursuant to hybrid application reference APP/12/00338) for a commercial building with offices, parking, vehicle and pedestrian access and hard and soft landscaping. The landscape design incorporates the retained protected hedgerows and their buffer zones along the east and west boundaries of the Application Site and includes native tree, shrub and bulb planting. Construction is programmed to commence in late summer 2020 and be complete by late spring 2021.
Desk studies and field surveys	Previous desk studies carried out for the Environmental Statement and Ecological Impact Assessments for Plot 2, 3A and 3B were reviewed and updated for this assessment. Ecological surveys and monitoring completed across the wider Dunsbury Park development site since 2010 were used to inform this assessment, including the following recent surveys: extended Phase 1 habitat survey in 2020, protected species surveys and monitoring carried out between 2017 and 2019 for bats, hazel dormice, widespread reptiles, badger and great crested newts.
Ecological features	A Special Area of Conservation designated for its important rare bat population is located 18 km from the Application Site. The Application Site is located within a Site of Special Scientific Interest Impact Risk Zone and there are 19 Sites of Importance to Nature Conservation within 1 km. There are eight ancient semi-natural woodlands and no ancient/veteran trees within 1 km of the Application Site. The Application Site is bordered to the west by, and connected to, important hedgerows with mature trees, and margins comprised of poor semi-improved grassland. The Application Site supports foraging/commuting bats (including Annex II species Bechstein's and barbastelle), hazel dormice and widespread species of reptile. It is also considered likely to support foraging badger, hedgehog and non-notable populations of terrestrial invertebrates and nesting birds. No invasive non-native plant species were recorded within the Application Site.
Potential impacts and effects	Potential for indirect impacts (i.e. habitat degradation) to Cherry Tree Row SINC and important hedgerows forming boundaries to the Application Site as a result of dust/groundwater pollution during construction of the Proposed Scheme. Potential for indirect impacts to important hedgerows (e.g. degradation of habitat that supports protected species – hazel dormice and bats) as a result of lighting during construction and operation of the Proposed Scheme. Potential for indirect impacts (e.g. disturbance) to bats (including Annex II species) and hazel dormice as a result of noise and light pollution during construction and operation of the Proposed Scheme. Potential for habitat fragmentation affecting these species as a result of lighting during operation of the Proposed Scheme.
Avoidance, mitigation and compensation measures	Design features include retention of important hedgerows and their buffer zones, a sensitive lighting scheme using guidance on bats and lighting from the Institute of Lighting Professionals, native planting and hedgerow management in accordance with the agreed maintenance schedule. Mitigation measures involve standard good construction practices including protection of trees, hedgerows and their buffer zones, employment of an Ecological Clerk of Works to oversee vegetation clearance under a Precautionary Method of Working for reptiles (and other protected species such as nesting birds, depending

	on the time of year), covering excavations overnight, adherence to pollution prevention guidance, and no night time working/lighting. The Habitat Management and Maintenance Plan will be followed throughout construction and operational maintenance.
Significance of residual effects	Providing the design and mitigation measures are implemented during construction and operation, the Proposed Scheme will have no significant adverse effects on Cherry Tree Row SINC, bats (including Annex II species) and hazel dormice.
Biodiversity enhancement measures	Bat boxes (2 no.) can be installed on mature trees within the hedgerows bordering the Application Site. Further details are provided in Section 5.

Report Validity

In the event of programme changes then updates to the surveys may be required to ensure the validity of the data, as per CIEEM guidance¹.

¹ CIEEM (2019) Advice Note on the Lifespan of Ecological Reports and Surveys

1. Introduction

Terms of Reference

- 1.1. Atkins, member of SNC-Lavalin Group, was commissioned by Portsmouth City Council to undertake an Ecological Impact Assessment (EclA) in connection with a Reserved Matters Application at Plot 4A for a proposed B2 Commercial unit, ancillary offices and car parking with hard and soft landscaping (hereafter referred to as the Proposed Scheme). The Proposed Scheme is located north-west of Havant in Hampshire and centred at Ordnance Survey National Grid Reference SU 69980 09210, as identified by the planning red line boundary shown on the Application Site Boundary in **Appendix A** (hereafter referred to as the Application Site).
- 1.2. This report presents the results of the EclA for the Proposed Scheme and considers both terrestrial and aquatic ecological receptors, which includes designated and non-designated sites, terrestrial and freshwater habitats, plants and species. The assessment has been informed by a desk study, field survey data, and consultation with relevant stakeholders and statutory bodies. This EclA describes the ecological baseline and evaluates the nature conservation importance of ecological features present within the zone of influence for the Proposed Scheme, characterises the impacts on important ecological features, sets out agreed avoidance, mitigation, compensation and enhancement measures, and assesses the significance of the residual effects of the Proposed Scheme on the important ecological features.
- 1.3. This EclA has been undertaken with reference to current good practice² and forms part of the technical information lodged with the Plot 4A Reserved Matters Application, which is submitted pursuant to the section 73 Hybrid Planning Application ref no. APP/12/00338, granted permission on 19th February 2014, for the wider Dunsbury Business Park development site (hereafter referred to as the Wider Site). The Wider Site proposals are split into two phases, as follows:

Phase 1

- Employment uses totalling 46,450 m² (mix of B1, B2 and B3 commercial premises) including an enterprise centre (outline);
- Hotel and conference centre 5,574 m² (outline);
- A new east west link road (detailed);
- Retention of existing trees and hedgerows (outline); and
- 130-150 m wide landscape buffer to A3M boundary and infrastructure planting to the site (outline).

Phase 2

- 15,329 m² B1, B2 and B8 floor space (outline).

- 1.4. Construction of the link road was completed in 2016 and is now called Fitzwygram Way. The development of Plots 2, 3A and 3B are also complete following Reserved Matters Applications and are now occupied.
- 1.5. The Wider Site including the existing built environment and habitat features referred to in this report are shown on the Wider Site Plan in **Appendix A**.

The Application Site

- 1.6. The Application Site is located to the north-west of Havant and approximately 10 km north of Portsmouth in Hampshire. It is former agricultural land totalling approximately 22300m², which has not been farmed, cut or grazed since approximately 2014. Cut and fill works were completed in August 2017 in accordance with the outline planning permission for the Wider Site to remove the topsoil, level and stabilise the area for development. Since these works were carried out, sparse vegetation has regrown on areas of bare ground/hardstanding and has encroached from the fenced buffer zone, which separates the development area within the Application Site from the hedgerow and buffer zone that forms the western boundary to the Application Site. There is also a hedgerow and protective buffer zone approximately 10 m away from the western boundary

² CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version
1.1. Chartered Institute of Ecology and Environmental Management, Winchester.

of the Application Site. These hedgerows and associated buffer zones are to be retained and protected as part of the outline plan for the Wider Site. Vegetation that has re-colonised the Application Site comprises ephemeral and tall ruderal vegetation, scattered scrub and semi-improved species-poor grassland.

- 1.7. The Application Site is bound by a new link road to the south (Fitzwygram Way), a mature hedgerow with trees to the west (H3 Long Hedge), Park Lane with hedgerow and trees to the east. In the Wider Site, Plot 4B (total area approximately 14900m²) and then Plot 5 are located immediately north of the Application Site (see **Appendix A**).
- 1.8. The Wider Site is bounded to the west by the A3(M) carriageway, by woodland and grassland to the south and north and by the residential areas of Havant to the east and south-east.

1.9. The Proposed Scheme

- 1.10. The Reserved Matters Application subject to this EclA is for the development of the Application Site (Plot 4A), located north of the access link road to the Wider Site.
- 1.11. The new commercial building comprises three equal portal bays, each spanning approximately 24 m x 128 m long running in an east to west direction, as well as an office element with welfare facilities at ground level and first floor offices. The second floor would be left as a shell for future expansion. Each portal bay has a minimum clear height to the underside of the structure of 12 m with an overall height of 15.80 m to the top of the roof parapet. The overall size of the building would be 81,500 m wide x 128,500 m long x 15,800 m high.
- 1.12. The offices and staff amenity space are located to the south-east of the building where the main entrance is located. Access is provided from the south and east (Fitzwygram Way) and car parking is arranged in rows to the front and sides of the building. A fenced service yard is located at the north-east corner of the building.
- 1.13. The landscape design will include native species throughout, which will comprise tree planting to the front/south of the building and throughout the car park to break up the area of hardstanding, and shrubs underplanted with bulbs. A close mown grass margin will edge the car park and under the overhead electricity cables there will be close mown grass and bulb planting.
- 1.14. The hedgerow (H3) and protective buffer zone containing a grass margin that form the western boundary to the Application Site and the hedgerow with protective grass margin buffer zone adjacent to the bridleway (Park Lane), approximately 10 m from the eastern edge of the Application Site, are to be retained and protected as part of the Proposed Scheme. These ecological features have been included within the Proposed Scheme design to minimise adverse impacts on habitats and protected/priority³ species (hazel dormice and the Annex II⁴ bat species Bechstein's and barbastelle, for which the hedgerow offers commuting and foraging habitat).
- 1.15. Construction is programmed to commence in late summer 2020 and be complete by late spring 2021.
- 1.16. The building layout along with access and parking, and the landscape design are provided in **Appendix A**.

Background Information and Scope of Assessment

- 1.17. Ecological survey work has been undertaken across the Wider Site since 2010 in connection with planning applications and pre-construction survey work. An Environmental Statement (ES)⁵ was lodged with the submission of the hybrid planning application in 2012. The ES identified the presence of habitats and species across the Wider Site that would be affected by the development and provided an outline of the proposed mitigation. Subsequently, a number of protected species are subject to specific planning conditions attached to APP/12/00338.
- 1.18. The design of the Wider Site has aimed to avoid adverse effects on protected and priority species as far as possible through minimising habitat loss (retention of hedgerows and woodland edges) and the implementation of sensible lighting schemes. In addition to this, the applicant agreed to allocate a 3.4 ha former arable field specifically for habitat creation where various ecological features would be created and managed throughout the life of the Dunsbury Hill Farm development and beyond to enhance biodiversity. The habitat creation area is located

³ <http://data.jncc.gov.uk/data/98fb6dab-13ae-470d-884b-7816afce42d4/UKBAP-priority-terrestrial-mammals.pdf>

⁴ Specific species subject to protection under Annex II of the Habitats Directive will have core areas of their habitat designated and protected to ensure conservation.

⁵ Atkins, 2012. *Dunsbury Hill Farm. Environmental Statement*.

approximately 450 m north of the Application Site. In the short term this area has been utilised for spoil storage but has now been landscaped and planted with trees and shrubs at the northern end to provide connectivity to the woodland and wildflower grassland and in turn will provide an increased food resource for pollinators and habitat for birds, reptiles and other mammals present at the Wider Site such as deer.

- 1.19. Following the granting of full planning permission for the access link road together with landscaping, infrastructure and associated works, protected species mitigation licences for bats and hazel dormice pertaining to the link road construction were granted by Natural England in 2014 (and a further licence was granted for hazel dormice pertaining to the development of Plot 2 in 2016). A Habitat Management and Maintenance Plan⁶ was produced as part of the hazel dormouse mitigation licence, which covers the link road and associated infrastructure. It outlined the general vision for the Wider Site in terms of nature conservation and provided some information regarding measures that will be undertaken for protected species present on site such as hazel dormice and bats. The Habitat Management and Maintenance Plan will be updated for each of the subsequent phases of development once they have reached detailed design stage. Masterplans were also produced for the link road phase as part of the bat and hazel dormouse mitigation licences⁷. These documents set out the various phases of the Wider Site development with a view to help assess the overall impacts of the proposed development on the bat population and the future mitigation across the whole project.
- 1.20. The proposals at the Application Site considered in this EcIA build on the principles approved and described in the general vision for the Wider Site in terms of nature conservation, habitat creation and enhancements, which would take place in the open space around the development to minimise any long-term impacts on habitats and species, as previously agreed in the hybrid planning permission.
- 1.21. The information within the ES, mitigation licences, an updated desk study and ecological survey work carried out across the Wider Site in connection with detailed design work for Plots 2, 3A, 3B as well as for the Hermitage Stream re-alignment and detailed design of Plot 6 (development currently on hold), was used to inform this Ecological Impact Assessment.

⁶ Atkins, 2014. *Dunsbury Hill Farm Habitat Management and Maintenance Plan*.

⁷ Atkins, 2014. *Dunsbury Hill Farm Bat and Dormouse Masterplans* (pertaining to Natural England licences 2014-412-EPS-MIT of bats and 2014_456-EPS-MIT for dormouse).

2. Methodology

Desk Study

- 2.1. The geographical area for obtaining ecological data through desk studies has been determined using professional judgement. Baseline data has been gathered from a range of sources through data requests, consultation, and using online resources as outlined below. This included data gathering in relation to statutory and non-statutory designated sites and protected and priority species. The study areas used for the data gathering are detailed in Table 2-1. The update data search was undertaken on 5th March 2020. A review of the previous desk studies for Plots 2, 3A and 3B was also undertaken and incorporated into this assessment. For species records collected, only those within 10 years of the data collection date have been considered within the assessment.
- 2.2. The following online resources were accessed:
- The Multi-Agency Geographic Information for the Countryside (MAGIC) website⁸ was reviewed for information on designated sites of nature conservation importance (statutory sites only) including internationally designated sites: Special Protection Areas (SPAs), Wetlands of International Importance (Ramsar sites) and Special Conservation Areas (SCAs). Notable habitats i.e. areas of ancient woodland and 'Habitats of Principal Importance for the Conservation of Biodiversity' included in the England Biodiversity List⁹.
 - Ordnance Survey maps and the Grid Reference Finder website¹⁰ were used to identify the presence of waterbodies within 500 m of the Application Site boundary, in order to establish if the land within and immediately surrounding the Application Site could be used as terrestrial habitat for great crested newt. This species typically uses suitable terrestrial habitat up to 500 m from a breeding pond. However, there is a notable decrease in great crested newt abundance beyond a distance of 250 m from a breeding pond¹¹.
 - The Woodland Trust Ancient Tree Inventory¹² was reviewed for ancient or veteran trees located outside ancient woodland.
- 2.3. A review of the following previous ecological reports was undertaken:
- Atkins (March 2012) Dunsbury Hill Farm. Environmental Statement. Volume 1;
 - Atkins (November 2015). Dunsbury Hill Farm, Havant Reserved Matters Application Plot 2 Ecological Impact Assessment. Version 2.0. Reference: 5127287;
 - Atkins (February 2018). Dunsbury Park, Havant Reserved Matters Application Plot 3A Development. Ecological Impact Assessment. Version 1.0. Reference: 5127287; and
 - Atkins (March 2018). Dunsbury Park, Havant Reserved Matters Application Plot 3B Development. Ecological Impact Assessment. Version 1.0. Reference: 5127287.
- 2.4. The following organisations were contacted to request relevant desk study data, including details of non-statutory designated sites:
- Hampshire Biodiversity Information Centre (HBIC).

Table 2-1 Update data search areas

Data type	Search area – distance from Proposed Scheme boundary
Statutory designated sites for nature conservation	2 km
Non-statutory designated sites for nature conservation	1 km
Priority habitats including ancient woodland and ancient/veteran trees	1 km

⁸ www.magic.gov.uk

⁹ Section 40 of the Natural Environment & Rural Communities (NERC) Act 2006 requires that every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity. The Secretary of State has drawn up, in accordance with Section 41 of the Act and in consultation with Natural England, a list of habitats and species of principal importance for the conservation of biodiversity in England that is known as the *England Biodiversity List*

¹⁰ <https://gridreferencefinder.com>

¹¹ Natural England (2004) An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt (ENRR576). <http://publications.naturalengland.org.uk/publication/134002>.

¹² <http://ati.woodlandtrust.org.uk/tree-search>

Legally protected and priority species	1 km (2 km for bats and birds)
Invasive non-native plant species	1 km

Planning Policy Review

- 2.5. A review of national and local planning policy relevant to the Proposed Scheme was undertaken as part of the data gathering. The following policy documents were subject to review:
- Department for Communities and Local Development (2019) National Planning Policy Framework¹³; and
 - Havant Borough Council adopted local plan (made up of the Core Strategy 2011 and the Site Allocations Plan 2014)¹⁴.
- 2.6. A summary of relevant planning policy is provided in **Appendix B**.

Ecological Field Surveys

- 2.7. The geographical area for undertaking ecological field surveys has been determined using the current survey guidance, professional judgement and the zones of influence, which have been determined based on the nature of the impacts arising from the Proposed Scheme.
- 2.8. The Wider Site was subject to detailed ecological surveys between 2010 and 2015 to inform the ES and EclA for Plot 2. Bat and hazel dormouse monitoring surveys were completed as part of the mitigation licence conditions between 2015 and 2017 respectively, and further survey work for these species was conducted in 2017 to inform the planned phased development of Plots 3A and 3B. The methodologies and results of this survey work and monitoring are provided in the previous ecological reports listed in Section 2.3 above. The picture gathered from this information is relevant for use within this EclA.
- 2.9. With this in mind, the field methodology information below covers only the most recent detailed survey and monitoring work completed within and surrounding the Application Site between late 2017 and 2020. This includes the following:
- An extended Phase 1 habitat survey undertaken in January 2020;
 - Update protected species surveys of Plot 6 (approximately 100 m north-east from the Application Site) due to the planned development of this plot, currently on hold, namely for badger, great crested newt, hazel dormouse, bats and common species of reptiles undertaken between January 2018 and November 2019; and
 - Continued monitoring of bat boxes in October 2017 and September and October 2018 and hazel dormouse nest boxes in October 2017 and July and October 2018.

Surveyor Competencies

- 2.10. All the surveys were led by surveyors who have been assessed¹⁵ to be at least of capable experience following the Chartered Institute of Ecology and Environmental Management (CIEEM) competency framework¹⁶.

Extended Phase 1 Habitat Survey

- 2.11. An update ecological walkover survey of areas within and adjacent to the Application Site, including land up to 50 m from the Application Site boundary where access was allowed (the Survey Area), was undertaken on 27th January 2020 broadly following the extended Phase 1 habitat survey methodology¹⁷. All land within and adjacent to the Application Site including land up to 50 m from the Application Site boundary (the Survey Area) was surveyed according to CIEEM guidance⁵.
- 2.12. The walkover survey recorded information on the habitats within the Survey Area and included a search for evidence of the presence of, and the potential of each habitat to support, priority and

¹³

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf

¹⁴ Havant Borough Council's adopted Local Plan. <https://www.havant.gov.uk/localplan>

¹⁵ Assessment undertaken by Atkins ecological technical leadership team in accordance with CIEEM competency criteria.

¹⁶ <https://www.cieem.net/competency-framework>

¹⁷ Joint Nature Conservation Committee (2010) Handbook for Phase 1 habitat survey - a technique for environmental audit.

protected species as recommended by CIEEM¹⁸. The species element of the extended Phase 1 habitat survey recorded evidence within the Application Site and land up to 50 m from the Site boundary only. Where Phase 2 surveys have been undertaken relevant to the Application Site, the survey extents are detailed in Table 2.2. below.

2.13. The extended Phase 1 habitat survey method comprised the following:

- Mapping habitats present according to the JNCC Phase 1 habitat survey methodology⁴, with target notes (TN) used to record specific details on the plant species composition of the habitats, current management and condition. TNs were also used to record features of ecological importance e.g. veteran trees;
- Assessing the potential of terrestrial habitats to support amphibians. Aquatic habitat outside the Application Site was assessed for its suitability to support great crested newts using the Habitat Suitability Index (HSI) assessment (see Phase 2 Surveys below);
- Assessing the suitability of habitats for nesting and wintering birds;
- Assessing the suitability of habitats for reptiles;
- Assessing the suitability of habitats for hazel dormouse; and
- Assessing the suitability of habitats for priority invertebrates.

2.14. In addition to the above, specific searches were made to the following:

- Potential roosting sites for bats within trees e.g. identification of suitable cracks and crevices (survey undertaken from ground only). The assessment of potential suitability of the trees for roosting sites for bats were categorised based on good practice guidance¹⁹.
- Signs of badger activity including setts, tracks, snuffle holes and latrines; and
- Evidence of the presence of the following invasive species was recorded where seen:
 - a. Evidence of animal species as listed on the Invasive Alien Species (Enforcement and Permitting) Order 2019; muntjac deer and grey squirrel.
 - b. Evidence of the presence of the following invasive species: Japanese knotweed, giant knotweed, hybrid knotweed, giant hogweed, Himalayan balsam, rhododendron, New Zealand pigmy weed, Virginia creeper, variegated yellow archangel, and cotoneaster. These are listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and subject to strict legal control.

Phase 2 Surveys

2.15. The Phase 2 survey works carried out in 2018 and 2019, that were used to inform this EcIA, are listed in Table 2-2 below. Full methods are provided in **Appendix C**.

Table 2-2 Phase 2 surveys

Survey type	Study area - distance from the Proposed Scheme boundary	Rational for study area	Survey dates
Badger survey	Plot 6 – approximately 100 m north-east of Application Site	Standard area based on good practice guidance.	20/06/2019
Bat ground level tree assessment	Plot 6 – approximately 100 m north-east of Application Site	Standard area based on good practice guidance.	23/01/2018
Bat climbed tree inspections	Plot 6 – approximately 100 m north-east of Application Site	Standard area based on good practice guidance.	31/05/2018 11/09/2018 01/06/2019
Bat dusk emergence (trees)	Plot 6 – approximately 100 m north-east of Application Site	Standard area based on good practice guidance.	11/09/2018 31/05/2019

¹⁸ Chartered Institute of Ecology and Environmental Management (2017) Guidelines for Preliminary Ecological Appraisal, Second Edition.

¹⁹ Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

Bat dawn re-entry (trees)	Plot 6 – approximately 100 m north-east of Application Site	Standard area based on good practice guidance.	26/08/2019
Bat trapping and radio tracking	In woodland around Wider Site in relation to Plot 6 – approximately 100 m north-east of Application Site	Standard area based on good practice guidance.	29/07/2019 30/07/2019 31/07/2019 01/08/2019 02/08/2019 22/09/2019 23/09/2019 24/09/2019
Dormouse presence/likely absence	Plot 6 – approximately 100 m north-east of Application Site	Standard area based on good practice guidance.	26/06/2019 (set up) 25/07/2019 19/08/2019 12/09/2019 16/10/2019 14/11/2019
Great crested newt eDNA	Plot 6 – approximately 100 m north-east of Application Site	Standard area based on good practice guidance.	20/06/2019 (sample taken) 25/06/2019 (received at laboratory) 04/07/2019 (result reported)
Reptile presence/likely absence and population size class assessment	Plot 6 – approximately 100 m north-east of Application Site	Standard area based on good practice guidance.	14/06/2019 (set up) 20/06/2019 26/06/2019 01/07/2019 05/07/2019 08/07/2019 10/07/2019 16/07/2019 19/07/2019 31/07/2019 07/08/2019 19/08/2019 12/09/2019

- 2.16. In addition, monitoring was undertaken in late 2017 and 2018 (see Table 2-3 below) as part of the conditions of the hazel dormouse and bat mitigation licences for the link road and Plot 2, the results of which were used to inform this EclA.

Table 2-3 Monitoring surveys

Survey type	Study area - distance from the Proposed Scheme boundary	Rational for study area	Survey dates
Bat boxes monitoring	Neville's Park East Wood Site of Importance for Nature Conservation (SINC) and Cherry Tree Row SINC –	Monitoring area as per mitigation licence.	23/10/2017 11/09/2018

	230 m south at the closest point to Application Site		03/10/2018
Dormouse boxes monitoring	Neville's Park East Wood SINC, Cherry Tree Row SINC and Hermitage Stream wet woodland area – 230 m south at the closest point to Application Site Beech Wood East - 145 m west at closest point to Application Site	Monitoring area as per mitigation licence.	24/10/2017 16/07/2018 23/10/2018

- 2.17. Detailed update Phase 2 surveys for hazel dormice and common species of reptiles were not undertaken within the Application Site to inform this EclA, as the suitable habitats for these species within the Application Site will be retained as part of the design. Based on the results from recent surveys for these species listed in Table 2-2 above and good habitat connectivity to/from the Application Site, hazel dormice and common reptiles are considered likely to be present in the hedgerows and rough grassland, respectively, in the protective buffer zones along the west boundary and 10 m to the east of the Application Site.
- 2.18. Based on the absence of suitable habitat recorded during the extended Phase 1 habitat survey, no other Phase 2 protected species or botanical surveys are required within the Site or adjacent habitat for the purpose of this EclA.

Survey Limitations

- 2.19. This section identifies any limitations to the surveys or assessment and provides an explanation as to the effect of these on the assessment.
- 2.20. The list of invasive plant species included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) is extensive and these plants are found in a range of different habitats. The extended Phase 1 habitat survey checked for the presence of Japanese knotweed, giant knotweed, hybrid knotweed, giant hogweed, Himalayan balsam, rhododendron, Virginia creeper, variegated yellow archangel, and cotoneaster species. Other invasive species may not have been recorded. Therefore, a precautionary approach is taken to recommended mitigation measures regarding invasive non-native plant species, provided in Section 4.
- 2.21. 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 ecological surveys undertaken to support this EclA have not therefore produced a complete list of plants and animals and the absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future. Therefore, a precautionary approach is taken to recommended mitigation, provided in Section 4.
- 2.22. The desk study reviewed the Woodland Trusts Veteran Trees inventory, which provides records of ancient and veteran trees, but is not an exhaustive list and other veteran trees may be present in the area. The walkover survey aimed to identify such features and as such this is not considered a constraint to the assessment.

Nature Conservation Importance

- 2.23. A number of criteria have become accepted as a means of assessing the nature conservation importance of a defined area of land which are set out in A Nature Conservation Review²⁰ and include diversity, rarity and naturalness.
- 2.24. The nature conservation importance or potential importance of an ecological feature is determined within the following geographic context:
- International (e.g. Special Areas of Conservation, Special Protection Areas, Ramsar sites);
 - National (e.g. Sites of Special Scientific Interest);
 - Regional (e.g. Environment Agency regional biodiversity indicators, important features in Natural England Natural Areas);
 - Metropolitan, County, Vice-County or Other Local Authority-wide Area (e.g. Local Nature Reserves, Sites of Importance for Nature Conservation);

²⁰ Ratcliffe, D. (1977) A Nature Conservation Review. Cambridge University Press.

- Local (undesigned ecological features e.g. old hedges, woodlands, ponds);
- The Application Site and its immediate environs (e.g. small pond, marshy grassland); and
- Negligible (e.g. areas of hardstanding and amenity grassland).

- 2.25. The following documents have been reviewed to assist in the determination of importance:
- IEEM (December 2010). In Practice No. 70, Dec 2010. Pg 23-35 Valuing Bats in Ecological Impact Assessment by Wray, S. et al.
- 2.26. Features that have been identified to be of less than local importance are not considered to be important ecological features and as such have not been considered within the impact assessment. Where mitigation is required for these features for legal reasons this is detailed in Section 4.

Impact Assessment

- 2.27. The assessment of the potential effects of the Proposed Scheme takes into account both on-site impacts and those that may occur to adjacent and more distant ecological features.
- 2.28. The zone of influence is an area within which ecological features may be subject to biophysical changes as a result of the Proposed Scheme. Throughout the EclA process the zone of influence was regularly reviewed. The zone of influence for the impact assessment is typically the same as the field survey area, as the likely impacts of the Proposed Scheme were considered when establishing the field survey areas. However, this was reviewed during the impact assessment, based on further understanding of the Proposed Scheme impacts and on the results of the desk study, field surveys and consultation. Any changes to the zone of influence are explained in Section 5.
- 2.29. Where impacts have been identified, details are provided within the assessment to characterise these in terms of their extent and magnitude, duration, frequency and timing, and reversibility. Both positive and negative impacts are discussed. Impacts were also characterised in terms of how they occur, i.e. direct, indirect secondary or cumulative. Impacts can be permanent or temporary and can include:
- Direct loss and degradation of wildlife habitats;
 - Fragmentation and isolation of habitats;
 - Mortality and injury to species;
 - Disturbance to species from noise, light or other visual stimuli;
 - Changes to key habitat features; and
 - Changes to the local hydrology, water quality and/or air quality.
- 2.30. For designated sites, effects are considered significant when a project and associated activities is likely to either undermine or support the conservation objectives or condition of the site(s) and its features of interest.
- 2.31. For ecosystems, effects are considered significant when a project and associated activities is likely to result in a change in ecosystem structure and function.
- 2.32. Consideration is given to whether:
- Any processes or key characteristics will be removed or changed;
 - There will be an effect on the nature, extent, structure and function of component habitats;
 - There is an effect on the average population size and viability of component species; and
 - Functions and processes acting outside the formal boundary of a designated site has also been considered, particularly where a site falls within a wider ecosystem e.g. wetland sites.
- 2.33. Some ecosystems can tolerate a degree of minor changes, such as localised or temporary disturbance or changes in physical conditions, without such changes harming their function or importance. For this EclA, ecological effects have been considered in the light of any information available about the capacity of ecosystems to accommodate change. Significant effects have been determined as being either negative or positive.
- 2.34. The conservation importance of undesignated habitats and species within a defined geographical area (International to Local) has been used in this assessment to determine whether the effects of the proposals are likely to be significant:

- For habitats, conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area; and,
- For species, conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

- 2.35. When assessing potential effects on conservation importance, the known or likely background trends and variations in status have been taken into account. The level of ecological resilience or likely level of ecological conditions, that would allow the population of a species or area of habitat to continue to exist at a given level or continue to increase along an existing trend or reduce a decreasing trend, has been estimated where appropriate to do so.
- 2.36. The avoidance, mitigation, compensation and/or enhancement measures described within the EclA have been incorporated into the design and operational phasing programme and taken into account in the assessment of the significance of effects. These mitigation measures include those required to achieve the minimum standard of established good practice together with additional measures to further reduce any negative impacts of the Proposed Scheme. The mitigation measures include those required to reduce or avoid the risk of committing legal offences.
- 2.37. If the design changes or the agreed mitigation cannot be implemented the effects will need to be reassessed and further surveys may be required. In this event, the conclusion of this EclA may no longer be valid.
- 2.38. In addition to measures required to ameliorate negative effects on important ecological features, further biodiversity enhancement measures have been identified and will be incorporated into the Proposed Scheme as it is progressed.
- 2.39. The impact assessment has taken account of cumulative effects, which were initially considered for the Wider Site in the ES⁵. In order to identify any new potential projects or additional information for projects previously identified in the ES, which could have a cumulative effect, a review was undertaken of Havant Borough Council's Adopted Allocations Plan (July, 2014)¹⁴ for significant or major committed developments in the vicinity that have a high level of certainty within the next five years (collectively referred to as identifiable developments). This review identified the projects listed in Table 2-4 below.

Table 2-4 Projects considered for cumulative effects

Project name	Summary of project	Distance from Proposed Scheme	Current status	Planning reference number	Suitable for cumulative assessment?
Dunsbury Park (Wider Site)	The wider development of the Business Park of which the Application Site is a part of.	Immediately adjacent	Hybrid and reserved matters (for Plots 2, 3A and 3B) planning permission granted.	APP/12/00338	Yes
Havant Thicket Winter Storage Reservoir	Creation of a 160-ha reservoir.	760 m	Planning application to be submitted in 2020.	N/A	No – ecological assessment information unavailable.
'UE6a'	Residential allocation for approximately 75 units.	520 m	No work undertaken as yet.	None	No – ecological assessment information unavailable.

Mitigation Hierarchy

- 2.40. The principles of the mitigation hierarchy^{21/22} have been adopted and used when considering impacts and subsequent effects on important ecological features within the zone of influence.
- 2.41. The principles of the mitigation hierarchy are that in order of preference impacts on biodiversity should be subject to:
- Avoidance;
 - Mitigation;
 - Compensation; and
 - Enhancement.

²¹ Department for Communities and Local Development (2018) National Planning Policy Framework, Paragraph 118.
<https://www.gov.uk/government/publications/national-planning-policy-framework--2>

²² CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, Paragraph 1.19. Chartered Institute of Ecology and Environmental Management, Winchester.

3. Baseline Conditions and Importance

- 3.1. This section provides details of the ecological baseline relevant to the Proposed Scheme recorded during the desk study and field surveys undertaken to inform this EclA. Full details for recent Phase 2 surveys are provided in **Appendix C**.

Statutory and non-Statutory Designated Sites

- 3.2. There are no statutory designated sites situated within the Application Site and/or within 2 km²³ of the Site. The Application Site is located within a Site of Special Scientific Interest (SSSI) Impact Risk Zone²⁴. However, the Proposed Scheme does not fall into any of the categories listed that are likely to involve potential impacts to statutory designated sites.
- 3.3. Refer to paragraphs 3.20-3.21 for consideration of a SAC designated due to the importance of its rare bat population.
- 3.4. There are no non-statutory designated sites situated within the Application Site and 19 SINCs within 1 km²⁵ of the Application Site, all of which are detailed in Table 3-1 below and shown on Figure D.1 in **Appendix D**.

Table 3-1 Non-statutory designated sites (SINCs) within 1 km of the Application Site

Site name	Location of designated site ²⁶	Area (ha)	Features of interest
Cherry Tree Row	35 m south	1.93	Ancient (relic) semi-natural woodland including areas of wet woodland.
Beech Wood East	145 m west	2.85	Ancient semi-natural broad-leaved woodland with areas of replanted coniferous trees and birch stands.
Outhurst/Inhurst/Beech Woods	310 m west	10.75	No information available.
Dunsbury Hill Wood	345 m north-east	6.70	Semi-natural woodland comprising valley alder wood which is an important community type of restricted distribution in the County
The Warren, Havant	350 m east	5.04	No information available.
Neville's Park Areas 2 & 3	350 m south	14.16	Agriculturally unimproved grasslands
Meadow by Bell's Copse	470 m north-east	4.94	Agriculturally designated grassland.
Dunsbury Hill Grassland 2	590 m north-east	3.52	No information available.
Hurst Wood, Havant	590 m north-west	2.03	No information available.
Neville's Park East Wood	600 m south	8.87	Ancient Semi Natural Woodland
Dunsbury Hill - Areas 5 & 6	645 m north	2.16	No information available.
Cabbagefield Row	650 m east	2.04	No information available.

²³ This is the zone of influence for statutory designated sites.

²⁴ A GIS tool developed by Natural England to make rapid initial assessment of the potential risks posed by development proposals to: Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites.

²⁵ This is the zone of influence for non-statutory designated sites.

²⁶ Where designated sites are situated outside of the Application Site boundary, the distance and direction is given to the closest point that the designated site is from the Application Site.

Bell's Copse	660 m north-east	33.29	No information available.
Bushy Lease	690 m south	6.40	No information available.
Stakes Coppice Remnant 7	730 m south-west	0.63	No information available.
Neville's Park West Wood	745 m south-west	4.51	No information available.
Dunsbury Hill - Area 1	755 m north	1.68	No information available.
Neville's Park Areas 4-10	870 m south	13.35	No information available.
Stakes Coppice Remnant 5	920 m south-west	0.53	No information available.

- 3.5. The non-statutory designated site Cherry Tree Row SINC, of County importance to nature conservation, could be adversely impacted by the Proposed Scheme due to its proximity to the Application Site. Therefore, Cherry Tree Row SINC is scoped into further detailed assessment.
- 3.6. Due to their distance from the Application Site, the relatively localised nature of the proposed works and absence of potential pollution pathways (e.g. watercourses), no impacts are anticipated on non-statutory designated sites that are located in excess of 100 m from the Application Site as a result of the Proposed Scheme and they are scoped out of further assessment.

Irreplaceable Habitats

- 3.7. There are no ancient woodlands within the Application Site and eight ancient semi-natural woodlands within 1 km²⁷ of the Application Site, all of which are detailed in Table 3-2 below.

Table 3-2 Ancient woodland within 1 km of the Application Site

Ancient woodland name and area (ha)	Location of ancient woodland ²⁸
Unnamed, 0.30 ha	475 m south
Unnamed, 5.75 ha	530 m south
Bells Copse, 20.59 ha	600 m north-east
Bushy Lease, 2.87 ha	615 m south
Cabbagefield Row, 2.04 ha	630 m east
Unnamed, 1.20 ha	850 m south
Unnamed, 0.13 ha	865 m south
Unnamed, 0.51 ha	875 m south

- 3.8. Due to their distance in excess of 100 m from the Application Site, the relatively localised nature of the proposed works and absence of potential pollution pathways (e.g. watercourses), no

²⁷ This is the zone of influence for ancient woodland.

²⁸ Where ancient woodlands are situated outside of the Application Site boundary, the distance and direction are given to the closest point that the ancient woodland from is the Application Site.

impacts are anticipated on ancient woodlands as a result of the Proposed Scheme and they are scoped out of further assessment.

- 3.9. A search of the Woodland Trust Ancient Tree Inventory²⁹ returned no records of ancient or veteran trees within 1 km of the Application site.

Habitats

- 3.10. The Application Site is a former arable field which was cleared in 2017 during a cut and fill levelling exercise and is currently a mixture of bare ground, recolonising ephemeral/ruderal vegetation, scattered scrub and poor semi-improved grassland. The west boundary to the Application Site comprises an important³⁰ native species-rich hedgerow (hedgerow H3) (see Figure A.1 in **Appendix A**) along with its protective buffer zone containing poor semi-improved (rough) grassland, which is fenced off from the development area with construction exclusion heras fencing. A further important native (species-poor) hedgerow H1 and its protected buffer zone is located approximately 10 m to the east of the Application Site. Plot 4B and then Plot 5 are located to the north of the Application Site, respectively. Plot 5 is bordered to the north by a further important native (species-poor) hedgerow and its protective buffer zone (hedgerow H2), which is connected to H3 (see Figure A.1 in **Appendix A**).
- 3.11. Table 3-3 below provides a summary description of each habitat present, identifies those habitats which are listed on Annex 1³¹ and/or listed as priority habitats³², and provides a nature conservation importance value for each habitat. The table also provides details of the area of each habitat within the Application Site and the proportion of the Application Site this makes up. Habitats are mapped on the extended Phase 1 habitat survey plan (Figure E.1 in **Appendix E**) with specific features highlighted by target notes (TN) on the figure. TN descriptions and photographs are also provided in **Appendix E**.

Table 3-3 Habitat types within 50 m³³ of the Application Site

Habitat type	Location of Habitat ³⁴	Area of Habitat/Distance of Linear Feature ³⁵		Annex 1 habitat y/n	Priority habitat y/n	Importance level	Rationale for valuation
		Ha/m	% of Site				
Ephemeral/ruderal vegetation between bare ground, scattered scrub and poor semi-improved grassland	Within Application Site	4.8 ha	100 %	n	n	Application Site	Negligible botanical value for nature conservation and limited potential to support protected/priority species.
Important Hedgerow containing mature trees (H3) – species-rich, intact	Forms west boundary of Application Site	345 m in total (extends to the north)	n/a	n	y	Local	Undesignated ecological feature qualifies ecologically as important under the

²⁹ <https://ati.woodlandtrust.org.uk/>

³⁰ <https://www.gov.uk/guidance/countryside-hedgerows-regulation-and-management#check-if-a-hedgerow-is-protected>

³¹ <http://jncc.defra.gov.uk/page-1523>

³² <http://jncc.defra.gov.uk/page-5706>

³³ This is the zone of influence for habitats.

³⁴ Where habitats are situated outside of the Application Site boundary, the distance and direction are given to the closest point that the habitat from is the Application Site.

³⁵ The area of habitat is only provided for those habitats that fall within the Application Site.

							hedgerow regulations (1997)³⁶ and contains hazel dormice, common reptiles and commuting/ foraging bats, including Annex II species (Bechstein's and barbastelle), all of which are protected species listed in the Wildlife and Countryside Act 1981 (as amended). Species include those listed on the IUCN red list as endangered, vulnerable or rare in Great Britain. Hampshire Biodiversity Action Plan (BAP) habitat.
Important Hedgerow containing mature trees (H1) – species-poor, defunct	Approx. 10 m to the east of the Application Site	250 m in total	n/a	n	y	Local	Undesignated ecological feature that is important due to presence of hazel dormice, common reptiles and commuting/ foraging bats, including Annex II species (Bechstein's and barbastelle), all of which are protected species listed in the Wildlife and Countryside Act 1981 (as

³⁶ The Hedgerow Regulations (1997) - <http://www.legislation.gov.uk/uksi/1997/1160/contents/made>

							amended). Species include those listed on the IUCN red list as endangered, vulnerable or rare in Great Britain. Hampshire Biodiversity Action Plan (BAP) habitat.
Important Hedgerow containing mature trees (H2) – species-poor, defunct	Approx. 200 m to the north and connected to hedgerow H3 bordering west of the Application Site	220 m in total	n/a	n	y	Local	Undesignated ecological feature that is important due to presence of hazel dormice, common reptiles and commuting/ foraging bats, including Annex II species (Bechstein's and barbastelle), all of which are protected species listed in the Wildlife and Countryside Act 1981 (as amended). Species include those listed on the IUCN red list as endangered, vulnerable or rare in Great Britain. Hampshire Biodiversity Action Plan (BAP) habitat.

- 3.12. Habitats bordering and connected to the Application Site comprised of important hedgerows containing mature trees, a Hampshire BAP³⁷ habitat of Local value to nature conservation, could be adversely impacted by the Proposed Scheme. Therefore, due to their close proximity, the important hedgerows (containing mature trees) are scoped into further detailed assessment.

³⁷ <https://documents.hants.gov.uk/biodiversity/HampshireBiodiversityActionPlanVolume2.pdf>

- 3.13. Features that have been identified to be of less than local importance (i.e. ephemeral/ruderal/scrub/poor semi-improved grassland) are not considered to be important ecological features and as such are scoped out of further assessment.

Protected and Priority Species

- 3.14. This section provides a summary of the results of the desk study³⁸, extended Phase 1 habitat survey and the Phase 2 surveys, along with the nature conservation importance for each species or species group. The full results of these are provided in **Appendix F**.

Badgers

- 3.15. The desk study in the ES and recent update data search returned no records of badgers within 1 km of the Application Site. However, previous field survey work carried out in 2011 for the Wider Site ES and Plot 2 EcIA recorded evidence of badger presence on field margins across the plots and a badger sett approximately 150 m west of the Application Site. During the 2019 survey work for Plot 6, badger latrines were identified on Park Lane/123 Bridleway approximately 100 m north-east of the Application Site, as well as within the grass margins of Plot 6 itself (see Figure F-1 in **Appendix F** for a map of the results). Mammal push-throughs were also found running into the scrub boundaries of Plot 6 and off-site to the east. No evidence of badger presence was recorded in the Application Site or within 50 m of the Application Site during the update extended Phase 1 habitat survey in 2020.
- 3.16. Due to the previous evidence of a badger sett and evidence of badger across the Wider Site, it is likely that badgers use the Application Site for foraging, but use is likely to be restricted to the field margins. The design incorporates measures to protect the field margins, which offer suitable foraging and commuting habitat for badgers.
- 3.17. As no badgers have been recorded within or immediately adjacent to the Application Site and suitable habitat for this species will be retained as part of the design, this species is scoped out of further detailed assessment. However, due to their legally protected status, appropriate mitigation measures will be included in Section 4 to avoid harm/injury to badgers during construction.

Great Crested Newts

- 3.18. The desk study in the ES and recent update data search returned no records of great crested newts within 1 km of the Application Site. There are no ponds or other aquatic habitats within the Application Site, one pond (Pond A, see Figure C-1 in **Appendix C**) within 500 m of the Application Site, and two ponds over 500 m from the Application Site (Ponds B and C, see Figure C-1 in **Appendix C**), which have good habitat connectivity to Pond A. During 2019 survey work, it was found that Pond A was scrubbed over and instead filled with nettles and bramble and Pond B was dry. Therefore, Ponds A and B were unsuitable for breeding great crested newts. Pond C was small with a 'poor' HSI score and returned a negative eDNA result confirming likely absence of great crested newts.
- 3.19. As no great crested newts have been recorded within or in proximity to the Application Site, this species is scoped out of further detailed assessment.

Bats (Annex II Species – Bechstein's and Barbastelle)

- 3.20. The desk study in the ES and recent update data search returned records of a (SAC (Singleton and Cocking Tunnels SAC)) designated for supporting significant numbers of barbastelle and Bechstein's bats approximately 18 km east of the Application Site. Bechstein's bat records were also returned from the update data search within 2 km of the Application Site and a known maternity colony of Bechstein's bats is located approximately 3 km north of the Application Site. No barbastelle records were returned from the desk study within 2 km of the Application Site.
- 3.21. Due to the distance of Singleton and Cocking Tunnels SAC from the Application Site, the relatively localised nature and scale of the Proposed Scheme, and the core sustenance zones of Bechstein's and barbastelle bats, which are considered to be at least 3 km¹⁹ and 6 km, respectively, no impacts are anticipated on this designated site as a result of the Proposed Scheme.
- 3.22. During 2015 survey work, a non-lactating female Bechstein's bat was recorded during trapping surveys in Cherry Tree Row SINC.

³⁸ Only recent records of species are provided here, where recent is taken to be in the last 10 years.

- 3.23. During 2017, activity surveys recorded a barbastelle bat commuting along H3 (the hedgerow bordering west of the Application Site). Static detectors recorded 19 *Myotis* sp. passes; however, due to their complex call nature, it was not possible to distinguish whether any of the calls were from Bechstein's bats.
- 3.24. During 2019 survey work, no Bechstein's or barbastelle bats were recorded during potential tree roost surveys or trapping surveys north-east of the Application Site.
- 3.25. The development area within the Application Site, comprised predominantly of bare ground and ephemeral/ruderal vegetation with some smaller areas of scattered scrub, does not offer suitable foraging habitat for Bechstein's and barbastelle bats. However, the hedgerows and their buffer zones bordering and connected to the Application Site provide commuting and foraging habitat for these two species, which are Annex II, priority species, and Hampshire BAP species, of Regional nature conservation importance due to their rarity in the UK throughout their range.
- 3.26. No roosting Bechstein's or barbastelle bats have been recorded within or adjacent to the Application Site and foraging/commuting habitat for these species will be retained as part of the design. However, there is potential for foraging/commuting Bechstein's and barbastelle bats to be adversely impacted by lighting from the Proposed Scheme. Therefore, Bechstein's and barbastelle bats are scoped into further detailed assessment.

Bats (Other Species)

- 3.27. The desk study in the ES and recent update data search returned records of common pipistrelle, brown long-eared, long-eared sp., unidentified *Myotis* sp., Alcaethoe, Brandt's, Daubenton's, whiskered, Natterer's, noctule, pipistrelle sp., *Nathusius'* pipistrelle and soprano pipistrelle within 2 km of the Application Site.
- 3.28. In 2015, survey work across the Wider Site focussing on Plot 2 recorded common pipistrelle during trapping surveys, and common pipistrelle, soprano pipistrelle, serotine and noctule during activity surveys. In 2016 and 2018, brown long-eared bats were recorded roosting in a bat box during monitoring surveys in Neville's Park East Wood SINC and a brown long-eared or Natterer's bat dropping (based on size and morphology only) was recorded in a bat box in the same area in 2017.
- 3.29. During 2017, activity surveys recorded bats foraging along the woodland margins and dark corridors formed by public footpaths surrounding Plot 3 and commuting/foraging activity along hedgerows north of the link road bordering the Application Site, Plot 4B and Plot 5, and along Park Lane bridleway adjacent to the east of the Application Site. The majority of the bats observed/recorded were common pipistrelle and soprano pipistrelle with less frequent serotine and *Myotis* species, along with occasional recordings of *Nathusius'* pipistrelle, noctule and brown long-eared bats. Bat activity was generally low during the update transect surveys, as it was during previous bat activity surveys in 2010, 2011 and 2015.
- 3.30. During 2018 and 2019 survey work, no bats were recorded in trees with suitability for roosting bats to the north and north-east of the Application Site, the nearest being 130 m north-east. Common pipistrelle, soprano pipistrelle, brown long-eared, noctule and serotine were recorded foraging/commuting in close proximity during emergence/re-entry surveys of two trees north-east of the Application Site. No other trees with bat roosting potential are within or directly adjacent to the Application Site.
- 3.31. During 2019 trapping surveys, common pipistrelle, soprano pipistrelle, whiskered, Natterer's and brown long-eared were recorded in Dunsbury Hill Wood SINC and Dunsbury Hill Grassland 2 SINC to the north-east of the Application Site.
- 3.32. The development area within the Application Site, comprised predominantly of bare ground and ephemeral/ruderal vegetation with some smaller areas of scattered scrub, offers very limited foraging habitat for other bat species. However, the hedgerows and their buffer zones bordering and connected to the Application Site provide commuting and foraging habitat for a range of other bat species, including priority species and Hampshire BAP³⁷ species, that are of nature conservation importance in the context of the Local area.
- 3.33. No roosting bats or trees suitable for roosting bats have been recorded within or directly adjacent to the Application Site and foraging/commuting habitat for these species will be retained as part of the design. However, there is potential for foraging/commuting bats to be adversely impacted by lighting from the Proposed Scheme. Therefore, bats (other species) are scoped into further detailed assessment.

Birds

- 3.34. The desk study in the ES and recent update data search returned records of 67 species of birds within 2 km of the Application Site, 18 of which, the firecrest, hobby, honey buzzard, osprey, whimbrel, red kite, common crossbill, Mediterranean gull, peregrine falcon, hen harrier, kingfisher, goshawk, green sandpiper, redwing and barn owl, are Schedule 1 species. None of these were recorded within the Application Site and the closest, red kite, was recorded approximately 140 m south of the Application Site in 2017.
- 3.35. Survey work carried out to inform the ES recorded 30 bird species, including redwing, a Schedule 1 species. However, redwing was recorded on winter passage early in the survey season having overwintered in the UK and was not breeding at the Wider Site (including the Application Site).
- 3.36. In May 2019, two birds' nests were recorded and avoided during ecological supervision of H3 trimming (the hedgerow bordering west of the Application Site), in accordance with an existing agreed hedgerow maintenance schedule³⁹.
- 3.37. The development area within the Application Site, comprised predominantly of bare ground and ephemeral/ruderal vegetation with some smaller areas of scattered scrub, offers suboptimal nesting/foraging habitat for birds. However, the hedgerows and their buffer zones bordering and connected to the Application Site provide nesting habitat for a number of bird species, including priority species and Hampshire BAP³⁷ species. Whilst Hampshire BAP species (such as tree sparrow and song thrush) could use the features for nesting, due to the limited size of the Application Site, any individuals that may be present would be of nature conservation importance in the context of the Application Site and its immediate environs only.
- 3.38. Features that have been identified to be of less than local importance (i.e. birds) are not considered to be important ecological features and as such are scoped out of further assessment. However, due to their legally protected status, appropriate mitigation measures will be included in Section 4 to avoid harm/injury to birds and damage/destruction of their nests during construction.

Hazel Dormice

- 3.39. The desk study in the ES and recent update data search returned two records of hazel dormouse within 1 km of the Application Site, the closest being approximately 155 m to the south of the Application Site.
- 3.40. Survey work carried out between 2010 and 2011 to inform the ES recorded hazel dormice within the woodland to the south and west of Plot 2.
- 3.41. In 2015, four unoccupied hazel dormouse summer nests were recorded within the woodland of Cherry Tree Row SINC south of Plot 2. This woodland strip is now separated from the Application Site by Fitzwygram Way.
- 3.42. Monitoring surveys of the Wider Site in 2016 and 2017 have recorded presence of hazel dormice in Cherry Tree Row SINC and Beech Wood East SINC.
- 3.43. During 2017 presence/likely absence surveys, no hazel dormice were recorded within woodland surrounding Plot 2 but did confirm that hazel dormice were present in hedgerow H2, located approximately 200 m to the north of the Application Site, and H3 forming the west boundary of the Application Site.
- 3.44. During 2019 presence/likely absence surveys, hazel dormice were recorded in hedgerows surrounding Plot 6, which is well connected to the hedgerows forming the east and west boundaries to the Application Site.
- 3.45. The development area within the Application Site, comprised predominantly of bare ground and ephemeral/ruderal vegetation with some smaller areas of scattered scrub, offers limited suboptimal nesting habitat for hazel dormice. However, the hedgerows and their buffer zones bordering and connected to the Application Site provide good habitat for hazel dormice, which are priority species and Hampshire BAP³⁷ species, and considered to be of County importance to nature conservation due to their rarity in the UK and declining status within Hampshire.
- 3.46. Hazel dormice have been recorded in the hedgerow bordering and connected to the Application Site, which will be retained along with their buffer zones as part of the design. However, there is potential for hazel dormice to be adversely impacted by lighting and disturbance from the Proposed Scheme. Therefore, hazel dormice are scoped into further detailed assessment.

³⁹ Prepared by Gristwood and Toms, 24th May 2018 via email to Lewis Budgen (BAM).

Invertebrates

- 3.47. The desk study in the ES and recent update data search returned records for a number of terrestrial invertebrates within 1 km of the Application Site. Species include stag beetle and a number of butterflies and moths, none of which were recorded within the Application Site.
- 3.48. There is no aquatic habitat within or adjacent to the Application Site. As such, aquatic invertebrates are not considered within this assessment.
- 3.49. The development area within the Application Site, comprised predominantly of bare ground and ephemeral/ruderal vegetation with some smaller areas of scattered scrub and poor semi-improved grassland, do not provide the structure, size and diversity of habitats required to promote an invertebrate community of special interest. The hedgerows bordering east and west of the Application Site offer suitable habitat for terrestrial invertebrates; however, it is unlikely that they would support significant populations of priority or Hampshire BAP³⁷ species. Therefore, terrestrial invertebrates that could utilise such habitats are of nature conservation importance in the context of the Application Site and its immediate environs only.
- 3.50. Features that have been identified to be of less than local importance (i.e. invertebrates) are not considered to be important ecological features and as such are scoped out of further assessment. However, the design incorporates measures to protect and provide new habitats of value for terrestrial invertebrates.

Reptiles

- 3.51. The desk study in the ES and recent update data search returned records of slow worm within 1 km of the Application Site.
- 3.52. Due to the limited distribution, absence of records and lack of suitable habitat for the rare reptiles smooth snake and sand lizard, these species were considered unlikely to be present within the Application Site and are not discussed further in this report.
- 3.53. Survey work carried out to inform the ES recorded all four common species of reptile (slow worm, common lizard, grass snake and adder) within the Wider Site.
- 3.54. Adders were translocated from H3 during the development of Plot 2 to the habitat creation area in the north of the Wider Site and slow worm were displaced and translocated from the attenuation pond area immediately south of Plot 3 to adjacent habitat.
- 3.55. In 2019, adder, slow worm and common lizard were recorded in Plot 6 and to the south of the plot during reptile presence/likely absence surveys.
- 3.56. The development area within the Application Site, comprised predominantly of bare ground and ephemeral/ruderal vegetation with some smaller areas of scattered scrub and semi-improved grassland, offers limited suitable habitat for reptiles. However, the hedgerows bordering and connected to the Application Site and their rough grassland buffer zones provide suitable habitat for low numbers of reptiles, which will be retained and protected as part of the design. Common species of reptiles are not priority species or Hampshire BAP³⁷ species. Therefore, reptiles that could utilise the habitats present are of nature conservation importance in the context of the Application Site and its immediate environs only.
- 3.57. Features that have been identified to be of less than local importance (i.e. reptiles) are not considered to be important ecological features and as such are scoped out of further assessment. However, the design incorporates measures to protect habitats of value for reptiles and due to their legally protected status, appropriate mitigation measures will be included in Section 4 to avoid harm/injury to individual reptiles during construction.

Other Protected/Priority Species

- 3.58. The desk study in the ES and recent update data search returned records for hedgehog and common toad within 1 km of the Application Site.
- 3.59. Due to the absence of suitable aquatic habitat, common toad along with other aquatic associated species such as otter/water vole, are unlikely to be present within or adjacent to the Application Site.
- 3.60. Suitable habitat for hedgehog is present within the Application Site but restricted mainly to the hedgerows and their rough grassland buffer zones. The design incorporates measures to protect these field margins, which offer suitable foraging and commuting habitat for hedgehog.
- 3.61. As no hedgehogs have been recorded within or immediately adjacent to the Application Site and suitable habitat for this species will be retained as part of the design, this species is scoped out of

further detailed assessment. However, appropriate mitigation measures will be included in Section 4 to avoid harm/injury to hedgehogs during construction.

Summary of Features of Nature Conservation Importance

- 3.62. Table 3-4 below provides a summary of the features of nature conservation importance, which are considered within the impact assessment. The table also provides details of the maximum zone of influence for each feature.
- 3.63. The following features that have been valued at less than local importance for nature conservation are not considered to be important ecological features in terms of this assessment and as such are not discussed further within this report:
- Habitats (ephemeral/ruderal/scrub/poor semi-improved grassland);
 - Birds;
 - Invertebrates; and
 - Reptiles.
- 3.64. In addition, the following features have also been scoped out of the impact assessment, the rationale for which is discussed in the relevant sections above:
- Designated sites (all except Cherry Tree Row SINC);
 - Irreplaceable habitats;
 - Badgers;
 - Great crested newts; and
 - Other protected/priority species.

Table 3-4 Determination of importance of ecological features and details of their zone of influence

Ecological Feature	Summary of baseline	Maximum zone of influence ⁴⁰	Importance level	Rationale for zone of influence
Non-Statutory Designated Sites (Cherry Tree Row SINC)	Cherry Tree Row SINC is located 35m south from the Application Site.	100 m	County	No direct impacts (e.g. habitat loss/fragmentation) anticipated as a result of construction/operation of the Proposed Scheme. Potential for indirect impacts (i.e. habitat degradation) up to 100 m as a result of dust/groundwater pollution during construction of the Proposed Scheme.
Important Hedgerows (H1, H2 and H3)	Important hedgerows border and are connected to the Application Site.	200 m	Local	No direct impacts (e.g. habitat loss/fragmentation) anticipated as a result of construction/operation of the Proposed Scheme. Potential for indirect impacts (e.g. habitat degradation) up to 100 m as a result of dust/groundwater pollution during construction of the Proposed Scheme. Potential for indirect impacts (e.g. degradation of habitat that supports protected

⁴⁰ The zone of influence may be different for the construction and operational phases. The maximum zone of influence is given here. Where there are differences between the construction and operational zones of influence these are discussed within the impact assessment.

				species (hazel dormouse and bats) including those on the IUCN Red List as endangered, vulnerable or rare) up to 200 m (to include hedgerows connected with the Application Site) as a result of lighting during construction and operation of the Proposed Scheme.
Bats (Annex II)	Barbastelle bat recorded commuting along H3 (the hedgerow bordering west of the Application Site). Bechstein's bat recorded foraging/commuting south of the Application Site in Cherry Tree Row SINC.	3 km	Regional	No direct impacts (e.g. killing/injury) anticipated as a result of construction/operation of the Proposed Scheme. Potential for indirect impacts (e.g. disturbance) as a result of noise and light pollution during construction and operation of the Proposed Scheme. Habitat fragmentation caused by lighting has potential to affect bats up to 3 km from the Application Site, as recommended by the County Ecologist. This is based on the discovery of several Bechstein's roosts (including maternity roosts) at a proposed development site near Horndean in 2014 ⁴¹ (approximately 3 km north of Dunsbury Park).
Bats (Other Species)	Multiple other species recorded foraging/commuting along the boundaries of Application Site: common pipistrelle, soprano pipistrelle, serotine, Myotis species, Nathusius' pipistrelle, noctule and brown long-eared.		Local	
Hazel Dormouse	Hazel dormice recorded in H3 (the hedgerow bordering west of the Application Site) and other hedgerows across the Wider Site that are connected to the Application Site.	500 m	County	No direct impacts (e.g. killing/injury) anticipated as a result of construction/operation of the Proposed Scheme. Potential for indirect impacts (e.g. disturbance) as a result of noise and light pollution during construction and operation of the Proposed Scheme. Habitat fragmentation caused by lighting or noise disturbance has potential to affect hazel dormice up to 500 m from the Application Site as individuals have a large home range in hedgerow habitat.

⁴¹ See Planning Application: "Land east of Horndean"

http://planningpublicaccess.easthants.gov.uk/onlineapplications/applicationDetails.do?activeTab=documents&keyVal=_EHANT_DCAPR_233593

Non-native Invasive Plant Species

- 3.65. The desk study in the ES and recent update data search returned multiple records for invasive non-native plant species within 1 km of the Application Site, none of which are within or adjacent to the Application Site.
- 3.66. No evidence of non-native invasive species has been recorded during survey work to date within or directly adjacent to the Application Site. However, appropriate mitigation measures will be included in Section 4 as a precaution to avoid the spread of invasive non-native plants during construction.

4. Design Features and Mitigation Measures

- 4.1. This section details the features that have been incorporated into the design which are of benefit to biodiversity and the mitigation measures which will be implemented during the construction and operational phases to reduce ecological impacts. In developing the mitigation, the mitigation hierarchy has been following, looking to avoid, minimise or restore in the first instance.
- 4.2. Features that have been valued at less than local importance to nature conservation (see Paragraph 3.63) are not considered to be important ecological features and as such have not been considered within the impact assessment. However, if mitigation is required for these features for legal reasons it is detailed within this section.
- 4.3. An Ecological Management Plan (EcMP)⁴² has been produced in accordance with planning condition A1 of the outline planning permission for the Wider Site, which details the ecological mitigation and enhancements that are also relevant to the Application Site. The Principal Contactor will be responsible for implementation of the EcMP throughout construction and operational maintenance of the Proposed Scheme .

Design Features

- 4.4. The following measures have been incorporated into the Proposed Scheme design:
- Retention and protection of the important hedgerows and their rough grassland buffer zones⁴³, one of which forms the west boundary to the Application Site and another is located approximately 10 m east of the Application Site. These buffer zones are demarcated by construction exclusion heras fencing and will be in place throughout construction. The hedgerows and their buffer zones are natural landscape features that have been incorporated into the landscape design for the Proposed Scheme⁴⁴;
 - The lighting scheme for external lighting at the Application Site will follow the recommendations published by the Institute of Lighting Engineers (ILE)⁴⁵, limiting emission of upward light to ensure the majority of useful light is directed downwards and to control undesirable spillage in other directions. External lighting will be installed to serve the main entrance and emergency exits and perimeter escape routes. Lighting levels will be adequate to deter unauthorised access at ground level around the perimeter of the building. Service yard lighting will be mounted on the building and on columns, directed downwards to achieve lighting levels suitable for safe movement of vehicles and warehouse operatives. Car park lighting will comprise column mounted luminaires, directed downwards to achieve lighting levels suitable for safe movement of vehicles and pedestrians. Non-illuminated branding will be used at branding locations on the front side elevations and above the main entrance canopy behind the curtain walling as indicated on the elevation drawings (all design details taken from the Design and Access Statement, Section 9.1⁴⁴);
 - Tree, shrub and bulb planting is comprised of predominantly native species to integrate the landscape design into the existing natural boundary features⁴⁴; and
 - Management and maintenance of the important hedgerows and their buffer zones in accordance with the existing agreed hedgerow maintenance schedule³⁹ and as advised by an ecologist.

Mitigation Measures

- 4.5. The following general measures will be implemented during the construction and operation phases of the Proposed Scheme:
- All retained trees and hedgerows will be suitably protected using guidelines provided in BS 5837:2012 Trees in relation to construction⁴⁶;

⁴² Atkins (March, 2014). Dunsbury Hill Farm, Hampshire. Habitat Management and Maintenance Plan (Link Road and Associated Infrastructure Phase). Version 2.0.

⁴³ The hedgerow buffer zone extends approximately 5 m outwards from the centre line of the hedgerow.

⁴⁴ BAM Design (2020). Proposed B2 Industrial Development. Plot 4A Dunsbury Park. Design and Access Statement. Revision P0.1.

⁴⁵ Bat Conservation Trust ILP (2018) Bats and artificial lighting in the UK: Overview of current evidence and mitigation guidance.

⁴⁶ British Standards Institute (2012) BS 5837:2012 Trees in relation to design, demolition, construction.

- All construction exclusion heras fencing marking the hedgerow buffer zones will be checked by an Ecologist and secured by site staff prior to construction to avoid encroachment from machinery/site staff. There will be no storage of any equipment/materials within the protected buffer zones;
- Prior to construction a suitably qualified Ecological Clerk of Works (ECoW) will be employed for the duration of construction of the Scheme and for pre-construction vegetation clearance and soil stripping works. Prior to any works starting, all site contractors will be given a tool-box talk by the ecologist on the protected species and habitats on site, particularly hazel dormice, reptiles and nesting birds and what to do if any of these, or other protected species, are found during the works;
- Vegetation clearance will be carried out in the presence of the ECoW under a Precautionary Method of Working for reptiles (and other protected species such as nesting birds as required, based on site/weather conditions at the time of the mitigation works). During construction, the working area will be strimmed to ground level and kept that way to ensure that habitats within the working area do not become suitable for reptiles and do not encourage reptiles into the working area during the construction period. Any reptiles encountered will be either left to disperse to adjacent retained suitable habitat (e.g. the buffer zones) or relocated by the ECoW into suitable retained habitat within the Wider Site;
- Vegetation clearance will be minimised and where possible undertaken outside the core bird nesting season, which is 1 March to 31 August (though it should be noted that variation in dates is possible, for example from geographical variations in climate, or due to a particularly mild winter) to avoid damage or destruction of occupied nests or harm to breeding birds. If this cannot be achieved, works within the core bird nesting season will require an inspection of vegetation to be cleared for breeding birds and their occupied nests by a suitably qualified ecologist no more than 24 hours prior to any vegetation clearance works being undertaken. If any nesting birds are identified during the survey, they will be left in situ for their entire nesting period and alternative approaches to the work proposed. This may include leaving an exclusion zone around the nests to avoid disturbance;
- Standard construction measures will be employed by the contractor including covering any excavations at night to prevent injury and death of badgers, deer, reptiles, foxes, hedgehogs and other wildlife;
- If holes / burrows for other species (e.g. fox or rabbit) are discovered, they should be left to move away of their own accord and burrows protected or closed following suitable humane methods. Under the Wild Mammals (Protection) Act 1996 it is an offence to intentionally inflict unnecessary suffering to any wild mammal;
- Pollution prevention guidelines⁴⁷ will be followed and Construction Industry Research and Information Association (CIRIA) guidance on the control of water pollution from construction sites⁴⁸; and
- There will be no night-time working (defined as work carried out between the times of one hour before sunset and one hour after sunrise) and therefore no additional temporary lighting will be required during construction, to avoid disturbance to foraging and commuting bats (also applicable to other nocturnal species).

⁴⁷ All of the pollution prevention guidelines (PPGs) are available from <http://webarchive.nationalarchives.gov.uk/20140328084622/http://www.environment-agency.gov.uk/business/topics/pollution/39083.aspx>. Note: the PPGs also make reference to environmental legal obligations, but that information is currently out of date and requires updating.

⁴⁸The CIRIA documents are a series of publications developed by the Construction Industry Research and Information Association. Each document is targeted at a particular type of business or activity and covers environmental good practice to minimise pollution.

5. Impact Assessment

- 5.1. This section characterises the impacts and the subsequent effects (both positive and negative) of the Proposed Scheme on the important ecological features within the zone of influence and assesses the significance of the residual effects (both positive and negative) based on the mitigation measures detailed in Section 4. The following potential impacts have been identified.

Construction Impacts

- Habitat degradation (e.g. through pollution events, dust and lighting); and
- Disturbance including noise, vibration and lighting to protected and priority species.

Operational Impacts

- Habitat degradation (through lighting); and
- Disturbance including noise and lighting to protected and priority species.

- 5.2. Based on the impacts identified above, the zones of influence detailed in Section 3 remain unchanged.

Residual Effects

- 5.3. A summary of the impact assessment, the proposed mitigation, and the residual effects during construction and operation are provided below, as well as details of proposed ecological enhancements (and compensation that takes into account the Wider Site).
- 5.4. If the design features or the agreed mitigation detailed in this EclA cannot be implemented, the effects will need to be reassessed and further surveys may be required. In this event, the conclusion of this EclA will need to be reviewed and amended, as appropriate, by an ecologist.

Construction and Operation

Designated sites

- 5.5. Due to the proximity of Cherry Tree Row SINC to the Application Site, there is potential for habitat degradation caused by pollution events and/or dust. However, providing the mitigation measures outlined in Section 4 regarding pollution prevention are implemented throughout construction of the Proposed Scheme, no significant adverse effects are anticipated on Cherry Tree Row SINC.
- 5.6. There will be no impacts on designated sites during operation of the Proposed Scheme.

Habitats

- 5.7. There will be no loss of important hedgerows containing trees. Due to the proximity of the important hedgerows adjacent and connected to the Application Site, there is potential for habitat degradation caused by pollution events and/or dust and/or inappropriate lighting affecting protected species. However, providing the mitigation measures outlined in Section 4 regarding pollution prevention and no night working/lighting during construction and design features regarding a sensitive lighting scheme during operation are implemented, no significant adverse effects are anticipated on important hedgerows.

Species

Bats

- 5.8. Due to the presence of Annex II bats within the Application Site and Wider Site (Bechstein's bat caught in woodland approximately 200 m south of the Application Site in 2015 and potential Bechstein's bat call records from activity surveys of hedgerows H1-3 in 2017; and barbastelle bat commuting along H3 during activity surveys in 2017) and other bat species using the hedgerows adjacent and connected to the Application Site to commute/forage, there is potential for disturbance and habitat fragmentation caused by noise and/or inappropriate lighting. However, providing the design features and mitigation measures outlined in Section 4 regarding protection of the hedgerows and no night working/lighting during construction and a sensitive lighting

scheme employed during operation are implemented, no significant adverse effects are anticipated on Annex II bats or other bat species.

Hazel dormice

- 5.9. Due to the presence of hazel dormice in the hedgerows bordering and connected to the Application Site, there is potential for disturbance and habitat fragmentation caused by noise and/or inappropriate lighting. However, providing the design features and mitigation measures outlined in Section 4 regarding protection of the hedgerows and no night working/lighting during construction and a sensitive lighting scheme employed during operation are implemented, no significant adverse effects are anticipated on hazel dormice.

Cumulative Impacts

- 5.10. It is appropriate to consider the impacts of the Proposed Scheme in combination with the Wider Site proposals. The total development occupies 33 ha of land of which 20.2 ha is being developed for commercial use in separate phases over a number of years. The area includes a 3.4 ha former arable field specifically for habitat creation.
- 5.11. The proposals for the Wider Site involve the loss of a large area of arable land and comparatively smaller areas of semi-improved grassland along with loss of sections of hedgerow, loss of habitat affecting protected species including bats, hazel dormice and reptiles, and construction and development adjacent to a number of connected SINC's (all detailed in the ES). The current proposals for the Application Site contribute to the overall loss of former arable land across the Wider Site in the local area.
- 5.12. The mitigation/compensation strategy for development of the Wider Site takes account of the habitat loss and predicted impacts to protected and priority species associated with the development of the Application Site. The habitat creation area has also been seeded with species-rich grassland and planted with native trees of local provenance to provide a woodland buffer to Beech Wood East SINC. These measures will provide compensation habitat for reptiles and foraging habitat for bats, bird and terrestrial invertebrates.
- 5.13. Ecological features that will be subject to adverse effects as a result of the Wider Site development comprise of bats. However, the overall residual effect of the Wider Site development taking mitigation into account was assessed as being neutral, as detailed in the ES.
- 5.14. The proposals for the Application Site do not alter the assessment of the impacts and effects for the overall Wider Site development of Dunsbury Park. Table 5-1 provides a summary of the cumulative impact assessment, the proposed mitigation and the residual impacts.

Table 5-1 Summary of cumulative impacts, mitigation and residual effects

Scheme	Location and distance from Proposed Scheme	Impacts of relevance	Likely In-combination impacts	Proposed mitigation	Residual Effects (Importance level affected)
Dunsbury Park	Development of subsequent plots adjacent to the Application Site.	Temporary loss of habitats for bats and disturbance during construction. Permanent localised habitat loss through lighting during operation.	Disturbance and/or habitat loss/fragmentation affecting hedgerows during construction and operation, which could adversely impact populations of bats and hazel dormice (considered as part of the ES).	As outlined in the ES. The Habitat Management and Maintenance Plan and design for the Wider Site prioritises the retention of woodland, hedgerows and their buffer zones to avoid/minimise impacts on bats and hazel dormice. The habitat creation area will also compensate for temporary habitat loss during construction.	Neutral (Regional – Annex II bats, Local – other bat species, County - hazel dormice).

Biodiversity Enhancements

- 5.15. Bat boxes⁴⁹ (2 no.) should be installed on mature/semi-mature trees within the hedgerows bordering and connected to the Application Site to increase roosting opportunities for bats associated with the hedgerows and across the Wider Site. It is recommended that a combination of bat boxes are used and an ecologist advises on the installation and types of box for the species recorded within the Application Site.

Ecological Management and Monitoring Plan

- 5.16. A detailed management and monitoring plan has been produced for the Wider Site⁴² and is to be followed throughout the construction and operational phases, as detailed in the document. It is a working document and will be updated throughout the development of subsequent plots in the Wider Site. In summary this management and monitoring plan includes:
- Habitat management and maintenance (relevant to the hedgerows within the Application Site and habitat creation area relevant to development of the Wider Site); and
 - Ecological monitoring (relevant to development of the Wider Site).

⁴⁹ The ecologist will advise on appropriate bat boxes from suitable suppliers such as <https://www.nhbs.com/equipment> or <http://www.vivarapro.co.uk/Bats>.

6. Conclusion

- 6.1. This EclA is based on previous and updated desk studies and ecological surveys and monitoring undertaken across the Application Site and Wider Site since 2010. This EclA specifically includes details of Phase 2 survey work and ecological monitoring of bats, reptiles and hazel dormice completed from late 2017 to date. The scope of the surveys was based on the initial EZol of the Proposed Scheme and included an extended Phase 1 habitat survey of the Application Site. The ecological features present within the Application Site are shown on the extended Phase 1 habitat drawing in **Appendix E** and survey results are included in **Appendix F**. Once all relevant available information was obtained, the final EZol of the Scheme was determined and the significance of impacts and subsequent effects (both positive and negative) on important ecological features was assessed.
- 6.2. The applicant has agreed that the avoidance, mitigation and/ or compensation measures identified in Section 4 above will be incorporated into the detailed design proposals for the Proposed Scheme and implemented as part of the overall development of the Application Site. The Proposed Scheme has maximised opportunities to incorporate and enhance biodiversity wherever possible, if not within the Application Site, within the Wider Site and habitat creation area.
- 6.3. Taking avoidance, mitigation and/or compensation measures into account, no significant adverse residual effects are anticipated on important ecological features associated with the Application Site and the Proposed Scheme conforms in respect of biodiversity to the National Planning Policy Framework (NPPF) 2019 Section 15 (*conserving and enhancing the natural environment*)¹³, Havant Borough Council's adopted local plan Policy CS11¹⁴ and Hampshire's BAP.
- 6.4. The cumulative impact assessment has identified that the residual effects associated with the development of Dunsbury Park (i.e. the Wider Site), taking mitigation into account, would be neutral and therefore not significant.
- 6.5. Biodiversity enhancements that are suitable for the Application Site are provided in Section 5 and the Habitat Management and Maintenance Plan (Atkins, March 2014) will be implemented throughout the construction phase (and operation, as detailed in the document) of the Proposed Scheme.

Report Validity

- 6.6. In the event of programme changes then updates to the surveys may be required to ensure the validity of the data, as per CIEEM guidance⁵⁰.

⁵⁰ CIEEM (2019) Advice Note on the Lifespan of Ecological Reports and Surveys

Appendices

Appendix A. Application Site Location Plans and Scheme Drawing

Figure A-1 Application Site Location Plan

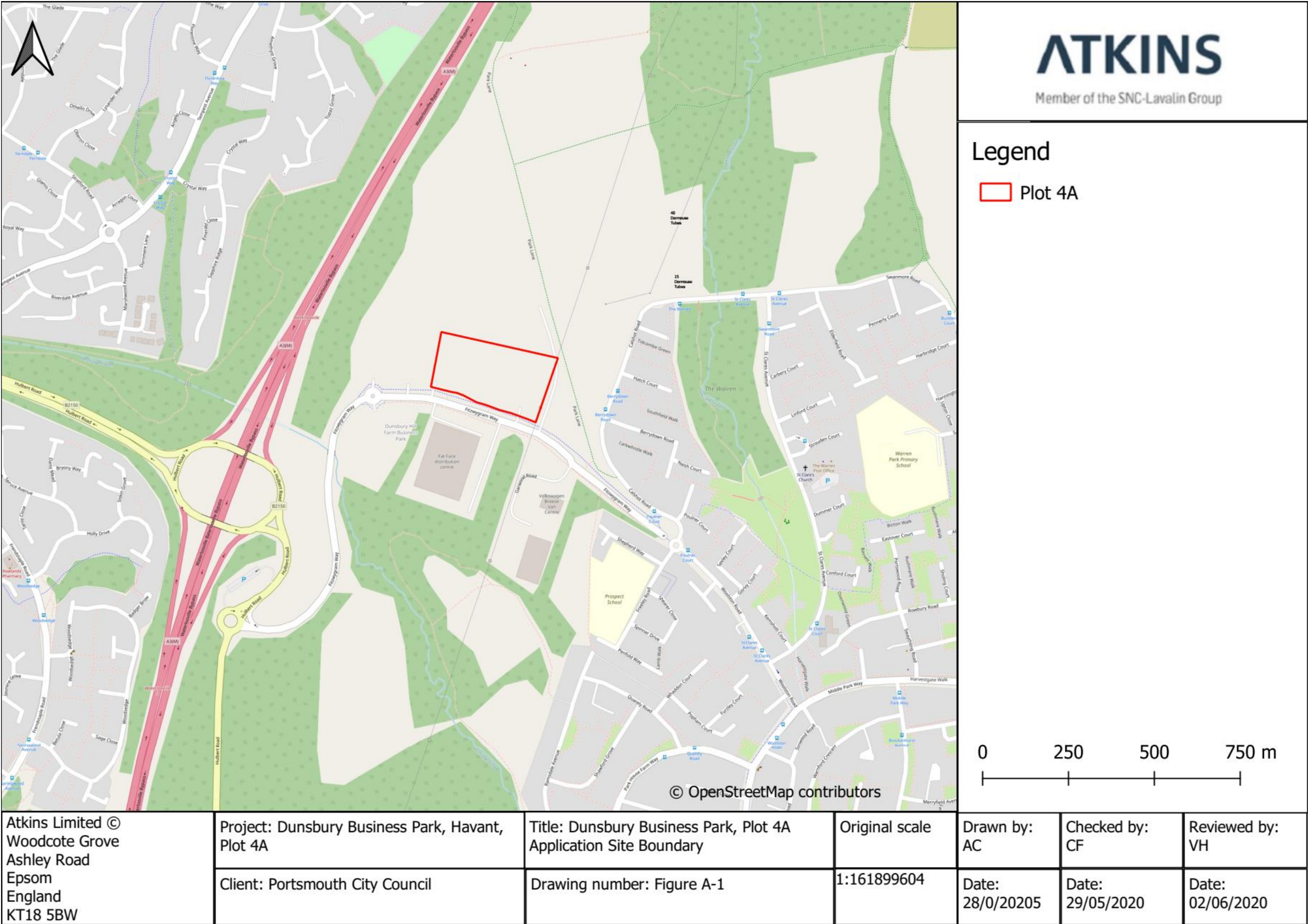
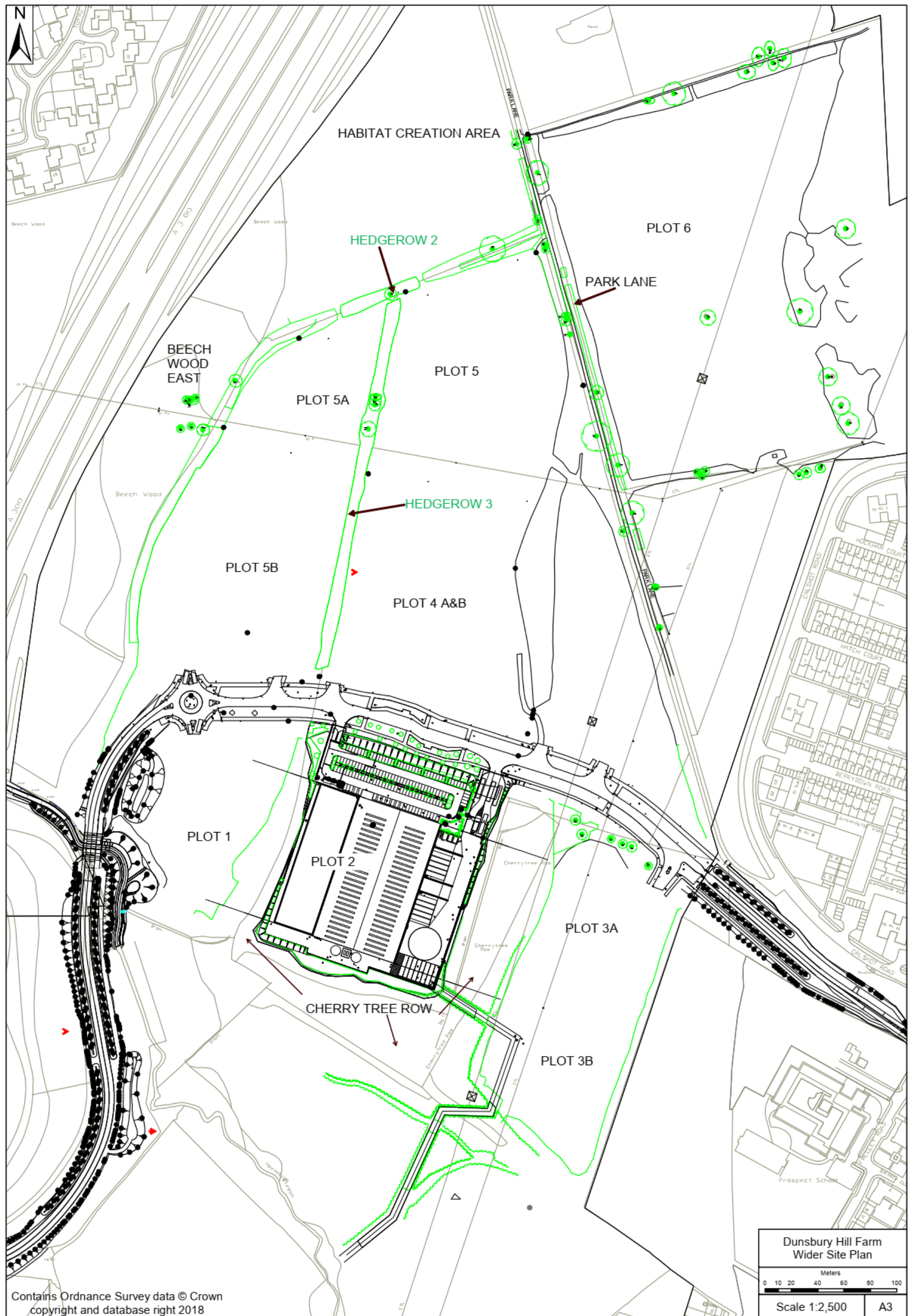


Figure A-2 Scheme Design Drawing (Including Landscape Proposals)



Figure A-3 Wider Site Plan



Appendix B. Planning Policy and Legislation

National Planning Policy Framework, 2019

- B.1. The National Planning Policy Framework (NPPF) sets out the Governments planning policies for England and how these are expected to be applied by Local Authorities within their Local Development Frameworks (LDF). The revised National Planning Policy Framework was published in February 2019.
- B.2. Chapter 15 of the NPPF 'Conserving and enhancing the natural environment' sets out the requirements to consider biodiversity in planning decisions.
- B.3. The paragraphs within Chapter 15 relevant to the Scheme, the key information from which is detailed below:

Para 170: Planning policies and decisions should contribute to and enhance the natural and local environment by

- a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
- b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
- c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;
- d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
- e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and
- f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

Para 171: Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework⁵¹; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.

Para 172: Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and the Broads⁵². The scale and extent of development within these designated areas should be limited. Planning permission should be refused for major

⁵¹ Where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a high quality

⁵² English National Parks and the Broads: UK Government Vision and Circular 2010 provides further guidance and information about their statutory purposes, management and other matters.

development⁵³ other than in exceptional circumstances, and where it can be demonstrated that the development is in the public interest. Consideration of such applications should include an assessment of:

- a) the need for the development, including in terms of any national considerations, and the impact of permitting it, or refusing it, upon the local economy;
- b) the cost of, and scope for, developing outside the designated area, or meeting the need for it in some other way; and
- c) any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated.

Para 173. Within areas defined as Heritage Coast (and that do not already fall within one of the designated areas mentioned in paragraph 172), planning policies and decisions should be consistent with the special character of the area and the importance of its conservation. Major development within a Heritage Coast is unlikely to be appropriate, unless it is compatible with its special character.

Habitats and biodiversity

Para 174. To protect and enhance biodiversity and geodiversity, plans should:

- a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity⁵⁴; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation⁵⁵; and
- b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

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

- a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts),
- b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
- c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons⁵⁶ and a suitable compensation strategy exists; and
- d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity

⁵³ For the purposes of paragraphs 172 and 173, whether a proposal is 'major development' is a matter for the decision maker, taking into account its nature, scale and setting, and whether it could have a significant adverse impact on the purposes for which the area has been designated or defined.

⁵⁴ Circular 06/2005 provides further guidance in respect of statutory obligations for biodiversity and geological conservation and their impact within the planning system.

⁵⁵ Where areas that are part of the Nature Recovery Network are identified in plans, it may be appropriate to specify the types of development that may be suitable within them.

⁵⁶ For example, infrastructure projects (including nationally significant infrastructure projects, orders under the Transport and Works Act and hybrid bills), where the public benefit would clearly outweigh the loss or deterioration of habitat.

improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.

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

- a) potential Special Protection Areas and possible Special Areas of Conservation;
- b) listed or proposed Ramsar sites⁵⁷; and
- c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

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

Havant Borough Council adopted local plan (Core Strategy, 2011 and Site Allocations Plan, 2014)

- B.4. Policy CS11: Protecting and Enhancing the Special Environment and Heritage of Havant Borough: Planning permission will be granted for development that:
1. Ensures the key landscape and built form principles set out in the Havant Borough Townscape, Landscape and Seascape Character Assessment are protected and where possible enhanced by partnership working with developers, groups and the wider community.
 2. Protects and where possible enhances the borough's statutory and non-statutory designated landscape, habitats and features of biological, hydrological or geological interest. Protection and enhancement will be achieved by appropriate adaptation and mitigation measures including wardening, education and information and the creation of new habitats, water bodies/courses planting of new trees and woodland.
 3. Has particular regard to the following hierarchy of nature conservation designations within the borough (as identified on the Proposals Map):
 - (i) Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar [International].
 - (ii) Sites of Special Scientific Interest (SSSI) and National Nature Reserves [National].
 - (iii) Sites of Importance for Nature Conservation (SINC), Local Nature Reserves (LNR), other Ancient Woodland not identified in (ii) above [Local].
 4. Protects and where appropriate enhances the borough's statutory and non-statutory heritage designations by appropriately managing development in or adjacent to conservation areas, listed buildings, scheduled ancient monuments, historic parks and gardens, archaeological sites, buildings of local historic or architectural interest.
 5. Supports an ongoing programme of survey of habitats and species and designation of Sites of Importance for Nature Conservation.
 6. Incorporates partnership working with conservation organisations to improve public understanding of biodiversity and to manage public access to designated sites, particularly on the coast, to reduce harm to nature conservation interests.
 7. Incorporates partnership working with landowners and developers to ensure land management practices restore, enhance and where appropriate create new valued landscapes, habitats and their soil structure, particularly the ancient woodland remnants of the Forest of Bere and coastal salt marsh.
 8. Protects wildlife habitats and wildlife corridors to prevent the fragmentation of existing habitats and to allow species, for example Brent Geese, to respond to the impacts of climate change by making provision for habitat adaptation e.g. coastal managed realignment and species migration.
 9. Maintains undeveloped gaps between the settlements of Emsworth/Havant; Havant/Waterlooville; Havant/Portsmouth; Emsworth/Westbourne and Leigh Park/Rowlands Castle as shown on the Proposals Map.

⁵⁷ Potential Special Protection Areas, possible Special Areas of Conservation and proposed Ramsar sites are sites on which Government has initiated public consultation on the scientific case for designation as a Special Protection Area, candidate Special Area of Conservation or Ramsar site.

10. Protects the best and most versatile agricultural land that has the greatest potential for local food security.
11. Responds to the emerging evidence from the Solent Disturbance and Mitigation Project, the published recommendations, and future related research.

Hampshire Biodiversity Action Plan

- B.5. The Hampshire BAP is available online³⁷ and contains actions plans for a number of habitats and species including hedgerows, arable land, stag beetle, barbastelle bat, serotine bat, dormouse, Bechstein's bat, pipistrelle bat, and a number of bird and invertebrate species.

Summary of Relevant Ecological Legislation in England

Table B-1 Summary of relevant ecological legislation in England

Species	Legislation	Offences	Licensing procedures and guidance
Bats <i>European protected species</i>	Conservation of Habitats and Species Regulations 2017 (as amended) Reg 43	Deliberately ⁵⁸ capture, injure or kill a bat; deliberate disturbance ⁵⁹ of bats; or damage or destroy a breeding site or resting place used by a bat. [The protection of bat roosts is considered to apply regardless of whether bats are present.]	A Natural England (NE) licence in respect of development is required. Guidance documents: <i>NE Standing Advice for protected species 2013</i> <i>European Protected Species: Mitigation Licensing- How to get a licence</i> (NE 2013) <i>Bat Mitigation Guidelines</i> (English Nature 2004) <i>Bat Workers Manual</i> (JNCC 2004)
	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb ⁶⁰ a bat in such a place.	Licence from NE is required for surveys (scientific purposes) that would involve disturbance of bats or entering a known or suspected roost site.
Badger	Protection of Badgers Act 1992	Wilfully kill, injure or take a badger; or intentionally or recklessly damage, destroy or obstruct access to a badger sett or disturb a badger in its sett. [It is not illegal to carry out disturbance activities in the vicinity of setts that are not occupied.]	Where required, licences for development activities involving disturbance or sett interference or closure are issued by Natural England (NE). Licences for activities involving watercourse maintenance, drainage works or flood defences are issued under a separate process. Licences are normally not granted from December to June inclusive because cubs may be present within setts. Guidance documents: <i>NE Standing Advice for protected species 2013</i> <i>Badgers & Development</i> (NE 2007)
Hazel dormouse <i>European protected species</i>	Conservation of Habitats and Species Regulations 2017 (as amended) Reg 43	Deliberately ⁵⁸ capture, injure or kill a hazel dormouse; deliberate disturbance ⁵⁹ of a hazel dormouse; or damage or destroy a breeding site or resting place used by a hazel dormouse.	A Natural England licence in respect of development is required. Guidance documents: <i>NE Standing Advice for protected species 2013</i> <i>European Protected Species: Mitigation Licensing- How to get a licence</i> (NE 2013) <i>Dormouse Conservation Handbook</i> (English Nature 2006)

⁵⁸ Deliberate capture or killing is taken to include “accepting the possibility” of such capture or killing

⁵⁹ Deliberate disturbance of animals includes in particular any disturbance which is likely a) to impair their ability (i) to survive, to breed or reproduce, or to rear or nurture their young, or (ii) in the case of animals of hibernating or migratory species, to hibernate or migrate; or b) to affect significantly the local distribution or abundance of the species to which they belong.

⁶⁰ Lower levels of disturbance not covered by the Conservation of Habitats and Species Regulations 2017 remain an offence under the Wildlife and Countryside Act 1981 although a defence is available where such actions are the incidental result of a lawful activity that could not reasonably be avoided.

	Wildlife and Countryside Act 1981 (as amended) S.9	Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb ⁶⁰ a hazel dormouse in such a place.	Licence issued for survey and conservation by Natural England.
Birds	Wildlife and Countryside Act 1981 (as amended) S.1	Intentionally kill, injure or take any wild bird; intentionally take, damage or destroy the nest of any wild bird while that nest is in use or being built; intentionally take or destroy the nest or eggs of any wild bird. Intentionally or recklessly disturb a Schedule 1 species while it is building a nest or is in, on or near a nest containing eggs or young; intentionally or recklessly disturb dependent young of such a species [e.g. most birds of prey, kingfisher, barn owl, black redstart, little ringed plover].	No licences are available to disturb any birds in regard to development. Licences are available in certain circumstances to damage or destroy nests, but these only apply to the list of licensable activities in the Act and do not cover development. General licences are available in respect of 'pest species' but only for certain very specific purposes e.g. public health, public safety, air safety. Guidance documents: <i>NE Standing Advice for protected species 2013</i>
Adder Common lizard Grass snake Slow worm	Wildlife and Countryside Act 1981 (as amended) S.9(1) and S.9(5)	Intentionally kill or injure any common reptile species.	No licence is required. However an assessment for the potential of a site to support reptiles should be undertaken prior to any development works which have potential to affect these animals. Guidance documents: <i>NE Standing Advice for protected species 2013</i>
Rabbits, foxes and other wild mammals	Wild Mammals (Protection) Act 1996	Intentionally inflict unnecessary suffering to any wild mammal.	Natural England provides guidance in relation to rabbits, foxes (which are also protected under the Wildlife and Countryside Act 1981 from live baits and decoys) and other wild mammals, on their website. Lawful and humane pest control of these species is permitted.

Site Designation	Legislation	Protection	Guidance
Local Sites (e.g. County Wildlife Sites, Sites of Importance for Nature Conservation)	There is no statutory designation for local sites.	Local sites are given protection through policies in the Local Development Plan.	Development proposals that would potentially affect a local site would need to provide a detailed justification for the work, an assessment of likely impacts, together with proposals for mitigation and restoration of habitats lost or damaged. Guidance documents: The National Planning Policy Framework (Department for Communities and Local Government, February 2019), with particular reference to Policy 15, and the joint Circular.

Habitats & Species	Legislation	Guidance
Species and Habitats of Principal Importance for the Conservation of Biodiversity	Natural Environment & Rural Communities Act 2006 S.40	S.40 of the NERC Act 2006 sets out the duty for public authorities to conserve biodiversity in England. Habitats and species of principal importance for the conservation of biodiversity are identified by the Secretary of State for England, in consultation with Natural England, are referred to in S.41 of the NERC Act for England. The list, known as the 'England Biodiversity List', of habitats and species can be found on the Natural England web site. The 'England Biodiversity List' is used as a guide for 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. Ecological impact assessments should include an assessment of the likely impacts to these habitats and species.
Biodiversity Action Plan (BAP) Habitats & Species	No specific legislation, unless it is also a species or habitat of principal importance as described above.	The Biodiversity Action Plan (BAP) is the UK's initiative to maintain and enhance biodiversity in response to the Convention on Biological Diversity signed in 1992. The UK BAP was used to draw up the 'England Biodiversity List' and has been succeeded by the UK Post-2010 Biodiversity Framework in 2012, due to a change in government strategy by all UK countries, focussing on managing the environment as a whole rather than dealing with different aspects of biodiversity and environment separately. However, the UK BAP list of priority habitats and species continue to be regarded as conservation priorities in the UK Post-2010 Biodiversity Framework (JNCC & Defra 2012).
Hedgerows	The Hedgerows Regulations 1997	Under the regulations, it is against the law to remove or destroy certain hedgerows without permission from the local planning authority in Wales. In general, permission will be required before removing hedges that are at least 20 metres in length, over 30 years old and contain certain species of plant. The local planning authority will assess the importance of the hedgerow using criteria set out in the regulations.

Appendix C. Phase 2 Survey Methods

Badger

- C.1. An inspection of the Application Site and up to 50 m for any signs of badgers was included in the extended Phase 1 habitat survey conducted on 27th January 2020 (refer to Section 2 of the main report).
- C.2. A badger survey was carried out for Plot 6 on 20th June 2019 by a suitably experienced ecologist in accordance with good practice guidance⁶¹ and CIEEM competencies for undertaking badger surveys⁶².
- C.3. The extent of the badger survey was based on the zone of influence for this species and included all land within Plot 6 and a 50 m buffer extending out in all directions where access allowed (the Badger Survey Area).
- C.4. The Badger Survey Area was inspected for evidence of badger activity including setts, latrines, dung pits, prints, snuffle holes (created when foraging), pathways, hairs (e.g. caught on fencing) and scratching posts.

Great Crested Newts

- C.5. All great crested newt surveys detailed below have been undertaken in accordance with good practice guidance⁶³ and CIEEM competencies for undertaking great crested newt surveys⁶⁴.

Habitat Suitability Index Assessment

- C.6. A Habitat Suitability Index (HSI) assessment was undertaken for Plot 6 on 20th June 2019 in accordance with good practice guidance⁶⁵.
- C.7. The extent of the HSI assessment was based on the predicted EZoI for this species and included a 500 m buffer extending out in all directions from the plot boundary where access was allowed (the Great Crested Newt Survey Area). Where major barriers to great crested newt dispersal (such as a motorway) were present between a given water body and the plot, the water body was omitted from HSI assessment and further survey for great crested newts.
- C.8. The survey was undertaken by suitably experienced ecologists with at least one great crested newt survey licenced surveyor present.
- C.9. The HSI is quantitative measure of habitat quality for great crested newts. The HSI is a numerical index between 0 and 1, derived from an assessment of ten habitat variables known to influence the presence of newts such as geographic location, water body size and permanence, the presence of predatory fish and wildfowl, availability of suitable terrestrial habitat and proximity to other water bodies, and scores each factor based on its level of suitability. An HSI of 1 is optimal habitat (high probability of occurrence), while an HSI of 0 is very poor habitat (minimal probability of occurrence). The HSI is calculated on a single water body basis but takes into account surrounding terrestrial habitat and local water body density. If a water body has a very low HSI score (<0.5) then there would typically be a minimal chance of great crested newt presence.
- C.10. The ponds identified from OS maps and located within 500m of Plot 6 are shown overleaf in Figure C-1. The ponds and their distance from the Application Site are summarised in Table C-1 below.

Table C-1 Pond distance and direction from the Application Site

Pond Reference	Distance and Direction from Application Site
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⁶¹ Harris, S., Cresswell, P. & Jefferies, D. (1989) Surveying Badgers. Occasional Publication No.9. The Mammal Society.

⁶² CIEEM (2013) Competencies for Species Survey: Badger. The Chartered Institute of Ecology and Environmental Management, Winchester.

⁶³ Great Crested Newt Mitigation Guidelines (English Nature, 2001)

⁶⁴ CIEEM (April, 2013) Competencies for Species Survey: Great Crested Newt.

⁶⁵ Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*) Herpetological Journal 10 (4), 143-155 (2000). Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. The great crested newt Habitat Suitability Index (HSI) is a quantitative measure of aquatic habitat quality for great crested newt. The HSI is a number between 0 and 1, derived from an assessment of ten habitat variables known to influence the presence of newts.

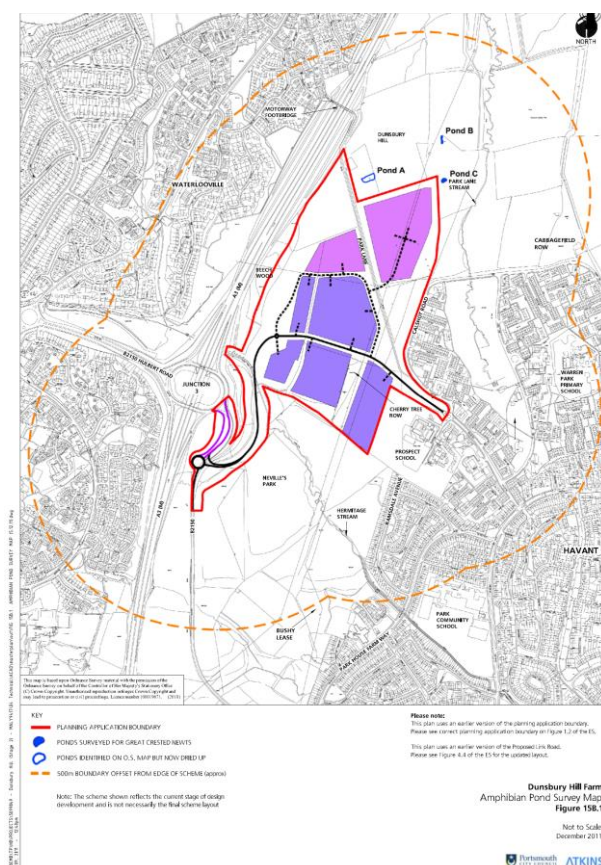
A	370 m north
B	600 m north-east
C	490 m north-east

- C.11. Pond B, even though over 500 m from the Application Site, is relevant to this Ecological Impact Assessment as it is well-connected to Ponds A and C. No other known ponds are located within 500 m from the Application Site.

Environmental DNA (eDNA)

- C.12. The eDNA survey involved the collection of water samples from the only pond with water, Pond C, to be tested for the presence of great crested newt DNA, which would indicate the species is present.
- C.13. eDNA water sampling was undertaken on a single visit to Pond C on 20th June 2019 by suitably trained and experienced Atkins surveyors.
- C.14. The sampling methodology followed an approved methodology⁶⁶, recognised by Natural England that minimises cross contamination. Field sampling equipment was supplied as sterile kits by the laboratory that was to carry out the DNA analysis (Sure Screen). In total, 20 water samples were collected from each water body sampled. Areas that may be used by great crested newts for displaying or egg-laying were selected for sampling and the sampling was carried out in daylight hours, and in dry weather. The surveyors held great crested newt survey licences from Natural England. Following completion of the sampling the collected water samples were stored under suitable conditions before being sent to the laboratory for testing.

Figure C-1 Ponds relevant to the Application Site



⁶⁶ Biggs, et al (2014) Technical Advice Note for Field and Laboratory Sampling of Great Crested Newt eDNA in *Analytical and methodological development for improved surveillance of the Great Crested Newt*. Defra Project WC1067. Appendix 5. Freshwater Habitats Trust, Oxford

Bats

- C.15. All bat surveys have been undertaken in accordance with good practice guidance⁶⁷ and CIEEM competencies for undertaking bat surveys⁶⁸.
- C.16. The methods of the survey work undertaken for Plot 6 used to inform this EclA are provided in **Annex A and B**.

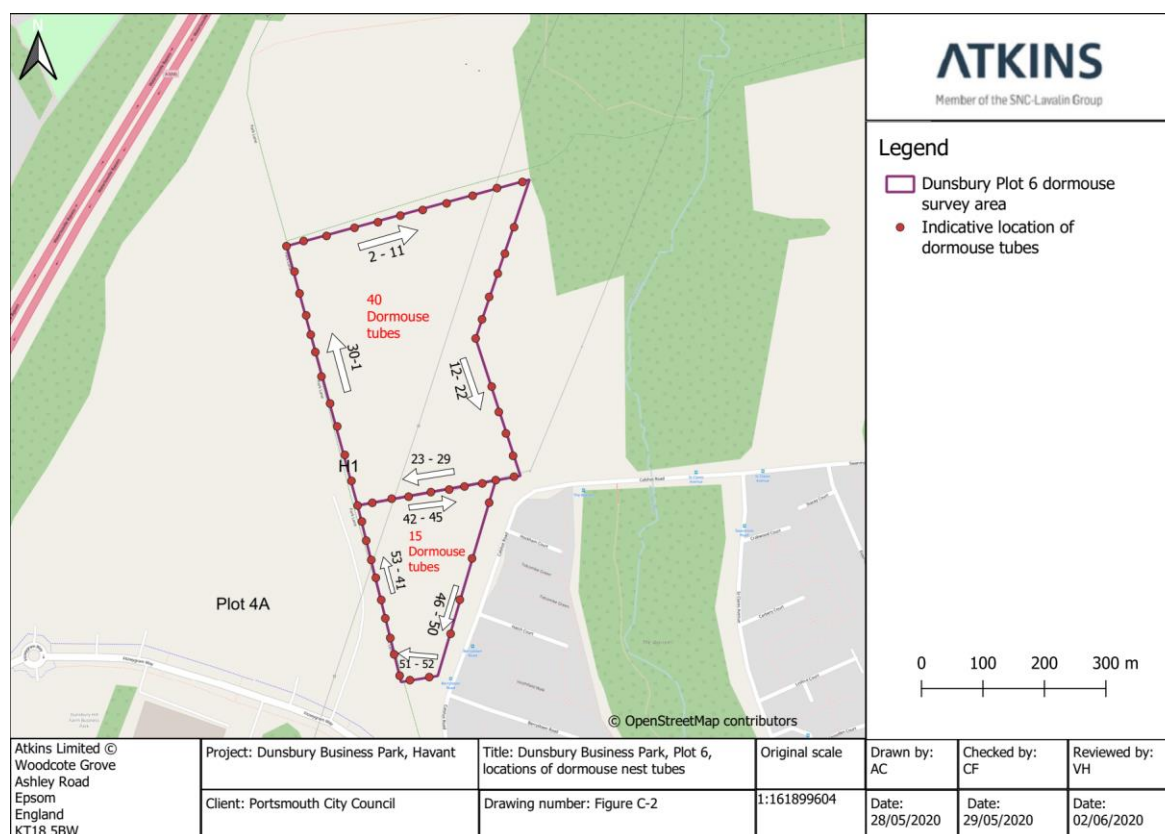
Hazel Dormouse

- C.17. All hazel dormouse surveys detailed below have been undertaken in accordance with good practice guidance⁶⁹ and CIEEM competencies for undertaking hazel dormouse surveys⁷⁰.

Presence/ Likely Absence Survey

- C.18. A hazel dormouse nest tube survey was carried out for Plot 6 in hedgerows connected to the Application Site between 25/07/2019 and 14/11/2019.
- C.19. A total of 55 artificial nest tubes were placed in areas of suitable habitat (hedgerow and scrub). Where possible, tubes were spaced between 15 m and 20 m apart. Tubes were fastened underneath horizontal tree/scrub branches (including bramble). The location of tubes and survey areas are shown on Figure C-2 below. Tube numbers 41-53 are located in the hedgerow (H1) approximately 10 m east from the Application Site.
- C.20. Further information regarding hazel dormouse was gathered from monitoring works across the site, which include hedgerow H3 (west boundary of the Application Site).

Figure C-2 Location of dormouse nest tubes



⁶⁷ Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). The Bat Conservation Trust, London

⁶⁸ CIEEM (2013) Competencies for Species Survey: Bats. Chartered Institute of Ecology and Environmental Management, Winchester.

⁶⁹ Natural England Standing Advice: Hazel or common dormice: surveys and mitigation for development projects, accessed 02/03/2020 from: <https://www.gov.uk/guidance/hazel-or-common-dormice-surveys-and-mitigation-for-development-projects>

⁷⁰ CIEEM, 2013. *Competencies for Species Survey: Hazel Dormouse*.

- C.21. The tubes were set out on 26/06/2019 and checked monthly from July up to November 2019. Survey checks were carried by a surveyor with a hazel dormouse survey licence on the following dates:
- 25/07/2019;
 - 19/08/2019;
 - 12/09/2019;
 - 16/10/2019; and
 - 14/11/2019.
- C.22. Using 50 tubes as a standard for surveying⁷¹, a combined Index of Probability score can be calculated as an indicator of thoroughness of a hazel dormouse survey. The Index of Probability score is based on the likelihood of a tube being occupied in any specific month and is highest in May, August and September when nest tubes are most frequently occupied as shown in Table C-2. The combined score is calculated by adding together the Index of Probability score for each full month the survey tubes are present and is increased or decreased depending on the number of nest tubes deployed⁷². A combined Index of Probability score of 20 or above must be achieved to judge likely absence in any particular survey area. The tubes were deployed between 26/06/2019 and 14/11/2019 and a combined score of 18 has been achieved. Presence has been confirmed from the surveys undertaken to date and therefore a combined score of 20 is not required.

Table C-2 Index of probability of finding hazel dormouse in nest tubes in any one month⁷³

Month	Index of probability
April	1
May	4
June	2
July	2
August	5
September	7
October	2
November	2

Common Species of Reptile

Presence/ Likely Absence Surveys

- C.23. Presence / likely absence surveys for common species of reptile were carried out for Plot 6, located 10 m east from the Application Site, between 20th June 2019 and 12th September 2019 in accordance with standard survey guidance⁷⁴ and CIEEM competencies for undertaking reptile surveys⁷⁵.

⁷¹ Natural England Standing Advice: Hazel or common dormice: surveys and mitigation for development projects, accessed 02/03/2020 from: <https://www.gov.uk/guidance/hazel-or-common-dormice-surveys-and-mitigation-for-development-projects>

⁷² The process of determining scores is provided at <https://www.gov.uk/guidance/hazel-or-common-dormice-surveys-and-mitigation-for-development-projects>

⁷³ This table is taken from Natural England Standing Advice, accessed 02/03/2020: <https://www.gov.uk/guidance/hazel-or-common-dormice-surveys-and-mitigation-for-development-projects>. The score system was developed in the following research report: Chanin, P. & Woods, M. 2003. Surveying dormice using nest tubes. Results and experiences from the South West Dormouse Project. English Nature Research Report No. 524. This was incorporated into: Bright, P., Morris, P. & Mitchell-Jones, T. (2006). Dormouse Conservation Handbook. Second Edition. English Nature, Peterborough

⁷⁴ Froglife (1999). *Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation*. Froglife advice sheet 10.

⁷⁵ CIEEM (April, 2013) *Competencies for Species Survey: Common Reptiles*.

- C.24. The extent of the reptile survey was based on the predicted EZol for this species group and included all suitable habitat (field margins) within Plot 6 and the grassland field to the south of Plot 6 (the Reptile Survey Area).
- C.25. A total of 73 artificial refuges consisting of roofing felt and corrugated metal measuring approximately 0.5m² were laid out within suitable habitat within the Reptile Survey Area on the 14th June 2019. The refuges were left to bed in for approximately 7 days to give reptiles a chance to locate them. Features that could be used for refuge by reptiles (e.g. litter and logs) were also checked where present.
- C.26. Seven checks of the artificial refuges were undertaken in suitable weather conditions (taken to be daytime air temperatures between 9°C and 18°C with little or no wind or precipitation) between the 20th June 2019 and 12th September 2019, with an additional five visits undertaken in suboptimal conditions, where the temperature was too high (see Table C-3 for details). The weather conditions during each survey period are summarised in Table C-3 below.
- C.27. Surveyors initially checked the upper surface of reptile mats to identify any reptiles basking. The refuges were then lifted to identify any reptiles present underneath. Notes of any reptiles identified such as; numbers, species, sex and age were recorded.

Table C-3 Reptile survey weather conditions summary

Date	Start/End Time	Start/End Temperature	Start/End Wind ⁷⁶	Start/End Precipitation ⁷⁷	Cloud Cover
20/06/2019	08.00/09.00hrs	14.0°C	1	None	80%
26/06/2019	08.00/09.00hrs	18°C	2	None	100%
01/07/2019	07.30/08.30hrs	19°C (suboptimal)	3	None	60%
05/07/2019	08.00/09.00hrs	20°C (suboptimal)	1	None	50%
08/07/2019	09.00/10.00hrs	16.0°C	3	None	40%
10/07/2019	08.00/09.00hrs	18.0°C	2	None	100%
16/07/2019	08.00/09.00hrs	18.0°C	2	None	20%
19/07/2019	08.00/09.00hrs	17.5°C	2	1 – before and after only	100%
31/07/2019	08.00/09.00hrs	17.0°C	3	None	100%
07/08/2019	08.00/09.00hrs	20°C (suboptimal)	2	None	50%
19/08/2019	10.00/11.00hrs	20°C (suboptimal)	2	1 – 10mins only	85%
12/09/2019	11.00/12.00hrs	20.0°C (suboptimal)	2	None	70%

Population Size Class Assessment

- C.28. The findings of the above presence/likely absence surveys were used to obtain an estimate of the population sizes within Plot 6, in accordance with standard survey guidance⁷⁴**Error! Bookmark not defined..**
- C.29. Table C-5 provides details of how the populations of each reptile species was classified following completion of all of the surveys.

⁷⁶ Wind speed score of 0-12 against Beaufort scale: 0 = calm, 2 = light breeze, 4 = Moderate breeze, 6 = strong breeze, 7 = High wind, 9 = Strong gale, 12 = Hurricane

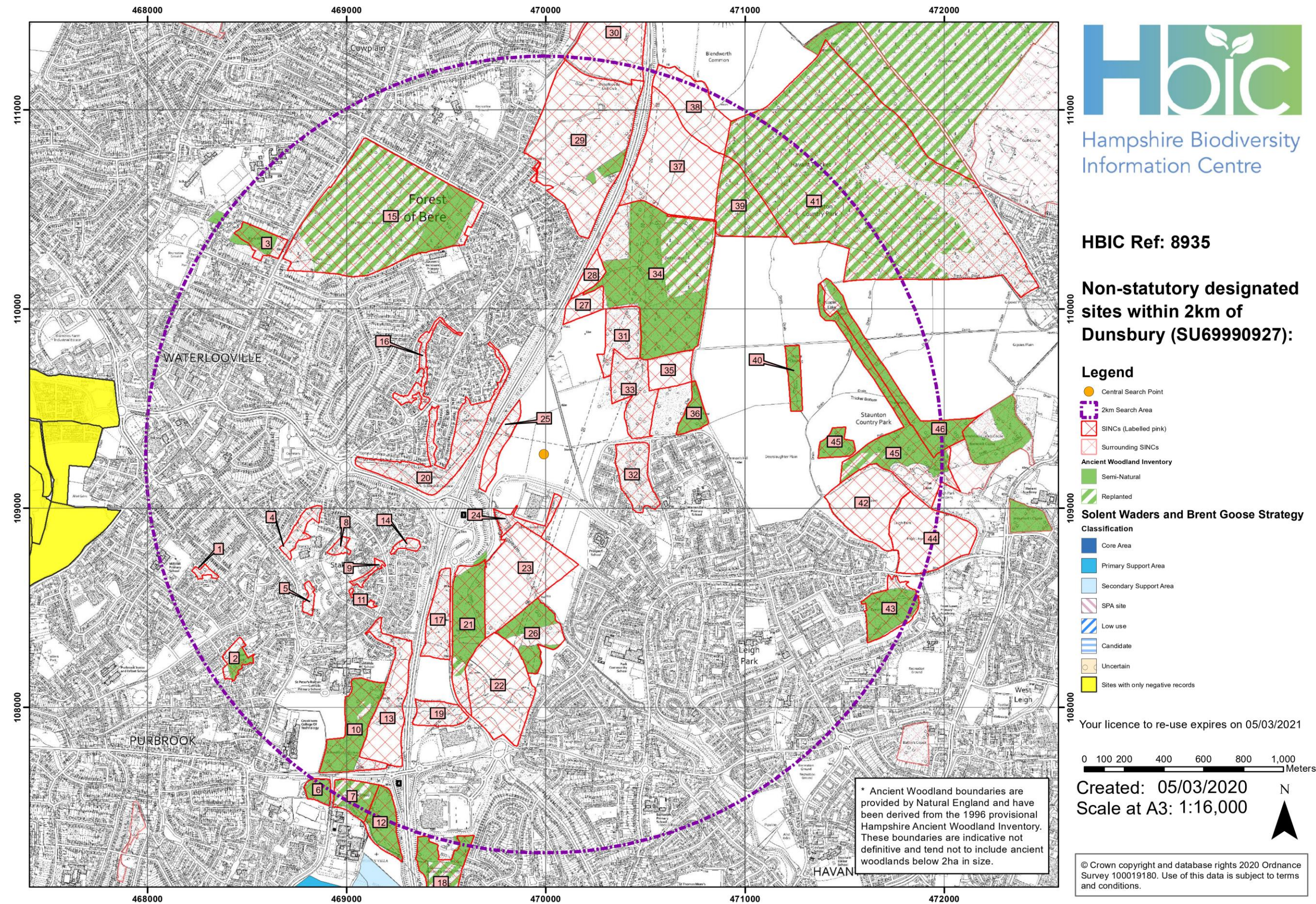
⁷⁷ Precipitation intensity on scale of 0-5: 0 = Dry, 1 = Light drizzle, 2 = Light rain, 3 = Moderate rain, 4 = Heavy rain, 5 = Torrential rain

Table C-4 Reptile population estimates⁷⁴

Species	Low population	Good population	Exceptional population
Common lizard	<5	5-20	>20
Slow worm	<5	5-20	>20
Grass snake	<5	5-10	>10
Adder	<5	5-10	>10

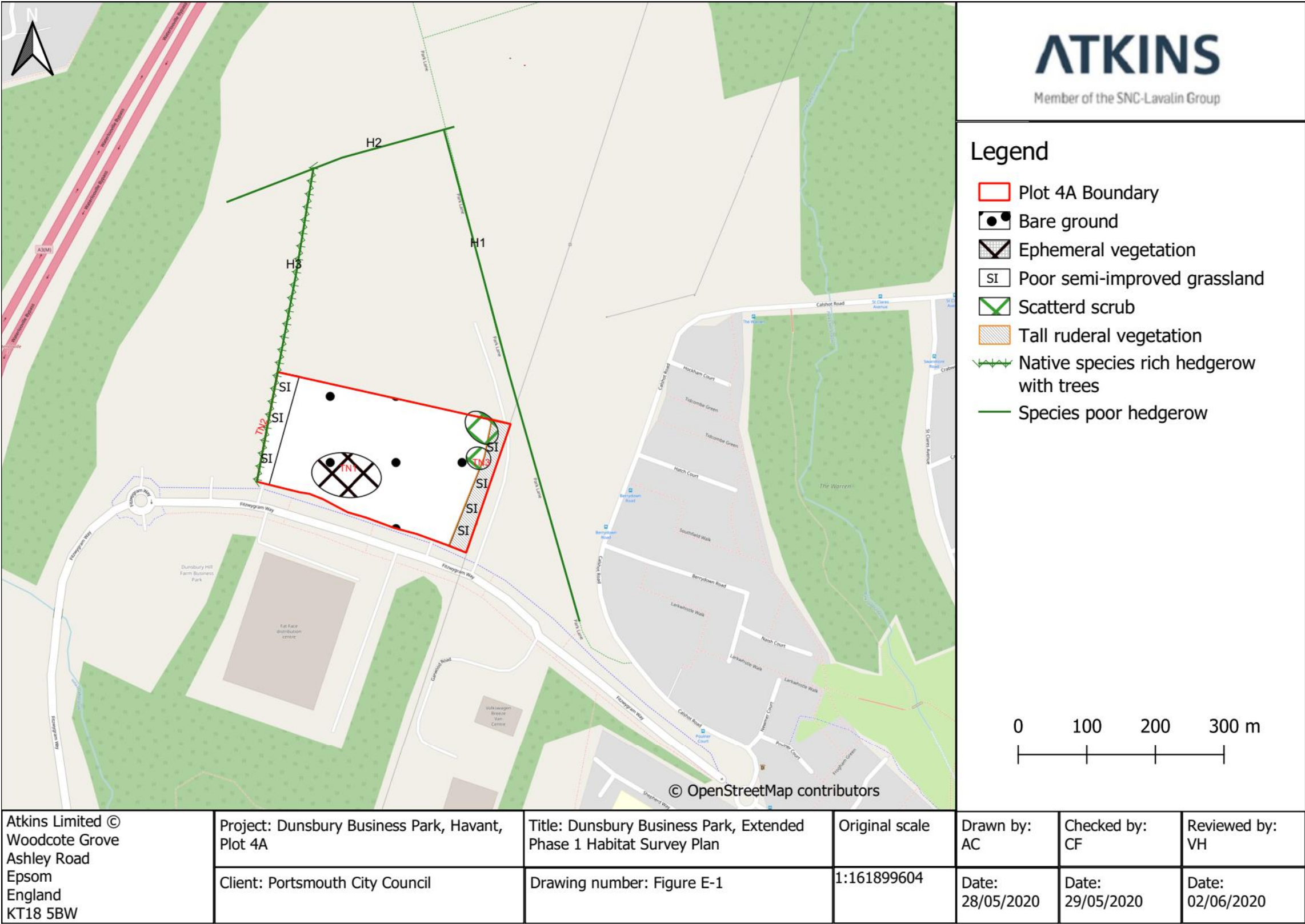
Appendix D. Locations of Non-Statutory Designated Sites

Figure D-1 Non-Statutory Designated Sites Plan



Appendix E. Extended Phase 1 Habitat Survey and Target Notes

Figure E-1 Extended Phase 1 Habitat Survey Plan



Target Notes and Photographs

Table E-1 Target notes and photographs

Target Note Reference	Description	Photograph
TN1	Bare ground and recolonising ephemeral/ruderal vegetation dominated the plot. This was partially flooded in January 2020.	
TN2	Hedgerow H3 along the west boundary.	
TN3	Scrub and ruderal margins.	

Appendix F. Phase 2 Survey Results

Badger

- F.1. No badgers or signs of badger were identified during the extended Phase 1 habitat survey carried out for the Application Site on 27th January 2020.
- F.2. Evidence of badger activity recorded during the survey of Plot 6 and used to inform this EcIA is provided as Figure F-1 below. No setts were identified within the Badger Survey Area.

Figure F-1 Badger Survey Results



Great Crested Newts

- F.3. The great crested newt survey results for Plot 6 and used to inform this EcIA are summarised in Table F-1 below.

Table F-1 Survey results for ponds A-C

Waterbody reference	HSI survey Date	HSI score	eDNA Survey result	Comments
Pond A	N/A	N/A	N/A	Surrounded by dense scrub. Considered to be dry.
Pond B	N/A	N/A	N/A	Dry in June 2019
Pond C	20 th June 2019	0.38 Poor	Negative	Shallow and heavily shaded. Smooth newts present.

- F.4. A negative eDNA test result was received from SureScreen Scientific on 04/07/2019 for Pond C (folio no.: E5679, report no.: 1).

Bats

- F.5. The results of the survey work undertaken for Plot 6 and used to inform this EclA are provided in **Annex A and B.**

Hazel Dormouse

- F.6. The hazel dormouse survey results for Plot 6 and used to inform this EclA are summarised in Table F-2. Locations of dormouse tubes are provided on Figure C-2 above.

Table F-2 Hazel dormouse survey results

Nest tube Reference ⁷⁸	Evidence of hazel dormouse activity	Month(s) evidence recorded in 2019
1	1 active dormouse in nest (escaped)	October
2-5	None	N/A
6	1 active dormouse in nest (escaped)	October
	2 active dormice in nest. Juvenile female, 12g. 1 escaped.	November
7	None	N/A
8	Dormouse nest	September, October, November
9	1 active dormouse in nest (escaped)	September
	Dormouse nest	October
10	Dormouse nest	September, October
11	None	N/A
12	4 active dormice in nest (escaped)	November
13	2x active dormice in nest. Adult male, testes showing, 21g. Juvenile female, 12g.	October
14-30	None	N/A
31	1 active dormouse in nest (escaped)	September
	Dormouse nest	October, November
32	Dormouse nest	August, September
33	Active adult male dormouse in nest. 17g, testes showing, short tail, small white tip.	October
	Dormouse nest	November
34	Active adult male dormouse in nest. 16g, testes showing.	September
	Dormouse nest	October
35	None	N/A
36	Active dormouse in nest (escaped). Docked tail.	October
	Dormouse nest	November
37-44	None	N/A

⁷⁸ The location of nest tubes are shown on Figure C-2.

45	1 active dormouse in nest (escaped)	November
46-55	None	N/A

- F.7. Wood mice or evidence of wood mice (food remains, nesting material) were found in numerous tubes, as follows: 1, 6, 9, 10, 13, 15, 16, 18, 23, 24, 25, 27, 28, 29, 32, 34, 35, 37, 38, 40, 41, 43, 44, 45, 47, 49, 50, 52, 55.

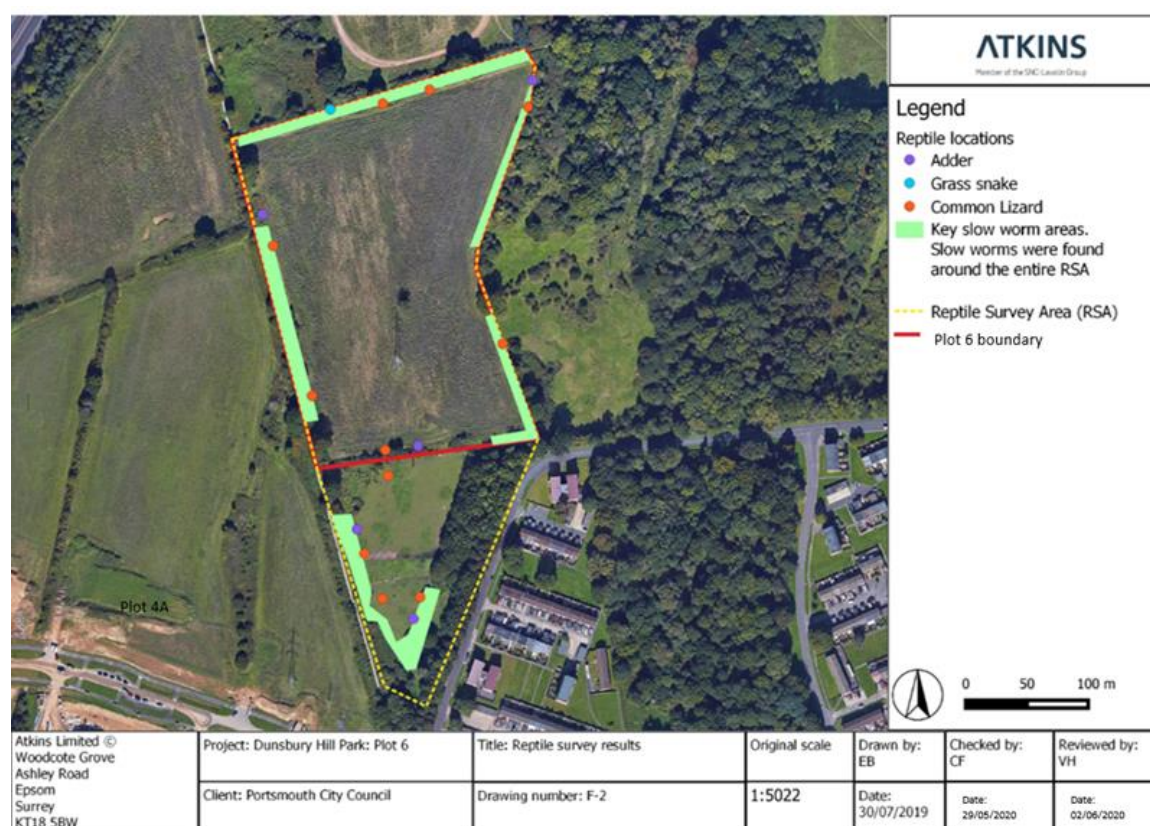
Common Species of Reptile

- F.8. The reptile survey results for Plot 6 and used to inform this EclA are summarised in Table F-3 and Figure F-2 below.

Table F-3 Reptile survey results

Species	Peak count ⁷⁹	Locations within Application Site	Population class ⁸⁰
Slow worm	578	All boundaries and southern grassland plot.	Exceptional
Common Lizard	22	All boundaries and southern grassland plot.	Exceptional
Adder	14	Southern, western and eastern boundaries. Southern grassland plot.	Exceptional
Grass snake	3	Northern boundary.	Low

Figure F-2 Reptile survey results



⁷⁹ The peak count from the presence absence and surveys is provided.

⁸⁰ Classification according to Froglife Advice Sheet 9 (1999)

Annex A Bat Surveys Report – Tree Climbing, Dusk Emergence and Dawn Re-entry (Sylvatica Ecology)



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Bat Surveys Report

Tree Climbing, Dusk Emergence and Dawn Re-Entry

Dunsbury Phased Development Project

Park Lane, Havant,
PO9 4HT

NGR: SU 69948 09164.

Date	Author	Version
26 th August 2019	Richard E Law BSc (Hons) MRes CEnv MCIEEM	1.0

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1 Introduction

Aim of the study

- 1.1 This report presents the findings of a suite of bat surveys (tree climbing surveys, dusk and re-entry surveys) across the development site located at approximately at Park Lane, Havant, PO9 4HT NGR: SU 69948 09164. A ground level tree inspection was carried out in January 2018 by Atkins staff, which found eight trees to have either a moderate or high potential to support roosting bats. Following this, the tree climbing surveys were carried out during the day of the 5th May 2018, the 11th September 2018 and the 1st June 2019. The dusk emergence surveys were carried out in the on the 11th September 2018 and the 31st May 2019. The dawn re-entry surveys were carried out on the 26th August 2019.

Site description

- 1.2 The development site is situated on an area of open fields bordered by hedgerow and woodland copses between the urban conurbations of Havant (to the east) and Waterlooville (to the west). Both of these urban areas are also separated by the A3 (M) road, which runs on a north – south axis.
- 1.3 **Figure 1 – Extent of the survey area (red line boundary)**



Legal Status of Bats

- 1.4 All eighteen of the UK's bat species are protected under Section 9 (4) (a) of the Wildlife and Countryside Act (WCA) 1981 (as amended). The WCA states that '*a person is guilty of an*

offence if intentionally or recklessly they disturb [a bat] while it is occupying a structure or place which it uses for shelter or protection; or damages, destroys and obstructs access to any structure or place which [a bat] uses for shelter or protection’.

1.5 Bats are also protected under the Conservation of Habitats and Species Regulations 2017. Bats are listed as European protected species under which it is an offence if;

- *a person deliberately captures, injures or kills any wild animal of a European protected species;*
- *deliberately disturbs wild animals of any such species;*
- *damages or destroys a breeding site or resting place of such an animal.*

1.6 Disturbances of animals include in particular any disturbance which is likely to impair their ability to;

- *survive, breed or reproduce, or to rear or nurture their young;*
- *in the case of animals of a hibernating or migratory species, to hibernate or migrate; or*
- *to affect significantly the local distribution or abundance of the species to which they belong.*

2 Methodology

2.1 The surveys were carried on using standard guidance and best practice methodology outlined in the Bat Workers Manual (Mitchell-Jones & McLeish, 2004), the Bat Mitigation Guidelines (English Nature, 2004) and Bat Surveys Guidelines for Professional Ecologists – Good Practice Guidelines (BCT 2016). The surveys were led by Richard Law (2015-12576-CLS-CLS).

2.2 Tree climbing surveys were carried out on the trees that were designated as having the potential to support roosting bats. Trees that were of moderate potential would require two surveys during the activity season. These were surveyed in 2018. The trees of high potential required three surveys, two of which were carried out in 2018, leaving only one further check required in 2019.

2.3 Where climbing was not possible due to the condition of the tree, dusk emergence and dawn re-entry surveys were carried out. Trees categorised as negligible and low potential were not surveyed on this occasion.

2.4 **Table 1 – Tree Categories and Survey Type**

Tree	Species	Bat Potential	Survey Technique Used
2	<i>Quercus robur</i>	High	Climbing
3	<i>Q. robur</i>	Moderate	Climbing
5	<i>Q. robur</i>	High	Dusk Emergence/ Dawn Re-Entry
6	<i>Q. robur</i>	High	Climbing
7	<i>Fraxinus excelsior</i>	Moderate	Climbing
9	<i>Q.robur</i>	High	Dusk Emergence/ Dawn Re-Entry
12	<i>Q.robur</i>	High	Climbing
13	<i>Q.robur</i>	High	Climbing

Equipment Used

2.5 Echo Meter Touch Pro (using iPad Air 125GB) and a Heterodyne (Bat Box duet III) bat detector was used to pick up any ultrasonic calls that bats could have made during the surveys. Night vision equipment (Yukon NvB Tracker) was used to aid the check for emerging/ re-entering bats during the surveys.

2.6 The tree climbing survey utilised rope access equipment (normally using prussic loops and hitch climbers) to ascend the tree into locations that were impossible to access from the ground or a ladder safely. An endoscope was used to inspect deep into any cavity. An initial check was made of the feature using a torch with a UV adaption that could highlight any areas where fluids (urine etc) could potentially be present.

Lead Surveyor

2.7 The survey work and reporting has been undertaken by Richard Law BSc MRes CEnv MCIEEM. Richard has been undertaking ecological survey work within the last 15 years on a number of differing locations throughout the United Kingdom for a variety of protected species, including bats (Class 2 2015-12576-CLS-CLS) reptiles, amphibians including great crested newt (*Triturus cristatus*) (Class 1 2016-20290-CLS-CLS) and terrestrial mammals including dormice (*Muscardinus avellanarius*) (2015-13188-CLS-CLS) and birds including barn owl licence (CL29/00236). Richard is also qualified in track and sign and trailing *via* an international system of assessment (www.trackercertification.com).

Limitations

- 2.8 It should be borne in mind that the behaviour of animals can be unpredictable and may not conform to standard patterns recorded in scientific literature. Therefore, this report cannot predict with absolute certainty, that animal species will occur in apparently suitable locations or habitats, or that they will not occur in locations or habitats that appear unsuitable.

3 Results

3.1 Figure 2 – Location of Trees



3.2 Table 2 –Survey Parameters and Weather Conditions for Dusk Emergence Surveys

Date	Start Time	End Time	Sunset (sunrise)	Temperature at start °C	Temperature at end °C	Wind	Cloud Cover % (visual estimate)	Precipitation during survey
11 th September 2018	18:50	21:00	19:24	18.2	16.3	South West light (1)	Overcast	None
31 st May 2019	20:40	22:45	21:08	15.3	14.7	South West light (2)	50%	None
26 th August 2019	04:15	06:14	(06:04)	22.2	22.1	None	None	None

- 3.3 Trees 5 and 9 both required dusk emergence and dawn=re-entry surveys due to their condition; being unsafe to climb. Tree 5 was a dead monolith with most of the bark now fallen, leaving only the

inner structure standing. There were a small number of splits and cracks in the trunk. Tree 9 had collapsed onto its side and had a large exposed cavity leading into the main trunk facing east.3.4

Table 3 – Tree Climbing Results

Tree	Species	Bat Potential	Feature Description	Findings May 2018	Findings Sept 2018	Findings June 2019
2	<i>Q. robur</i>	High	Feature within tree is a split within a horizontal limb. This feature, following inspection, penetrated upwards into the limb approximately 20cm. This would potential harbour a roosting bat, although likely to be individuals rather than a large colony	No evidence of bats observed	No evidence of bats observed	No evidence of bats observed
3	<i>Q. robur</i>	Moderate	The feature facing north contained a blue tit nest. However, on further inspection of the tree, a feature at 10m was noted which penetrated 30cm into the main trunk. This could provide roosting opportunity for bats	No evidence of bats observed	No evidence of bats observed	N/A
6	<i>Q. robur</i>	High	Many holes within this tree that could provide roosting opportunities for bats. There was a large tear out, which had then formed a rotting split which could provide a location for a large colony of bats.	No evidence of bats observed	No evidence of bats observed	No evidence of bats observed
7	<i>Fraxinus excelsior</i>	Moderate	Callous roll. Some potential to provide a roosting opportunity for low numbers of bats	No evidence of bats observed	No evidence of bats observed	N/A
12	<i>Q. robur</i>	High	Tear extended down 10cm into tree. While exposed, this tree could potential support a low number of bats, possibly one or two.	No evidence of bats observed	No evidence of bats observed	No evidence of bats observed
13	<i>Q. robur</i>	High	The feature on the horizontal limb was highly likely to contain a colony of bats during the main activity season. It extended 45cm into the horizontal limb, with clearance immediately below the feature. An additional feature was noted, further up into the canopy. This was potentially able to support bats, although likely to be in lower numbers than the first feature.	No evidence of bats observed	No evidence of bats observed	No evidence of bats observed

3.5 During the tree climbing surveys no evidence of bats was noted. The features surveyed did retain the potential to support bats, as noted in Table 3 above.

3.6 **Table 4 - 11th September 2019 Dusk Survey at Trees 5 and 9 Combined**

Time	Species	Number	Location	Behaviour
19:44	Soprano pipistrelle	1	South along eastern hedge line	Commuting
19:57	Serotine	1	Along Northern Hedge line	Commuting
19:58	Soprano pipistrelle	1	Along Northern Hedge line	Commuting
20:14	Common pipistrelle	1	Along Northern Hedge line	Commuting
20:25	Common pipistrelle	1	Along Northern Hedge line	Commuting
21:00 Survey End				

3.7 No bats were observed emerging from either of the two trees during the survey. A relatively low level of activity was recorded across the survey area, with five bat passes noted. Three bat species present during the survey. These were serotine (*Eptesicus serotinus*) common pipistrelle (*Pipistrellus pygmaeus*) and soprano pipistrelle (*P. pygmaeus*).

3.8 **Table 5 – 31st May 2019 Dusk Survey at Tree 5**

Time	Species	Number	Location	Behaviour
21:01	Noctule	1	Overhead/ not seen	Foraging
21:13	Common pipistrelle	1	Along tree line West to East	Commuting/ Foraging
21: 16	Common pipistrelle	1	Along tree line East to West	Commuting/ Foraging
21:28	Common pipistrelle	1	Along tree line West to East	Commuting/ Foraging
21:34	Common pipistrelle	1	Along tree line West to East	Commuting/ Foraging
21:43	Soprano pipistrelle	1	Along tree line West to East	Commuting/ Foraging
21:57	Common pipistrelle	1	Along tree line West to East	Commuting/ Foraging
22:09	Common pipistrelle	1	Along tree line West to East	Commuting/ Foraging
22:13	Common pipistrelle	1	Along tree line West to East	Commuting/ Foraging
22:45 Survey End				

3.9 **Table 6 – 31st May 2019 Dusk Survey at Tree 9**

Time	Species	Number	Location	Behaviour
21:02	Noctule	1	Overhead/ not seen	Foraging
21:23	Common pipistrelle	1	Along tree line North to south	Commuting/ foraging
21:36	Common pipistrelle	1	Along tree line North to south	Commuting/ foraging
21:52	Common pipistrelle	1	Along tree line North to south	Commuting/ foraging
22:09	Common pipistrelle	1	Along tree line North to south	Commuting/ foraging
22:16	Common pipistrelle	1	Along tree line North to south	Commuting/ foraging
22:35	Common pipistrelle	1	Along tree line North to south	Commuting/ foraging
22:45 Survey End				

3.10 No bats were observed emerging from either of the two trees during the survey. Three bat species were noted foraging and commuting during the surveys, common pipistrelle, soprano pipistrelle and noctule.

3.11 **Table 7– 26th August 2019 Dawn Survey at Tree 5**

Time	Species	Number	Location	Behaviour
04:16	Common pipistrelle	1	Not seen	Commuting
04:20	Brown long eared	1	Not seen	Commuting
04:57	Common pipistrelle	1	Heading north over head	Commuting
05:12	Common pipistrelle	1	Heading north over head	Commuting
05:14	Common pipistrelle	1	Heading north over head	Commuting
06:14 Survey End				

3.12 **Table 8– 26th August 2019 Dawn Survey at Tree 9**

Time	Species	Number	Location	Behaviour
04:18	Brown long eared	1	Not seen	Commuting
04:17	Common pipistrelle	1	Not seen	Commuting
04:18 – 04:26	Serotine	1	To the south, along east/ west field boundary	Foraging
04:34 - 04:36	Soprano pipistrelle	1	Overhead/ along tree line running north/ south	Foraging
04:39 – 04:44	Soprano pipistrelle	1	Overhead/ along tree line running north/ south	Foraging
05:18	Common pipistrelle	1	Heading north along hedgeline	Commuting
05:22	Common pipistrelle	1	Heading north along hedgeline	Commuting
05:26	Soprano pipistrelle	1	Heading north along hedgeline	Commuting
05:26	Common pipistrelle	1	Heading north along hedgeline	Commuting
05:29	Common pipistrelle	1	Heading north along hedgeline	Commuting
06:14 Survey End				

3.13 No bats were observed re-entering either of the two trees during the survey. A relatively low level of activity was recorded throughout all the surveys. Four bat species were noted during the surveys. Common pipistrelle, soprano pipistrelle, brown long eared (*Plecotus auritus*) and serotine (*Eptesicus serotinus*). These were all generally limited to commuting behaviour, with foraging noted mostly along the tree line at Tree 5 from serotine and soprano pipistrelle. Any commuting activity noted was in a northerly direction.

4 Discussion

4.1 No emergence or re-entry of bats was recorded during the surveys, neither was any evidence of bats noted within the trees. While evidence of bats was not observed, there remains the potential for bats to be present within all of these trees, therefore caution must be exercised if these trees are to be removed and a soft felling process is recommended.

5 References

BCT (2016) Bat Survey Guidelines for Professional Ecologist – Good Practice Guidelines

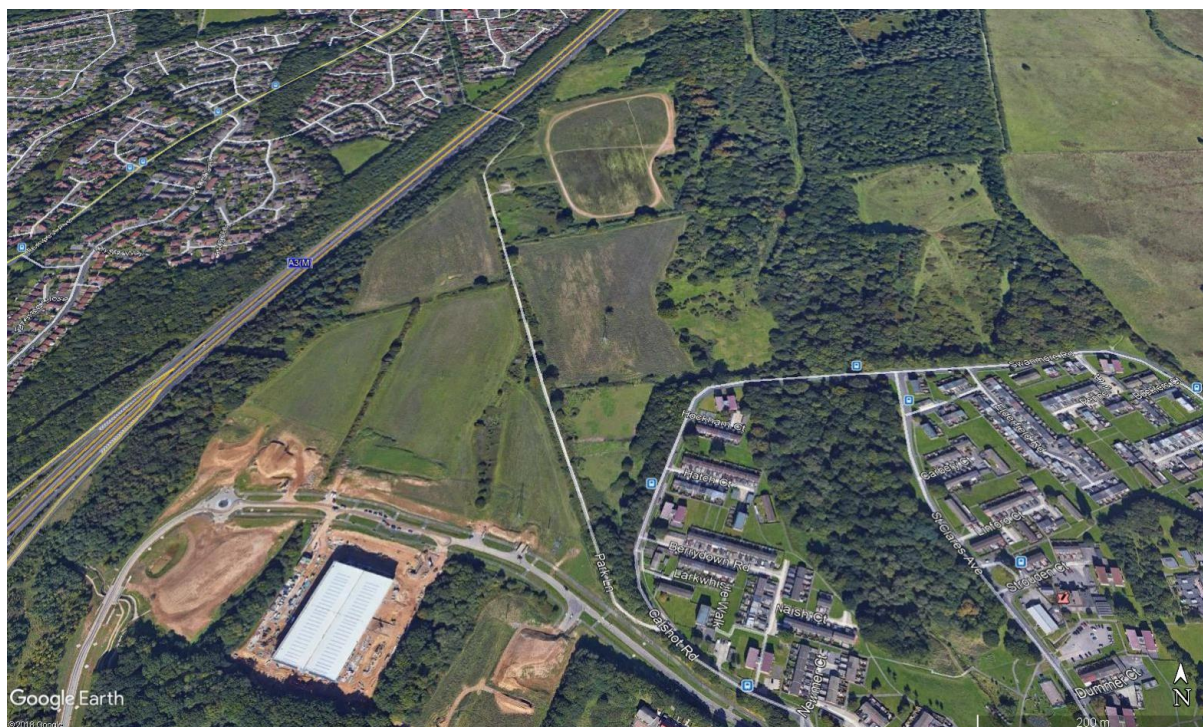
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Annex B Advanced Bat Surveys (Davidson-Watts Ecology)



Dunsbury Hill Farm
Advanced Bat Surveys
Atkins
27 May 2020



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1. Introduction

1.1. Terms of Reference

This report presents the findings of advanced bat surveys (trapping and radiotracking) in relation to the Dunsbury Hill Farm Development in Havant, Hampshire (hereafter referred to as 'the Scheme'). The Scheme is a multi-phase commercial development, centred approximately on Ordnance Survey National Grid Reference SU702099, as shown by the red line boundary in Figures 1 and 2. The advanced bat surveys focussed on identifying potential constraints in relation to bats associated with Plots 6 and 7 (hereafter referred to as 'the Site'). A plan showing the location of the Site is provided in Figure 3. The desk study and survey work were carried out by Davidson-Watts Ecology Limited on behalf of Atkins, member of the SNC-Lavalin Group.

1.2. Background

The Scheme is located north/north-west of Havant in Hampshire (see Appendix A, Figures 1 and 2) and involves the development of a Link Road and Business Park. Outline planning permission for the business park plots [App/15/00732] as well as detailed planning permission for the Link Road [App/12/00338] were granted in March 2014. The outline permission had several planning conditions, including A17 and A18 relating to ecological mitigation with regards to bats and hazel dormouse. These conditions are to be discharged each time a plot is released for development, through Reserved Matters applications.

During a bat trapping survey undertaken in early September 2015 to inform the development of Plot 2 (as part of Reserved Matters Application App/15/01156), an adult female Bechstein's bat *Myotis bechsteinii* (a rare UK bat species – see Section 1.3 for further information), was trapped within the woodland adjacent to the south of Plot 2; this individual was not tagged/radio tracked. Plot 2 is located approximately 240 m south-west from Plot 7, and Plot 6 is situated adjacent to the north of Plot 7. Further trapping surveys were undertaken south and west adjacent to Plot 2 in 2016 by Davidson-Watts Ecology Limited to determine if any further individuals or a nearby roost were present. However, no Bechstein's bats were encountered during these surveys.

Based on the results of ecological surveys undertaken, a mitigation strategy was agreed and included as part of the consent for the development of Plot 2. Due to the discovery of the adult female Bechstein's bat adjacent to Plot 2 and records of Bechstein's bat maternity roosts discovered less 2.5km to the north-east of Plot 6 (as part of the planning application for Land East of Horndean¹) undertaken by Davidson-Watts Ecology Limited 2014 and 2015), further information was considered necessary to inform mitigation measures for the development of Plots 6 and 7. Following consultation with Tristan Norton, Senior Ecologist at Hampshire County Council, it was agreed that follow up trapping and radiotracking studies would be undertaken in 2019. The aim of these surveys is to further understand use of the Site by rare bat species, provide sufficient information to inform mitigation design for the future development Plots within the Scheme, and to ensure the conservation status of the bat species within the local area.

1

<https://easthants.moderngov.co.uk/documents/s3896/EHDC%20Part%201%20Section%201%20Item%201%20Land%20east%20of%20Horndean%20Rowlands%20Castle%20Road%20Horndean.pdf>

1.3. Legislation

In England, Scotland and Wales all bat species are fully protected under the Wildlife and Countryside Act 1981 (WCA) (as amended) through inclusion in Schedule 5. In England and Wales, this Act has been further amended by the Countryside and Rights of Way Act 2000 (CRoW).

All bats are also fully protected under Schedule 2 of The Conservation of Habitats and Species Regulations 2017 (as amended), (the Habitats Regulations), which defines all bats as 'European protected species (EPS) of animals'. Under the regulations, the conservation of Bechstein's bat requires the designation of Special Areas of Conservation (SACs).

Several bat species (including Bechstein's bat) are listed as Species of Principal Importance for the Conservation of Biodiversity under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. These species need to be taken into consideration by a public body when performing any of its functions with a view to conserving biodiversity.

Bechstein's bat is also classified as Near Threatened on the International Union for Conservation of Nature (IUCN) Red List².

1.4. Objectives

Davidson-Watts Ecology Ltd were commissioned by Atkins Limited on behalf of Portsmouth City Council to undertake the advanced surveys in 2019 to achieve the following objectives:

- Further investigate the status of Bechstein's bat and other tree roosting bat species (*Myotis* sp./*Nyctalus* sp.) at the proposed development site with an emphasis on woodland habitat and tree lines during the breeding season (July – September 2019);
- Radio track male and female Bechstein's bats and other breeding *Myotis* sp./*Nyctalus* sp. bats to determine home ranges, activity patterns, habitat use and roost locations; and
- Present a robust data set to show use of the Site and surrounding areas by Bechstein's bat and other tree roosting (*Myotis* sp./*Nyctalus* sp.) bats to meet the conditions associated with the outline planning permission for the Scheme, and to inform appropriate mitigation measures for the development of Plots 6 and 7, including roost protection, lighting design, detailed landscaping/planting inventories and habitat management.

² <https://www.iucnredlist.org/species/14123/22053752>

2. Methodology

2.1. Approach

Due to the inherent difficulty in using non-invasive techniques to locate bat roosts in trees and gather data on more sensitive bat species such as the Bechstein's bat, trapping and radio-tracking surveys were proposed in order to meet the objectives set out in Section 1.4 above. The survey activities aimed to trap and radio-tag individual female and male bats in order to determine their breeding status and confirm the presence/likely absence of Bechstein's bats. Where tree-roosting bats were identified, they were tagged and radio-tracked in order to locate maternity and other roost types, determine home ranges and habitat use within and surrounding Plots 6 and 7.

Two survey sessions were undertaken during the bat active season in 2019. Session 1 - bat trapping and radiotracking surveys from 29th July – 3rd August 2019, and Session 2 - bat trapping and radiotracking surveys from 22nd – 26th September 2019.

Climbed tree inspections have been undertaken in combination with these advanced methods to supplement survey data³.

All bat trapping and radio-tagging activities were licensed under Natural England Project Licence 2019-40806-SCI-SCI held by Dr Ian Davidson-Watts.

2.2. Trapping

Up to six Austbat 4m² double lined harp traps and two sets of Avisoft mist nets (ranging from 2m-18m in length) were deployed in woodlands within the red line boundary of the Scheme (Figure 2) and adjacent woodlands for up to three nights each survey session in July/August and September 2019 to trap free flying bats. Priority areas included the copses and ancient woodlands within the Scheme and large woodlands adjacent to the Site. Captured bats were processed to determine species, sex, breeding status and where appropriate, selected for radiotracking.

Up to six acoustic lures (e.g. Sussex Autobat) were used to improve catch efficiency in open woodland (Hill and Greenaway, 2005). The Sussex Autobats emitted synthesised Bechstein's bat social calls. Lures were placed next to mist nets or harp traps and left for up to 15 minutes. Following this, they were 'walked' between trapping locations for a further 10 minutes. A quiet period of 15 minutes then followed, during which the lure was switched off, before the process started again. The lures were not used within 50m of known active and occupied breeding roosts.

2.3. Radio-telemetry

Target bats for radio tracking included any Bechstein's, barbastelle and other *Myotis* sp. and/or *Nyctalus* sp. likely to be roosting in trees on or near the Site. Target bats were fitted with lightweight radio transmitter tags (Biotrack Ltd, Wareham, Dorset, United Kingdom) weighing generally <5% of the weight of the bat using medical adhesive. Tagging of female bats in advanced stages of pregnancy and very early lactation was avoided.

Breeding bats were tagged if they met the target weight and were in good condition as it was important to understand their habitat requirements, and this was a key objective of the study. All bats were processed quickly and released within 30 minutes of capture provided the glue attaching the transmitter had cured sufficiently. Bats were tracked using a Sika receiver (Biotrack Ltd.,

³ Atkins, 2020. Dunsbury Business Park. Plot 6 Ecology Survey Report.

Wareham, United Kingdom) and 3 or 5 -element Yagi antenna (Marina Radar, Lowesoft, United Kingdom) on foot or by vehicle.

2.4. Roost emergence

During radio-tracking, confirmed roost locations were plotted on a map and emergence counts undertaken using infra-red cameras to gather information on roost status and size. Roost attributes such as location, height, diameter of the tree at breast height (DBH), species of tree and type of cavity (where appropriate), were recorded.

2.5. Evaluation

Ecological features and resources have been evaluated based on the approach described in 'Guidelines for Ecological Impact Assessment in the United Kingdom' published by the Institute of Ecology and Environmental Management (2019) whereby the value of an ecological feature or resource is determined within a defined geographical context using the following criteria:

- International;
- National (England);
- Regional (South-East);
- County (or Metropolitan) (Hampshire);
- District (or Unitary Authority, City or Borough) (Havant);
- Local (or Parish) (Havant); and
- At the Site level only.

3. Results

3.1 Trapping

The locations of the traps are provided on Figure A-4 in Appendix A and the full trapping survey results are included in Appendix B. The meteorological data for the surveys and sunset times are also included in Appendix B.

No Bechstein's bats (or other Annex II bat species) were captured during either of the two trapping sessions at the Site.

Pipistrellus sp.

The trapping surveys in July/August 2019 captured one adult male soprano pipistrelle *Pipistrellus pygmaeus*. The surveys also captured two adult male common pipistrelles *Pipistrellus pipistrellus* and a juvenile female common pipistrelle in July 2019.

No pipistrelle bats were captured during Session 2 in September 2019.

Myotis sp.

In July 2019, the trapping surveys caught two adult male whiskered bats *Myotis mystacinus*, one adult male Natterer's bat *Myotis nattereri* and a juvenile male Natterer's bat, and one further adult male Natterer's bat in August 2019.

During the September 2019 trapping survey, two adult male Natterer's bats and two adult female Natterer's bats (post-lactating) were caught in the woodland adjacent to the north-east of the Site, and two adult female post-lactating Natterer's bats were caught in the woodland adjacent to the south-western edge of the Site.

Brown long-eared bats *Plecotus auritus*

In July and August 2019, the trapping surveys caught two adult female post-lactating brown long-eared bats, an adult nonparous female, two adult males and a juvenile male brown long-eared bat in the woodland adjacent to the north-eastern boundary of the site, and an adult male brown long-eared bat in the south-western section of woodland.

No brown long-eared bats were caught during Session 2 in September.

3.2 Radiotracking

An adult male Natterer's bat was captured in Trap 3 and subsequently tagged on 29th July 2019. The bat was released and moved north from its trapping location to the north end of Park Lane, offsite on the southbound embankment of the A3M. The bat was located at the north of the site within woodland along the northbound embankment on the A3M. The general location of the roost is shown in Figure 5 but the precise location of the roost could not be confirmed due to lack of access.

An adult male Natterer's bat (bat 241205) was captured in Trap 1 and subsequently tagged on 22nd September 2019. The bat was released at 21:02 and tracked back to its roost. The location of this bat's roosting location within the tree could not be identified. The details of where the bat was recorded foraging and the final roost location are included in Figure 5 and detailed in Table 1 below and Appendix B.

Table 1: Tracking data for bat 241205

Map ref	Bat ref	Date	Time	X (Easting)	Y (Northing)	Comments
Point 1	241205	22/09/19	21:02	470501.25	109469.38	Static after release
Point 2	241205	22/09/19	21:15	470486.54	109958.11	Moved quickly north
Point 3	241205	22/09/19	22:01	470831.78	110438.38	Weak intermittent signal
Point 4	241205	22/09/19	22:07	470637.85	110400.6	Stronger signal, intermittent - likely to be foraging in woodland
Point 5	241205	22/09/19	22:20	470690.54	110374.62	Stronger signal, intermittent - likely to be foraging in woodland
Point 6	241205	23/09/2019	00:22	470653.03	110132.09	Brief fix, reasonable signal, foraging in copse
Point 7	241205	23/09/2019	01:17	470594.16	110420.91	Weak intermittent signal
Roost	241205	23/09/2019	12:30	470889.49	110534.82	Bat at roost, found during day search. Mature oak tree (see Appendix C for further details).

Bat 241205's tree roost was a mature oak *Quercus robur*, possessing multiple opportunities for bats to roost. Surrounding it are some smaller dead trees, which may also offer some opportunity for bats to roost.

3.3. Constraints

Access was not available to survey the woodland embankment where the Natterer's adult male was roosting in July 2019. The surveyor was able to access the south and north embankments to confirm that the bat roost was within the section shown on Figure 5, but the precise tree could not be confirmed.

The trapping surveys on 30th July and 24th September were subject to rain during parts of each of these surveys. This would have limited the effective trapping hours undertaken; however, it should be noted that bats were captured on both survey nights.

4. Evaluation

4.1. *Pipistrelle* sp.

A single adult male soprano pipistrelle was caught at Trap 1 in the woodland to the east of the Site in July 2019.

Soprano pipistrelle is a common and widespread bat in the UK (Bat Conservation Trust (BCT), 2019) with a stable population since 1999. It is also listed as a Species of Principal Importance on S41 of the NERC Act 2006. The presence of a non-breeding male bat in July would therefore be of nature conservation importance at the site level.

Two adult males and a juvenile male common pipistrelle bat were trapped in the woodland east of the Site in July 2019.

Common pipistrelle is a common and widespread bat in the UK (BCT, 2019) with an increasing population since 1999. The breeding population of common pipistrelle is therefore considered to be of nature conservation importance at the site level.

4.2. *Myotis* sp.

The trapping surveys in July, August and September 2019 caught adult post-lactating females and male Natterer's bats in breeding condition as well as a juvenile male Natterer's bat. Two adult male Natterer's bat tree (day) roosts were located; one adjacent to the Site to the west and one 980m offsite to the north-east.

Populations of Natterer's bats in England are considered to be common and widespread and have increased since 1999 (BCT, 2019). The breeding population of Natterer's bats is therefore considered to be of nature conservation importance at the Site level.

Two adult male whiskered bats were trapped during the July 2019 survey.

Populations of whiskered bats are considered to have been stable in Great Britain since 1999 and are locally frequent (BCT, 2019). The presence of two non-breeding bats in July 2019 would therefore be of nature conservation importance at the site level.

4.3. Brown long-eared bats

The July and August 2019 surveys captured adult post-lactating females, adult male and juvenile male brown long-eared bats in the woodland east of the Site and an adult male brown long-eared bat in south-western section of wood.

Brown long-eared bats are widespread and common with stable populations since 1999 (BCT, 2019) and are listed as Species of Principal Importance under S41 of the NERC 2006. The presence of a breeding population of brown long-eared bats would therefore be of nature conservation importance at the local level.

4.4. Overall species assemblage

Five species of bat were recorded to be using the woodland to the east and west of the Site including breeding populations of three species (Natterer's bat, brown long-eared bat and a juvenile female common pipistrelle captured in July 2019). Two Species of Principal Importance were recorded (non-breeding soprano pipistrelle and breeding brown long-eared bat). The species assemblage of bats is therefore determined to be of nature conservation importance at the local level for the woodland habitats adjacent to the boundaries of the Site.

5. Discussion

No Bechstein's bats were encountered or captured during the surveys, despite a high level of trapping effort, which exceeded the minimum requirements for trapping this species (Collins, 2016). The absence of this bat species may be as a result of a number of factors, which include the possibility that the survey area is not used by Bechstein's bats during the months (July/August and September) sampled.

The surveys revealed the presence of breeding populations of common pipistrelle, brown long-eared bat and Natterer's bat and non-breeding populations of soprano pipistrelle and whiskered bat. The overall species assemblage is of nature conservation importance at the local level. This is in-line with the nature conservation assessment for bats in the Environmental Statement for the Scheme⁴, as bats protected at a European/International and National/UK level were recorded and bat species identified within the Hampshire Biodiversity Action Plan⁵ were also recorded during the surveys (common pipistrelle).

⁴ Atkins, 2012. Dunsbury Hill Farm Environmental Statement Volume 1. Portsmouth City Council.

⁵ <https://documents.hants.gov.uk/biodiversity/HampshireBiodiversityActionPlanVolume2.pdf>

6. References

Bat Conservation Trust, (2019). The National Bat Monitoring Programme Annual Report 2018. Bat Conservation Trust, London.

Collins (ed) (2016) Bat Surveys: Good Practice Guidelines, 3rd Edition, Bat Conservation Trust.

Hill, D.A. and Greenaway. F. (2005). Effectiveness of an acoustic lure for surveying bats in British woodlands. Mammal Review, 35, 116-122.

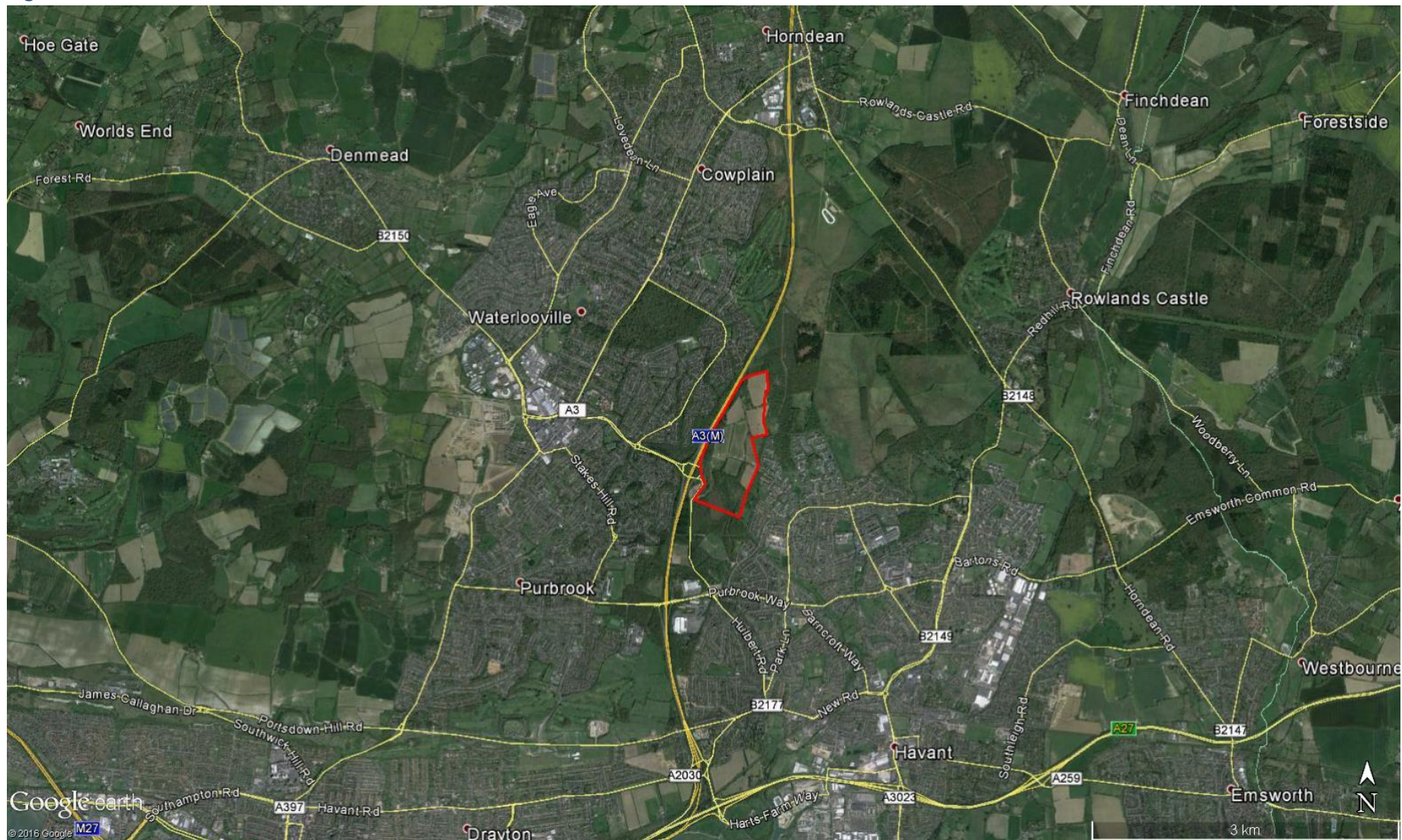
HMSO The Conservation of Habitats and Species Regulations 2017 (as amended).

HMSO The Countryside and Rights of Way Act 2000.

HMSO Wildlife and Countryside Act 1981 (as amended).

Appendix A. Figures

Figure A-1: Scheme Location



Dunsbury Hill Farm

Advanced Bat Surveys



27 May 2020

Figure A-2: Scheme Red Line Boundary

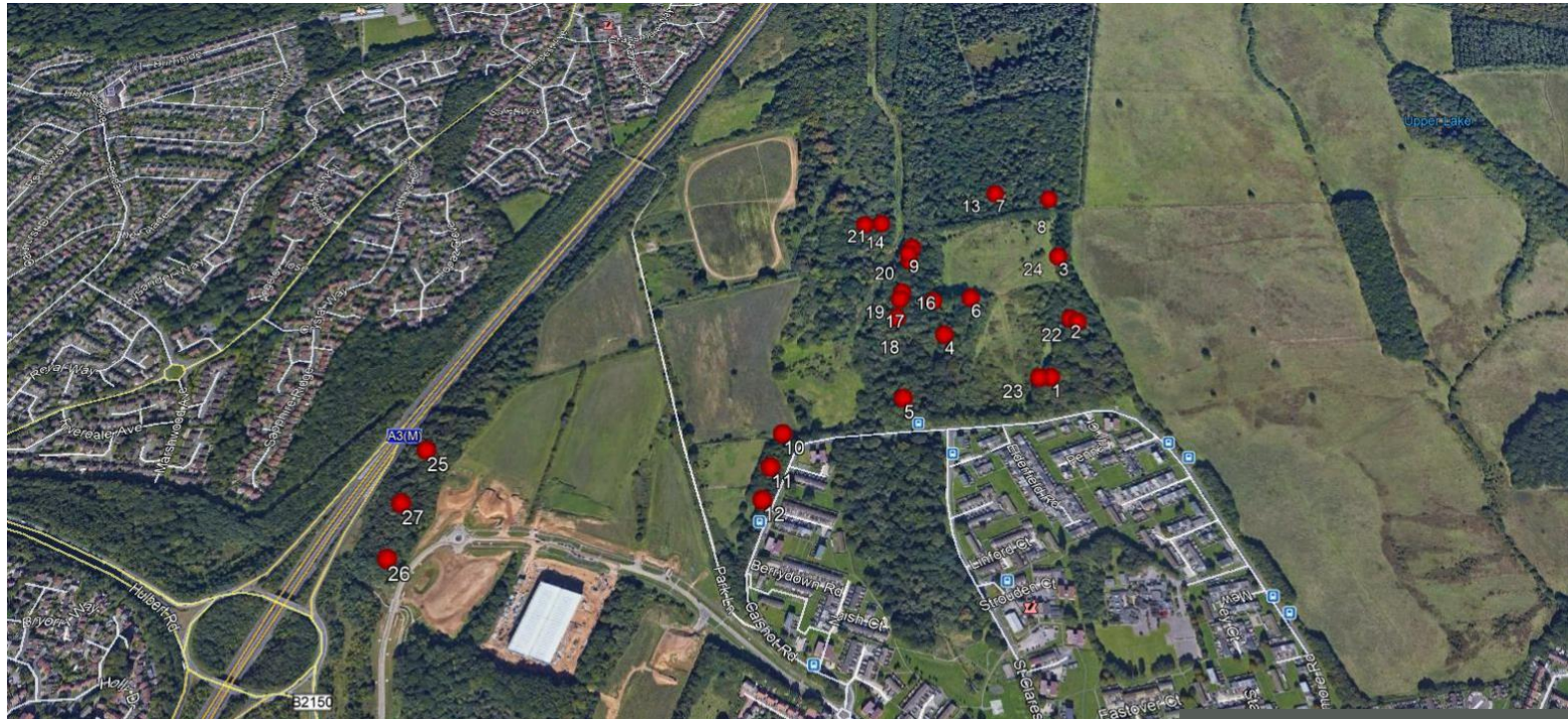


Figure A-3: Site Location - Plots 6 and 7

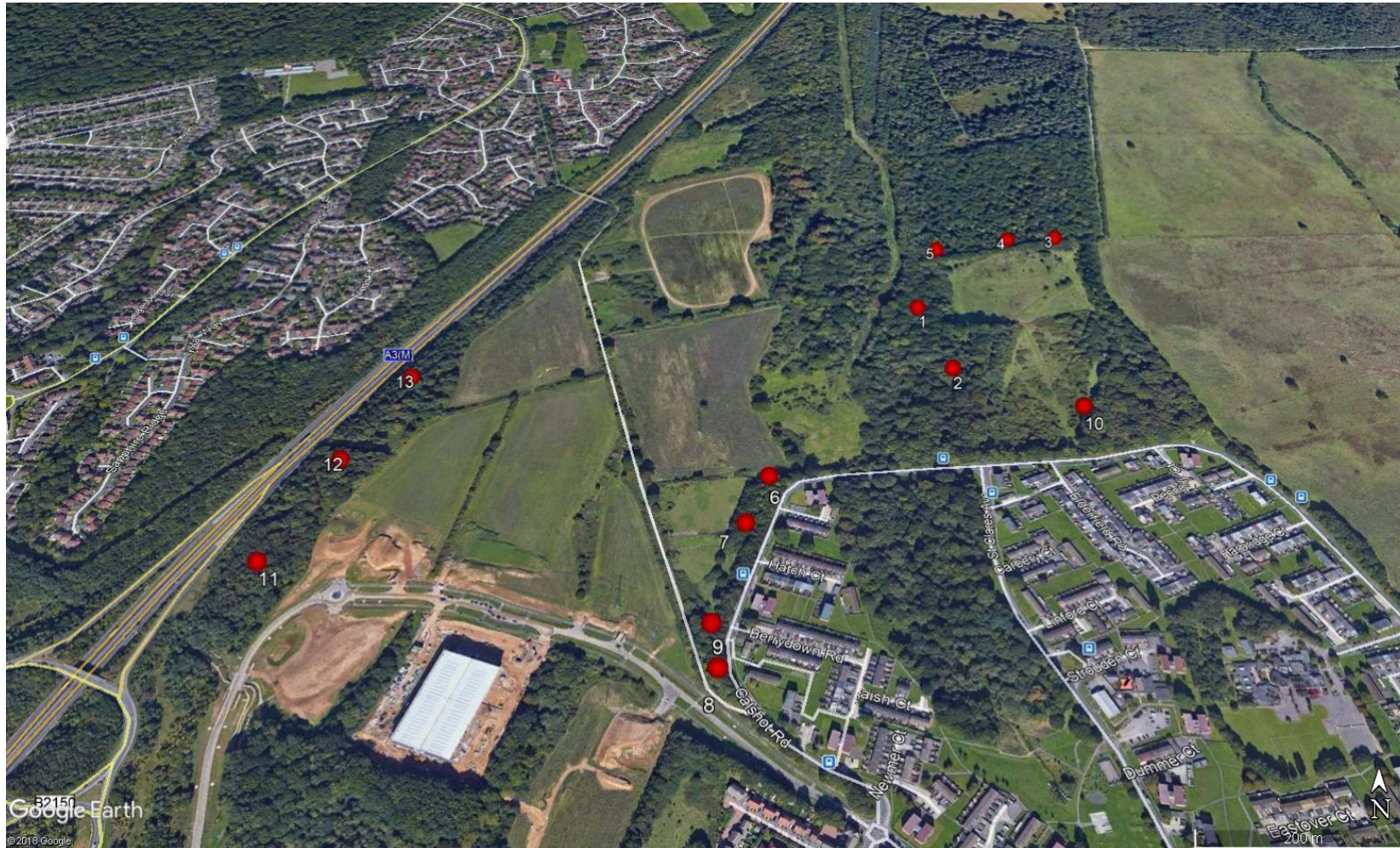


Figure A-4: Trapping Locations

Session 1



Session 2



Appendix B. Radiotracking Results

Figure B-1: Radiotracking Results

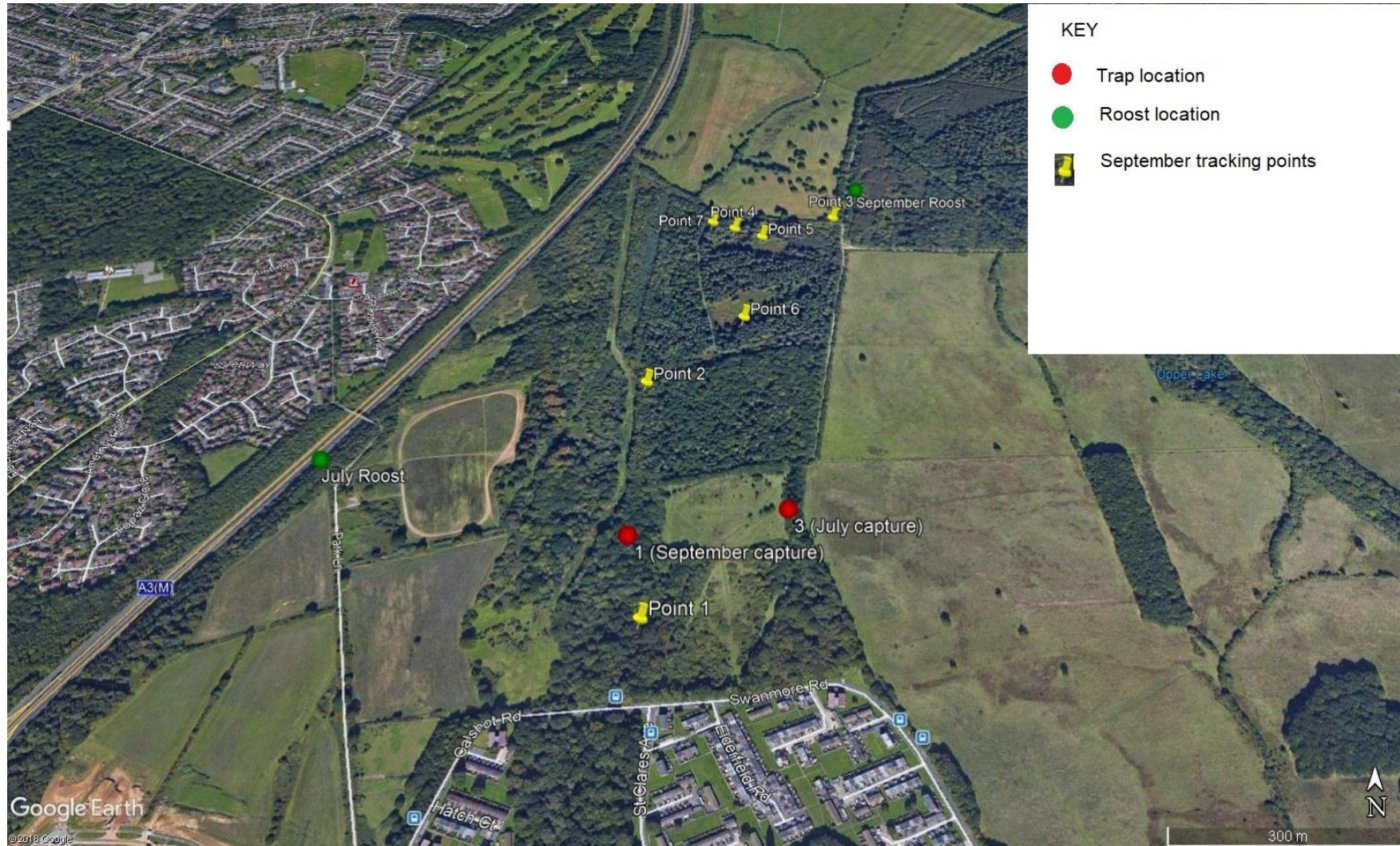


Table B-1: Trapping Survey Results

Date (at start)	Time	Species	Sex	Age (class)	Breeding status	Trap No.	Trap location	Weather	Sunset	Comments
Session 1 – JULY/AUGUST 2019										
29/07/2019	22:53	<i>Myotis mystacinus</i>	M	Adult		3	SU7072409676	Dry; Beaufort scale 2; 17°C; 4 oktas	20:54	
29/07/2019	23:25	<i>Pipistrellus pygmaeus</i>	M	Adult	Testes swollen	1	SU7069109431			
29/07/2019	23:33	<i>Myotis nattereri</i>	M	Adult		3	SU7072409676			Bat ref 240326 freq 5767
29/07/2019	0:35	<i>Plecotus auritus</i>	F	Adult	Post-lactating	1	SU7069109431			
29/07/2019	1:15	<i>Myotis nattereri</i>	M	Juvenile		1	SU7069109431			
29/07/2019		Nil captures				2	SU7073209547			
29/07/2019	0:20	<i>Pipistrellus pipistrellus</i>	M	Adult		4	SU7052809512			
29/07/2019		Nil captures				5	SU7045909388			
29/07/2019		Nil captures				6	SU7057409587			
30/07/2019	22:36	<i>Myotis nattereri</i>	M	Adult		7	SU7062809814		20:53	

Date (at start)	Time	Species	Sex	Age (class)	Breeding status	Trap No.	Trap location	Weather	Sunset	Comments
30/07/2019	23:11	<i>Plecotus auritus</i>	M	Juvenile		8	SU7071909803	Dry initially with heavy rain from 00:30; Beaufort scale 5-6; 16°C; 4-8 oktas		
30/07/2019		<i>Nil captures</i>				9	SU7047609679			
30/07/2019		<i>Nil captures</i>				10	SU7027309320			
30/07/2019		<i>Nil captures</i>				11	SU7025609260			
30/07/2019		<i>Nil captures</i>				12	SU7024509203			
31/07/2019	0:29	<i>Plecotus auritus</i>	F	Adult	Post-lactating	13	SU7062809814	Dry; Beaufort scale 2; 18°C; 0 oktas	20:51	
31/07/2019		<i>Nil captures</i>				14	SU7040409741			
31/07/2019	0:19	<i>Myotis mystacinus</i>	M	Adult		15	SU7048209692			
31/07/2019	22:32	<i>Pipistrellus pipistrellus</i>	F	Juvenile	Nulliparous (never given birth)	16	SU7051309580			
31/07/2019	0:14	<i>Pipistrellus pipistrellus</i>	M	Adult		17	SU7046309597			
31/07/2019		<i>Nil captures</i>				18	SU7045309545			
1/08/2019	0:22	<i>Plecotus auritus</i>	M	Adult		19	SU7045909583	Dry; Beaufort	20:50	

Date (at start)	Time	Species	Sex	Age (class)	Breeding status	Trap No.	Trap location	Weather	Sunset	Comments
1/08/2019	0:58	<i>Plecotus auritus</i>	F	Adult	Nonparous (not given birth)	20(net)	SU7047709664	scale 2; 18°C; 2 oktas		
1/08/2019		<i>Nil captures</i>				21	SU7043209744			
2/08/2019	0:40	<i>Plecotus auritus</i>	M	Adult		22	SU7074309541	Dry; Beaufort	20:48	
2/08/2019		<i>Nil captures</i>				23	SU7067309430	scale 2; 19°C; 2 oktas		
2/08/2019		<i>Nil captures</i>				24	SU7072409676			
2/08/2019	22:28	<i>Myotis nattereri</i>	M	Adult		25	SU6973409283			
2/08/2019	22:31	<i>Plecotus auritus</i>	M	Adult		25	SU6973409283			
2/08/2019		<i>Nil captures</i>				26	SU6970609097			
2/08/2019		<i>Nil captures</i>				27	SU6971109190			
SESSION 2 - SEPTEMBER 2019										

Date (at start)	Time	Species	Sex	Age (class)	Breeding status	Trap No.	Trap location	Weather	Sunset	Comments
22/09/2019	20:15	<i>Myotis nattereri</i>	M	Adult	Swollen testes (in breeding condition)	1	SU7048009621	Dry; Beaufort scale 2-3; 16°C; 2-3 otkas	19:03	Tag freq 173.288 Bat ref 241205
22/09/2019	23:20	<i>Myotis nattereri</i>	F	Adult	Post-lactating	1	SU7048009621			
22/09/2019		<i>Nil captures</i>				2	SU7051209500			
22/09/2019		<i>Nil captures</i>				3	SU7069409780			
22/09/2019	23:56	<i>Myotis nattereri</i>	F	Adult	Post-lactating	4	SU7062509775			
22/09/2019		<i>Nil captures</i>				5	SU7052009750			
23/09/2019		<i>Nil captures</i>				6	SU7027309310	Steady light rain; Beaufort scale 5 - 6; 16°C; 8 oktas	19:00	
23/09/2019		<i>Nil captures</i>				7	SU7024509238			
23/09/2019		<i>Nil captures</i>				8	SU7021509045			
23/09/2019		<i>Nil captures</i>				9	SU7020809100			
24/09/2019	21:35	<i>Myotis nattereri</i>	M	Adult	Swollen testes (in breeding condition)	10	SU7066609433	Persistent light rain to heavier showers; Beaufort scale 5-6;	18:57	
24/09/2019		<i>Nil captures</i>				11	SU6970809175			
24/09/2019		<i>Nil captures</i>				12	SU6976409330			

Date (at start)	Time	Species	Sex	Age (class)	Breeding status	Trap No.	Trap location	Weather	Sunset	Comments
24/09/2019		<i>Myotis nattereri</i>	F	Adult	Post-lactating	13	SU6982209474	16°C; 8 oktas		
24/09/2019		<i>Myotis nattereri</i>	F	Adult	Post-lactating	13	SU6982209474			

Photograph B-1: Tree Roost – adult male Natterer's bat (September 2019)



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