

LAND ADJOINING 4 BROOKFIELD PROVIDENCE PLACE BURSLEDON

ECOLOGICAL IMPACT ASSESSMENT (EcIA)



Vested Outsourcing
Partners

Written By:	LG
Checked By:	DW
Date:	08.09.2022
Document File Ref:	PRI23459 EcIA
Revision:	*
Date of last revision:	-
Revised by:	-

QUALITY ASSURANCE

- 1.1. This report has been prepared in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Report Writing (2nd Edition, December 2017).
- 1.2. The facts stated in this report are true to the best of our knowledge and belief, and any opinions expressed are held genuinely and in accordance with the accepted standards of the profession. ACD Environmental Ltd is a CIEEM Registered Practice.

Client:	Vested Outsourcing Partners
Site/job:	Land Adjoining 4 Brookfield, Providence Place, Bursledon
Author:	Lily Gilbert
Technical review:	Daniel Wood



CONTENTS

1	EXECUTIVE SUMMARY	1
2	INTRODUCTION	3
3	PLANNING POLICY AND LEGISLATION	8
4	METHODOLOGY	16
5	BASELINE ECOLOGICAL CONDITIONS	21
6	ASSESSMENT OF EFFECTS AND MITIGATION MEASURES	42
7	COMPENSATION	58
8	BIODIVERSITY NET GAIN	60
9	CONCLUSIONS	62

APPENDIX 1: 2022 HABITAT PLAN

APPENDIX 2: BIODIVERSITY NET GAIN PLAN

APPENDIX 3: 2022 SITE PHOTOGRAPHS

APPENDIX 4: FIELD SURVEY METHODOLOGY

1 EXECUTIVE SUMMARY

Purpose of report	To assess the ecological impacts of a proposed development at Land adjoining 4 Brookfield, Providence Place, Bursledon clearly identifying any 'significant effects' on important ecological features (including designated sites or protected species) and detailing any mitigation and/or compensation measures required, and how these could be secured.
Description of proposed development	Full planning permission is being sought for demolition of the current buildings and construction of a Veterinary Practice and 16 residential buildings, with associated access, carparking, landscaping, and attenuation pond
Brief description of the Site	The proposed development site is predominantly dense scrub, other neutral grassland and modified grassland, with numerous dilapidated outbuildings and scattered trees. Mature tree lines form the Application Site boundaries and Badnam Creek runs along the northern boundary. The A27 (Providence Hill) forms the southern boundary and there is a new residential development to the immediate north.
Designated nature conservation sites	Windmill Fields Wood SINC lies approximately 10m to the north east of the Application Site. The Application Site falls within a Nutrient Impact Area due to its proximity to the designated sites in and around the Solent.
Key habitats	The most valuable habitats present within the Application Site comprise the perimeter tree lines, Badnam Creek, dense scrub and other neutral grassland.
Key species	- Numerous trees around the Application Site perimeter have suitable features for roosting bats although no roosts have been confirmed. The Application Site is used by low numbers of common species of commuting and foraging bats. - The boundary trees and scrub are likely to be used by nesting and foraging birds. - A low population of slow worm was recorded on-site in 2016.
Key impacts	0.65ha of dense scrub will be lost 0.25ha of other neutral grassland and 0.19ha of amenity grassland will be lost. - Four trees will be felled to facilitate the creation of the new access in the southern boundary tree line. Approximately 15 scattered trees will be felled, including one mature horse chestnut and two semi mature fruit trees in the east of the Application Site. - An increase in lighting has the potential to impact commuting and foraging bats. - Nutrient Budget Calculations have demonstrated that mitigation will be required to ensure the development achieves nutrient neutrality. - Habitats that support a small population of slow worm will be lost. - The proposals are delivering a -35.61% loss in habitat units, 18.36% gain in hedgerow units and no change in river units with the Biodiversity Metric 3.1.

Key Mitigation	• Retention and enhancement of a reptile receptor area on-site and a 30-day translocation and phased habitat clearance to move reptiles out of the development area. • Small stands of rhododendron and cherry laurel, both of which are invasive species, will be removed by a specialist contractor. • Scrub, trees and buildings will be cleared outside of the nesting bird season. • A sensitive lighting scheme will be required to avoid illuminating all mature trees/ lines of trees and proposed bat boxes. • Payments will be made to the Eastleigh Borough Council Nitrates offsetting scheme to mitigate for the likely significant effects on the Solent's designated sites.
Compensation	• Tree planting is proposed throughout the development, including native and fruit bearing species. • Areas of species rich, native mixed scrub are proposed within the development. • Integrated bird nest boxes for swift, swallow and small birds and bat boxes will be built into the proposed houses to replace lost nesting and roosting opportunities. • Offsite biodiversity offsetting will be required to compensate for the overall net loss in habitat units.
Enhancements	• Integrated bat and bird boxes will be built into the proposed houses. • Invertebrate boxes will be built into the proposed houses. • Pollinator friendly plants will make up the majority of the planting schedule. • A sedum green roof is proposed on the roof of the veterinary practice and native climbers will be trained up the proposed acoustic walls. • The landscape planting scheme will utilise night-flowering blossoms, highly fragrant species and pale coloured species that will enhance the Application Site for flying insects and therefore foraging bats. • Log piles will be created within the boundary habitats.
Conclusions	The proposed development will comply with Paragraphs 174 – 182 of the NPPF, and relevant policies relating to ecology and nature conservation within the Eastleigh Borough Local Plan.

2 INTRODUCTION

- 2.1. This report provides an assessment of the ecological effects of the proposed development of an area of land known as Land Adjoining 4 Brookfield, Providence Place, Bursledon hereafter referred to as the Application Site (see **Image 1**). The principal author of this report is Lily Gilbert MCIEEM. The client is Vested Outsourcing Partners.

Background

- 2.2. The Application Site is situated to the north of Providence Hill (A27) in a residential area. Bursledon Windmill and Conservation Area lies to the north and is separated from the Application Site by a new residential development. Badnam Creek runs along the northern boundary of the Application Site.
- 2.3. The Ordnance Survey Grid Reference for the centre of the Application Site is SU 48300 10634. The Application Site measures approximately 1.2 hectares comprising predominantly modified and other neutral grassland along with dense scrub and scattered trees. Several outbuildings, which have fallen into disuse, are present onsite. Mature tree lines run along the northern, eastern and southern boundaries of the Application Site.
- 2.4. A full planning application (Ref: F/22/93160) was submitted in May 2022 for demolition of the current buildings and erection of buildings within the Application Site including the construction of a Veterinary Practice and 16 residential buildings, with associated access, carparking, landscaping, and attenuation pond. The Application Site is allocated in the Eastleigh Local Plan for development. Following submission of the planning application, Eastleigh Borough Council commented on the application via an email dated 19th July 2022 and have requested the following further information and update surveys. The requested information has been included within this report and we confirm is based on up-to-date surveys where necessary/required.

“The recommendations in the Extended Phase 1 Habitat Survey report by Aven Ecology (October 2021) are sound and should be implemented. The presence of any protected species must be checked before determination.

To summarise, this includes:

- Updated bat emergence survey, static monitoring and activity transects, checking B6 and B7, as well as bat activity across the site;*
- Any trees scheduled to be removed to be checked for potential bat roost features;*

- *Vegetation removal to be done outside of bird nesting season or only after a check by a suitably qualified ecologist;*
- *An updated eDNA survey of pond 1, to be done between April and June, (next possible time would be in the 2023 season);*
- *An updated reptile mitigation strategy;*
- *An update badger survey in the winter months and just prior to commencement of works;*
- *An updated evaluation of the most recent dormouse presence records in the local area to determine whether it is likely for dormouse to be using the site (in conjunction with EBC ecology team);*
- *A method statement to avoid spreading invasive Rhododendron and cherry laurel.*

I can see that there is a planting list on the Landscape proposals plan, however the print is blurry and I cannot read it on this plan or on the plan in the DAS. Could I have this information in a pdf or a word document please?

Is there a planting scheme for the green roof on the veterinary surgery?

The reptile translocation site is located behind the veterinary surgery. How will this site be protected from use by pet cats and dogs, and kept for the benefit of reptiles?

Any closed board fencing should have holes in the baseboards (13 x 13 cm minimum) to allow free passage of small animals through the gardens.

What is the proposed SINC buffer? It needs to be shown on the site plan.

SuDS

The measurements on the attenuation basin are given as m, which usually means metres. The basin sections drawing lists the top water level as 35.37 m, which cannot be correct.

What is the actual slope of the sides of the attenuation basin? The south and western sides look very steep and look like they would be a hazard to people and animals. What is the planting plan for the attenuation basin?

How is the 2 part swale proposed to work? Unless I am mistaken, this looks like the water flow would split and either go one way or the other, then come back together, so this would be one

treatment method not two as stated in the Flood Risk Assessment and drainage strategy document.”

Previous Ecology Surveys

- 2.5. An update Extended Phase 1 Habitat Survey was undertaken by Aven Ecology in March 2021 and the results presented in an Extended Phase 1 Habitat Survey Report¹, which was submitted to the council as part of the planning application.
- 2.6. Aven Ecology previously undertook ecological surveys at the Application Site during 2016/2017 in relation to different development proposals by another developer (Outline Planning Application Ref.: O/17/80899: granted by Eastleigh Borough Council (EBC) in July 2018 but withdrawn by the developer in October 2020). These surveys found:
- Suitable terrestrial habitat within the Application Site for great crested newt, as well as a suitable pond for great crested newt breeding within 250m of the Application Site, but found no evidence to confirm presence of great crested newt;
 - A small population of slow worms within the western half of the Application Site;
 - Suitable bat roosting habitat within the outbuildings and boundary trees;
 - Foraging/commuting activity by at least six species of bat;
 - Evidence of a common pipistrelle possibly roosting within one of the southern boundary trees; and
 - Small stands of non-native invasive species (Rhododendron sp. and cherry laurel).

¹ Aven Ecology (2021) *Extended Phase 1 Habitat Survey Report – Land adjoining 4 Brookfield, Providence Hill, Bursledon, Hampshire*



Image 1: Application Site location and approximate site boundary shown in red. Map data (2017): Google. Imagery (2017): Getmapping plc.

Competence

- 2.7. This report has been written by Lily Gilbert, ACD Environmental Ltd. Lily is a Principal Ecologist and has over nine years' experience working for commercial consultancy and specialises in European Protected Species (EPS) legislation and mitigation. Lily is a Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM) and holds licences for barn owl, bats, hazel dormouse and great crested newt.
- 2.8. A Technical Review of this report has been undertaken in line with ACD Environmental Ltd's Quality Assurance procedures. The Technical Review was undertaken by Daniel Wood. Daniel is the Director of Ecology and has 14 years' experience working for commercial consultancy and specialises in European Protected Species (EPS) legislation and mitigation, holding licences for barn owl, bats, hazel dormouse, and great crested newt. He is a Registered Consultant on the badger and bat mitigation class licences. He is qualified in MoRPH5 River Condition Assessment. He has significant experience of EcIA and has acted as Expert Witness at Public Inquiry. He is a Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM).

Purpose of the report

- 2.9. The purpose of this Ecological Impact Assessment (EcIA) is as follows:

- To identify and describe all potentially significant ecological effects associated with the proposed development.
- To set out the mitigation measures required to ensure compliance with nature conservation legislation and relevant planning policy, and to address any potentially significant ecological effects.
- To identify how mitigation measures will/could be secured.
- To identify any significant residual ecological effects and set out any compensation measures proposed to address these.
- To identify appropriate enhancement measures in order to achieve Biodiversity Net Gain.
- To set out the requirements for post-construction monitoring.

3 PLANNING POLICY AND LEGISLATION

Legislation

3.1. The following pieces of legislation are of specific relevance to this assessment:

- The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019². This piece of legislation is of relevance because the Application Site falls within the Zone of Influence of a number of SSSI's and is within the Nutrient Impact Area for the statutory designated sites in and around the Solent, which are designated under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.
- Wildlife and Countryside Act 1981³ (as amended, including by the Countryside and Rights of Way Act 2000). This piece of legislation is relevant because the Application Site supports nesting birds.
- Natural Environment and Rural Communities (NERC) Act 2006⁴. Section 41 includes lists of habitats and species recognised as of 'principal importance' for the conservation of biodiversity. Section 40 of the NERC Act 2006 requires all public bodies to have regard for biodiversity conservation when carrying out their function. This is commonly referred to as the 'biodiversity duty'.
- Hedgerows Regulations 1997.

3.2. The following pieces of legislation have been considered, but are not considered to be of specific relevance in this case:

- Protection of Badgers Act 1992 (no badger setts are present within the Application Site or sufficiently close to be affected).

² Great Britain. *The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019* No.579 [online]. Available from: <https://www.legislation.gov.uk/ukdsi/2019/9780111179512/contents>

³ Great Britain. *Wildlife and Countryside Act 1981* [online]. Available from: <http://www.legislation.gov.uk/ukpga/1981/69/contents>

⁴ Great Britain. *Natural Environment and Rural Communities Act 2006* [online]. Available from: <http://www.legislation.gov.uk/ukpga/2006/16/contents>

Planning policy

National Planning Policy Framework 2021⁵

3.1. Paragraph 180 of the NPPF states that when determining planning applications, local planning authorities should apply the following principles:

- If significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused
- 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
- Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists
- Development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

Eastleigh Borough Local Plan⁶

3.2. The Eastleigh Borough Local Plan was adopted in April 2022. Strategic policies of relevance to the proposals at the Application Site are as follows:

- Policy S9 – Green Infrastructure

⁵ Great Britain. *National Planning Policy Framework (2021)*. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework-2>

⁶ <https://www.eastleigh.gov.uk/media/11234/eastleigh-borough-local-plan.pdf>

“Through new development and other initiatives the Borough Council will seek to achieve the provision, retention and/or enhancement of the following forms of multifunctional green infrastructure, including provision of:

a. landscape scale strategic links across the Borough boundary, to and between the Borough’s settlements, the countryside, the coast, and the major areas of open space including the country parks (see strategic policy S12);

b. interlinked publicly accessible open space through new and existing development including for example formal sports facilities and informal amenity spaces and cemeteries (see policies DM32-DM34, Chapter 5 and detailed proposals in Chapter 6);

c. green infrastructure incorporated into all new development with multifunctional spaces connected by primary, secondary and tertiary green links;

d. interconnected urban green infrastructure within the fine grain of existing and new development including green, cycle ways, paths and linkages between community facilities and open spaces to link community facilities; e. green stepping stones such as street trees, green roofs and walls, pocket parks and urban copses (see policy DM1, Chapter 5);

f. connected habitats linking the network of designated sites and existing priority habitats, taking account of the Hampshire ecological network map (see policy DM11, Chapter 5);

g. incorporation of historic buildings and landscapes, including historic parks and gardens within the wider Green Infrastructure to protect their setting (see policy DM12, Chapter 5); and

h. opportunities for local food growing including allotments, community orchards and farms (see policies DM32 to DM34, Chapter 5 and detailed proposals in Chapter 6).”

- *Policy S5 - New development in the countryside*

“..a. avoid adverse impacts on the rural, woodland, riparian or coastal character, the intrinsic character of the landscape including the avoidance of adverse landscape impacts on areas adjoining national parks and their settings, the significance of heritage assets and on the biodiversity of the area

b. secure long-term beneficial management practices that will enhance the landscape and biodiversity of the countryside and coast;...”

- *Policy DM1*

“All new development should (as relevant):

a. not have an unacceptable impact on, and where possible should enhance:

i. residential amenities of both new and existing residents; the character and appearance of urban areas, the countryside and the coast;

ii. biodiversity (avoiding significant adverse impacts); and

iii. the significance of heritage assets;

... d. not involve the loss of or damage to trees, woodlands, hedgerows, ponds, priority habitats or other landscape features of value to the character of the area, for appearance or biodiversity unless they can be replaced with features of equivalent or enhanced value, (recognising that some species and habitats may be irreplaceable)...”

- Policy DM11 - Nature conservation

“The Council will work with statutory and voluntary agencies and developers, and will determine planning applications, to:

a. protect, conserve and enhance all:

i. international, national and local nature conservation designations; and

ii. networks of natural habitats and features, including the Local Ecological Network, Priority Biodiversity Areas and Priority Biodiversity Links, watercourses, wetland complexes, woodland trees, and trees and hedgerows important to biodiversity and local character; and facilitate their adaptation to climate change wherever possible;

b. assist in achieving national, county and local biodiversity targets as set out in Biodiversity Action Plans (BAPs);

c. seek a net gain of biodiversity on all development sites (including sites for redevelopment) through the protection, enhancement and connection of existing and provision of new habitats and features of nature conservation interest compatible with the native biodiversity characteristics of the Borough, having regard to local geodiversity and soils; and

d. contribute to major elements of the PfSH Green Infrastructure Strategy and other strategies for the provision and enhancement of multifunctional green infrastructure including green routes,

ecological networks and biodiversity enhancements (see strategic policy S9).

International Designations

2. Development which is likely (either individually or in combination with other developments) to adversely affect the integrity of an international or European nature conservation site will not be permitted subject only to imperative reasons of overriding public interest and securing any necessary compensatory measures in the absence of alternative solutions. A 'project level' Habitat Regulations Assessment will be required where there are likely significant effects or uncertainty. Any mitigation measures required to ensure no adverse impact must be implemented at the appropriate time.

3. The Council will work with PfSH, Natural England, the Environment Agency and other wildlife organisations to develop and implement with developers a strategic approach to the protection and enhancement of international and European sites from the direct and indirect effects of development. Within Eastleigh Borough this will include:

a. implementing:

i. the Solent Recreation Mitigation Strategy (requiring contributions from residential developments within 5.6 kilometres of the Solent Special Protection Area to the Strategy); and

ii. the interim and any future New Forest Recreation Mitigation Strategy if required; or alternative agreed site specific measures to address recreational disturbance;

b. preserving the water quality and flows within the Itchen and Hamble, Southampton Water and Solent;

c. protecting the River Itchen SAC, in particular the maintenance and where appropriate restoration of habitats and qualifying species to favourable conservation status (as defined by article 1 of the Habitats Directive); and

d. seek contributions towards measures set out in the Southern Damselfly Conservation Strategy (or other strategy) specifically to deliver biodiversity net gain. National and Local Designations

4. Development will not be permitted if it is likely (either individually or in combination with other developments) to have a direct or indirect adverse effect on a Site of Special Scientific Interest (SSSI), Site of Importance for Nature Conservation (SINC) or Local Nature Reserve (LNR) as shown on the policies map (or on a more recent plan provided by the Hampshire Biodiversity Information

Centre) unless it can be demonstrated that:

- a. there are no alternative solutions;*
- b. the adverse effects are unavoidable;*
- c. measures are taken to mitigate or, as a last resort, compensate for the adverse effects;*
- d. there is an overall biodiversity net gain; and*
- e. if there are any residual adverse effects which cannot be avoided, mitigated or compensated, the benefits of the development must clearly outweigh the adverse effects on the nature conservation value of the site and any broader impacts on national and local designations. Priority habitats, protected and priority species and the local ecological network.*

5. Development will not be permitted if it is likely (either individually or in combination with other developments) to have a direct or indirect adverse effect on priority habitats, protected or priority species, or on the local ecological network unless it can be demonstrated that:

- a. there are no alternative solutions;*
- b. the adverse effects are unavoidable;*
- c. measures are taken to mitigate or, as a last resort, compensate for the adverse effects;*
- d. there is an overall biodiversity net gain; and e. if there are any residual adverse effects, the benefits of the development clearly outweigh the adverse effects on priority habitats, priority and protected species, and the local ecological network.*
Irreplaceable habitats

6. Development will not be permitted if it results in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees), unless there are wholly exceptional reasons and a suitable compensation strategy exists.

Buffers

7. Buffers free from development will be provided to designated sites to avoid/mitigate impacts, including recreational impact and impacts on edge habitats, and to maintain dark skies.

Surveys

8. *Development will not be permitted unless it can be demonstrated that:*

- a. there have been thorough habitat and species surveys;*
- b. the great crested newt strategic survey and strategy have been considered in all developments within 500m of a great crested newt pond; and*
- c. the strategic bat trapping survey has been considered in all developments within the locality of a woodland or connected habitat networks.”*

3.3. The Application Site has been allocated for housing in the Eastleigh Borough Local Plan. The policy is as follows:

“Policy BU1, Land north of Providence Hill

1. An area of 1.1 hectare on the north side of Providence Hill is allocated for residential development of approximately 19 dwellings. Planning permission will be granted provided that detailed proposals accord with the development plan and meet the following specific development requirements:

- a. noise and air quality assessments are undertaken to confirm that the site can be developed satisfactorily for residential purposes given the proximity to A27;*
- b. hydrological surveys are undertaken to identify the extent of the headwater system on site and the hydrological routes that feed the headwater and provide chemical and water quality testing to act as a baseline to monitor impact;*
- c. the development incorporates measures to safeguard the adjoining stream and Windmill Woods Site of Importance for Nature Conservation (SINC) with 20m undeveloped buffers;*
- d. to preserve water quality and flows into the unnamed watercourse to the north of the site details of Sustainable Urban Drainage shall be provided in accordance with policy DM6 as part of any application for outline or full planning permission;*
- e. ensure avoidance or mitigation of direct and indirect adverse impacts on habitats or species protected by legislation or identified as of principal importance within the NERC Act 2006 S41 lists and that there is a net gain in biodiversity;*
- f. the development provides a high quality landscaped setting which preserves or enhances the special interest, character and appearance of the adjoining Bursledon Windmill Conservation Area and safeguards the setting of the listed windmill;*

g. a new vehicular and pedestrian access is provided from Providence Hill; and

h. occupation of the development is phased to align with the delivery of any necessary wastewater network reinforcement, in liaison with the service provider.”

Supplementary Planning Documents

3.4. Supplementary planning documents that have been reviewed as part of this Ecological Impact Assessment include:

- Eastleigh Borough Council Biodiversity Action Plan 2012 – 2022⁷;
- Eastleigh Borough Council Biodiversity SPD⁸; and
- Partnership/Hampshire Biodiversity Information Centre Hampshire Biodiversity Action Plan Biodiversity Opportunity Areas⁹.

⁷ <https://www.eastleigh.gov.uk/media/4121/biodiversity-action-plan-2012-22.pdf>

⁸ <https://www.eastleigh.gov.uk/media/2392/biodiversity.pdf>

⁹ https://documents.hants.gov.uk/biodiversity/HampshireBiodiversityActionPlanVolume2.pdf?_gl=1*lb0ny9*_ga*MTc2MDE5MDk2OS4xNjU5NjExNTU1*_ga_8ZVSPZWL5T*MTY1OTYxMTYwNy4xLjAuMTY1OTYxMTYwNy4w

4 METHODOLOGY

Scope of assessment

- 4.1. The EcIA focuses on 'important ecological features', i.e. those which are considered to be of relevance to the decision-making process and could be affected by the proposed development. Important ecological features include protected species, habitats/species of 'principal importance' for biodiversity conservation (i.e. Section 41 habitats/species¹⁰), birds of conservation concern¹¹, invasive non-native plant species¹², and habitats and species identified as priorities for conservation in the Hampshire/ Eastleigh Borough Council Biodiversity Action Plan¹³¹⁴.

Zone of influence

- 4.2. The 'zone of influence' (ZOI) is the area over which important ecological features (on-site or off-site) may be affected as a result of the proposed development and associated activities. The ZOI can vary for different ecological features, depending on their sensitivity to environmental change.
- 4.3. The ZOI for statutory designated sites has been informed by Natural England's Sites of Special Scientific Interest (SSSIs) Impact Risk Zones¹⁵ (IRZs). IRZs define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts. This has been determined as part of the desk study, as discussed below.

Desk Study

- 4.4. An update data search was requested from Hampshire Biodiversity Information Centre in August 2022 to inform this impact assessment.
- 4.5. The MAGIC website¹⁶ was used in August 2022 to carry out a 5km data search for nearby

¹⁰ Section 41 (41) of the Natural Environment and Rural Communities (NERC) Act, which came into force on 1st October 2006, requires the Secretary of State to publish a list of habitats and species which are of principle importance for the conservation of biodiversity in England.

¹¹ Red list species are those that are globally threatened, whose population or range has declined rapidly in recent years (i.e. by more than 50% in 25 years), or which have declined historically and not recovered. Amber list species are those whose population or range has declined moderately in recent years (by more than 25% but less than 50% in 25 years), those whose population has declined historically but recovered recently, rare species (<300 breeding pairs or <900 wintering individuals), those with internationally important populations in the UK, those with localised populations, and those with an unfavourable conservation status in Europe. Species that meet none of these criteria are Green-listed.

¹² Invasive non-native plants (Section 14) on Schedule 9 of the Wildlife & Countryside Act 1981 (as amended).

¹³ https://www.gosport.gov.uk/media/1357/LP-E2-4-The-Hampshire-Biodiversity-Action-Plan-Vol-2-Hampshire-Biodiversity-Partnership-July-2000/pdf/LP_E2_4_Hampshire_Biodiversity_Action_Plan_Vol_2.pdf?m=636975888121070000

¹⁴ <https://www.eastleigh.gov.uk/media/4121/biodiversity-action-plan-2012-22.pdf>

¹⁵ Natural England (June 2019). Natural England's Impact Risk Zones for Sites of Special Scientific Interest (For use by Local Planning Authorities to assess planning applications for likely impacts on SSSIs/SACs/SPAs & Ramsar sites and determine when to consult Natural England).

¹⁶ Multi Agency Geographic Information for the Countryside [online]. Available at: <https://magic.defra.gov.uk/>

granted EPS licences, and statutory designated sites including SSSIs, Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) with an Impact Risk Zone (IRZ) that overlaps with the Application Site.

2022 Field surveys

- 4.6. A summary of update ecological field surveys carried out in 2022 is provided in **Table 1**. Descriptions of full survey methods are provided in **Appendix 4**.

Table 1: Field surveys

Survey	Surveyor/s	Survey date/s	Study Area	Relevant guidelines
Bats - Preliminary Roost Assessment of trees(PRA)	Lily Gilbert MCIEEM Katie Crawford	21/06/2022	All trees scheduled to be removed.	Collins (2016)
Bat emergence/ dawn re-entry survey	Lily Gilbert MCIEEM Katie Crawford Anouska Laramy	21/06/2022 & 22/06/2022	Buildings 6 and 7 and horse chestnut (Tree 1) scheduled to be removed	Collins (2016)
Bat transect survey	Ryan Yeates ACIEEM	21/06/2022 & 22/06/2022	Accessible areas of red line boundary	Collins (2016)
Update Great crested newt - Habitat Suitability Index (HSI) Assessment	Ryan Yeates ACIEEM Anouska Laramy	21/06/2022	Bursledon Windmill pond	HSI Scoring System ¹⁷
Great crested newt eDNA sampling	Ryan Yeates ACIEEM Anouska Laramy	21/06/2022	Bursledon Windmill pond	Biggs (2014) ¹⁸
Update botanical assessment of grassland	Dominic Price	29/06/2022	Grassland in east of Application Site	
MORPH5 River Condition Assessment Survey	Daniel Wood MCIEEM	08/08/2022	Badnam Creek and watercourse corridor	

¹⁷ Available at: <http://www.arguk.org/download-document/9-great-crested-newt-habitat-suitability-index-arg-advice-note-5>

¹⁸ Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.

Limitations

- 4.7. An update Extended Phase 1 Habitat Survey was not carried out in 2022 as the most recent update Extended Phase 1 Habitat Survey carried out by Aven Ecology in March 2021 is still considered in date. A walkover of all accessible areas of the Application Site was carried out on 21st June 2022 to update the baseline, record any change to the condition of the habitats on-site and any evidence of protected species.
- 4.8. The scrub in the west of the Application Site was dense and largely impenetrable in June 2022, therefore this part of the Application Site was not surveyed in detail in 2022. Providing an update survey for badger is carried out in the winter pre-commencement, this is not considered to pose a significant constraint to this impact assessment.

Biodiversity Metric 3.1

- 4.9. The Biodiversity Metric 3.1 was used to demonstrate how the development will deliver a net gain for biodiversity. A detailed methodology is provided within Appendix 4 of this report.

Assessment methodology

- 4.10. The habitats and species evaluations and likely effects are made with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment¹⁹.
- 4.11. The importance of ecological features has been assessed by carrying out a suite of specialist surveys (**Table 1**) to determine whether protected species/habitats, and/or species/habitats of conservation concern are present in the Application Site or its ZOI, then comparing their status at the international/national/county/regional/local scale, through the use of available contextual information, to establish the importance of those features in a geographical context.
- 4.12. The overall effect of the proposed development on a given feature has been predicted, considering the baseline data collected through desk study and field survey, and the various impacts expected to occur. An assessment has then been made as to whether the effect on each important ecological feature is likely to be significant or not.
- 4.13. Significance is the weight that should be attached to effects when decisions are made. For the purpose of EclA, a likely significant effect is an effect that either supports or undermines biodiversity conservation objectives for important ecological features (which could be species populations/groups of species, habitats, or a designated site), or for biodiversity in general.

¹⁹ CIEEM (2019). Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater and Coastal, Version 1.1. updated September 2019. Chartered Institute of Ecology and Environmental Management, Winchester.

Effects have been considered significant at a wide range of scales, from national to local.

- 4.14. A sequential process has been adopted to avoid/mitigate, and if required, compensate for significant negative ecological effects. This is referred to as the 'Mitigation Hierarchy'. Avoidance includes measures to change the design of the proposed development to avoid an impact occurring. Mitigation includes measures to avoid or reduce the negative impacts of the proposed development. Compensation addresses significant negative residual effects (those likely to occur after avoidance and mitigation have been considered). It is this objective of compensation, and not its location, that distinguishes compensation from 'mitigation'.
- 4.15. In EclA, it is only essential to assess and report significant residual effects that remain after mitigation measures have been taken into account. However, the potential significant effects without mitigation as well as the residual significant effects following mitigation have been presented where the mitigation proposed is experimental, unproven or controversial and/or to demonstrate the importance of securing the measures proposed through planning conditions or obligations.

Valuation

- 4.16. The value of important ecological features (sites, habitats and species) is assigned according to their scale of importance using the following terms:
- International importance – ecological features of international importance such as SPAs and SACs, and/or sites that support internationally-important populations of species.
 - National importance – ecological features of national importance such as SSSIs, features which meet the criteria for designation as a SSSI, and/or sites that support nationally-important populations of certain species.
 - Regional importance – ecological features of regional importance, such as a species population that is of importance at a scale greater than the County, but does not meet the criteria for National Importance
 - County importance – ecological features of county-scale importance, including features that have been designated as local wildlife sites, or meet the criteria for designation as a local wildlife site, and/or county-important populations of species
 - Local importance – ecological features of local importance, including habitats

or species populations listed as being of nature conservation importance (e.g. S41, local BAP, or listed in local planning policy) which are not considered to be of County importance by virtue of the quality, size/number, rarity, the extent to which they are threatened throughout their range, or to their rate of decline.

Precautionary principle

- 4.17. The evaluation of significant effects is based on the results of the ecological surveys carried out in the Application Site and other available evidence. In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant effect, a significant effect is assumed. Where uncertainty exists, it has been duly acknowledged.

5 BASELINE ECOLOGICAL CONDITIONS

Context

- 5.1. The Application Site is situated to the north of Providence Hill (A27) in a residential area with Bursledon Windmill and Conservation area to the north. Badnam Creek runs along the northern boundary of the Application Site.

Statutory Designated Sites

- 5.2. Statutory designated sites are the most significant ecological receptors and include Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and RAMSAR sites, which are all of **International Value**, and Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs), which are of **National Value**.
- 5.3. Local Nature Reserves (LNRs) are notified under Section 21 of the National parks and Access to the Countryside Act 1949 (as amended) by local authorities and are of **Local Value**. They are intended for public appreciation and enjoyment of wildlife. The LNR designation does not afford special protection; however, LNRs are protected under legislation and planning policy.
- 5.4. Statutory designated sites of relevance to the Application Site are shown in **Table 2**.

Table 2: Statutory designated sites of relevance to the Application Site.

Name of statutory designated sites	Approximate distance and direction from Application Site	Reason for designation
Netley Common LNR	900m north	Southampton's last remaining piece of open heathland including grassland with islands of scrub surrounded by a mixed woodland fringe. Heathland is particularly rare and remnant fragments of heathland are of national biodiversity importance and are host to a variety of wildlife.
Manor Farm LNR	950m north east	Abundant wildlife from roe deer <i>Capreolus capreolus</i> in the woods to curlews <i>Numenius arquata</i> along the river and skylarks <i>Alauda arvensis</i> in the fields, plus an amazing array of wildflowers, insects and reptiles.

Name of statutory designated sites	Approximate distance and direction from Application Site	Reason for designation
Upper Hamble Estuary and Woods SSSI	950m east	Comprises the uppermost section of the estuary of the River Hamble and its flanking zones of saltmarsh, reedswamp and ancient semi-natural woodland. Twelve types of ancient broad-leaved woodland occur in the SSSI and collectively comprise one of the most ecologically diverse woodland areas in central southern England. A few small areas of unimproved neutral grassland occur along the river. The gradation from ancient semi-natural woodland to estuarine saltmarsh is a nationally rare feature, there are also swamp and fen features.
Solent Maritime SAC	1.2km east	The Solent encompasses a major estuarine system on the south coast of England which comprises a number of Annex I habitats including sandbanks, mudflats and coastal lagoons. Desmoulin's whorl snail <i>Vertigo moulinsiana</i> an Annex II species is also present.
Solent and Southampton Water SPA	1.2km east	The Solent as a whole exceeds 90,000 waders annually and the mudflats, coastal lagoons, shingle and saltmarsh provide vital feeding and roosting grounds for these. The shingle banks also provide important breeding grounds for terns.
Hacketts Marsh LNR	1.4km south	The meadows are species-rich and support large hybrid heath spotted orchid populations <i>Dactylorhiza maculate</i> x. The reserve is of particular importance for a wide range of insects (some nationally rare), and forms an important feeding area and high-water roost for waders.
Solent and Dorset Coast SPA	1.6km south east	Designated for supporting breeding populations of sandwich tern <i>Sterna sandvicensis</i> , common tern <i>Sterna hirundo</i> and little tern <i>Sternula albifrons</i> .

Name of statutory designated sites	Approximate distance and direction from Application Site	Reason for designation
Lincegrove and Hackett's Marshes SSSI	1.6km south	One of the best examples of saltmarshes on the south coast. It is dominated by sea purslane <i>Halimione portulacoides</i> and common cordgrass <i>Sporobolus anglicus</i> , with other flora including sea lavender <i>Limonium vulgare</i> , thrift <i>Armeria maritima</i> , sea aster <i>Tripolium pannonicum</i> and sea clubrush <i>Bolboschoenus maritimus</i> .
Solent and Southampton Water RAMSAR	1.7km south	The site is comprised of estuaries and adjacent coastal habitats including intertidal flats, saline lagoons, shingle beaches, reefs, saltmarsh, and reedbeds, damp woodland, and grazing marsh. It supports internationally important numbers of wintering waterfowl (51,361 over the winter) including common ringed plover <i>Charadrius hiaticula</i> , Eurasian teal <i>Anas crecca</i> and dark bellied Brent geese <i>Branta bernicla bernicla</i> , important breeding gull and tern populations, and an impressive assemblage of rare invertebrates and plants.

- 5.5. The Application Site falls within a SSSI Impact Risk Zone (IRZ), which states that the Local Planning Authority (LPA) should consult Natural England for all residential planning applications of 500 units or more and for 100 or more houses outside of existing settlements/urban areas. As the Application Site is within an urban area, Natural England will not need to be consulted specifically on this matter.
- 5.6. The Application Site falls within a Solent Nutrient Impact Area, which means that for new development with overnight accommodation, Reg 63 of the Conservation of Habitats and Species Regulations 2017 must be applied. The LPA is to refer to Natural England's Solent Nutrient Neutrality Advice.
- 5.7. The Application Site is located approximately 1.2km from the Solent and Southampton Water SPA and the Solent Maritime SAC. The Application Site is situated within the River Hamble catchment (which ultimately drains to the Solent), therefore the drainage strategy for the

proposed development must ensure that there are no adverse effects on the ecological status of both the Hamble catchment and the SPA/SAC.

- 5.8. The Application Site is currently an open, undeveloped field and drains naturally. There is no apparent connection to a southern water public sewer. The Application Site does not currently produce any foul flows and there are no apparent connections to existing Southern Water sewers. There is a Southern Water foul water public sewer running in Providence Hill A27 to the south of the Application Site.
- 5.9. Information to inform an Appropriate Assessment has been included within Section 6 of this report to enable the LPA to carry out an Appropriate Assessment.

Non-statutory Designated Sites

- 5.10. In Hampshire, non-statutory sites are termed Sites of Importance for Nature Conservation (SINCS) and are of **County Value**.
- 5.11. SINCS within 2km of the Application Site are shown in **Table 3**.

Table 3: SINCS within 2km of the Application Site

SINC Name	Approximate distance and direction from Application Site	Qualifying Criteria
Windmill Fields Wood	10m north east	Other woodland where there is a significant element of ancient semi-natural woodland surviving or supporting some characteristics of ancient woodland
Oakleigh Meadow	300m north east	Semi-improved grasslands which retain a significant element of unimproved grassland
Windhover (Netley Common South)	800m north west	Heathland
Land North of Bridge Road	900m south east	Semi-improved grasslands which retain a significant element of unimproved grassland
Piland's Wood (Upper)	1km south	Ancient Semi-natural Woodlands and wet woodland
Peewit Hill	1km north	Heathland and black sedge <i>Schoenus nigricans</i>

SINC Name	Approximate distance and direction from Application Site	Qualifying Criteria
Durncomb's Copse	1km north east	Other woodland where there is a significant element of ancient semi-natural woodland surviving or supporting some characteristics of ancient woodland
Durncomb's Copse Meadow	1km north east	Semi-improved grasslands which retain a significant element of unimproved grassland
Netley Common, Hound	1km north west	Semi improved grassland, heathland, dens, flushes and seepages
Piland's Copse	1.1km north east	Ancient Semi-natural Woodlands
Sandpit Copse	1.2km north east	Ancient Semi-natural Woodlands/ other woodland
Priors Hill Brickworks	1.2km south west	Other woodland
Piland's Wood (Lower)	1.3km south	Ancient Semi-natural Woodlands
Brixedone Saltmarsh & Mudflat	1.3km south east	Semi-natural coastal and estuarine habitats (including saltmarsh, intertidal mudflats, sand dunes, brackish ponds, saline lagoons, inundation grasslands of the coastal plain, maritime cliffs and maritime grasslands Species present include purple glasswort <i>Salicornia ramosissima</i> , English scurvygrass <i>Cochlearia anglica</i> and marsh mallow <i>Althaea officinalis</i>
Netley Common, Southampton	1.3km north west	Semi-improved grasslands which retain a significant element of unimproved grassland, heathland, fens
Dumbleton's Copse	1.4km north west	Heathland

SINC Name	Approximate distance and direction from Application Site	Qualifying Criteria
River Hamble Mudflats & Saltmarsh - 3	1.4km south east	Semi-natural coastal and estuarine habitats
River Hamble Mudflats & Saltmarsh - 2	1.4km south east	Semi-natural coastal and estuarine habitats
Bursledon Meadow	1.5km south east	Agriculturally unimproved grasslands which are not of recent origin
Netley Hill Heath	1.5km north	Heathland
Mallards Moor	1.5km south	Ancient woodland and wet woodland
Burrows Copse (Remnant)	1.6km west	Ancient woodland and other woodland
Weston Greenway	1.7km west	Ancient woodland, other woodland and wet woodland
Priors Hill Copse/Hound Grove	1.7km south west	Ancient woodland
River Hamble Mudflats & Saltmarsh - 4	1.7km south east	Semi-natural coastal and estuarine habitats. Species present include sea wormwood <i>Seriphidium maritimum</i>
River Hamble Mudflats & Saltmarsh - 1	1.8km south east	Semi-natural coastal and estuarine habitats
Lower Swanwick Woodlands	1.8km south east	Ancient woodland and wet woodland
Andark Marsh	1.9km south east	
Kings Copse Meadow & Pond	1.9km north east	Semi improved grassland and fens

SINC Name	Approximate distance and direction from Application Site	Qualifying Criteria
Netley Farm Closed Landfill Site	1.9km west	Species present include annual beard grass <i>Polypogon monspeliensis</i> and narrow leaved birds foot trefoil <i>Lotus tenuis</i> .
Swanwick Wood	1.9km east	Ancient woodland
Badnum Copse	1.9km south	Ancient woodland, wet woodland and semi-natural coastal and estuarine habitats
Tanhouse Meadow	2km north east	Fens, flushes, seepages, springs and inundation grasslands of floodplains that support a flora and fauna of less-improved wet conditions
Swanwick Nature Reserve	2km east	Ancient woodland, other woodland and unimproved grassland, open freshwater and the following species long horned bee <i>Eucera longicornis</i> , great crested newt <i>Triturus cristatus</i> , white admiral <i>Limenitis camilla</i> , sallow guest weevil <i>Melanapion minimum</i> and purple emperor <i>Apatura iris</i>
Shoreburs Greenway	2km north west	Other woodland, wet woodland, semi improved grassland and the following species Weasels snout <i>Misopates orontium</i> , corn spurry <i>Spergula arvensis</i> , white letter hairstreak <i>Satyrrium w-album</i> , plicate sweet grass <i>Glyceria fluitans x notata</i>

- 5.12. The western half of the Application Site is shown on the Ecological Network Map as a core non-statutory network. This has been derived from numerous sources such as the Ancient Woodland Inventory, HBIC Broad Habitat Layer and HBIC Priority Habitat Layer. In this instance, it is likely that this is a result of part of the Application Site being mapped as mixed woodland.

Habitats

- 5.13. The habitats within the Application Site were assessed as part of the previous extended Phase 1 Habitat Survey and full descriptions are provided in the Avens Ecology Report. This report should be referenced for full descriptions of the habitats. A summary of the habitats and any changes noted during the 2022 surveys are provided below. Detailed condition assessments have been submitted for each habitat type alongside the Biodiversity Metric 3.1.

Buildings and hardstanding

- 5.14. There are 11 small outbuildings within the Application Site in various states of disrepair. The buildings are constructed from a range of materials, including wood, glass, corrugated asbestos sheets and polythene.
- 5.15. Spoil piles are present in the areas surrounding the buildings. These comprise brash, rubble and debris and are partially vegetated with coltsfoot *Tussilago farfara* and nettles *Urtica dioica*.
- 5.16. An area of hardstanding associated with the offsite residential properties to the south east is present in the south east corner the Application Site.

2022 Update

- 5.17. The condition of the buildings and hardstanding is similar to that reported in the Phase 1 Report. The buildings are of **negligible ecological importance in their own right**. Their potential for protected species is discussed in the Fauna section.

Modified grassland

- 5.18. An area of grassland in the east of the Application Site comprises mown amenity grassland. The sward is dominated by perennial ryegrass *Lolium perenne*, broadleaved dock *Rumex obtusifolius*, creeping buttercup *Ranunculus repens* and daisy *Bellis perennis*. There are areas of introduced shrub planting and trees within the improved grassland.

2022 Update

- 5.19. The area of mown grassland has decreased in size between 2021 and 2022. A larger area of grassland has been left unmown and is now categorised as poor semi improved grassland.
- 5.20. The improved grassland is assessed as being of negligible importance in its own right.

Other Neutral Grassland

- 5.21. An area of grassland in the centre of the Application Site has previously been recorded as semi improved grassland, supporting species such as perennial rye-grass, cocksfoot *Dactylis glomerata*, Yorkshire fog *Holcus lanatus*, creeping buttercup and daisy. A strip of the grassland is enclosed within a barbed wire and post fence. In addition to the species associated with the larger area of grassland this smaller patch included ruderal species, such as broadleaved dock *Rumex obtusifolia*, teasel *Dipsacus fullonum*, hogweed *Heracleum sphondylium* and nettle *Urtica dioica*.

2022 Update

- 5.22. To inform the Biodiversity Metric, an update assessment of the grassland was carried out on 29th June 2022 by Dominic Price FCMA MSc BSc of Ilex Ecology Ltd.
- 5.23. The grassland was found to be dominated by grasses, with Yorkshire fog forming the highest cover, and lesser amounts of common bent *Agrostis capillaris*, false oatgrass *Arrhenatherum elatius* and cock's-foot. There were several stands of sweet vernal-grass *Anthoxanthum odoratum*, and in these areas of shorter sward common bent reached high levels of coverage.
- 5.24. Some lesser stitchwort *Stellaria graminea* was recorded, but only in occasional patches, compared with large amounts of more mesotrophic forbs, dominated by white clover *Trifolium repens*, creeping buttercup, red clover *Trifolium pratense* and occasional clumps of meadow vetchling *Lathyrus pratensis*, cut-leaved crane's-bill *Geranium dissectum* and common cat's-ear *Hypochaeris radicata*.
- 5.25. Several clumps of corky-fruited water-dropwort *Oenanthe pimpinelloides*, which is typically associated with damper soils, was found. The high cover and tussocky formation of the Yorkshire fog, along with the presence of oak and horse chestnut saplings suggested that the grassland had not been managed for some time.
- 5.26. There is an undeniable presence of some acid grassland indicators on-site, but occurring at levels where they are largely subdominant to more mesotrophic species, in particular Yorkshire fog.
- 5.27. In addition the dense, tall sward, indicating elevated nutrient levels, suggest a more neutral and eutrophicated soil. On balance this area of grassland is therefore considered to not represent lowland acid grassland. For Phase 1 this would be considered as poor semi-improved grassland, and under UKHAB g3c Other neutral grassland. Due to the lack of management and high cover of Yorkshire fog there is no NVC community with a high

correspondence to this habitat.

- 5.28. The grassland is considered to be of **importance within the zone of influence**, which in this case is the Application Site.

Scattered trees/ Line of Trees

- 5.29. The northern, southern and eastern boundaries of the Application Site are lined with mature trees. Species along the eastern boundary include pedunculate oak *Quercus robur* and horse chestnut *Aesculus hippocastanum*, with an understorey of holly *Ilex aquifolium*, hawthorn *Crataegus monogyna*, cherry laurel *Prunus laurocerasus* and elder *Sambucus nigra*.
- 5.30. The eastern end of the northern boundary includes pedunculate oak, beech *Fagus sylvatica*, with occasional scots pine *Pinus nigra* and yew *Taxus baccata*; the understorey comprises holly, hawthorn, cherry laurel and elder (which included a defunct hedge); the western end of the northern boundary comprises silver birch *Betula pendula*, sycamore *Acer platanus* and willow *Salix sp.*, with the understorey including gorse *Ulex europaeus* and broom *Cytisus scoparius*.
- 5.31. The southern boundary, which is on a shallow bank, borders the A27 road and comprises mainly pedunculate oak and sycamore with occasional ash *Fraxinus excelsior*, Norway maple *Acer platanoides* and Lawson Cypress *Chamaecyparis lawsoniana*.
- 5.32. There are a number of scattered trees throughout the grassland and scrub habitats, including apple *Malus sp.*, pear *Pyrus sp.*, hazel *Corlus avellana* and horse chestnut.

2022 Update

- 5.33. No change to the condition of the scattered trees/ line of trees was noted during the 2022 surveys.
- 5.34. The lines of trees and mature scattered trees are of **local importance**. The tree lines provide good connectivity for wildlife and a number of the mature trees on-site are veteran trees with varying degrees of dead wood, which is likely to support wildlife.

Scrub

- 5.35. In the 2021 report it was noted that dense and scattered bramble scrub *Rubus fruticosus*, formerly associated mainly with the tree-line along the southern boundary of the Application Site, had colonised much of the western half of the Application Site. This area had formerly been dominated by semi-improved grassland, and bare ground arising from tree removal.

2022 Update

- 5.36. The scrub is now well established and dense, covering the majority of the western half of the Application Site. Species present include bramble, birch *Betula pendula*, oak, ash *Fraxinus excelsior*, elder *Sambucus nigra*, blackthorn *Prunus spinosa*, gorse and broom. Much of the scrub was not accessible due to its dense structure, however, small glades were apparent on the edge of the scrub. The scrub includes a mixed age range of vegetation, including some young trees.
- 5.37. This part of the Application Site is shown on the Priority Habitat Inventory on MAGIC Maps as mixed, mainly broadleaved deciduous woodland. This record is from the National Forest Inventory in 2014. The southern boundary of the Application Site and part of the northern boundary are also mapped as mixed mainly broadleaved woodland that is not a Priority Habitat. It appears as though the woodland was cleared between 2014 and 2016, prior to the initial ecological surveys carried out by Aven Ecology.
- 5.38. The dense scrub is in the process of succeeding back into mixed broadleaved woodland, it is connected to the SINC woodland offsite to the north east and is therefore assessed as being of **Local Importance**.

Watercourse

- 5.39. A small watercourse is present on the northern boundary tree-line. The watercourse flows west to east for c.500 metres, joining the upper reaches/headwaters of Badnam Creek, which flows south for c2.5km, before discharging into the River Hamble Estuary.
- 5.40. The watercourse resembles a dry ditch. The bed of the ditch comprised leaf litter and remnant dry silt. A mature Scot's' pine was growing in the centre of the ditch, which indicates that standing water is rarely present. No aquatic or marginal vegetation has previously been apparent within the ditch, however, it could be seasonally wet during periods of prolonged/heavy rainfall. The average width of the ditch was 2.2 metres. The ditch was heavily shaded by mature trees and shrubs on the southern (site) boundary, and a steep bank on the northern boundary. The the offsite northern bank of the ditch was vegetated with patchy bramble scrub, tall ruderal vegetation (mainly nettles), saplings, and scattered trees.

2022 Update

- 5.41. For the purposes of the Biodiversity Metric 3.1, a MoRPH River Condition Assessment Survey was carried out on 8th August 2022.

- 5.42. The watercourse, which is part of the upper reaches of Badnam Creek, was found to be in moderate condition. Full results of the River Condition Assessment are provided in Tables 4-8.

Table 4: Survey Details

River	Badnam creek (upper reaches)
Reach	Providence Hill
Subreach	Headwaters (tributary of)
Project name	Land Adjoining 4 Brookfield, Providence Place, Bursledon.
MoRPH correlation code	PRI23459

Table 5: Dimensions

River shape	1.57
Average width	2.2

Table 6: River Type Calculations

A1 – Braiding index	1
A2 – Sinuosity index	1.04
A3 – Anabranching index	0
A4 – Level of confinement	Partly confined
A5 – Valley gradient	0.05
A6 – Bedrock reach?	No
A7 – Coarsest bed material	Silt
A8 – Average alluvial bed material size	Silt
Calculated River Type	K (straight/sinuuous)

Table 7: River Condition Calculations

B1 - Bank top vegetation structure (+)	2
B2 - Bank top tree feature richness (+)	0
B3 - Bank top water-related features (+)	0
B4 - Bank top NNIPS (-)	-1
B5 - Bank top managed ground cover (-)	-2
C1 – Bank face riparian vegetation structure (+)	1
C2 – Bank face tree feature richness (+)	1

C3 – Bank face natural bank profile extent (+)	2
C4 – Bank face natural bank profile richness (+)	2
C5 – Bank face natural bank material richness (+)	2
C6 – Bank face bare sediment extent (+)	0
C7 - Bank face artificial bank profile extent (-)	0
C8 - Bank face reinforcement extent (-)	0
C9 - Bank face reinforcement material severity (-)	0
C10 - Bank top NNIPS (-)	-1
D1 - Channel margin aquatic vegetation extent (+)	0
D2 - Channel margin aquatic morphotype richness (+)	0
D3 - Channel margin physical feature extent (+)	0
D4 - Channel margin physical feature richness (+)	0
D5 – Channel margin artificial features (-)	0
E1 – Channel aquatic morphotype richness (+)	0
E2 – Channel bed tree features richness (+)	2
E3 – Channel bed hydraulic features richness (+)	0
E4 – Channel bed physical feature extent (+)	0
E5 – Channel bed physical feature richness (+)	0
E6 – Channel bed material richness (+)	1
E7 – Channel bed siltation (-)	0
E8 – Channel bed reinforcement extent (-)	0
E9 – Channel bed reinforcement material severity (-)	0
E10 – Channel bed artificial features severity (-)	0
E11 – Channel bed NNIPS extent (-)	0
E12 - Channel bed filamentous algae extent (-)	0

Table 8: River Condition:

Condition Score (Preliminary)	0.38
Condition Class / Score (Final)	Moderate

5.43. Following the River Condition Assessment (which combines the averaged condition scores with the river type study), the River Condition Score was 'Moderate'.

- 5.44. Of the 32 condition indicators, the watercourse did not achieve any high scores (4 or 3 on positive indicators) or low scores (-4 or -3 on negative indicators) and scored zero on 11 out of 19 positive indicators. This is likely to be a result of the ditch-like characteristics (the channel was uniform), and because the ditch is predominantly dry, therefore, many of the indicators for aquatic characteristics were not present.
- 5.45. The watercourse achieved negative scores for bank top managed ground cover. This is because vegetation along right-hand bank was regularly managed and comprised short grassland), and laurel was present, which is a non-native invasive species.
- 5.46. The watercourse achieved positive scores of 2 for bank top vegetation structure, bank face natural profile extent, profile richness, and material richness, and channel bed tree features richness. This is because the banks support mature trees, scrub, saplings, and tall herbs.
- 5.47. Although there is no minimum width for MoRPH5 surveys as such; it can be used for small, or evenly seasonally dry, channels, many of the condition indicators are associated with aquatic features. Given that the watercourse is predominantly dry, and there were no aquatic features present, the absence of water has probably affected the condition score.
- 5.48. Although fauna is not considered in the River Condition Assessment, healthy watercourses should support diverse and/or abundant aquatic life. Given that the watercourse did not support any aquatic life, its current value to biodiversity is somewhat limited. The lack of water and aquatic features is likely particularly apparent in 2022, given the drought conditions throughout much of the summer.
- 5.49. Notwithstanding the above, the banks/channel are natural, they support diverse vegetation, including mature trees, the watercourse is capable of supporting aquatic features, and the watercourse is connected to the River Hamble.
- 5.50. The watercourse is considered to be of Local Importance.

Fauna

- 5.51. Fauna are listed in alphabetical order below. Where further surveys have been conducted, full methodologies can be found in Appendix 4.

Amphibians

- 5.52. The closest record of great crested newts returned by HBIC is 1.4km to the south east of the Application Site and the record is dated from 2005.

- 5.53. The 2021 ecology report assessed the Application Site as being suitable for terrestrial great crested newts. The stream north of the Application Site is noted as being unsuitable due to running water however, a pond located 200m to the north of the Application Site at Bursledon Windmill was subject to a Habitat Suitability Index Assessment in 2016 and 2021 and was found to have 'good' suitability for great crested newts.

2022 Update

- 5.54. The likelihood of finding great crested newts within the Application Site has reduced recently following the building of the development to the north, which separates the Application Site from the nearest pond. Nevertheless, an update HSI Assessment and eDNA sampling of the Bursledon Windmill pond was carried out on 21st June 2022.
- 5.55. The HSI assessment in 2022 was consistent with the 2021 finding and eDNA sampling of the pond came back as negative for great crested newt presence.
- 5.56. Due to the lack of a known great crested newt population in proximity to the Application Site, and the relative isolation of the Application Site from ponds within 500m, great crested newts are assumed to be likely absent from the Application Site and will not be discussed further in this report.

Badgers

- 5.57. HBIC returned numerous records of badger within 2km of the Application Site but none from within or adjacent to the Application Site.
- 5.58. The scrub, tree lines and grassland within the Application Site provide suitable habitat for badger foraging, commuting and sett building. Within the previous ecology report it was noted that badger hairs were found on the barbed wire fence along the northern boundary of the Application Site in 2016. No other signs of badger have been found on-site previously.

2022 Update

- 5.59. No signs of badger were recorded in 2022, although much of the dense scrub could not be searched thoroughly.
- 5.60. **An update survey for badger will be carried out in winter 2022/ 2023 when the west of the Application Site is more accessible. This could be secured by a suitably worded planning condition, if required**

Bats

- 5.61. HBIC returned records of myotis sp., Daubenton's *Myotis daubentonii*, whiskered *Myotis mystacinus*, Brandt's *Myotis brandtii*, Natterer's *Myotis nattereri*, noctule *Nyctalus noctula*, pipistrelle *Pipistrellus* sp. and brown long eared *Plecotus auritus* bats within 2km of the Application Site.
- 5.62. During the previous bat surveys, at least six species of bat were recorded foraging/commuting within the Application Site. Buildings 6 and 7 were assessed as having low suitability for roosting bats. The surveys in 2016 also noted that none of the buildings were occupied by bats but that a common pipistrelle was likely to be roosting in a northern boundary tree. The 2021 survey agreed largely with these results.

2022 Update

- 5.63. The buildings were found to be in a similar state with no direct evidence of roosting bats present. Ground level tree assessments were not carried out of all of the trees on-site as the majority are being retained and protected from the development. The trees scheduled for removal were subject to a ground-level tree assessment to check for potential roost features. Only one tree was found to have a potential roost features. The horse chestnut (Tree 1) in the east of the Application Site has a shallow flush cut approximately 5m high on the north facing elevation of the main trunk. Sparse ivy covers the trunk and it is unclear from the ground whether the flush cut has rotted back to form a crevice. This tree was therefore included in the scope of the update emergence/ re-entry survey.
- 5.64. No bats were recorded emerging from buildings 6 or 7 or the mature horse chestnut (Tree 1) during the emergence/ re-entry surveys on the 21st and 22nd June 2022. Low numbers of common pipistrelle and soprano pipistrelle bats were observed commuting and foraging over the grassland early in the survey. The bats were recorded early in the evening, suggesting that there is a roost nearby.
- 5.65. Only common species of bat were recorded on-site in 2022, however, the habitats on-site are relatively uncommon in the local area, therefore, the Application Site is considered to be of Local importance for foraging and commuting bats.

Birds

- 5.66. The data search returned records of various bird species within 2km of the Application Site, including numerous species associated with the local wetland and estuary habitats. Relevant

species have been grouped by their UK conservation status according to the RSPB²⁰ as follows:

- Red-listed: cuckoo *Cuculus canorus*, woodcock *Scolopax rusticola*, house sparrow *Passer domesticus*, song thrush *Turdus philomelos*, mistle thrush *Turdus viscivorus*, starling *Sturnus vulgaris*, lesser spotted woodpecker *Dryobates minor*, merlin *Falco columbarius*, linnet *Linaria cannabina* and nightingale *Luscinia megarhynchos*.
- Green listed: kingfisher *Alcedo atthis*, peregrine *Falco peregrinus*, hobby *Falco subbuteo*, firecrest *Regulus ignicapilla*, red kite *Milvus milvus*, Dartford warbler *Curruca undata*, golden plover *Pluvialis apricaria* and barn owl *Tyto alba*.

- 5.67. The 2021 Phase 1 Report noted that birds were likely nesting in the scrub and trees on-site but that ground nesting birds were considered unlikely to be present due to the small area of suitable grassland habitat and relatively high disturbance levels.
- 5.68. Anecdotal sightings of song thrush *Turdus philomelos* and bullfinch *Pyrrhula pyrrhula* in a neighbor's garden have been reported to the Eastleigh Borough Council Ecology Officer. There is suitable habitat for both species within the Application Site, however, neither has been observed on-site.

2022 Update

- 5.69. There remains suitable bird nesting habitat within the scrub, trees and buildings within the Application Site. It is considered likely that a relatively diverse assemblage of birds are likely to use the Application Site for nesting and feeding, however, the species present are likely to be somewhat limited due to the urban context of the Application Site.
- 5.70. The habitats suitable to support birds within the Application Site are relatively uncommon within the local area. The bird interest is considered to be of Local **importance**.

Hazel dormouse

- 5.71. The boundary lines of trees, associated understorey and scrub on-site offer some suitability for hazel dormouse. On-site habitats have some connectivity along the Badnam Creek corridor with suitable offsite habitats, including the SINC woodland and hedgerows to the northeast. Hazel dormouse presence/ likely absence surveys in 2016, found no hazel dormouse (see planning ref O/17/81166). This included offsite areas to the north, but also the three boundaries

²⁰ Available at: <https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/uk-conservation-status-explained/>

of the Application Site.

2022 Update

- 5.72. HBIC returned four records of hazel dormouse within 2km of the Application Site. The closest record is from 2007 and is situated 266m to the northeast of the Application Site, in vegetation on the northern embankment of the M27 motorway. Two records are from an area of woodland approximately 700m to the north of the Application Site. The most recent of these records is from 2020. The fourth record is from 2007 and is approximately 900m to the east of the Application Site in vegetation on the northern embankment of the M27 motorway.
- 5.73. Connectivity between the Application Site and the closest record is restricted by the presence of the M27 motorway and the fragmented local hedgerow network. The records to the north are separated from the Application Site by numerous roads and residential areas with no connecting habitat.
- 5.74. There are no granted EPS licences for hazel dormouse within 2km of the Application Site.
- 5.75. The dense scrub and boundary tree lines do offer some suitability for hazel dormouse, however, due to the clearance of the woodland on-site between 2014 and 2016, the habitat has obviously been subject to significant disturbance, which likely reduced its suitability for hazel dormouse. As a result, and due to the lack of good connectivity with known dormouse populations and areas of suitable woodland, it is considered that hazel dormouse are likely absent.

Invertebrates

- 5.76. The data search returned records of the following invertebrate species within 2km of the Application Site, which are all listed on Schedule 41 of the NERC Act; stag beetle *Lucanus cervus*, cinnabar moth *Tyria jacobaeae*, grey dagger moth *Acronicta psi*, knot grass *Acronicta rumicis*, sallow *Cirrhia icteritia*, small phoenix *Ecliptopera silaceata*, oak hook tip *Watsonalla binaria* and oblique carpet *Orthonama vittate*.
- Due to the presence of old trees, rotting wood and oak trees within the Application Site, stag beetle could be present.
 - A small amount of ragwort was present within the grassland on-site, which is the cinnabar moth caterpillars' preferred food plant.
 - Grey dagger moths are found in woodland and scrub and the caterpillars feed on a range of broadleaved trees including blackthorn and apple.

- Knot grass moths are found in various habitats and the caterpillars feed on herbaceous plants such as dock and teasel.
- Sallow moths are found in damp woodland and the larvae feed on willow catkins.
- Small phoenix moths inhabit a range of woodland and open habitats and their main larval foodplants are willowherbs.
- Oak hook tip moths inhabit oak woodland and parkland and their larval foodplant is oak.
- Oblique carpet moths inhabit marshy and damp habitats and their caterpillars feed on various bedstraw species.

5.77. Under its current management regime, the Application Site supports a matrix of habitat types that are likely to support a relatively diverse assemblage of invertebrate species.

5.78. Although the habitats on-site have potential to support the Schedule 41 species noted above, the Application Site is relatively isolated from other habitats that are likely to support rarer species, therefore, their presence is considered unlikely and invertebrates have been scoped out of further assessment.

Reptiles

5.79. Reptile surveys carried out by Aven Ecology in August/ September 2016 confirmed the presence of a small population of slow worm within the Application Site. The slow worms were mainly found within the western half of the Application Site, in what was a matrix of scrub and rough grassland in 2016.

2022 Update

5.80. HBIC provided records of slow worm *Anguis fragilis*, common lizard *Zootoca vivipara*, adder *Vipera berus*, and grass snake *Natrix Helvetica* within 2km of the Application Site. The closest record is of slow worm in 2006, 196m to the south west of the Application Site.

5.81. The majority of the Application Site remains suitable for reptiles, however, as the scrub has matured and become denser, the suitability of the western half of the Application Site for reptiles is likely to have reduced as there will be fewer areas suitable for basking.

5.82. The Application Site is relatively isolated from other areas of suitable reptile habitat, therefore, other species of reptiles are unlikely to have colonised the Application Site in the intervening

period. There is low potential for individual grass snake to enter the Application Site from the other side of Badnam Creek and the habitats on-site are suitable for grass snake.

- 5.83. Given the above, it is considered unlikely that the status of reptiles within the Application Site will have changed significantly since 2016, therefore, update surveys were not considered necessary.
- 5.84. The reptile interest is assessed as being of **Local importance**.

Water voles

- 5.85. HBIC returned one record of water vole *Arvicola amphibius* within 2km of the Application Site. The record, which is from 2009, is from a watercourse approximately 500m to the south of the Application Site. There is no habitat connectivity between this record and the Application Site.
- 5.86. Badnam Creek, which runs along the Application Site boundary, has low suitability for water vole. The ditch channel is overgrown with vegetation and the banks are steeply sloping and largely overgrown with bramble scrub. However, no holes indicative of water vole or other evidence of water vole was recorded along the watercourse.
- 5.87. It is considered unlikely that water vole would use the watercourse within the Application Site, therefore they will not be discussed further in this report.

Other mammals

- 5.88. The data search returned a number of records for hedgehog *Erinaceus europaeus* and fox *Vulpes vulpes*.
- 5.89. The scrub and spoil/ rubble piles provide suitable habitat for hibernating and sheltering hedgehog *Erinaceus europaeus*, whilst the grassland is likely to be used by foraging hedgehog.

Invasive Species

- 5.90. Two small clumps of the invasive shrub species *Rhododendron sp.* were recorded along the northern boundary of the Application Site. Patches of cherry laurel *Prunus laurocerasus*, which is also known to be invasive, were recorded in the understorey of the northern boundary.

2022 Update

- 5.91. A small stand of Japanese knotweed *Fallopia japonica* was recorded within five meters of the

southern Application Site boundary, adjacent to the pavement of Providence Hill (Grid Reference: SU4823410638). The stand covered an area of approximately 1m² .

6 ASSESSMENT OF EFFECTS AND MITIGATION MEASURES

- 6.1. In accordance with CIEEM guidelines, the following important ecological features have been identified with the potential to be affected by the proposed development and carried forward for further assessment:

Table 9: Important ecological features brought forward for impact assessment

Statutory sites	Solent and Southampton Water SPA, Solent Maritime SAC, Solent and Southampton Water RAMSAR
Local Wildlife sites	Windmill Fields Wood SINC
Habitats	Mature trees/ Lines of trees Dense Scrub Watercourse – Badnam Creek
Species and species groups	Bats – commuting and foraging Birds – nesting and feeding Reptiles – small population of slow worm Badger

- 6.2. The following ecological features have been scoped out of the ecological impact assessment, owing to the conclusion that no significant effects are predicted:

Table 10: Ecological features scoped out of the impact assessment

Statutory sites	All others
Non-statutory sites	All others
Habitats	Grassland – modified and other neutral Buildings and hardstanding
Species and species groups	Great crested newt Roosting bats Water vole Invertebrates

Statutory Sites

- 6.3. There is existing evidence of high levels of nitrogen and phosphorus in the Solent water environment with evidence of eutrophication at some designated sites. The Partnership for Urban South Hampshire (PUSH), Natural England (NE), and Environment Agency (EA) have been jointly working to develop an Integrated Water Management Strategy (IWMS). This examines the potential for the PUSH region to accommodate future housing growth without having a detrimental effect upon the water environment. A Water Quality Working Group has been set up to identify and analyse the existing evidence gaps and evaluate the need for strategic mitigation measures.
- 6.4. The proposed development at the Application Site comprises a development (including residential housing) situated within the River Hamble catchment (which ultimately drains to the Solent). It is Natural England's view that these implications, and all other matters capable of having a significant effect on designated sites in the Solent, must be addressed in the ways required by Regulation 63 of the Conservation of Habitats and Species Regulations 2017.
- 6.5. Where there is a likelihood of significant effects (excluding any measures intended to avoid or reduce harmful effects on the European site), or there are uncertainties, a competent authority should fully assess (by way of an "Appropriate Assessment") the implications of the proposal in view of the conservation objectives for the European site(s) in question.
- 6.6. An Appropriate Assessment cannot have lacunae and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the works proposed on the protected site concerned. Complete information is required to ensure that the proposal will not affect the integrity of the international sites.
- 6.7. Natural England advises that the wastewater issue is examined within the Appropriate Assessment and that the existing nutrient and conservation status of the receiving waters be taken into account.
- 6.8. During the summer of 2018, a review of the condition of designated sites water environment in the Solent harbours was undertaken. The best available up-to-date evidence has identified that some interest features at the designated sites, such as intertidal mudflat habitat and the wildlife they support are widely in unfavourable condition due to existing levels of nutrients and are therefore at risk from additional nutrient inputs.
- 6.9. It is Natural England's view that there is a likely significant effect on several internationally designated sites (Special Protection Areas, Special Areas of Conservation and Ramsar sites) due to the increase in wastewater from the new developments coming forward.

- 6.10. The achievement of nutrient neutrality, if scientifically and practically effective, is a means of ensuring that development does not add to existing nutrient burdens.
- 6.11. Natural England have prepared a document²¹, which provides advice on achieving nutrient neutrality for new development in the Solent region. This methodology is based on best available scientific knowledge and is subject to revision as further evidence is obtained. Local Planning Authorities are advised to take a precautionary approach in line with existing legislation and case-law when addressing uncertainty and calculating nutrient budgets.
- 6.12. Nutrient neutrality is a means of ensuring that development does not add to existing nutrient burdens and this provides certainty that the whole of the scheme is deliverable in line with the requirements of the Conservation of Habitats and Species Regulations 2017 (as amended).
- 6.13. The information provided herewith should provide the competent authority with sufficient information to conclude that the proposed development will not adversely impact the integrity of the Solent and Southampton Water SPA and the Solent Maritime SAC, either alone or in combination with other plans or projects.
- 6.14. Nitrogen Budget Calculations were produced by Paul Basham Associates and have been outlined in full within their report²². The results have been summarised below.

Nutrient Neutrality for New Development

- 6.15. Achieving nutrient neutrality is one way to address the existing uncertainty surrounding the impact of new development on designated sites. The methodology proposed by Natural England outlines how to calculate nutrient budgets and options for mitigation, should this be necessary.
- 6.16. There is evidence that inputs of both phosphorus and nitrogen influence eutrophication of the water environment. However, the principal nutrient that tends to drive eutrophication in the marine environment is nitrogen and this is supported by modelling and evidence.
- 6.17. The nutrient budget in this report calculates quantities of nitrogen (N) generated by development. This N comes in different forms and measured N concentrations vary according to exactly what is measured. These differences need to be recognised when calculating nutrient budgets. The key measurement is Total Nitrogen (TN), i.e. both organic and inorganic forms of nitrogen, because this is what is available for plant growth. TN is the sum of the inorganic forms - nitrate-nitrogen (NO₃-N), nitrite nitrogen (NO₂-N), ammoniacal - N - and

²¹ Natural England (February 2022) *Nutrient Neutrality Generic Methodology*

²² Paul Basham Associates (May 2022) *Flood Risk Assessment and Drainage Strategy*

organically bonded nitrogen.

Limitations

- 6.18. The nutrient neutrality calculation includes key inputs and assumptions that are based on the best-available scientific evidence and research. There is uncertainty associated with predicting occupancy levels and water use for each household in perpetuity. Similarly, identifying current land / farm types and the associated nutrient inputs is based on best-available evidence, research and professional judgement and is again subject to a degree of uncertainty.
- 6.19. It is advised that a precautionary approach is followed to account for the uncertainties in the calculator.
- 6.20. The methodology is for all types of development that would result in a net increase in population served by a wastewater system

Calculating Nutrient Budgets

- 6.21. The full methodology is outlined in the Natural England guidance and has been summarised below.

Stage 1

- Calculate increase in population due to the development;
- Calculate the increase in wastewater production;
- Confirm Wastewater treatment works (WwTW) and permit level; and
- Calculate Total Nitrogen (TN) in Kg per annum that would exit the WwTW after treatment derived from the proposed development.

Stage 2

- Adjust nitrogen load to account for existing nitrogen from current land use.

Stage 3

- Adjust nitrogen load to account for land uses with the proposed development.

Stage 4

- Calculate the net change in the Total Nitrogen load that would result from the

development.

Results

Stage 1	Calculate total Nitrogen in kg per year derived from the development that would exit the Wastewater Treatment Works (WwTW) into Solent catchments after treatment	
Step 1	Calculate additional population	
	Enter the number of units proposed	16
	Net population increase per housing unit	2.40
	Total net population increase generated by the development	38.40
Step 2	Calculate wastewater volume generated by the development	
	Water use in litres per person per day	110
	Total wastewater volume generated by the development (litres per day)	4,224
Step 3	Confirm receiving WwTW and permit limit	
	Select the wastewater treatment works the development will connect to	Peel Common
	Wastewater treatment works' permit limit (mg per litre)	9.0
	Wastewater treatment works' discharge level (mg per litre)	8.1
Step 4	Calculate total nitrogen in kg per year discharged by the WwTW	
	Deduct acceptable Nitrogen loading in wastewater (mg per litre)	6.1
	Total Nitrogen discharged by WwTW (mg per day)	25,766.4
	Total Nitrogen discharged by WwTW (kg per day)	0.0258
	Total Nitrogen discharged by WwTW (kg per year)	9.4

Stage 2	Calculate existing (pre-development) nitrogen from current land use of the development site	
Step 1	Total area of development site	
	Enter the total area of the development site (hectares)	1.12
Step 2	Identify current land uses of the development site	
	Enter area currently used for urban development (hectares)	0.02
	Enter area currently used for open space / greenfield (hectares)	1.10
	Enter area currently used for woodland (hectares)	0.00
	Enter area currently used for community food growing / catchment average (hectares)	0.00
	Enter area currently used for cereals (hectares)	0.00
	Enter area currently used for dairy (hectares)	0.00
	Enter area currently used for general cropping (hectares)	0.00
	Enter area currently used for horticulture (hectares)	0.00
	Enter area currently used for pig farming (hectares)	0.00
	Enter area currently used for lowland grazing (hectares)	0.00
	Enter area currently used for mixed farming (hectares)	0.00
	Enter area currently used for poultry farming (hectares)	0.00
	Check to help ensure that sum total of land uses in Step 2 equals site area in Step 1	1.1
Step 3	Calculate nitrogen load from current land usage	
	Total Nitrogen load from current land usage (kg per year)	5.8

Stage 3 Calculate nitrogen load for the non-built land uses proposed for the development site		
Step 1	Identify proposed land uses of the development site	
	Enter the total urban area to be created (hectares)	0.68
	Enter the total designated open space / SANG area to be created (hectares)	0.44
	Enter the total nature reserve area to be created (hectares)	0.00
	Enter the total woodland area to be created (hectares)	0.00
	Enter the total community orchard area to be created (hectares)	0.00
	Enter the total community food growing / allotment area to be created (hectares)	0.00
	<i>Check to help ensure that sum total of proposed land uses equals site area in Stage 2</i>	1.12
Step 2	Calculate total Nitrogen load from proposed land uses	
	<i>Total Nitrogen load from future land uses (kg per year)</i>	11.92

Stage 4 Calculate the net change in Nitrogen load from the proposed development		
Step 1	Identify Nitrogen load from wastewater (Stage 1)	
	<i>Nitrogen leaving wastewater treatment works (kg per year)</i>	9.40
Step 2	Calculate net change in Nitrogen load from land use changes	
	<i>Total Nitrogen load from future land use (kg per year)</i>	6.14
Step 3	Calculate total Nitrogen budget for the development site	
	<i>Nitrogen budget for the site (kg per year)</i>	15.54
Step 4	Calculate precautionary buffer if Nitrogen budget exceeds zero	
	<i>Precautionary Nitrogen buffer (kg per year)</i>	3.11

Total Nitrogen budget for the proposed development (kg per year)		18.7
Development will generate additional Nitrogen - Mitigation is required Please liaise with your Local Planning Authority for advice on next steps		

Consideration of Likely Significant Effects

- 6.22. The first test of Regulation 63 of the Habitats Regulations requires an assessment of whether the proposed development is likely to have a significant effect on the European sites in question, either alone or in combination with other plans and projects.
- 6.23. Without mitigation, the proposed development would have a likely significant effect alone and in combination with other plans and projects on the SAC and SPA as a result of an overall increase in the amount of nitrogen generated, when compared with the current baseline.
- 6.24. The calculated increase in the amount of nitrogen generated as a result of the proposed development has the potential to trigger the following impact pathways if appropriate mitigation is not put in place:
- Indirect effects on the populations of species for which the sites are designated or classified due to loss or degradation of their habitat (quantity/quality);

- Changes to the composition of the habitats for which the sites are designated (e.g. reduction in species structure, abundance or diversity that comprises the habitat over time); and
- Interruption or degradation of the physical, chemical or biological processes that support habitats and species for which the sites are designated or classified.

Mitigation

- 6.25. Eastleigh Borough Council has developed a scheme that enables developers to offset excess nutrient outputs against Council-owned land through the purchase of nitrate credits. Eastleigh Borough Council will be consulted specifically on this matter.
- 6.26. Eastleigh Borough Council currently presides over 238 hectares of mitigation land, worth a total of 11,354 credits (1 credit = 1 kilogram of nitrates per year). The cost per credit is £3,000 + VAT.
- 6.27. Vested Outsourcing Partners Ltd are committed to paying £56,100 + VAT along with all associated legal and administrative costs.

Non-statutory Sites

- 6.28. Built form has been kept away from the north-eastern corner of the Application Site to provide a buffer between the development and the offsite SINC woodland. The closest construction activities will be approximately 30m from the SINC and will involve the digging of the SUDS basin.
- 6.29. Careful design of the drainage scheme (as detailed in para 6.37) will ensure that additional pollutants do not enter the watercourse and indirectly impact upon the SINC woodland. A Construction and Environmental Management Plan (CEMP) will be produced prior to the start of works and it will provide information on control measures to suppress, noise, dust, vibration and light, which will further minimise the impact on the adjacent habitats.
- 6.30. Direct impacts on the SINC once the development is operational are considered unlikely as easy access is restricted by the presence of Badnam Creek and the lack of public footpaths leading to and around the SINC.

Habitats

Mature Trees & Lines of Trees

- 6.31. All of the trees along the northern and eastern boundaries of the Application Site will be retained. A group of four immature sweet chestnut and English oak trees situated midway along the southern boundary tree line will be removed to facilitate the new access road. Approximately 15 scattered trees will be felled, including one mature horse chestnut and two semi-mature fruit trees in the east of the Application Site.
- 6.32. Root Protection Zones (RPZs) will be established around all retained trees prior to the start of works within the Application Site. A veteran oak tree in the northern boundary will be protected from the development with a RPZ fifteen times the diameter of the trunk to account for its age and importance. Boundary habitats will be fenced off during construction to protect them from traffic.
- 6.33. Due to the loss of one mature tree and fifteen immature/semi-mature trees, without suitable compensation, the overall residual impact is considered to be non-significant negative.

Dense Scrub

- 6.34. The development will lead to the removal of 0.65ha of dense scrub. 0.066ha of scrub will be retained around the perimeter of the Application Site. Retained areas of scrub will be protected during construction with suitable RPZ's and Heras fencing.
- 6.35. Without suitable compensation, the overall residual impact is considered to be non-significant negative.

Watercourse/ Badnam Creek

- 6.36. Without suitable mitigation, there is potential for the watercourse to be negatively impacted during both the construction and operational phases of the development. During construction, pollution and run-off could negatively impact the watercourse and habitats downstream. Impacts to aquatic life within the Application Site are limited, due to the fact that there is no evidence that it currently supports aquatic life.
- 6.37. A suitable CEMP will be produced to ensure appropriate control measures are put in place during construction.
- 6.38. A wide vegetated buffer has been retained between the development and the watercourse. On-site drainage has been carefully designed to minimise impacts on the watercourse. The

proposals for the surface water drainage are to store surface run off from the roads and buildings in a vegetated detention basin on-site. This vegetated detention basin will provide a first stage of natural filtration in accordance with the requirements of the Eastleigh Local Plan. The filtration will be provided by the planting contained within the basin. This will then pass through the flow control manhole S12 and run into a dual-swale system before discharging into the existing watercourse adjacent to the northern boundary of the Application Site. This will directly affect 3-5 metres of natural bank.

- 6.39. The discharge from the flow control manhole will be at a rate that mimics the Application Site's greenfield run off rate of 2.5 l/s, restricted by a HydroBrake flow control device. An ordinary watercourse consent will be required. Permeable paving is proposed to collect surface runoff from driveways and parking areas and provide short term storage at source.
- 6.40. Management of the bankside habitat will improve, going from short grass to tall herbs and longer grasses and the attenuation basin will create some wetland habitat adjacent to the watercourse.
- 6.41. Providing a detailed CEMP is produced and implemented, and the proposed drainage scheme is carefully maintained, the overall residual impacts on the watercourse are considered to be neutral.

Invasive Species

- 6.42. Small areas of cherry laurel and rhododendron are present within the Application Site. Both species are recognised as being invasive and result in significant loss of biodiversity, therefore, they will be eradicated from the Application Site.
- 6.43. The following management plan will be implemented prior to the commencement of work on-site. A suitably qualified contractor will undertake this clearance. They will review this proposed management plan prior to the start of works and make any amendments as necessary.
- An update walkover survey will be carried out in the winter by an approved contractor to accurately identify and map stands of rhododendron and cherry laurel within the Application Site.
 - Seedlings will be pulled up by hand and plants will be dug up by hand if possible, ensuring roots are not left behind.
 - All trunks and stems will be cut during the winter (September to March) to enable access for chemical treatment.

- Young bushes, any regrowth from stumps and any remaining seedlings will be treated with a foliar spray mixed with an adjuvant (this breaks down the waxy layer on the surface of the leaf) between May and October.
- Mature bushes will be treated with a stem injection.
- Cuttings (including leaf litter where possible) will be gathered up and burned in one area of the Application Site as approved by an ecologist.

- 6.44. Providing the methods detailed above are implemented and the long term management of the development accounts for the control of invasive species, the overall residual impact is considered to be positive.
- 6.45. The offsite Japanese knotweed has been reported to the council (who own this area of land), for them to deal with as deemed appropriate. Any change to the status of invasive species on-site will be identified during the update walkover by an approved specialist contractor and dealt with accordingly.

Fauna

- 6.46. Care will be taken during clearance/groundworks to ensure wildlife is not harmed and if any protected species are found when the ecologist is not in attendance, works will stop, they will not be handled and ACD Environmental Ltd contacted in the first instance.
- 6.47. Any excavations will be covered when works are not taking place to ensure that they do not fill with water and prevent the potential for wildlife to become trapped (especially badger) and avoid encouraging amphibians during the course of the works.

Bats

- 6.48. The horse chestnut tree in the south of the Application Site that is scheduled for removal has been assessed as having low suitability for roosting bats. No evidence of bats was recorded during the emergence/ re-entry surveys in June 2022, however, as a precaution, the tree will be felled following a soft felling methodology. This will include the hand stripping of the ivy which has grown up the trunk and the careful felling of the section of the tree which contains the PRF. This part of the tree will be carefully lowered to the ground and left for 48 hours with the feature facing upwards, to give any wildlife inside time to escape.
- 6.49. A number of trees on-site, particularly along the northern boundary have been identified as having high potential for roosting bats. Without appropriate mitigation, these trees are likely to be subject to an increase in disturbance during construction activities and a long-term increase

in lighting once the development is operational. If bats start using these features, this could negatively impact upon any bat roosts present and could cause bats to abandon their roosts. It would also decrease the suitability of the trees to support roosting bats and would therefore reduce the overall value of the Application Site for roosting bats.

- 6.50. These trees are being retained with a wide buffer to keep them dark and undisturbed. If these trees need to be removed or are likely to be impacted by the development, these trees will be inspected further using an endoscope by ecologist/s to look for evidence of bats.
- 6.51. Buildings 6 and 7 have low potential to support small numbers of roosting bats. No bats have been observed emerging/ re-entering from any of the buildings and only low levels of bat foraging activity from common pipistrelle and soprano pipistrelle bats were recorded in 2022. Common pipistrelle and soprano pipistrelle are widespread across the UK and show a trend for increasing populations.
- 6.52. As no evidence of roosting bats has been recorded during the update survey, there will be no legal restrictions to the demolition of the buildings within the Application Site with respect to bats (see nesting bird restrictions below).
- 6.53. In the absence of mitigation, the removal of the trees to create the site access off Providence Hill could result in the severance of a linear corridor and a net decrease in foraging and commuting habitat in the local area. This in turn could increase foraging and commuting pressure on off-site habitats and could force bats to increase their range; utilising longer and more energy-demanding commuting routes. This could have a detrimental effect on the conservation status of the local populations.
- 6.54. Without appropriate consideration, foraging and commuting bats are likely to be impacted by the increase in lighting from the new development. This could alter and restrict bat movements within the local area and lead to a loss in available foraging habitat for the local bat populations.
- 6.55. Lighting has been shown to have an adverse effect on bats through direct avoidance of illuminated areas and increased mortality of invertebrate prey. Where inappropriate lighting occurs close to roost sites, bats may abandon their roost or delay their emergence, which limits their foraging opportunities. Lighting a commuting or foraging route may also impact upon the integrity of a roost, even if the roost itself is not directly affected.
- 6.56. Artificial lighting will be minimised within the scheme and new lighting will have hoods and cowls to minimise light spill into the sky or onto trees. Consideration will be given to:
- Lighting will only be installed where there is significant need, a minimal amount

of light will be used and lighting will be dimmed during periods of low public use;

- Avoid the use of high pressure sodium lights, white LED broad spectrum lights and short wavelength 'blue' white sources throughout the Application Site;
- Using low spectrum lights with no UV content such as warm white LED; and
- Lights must have focused luminance on their target area preventing light pollution into other areas, for example using directional downlights, illuminating below the horizontal plane; using the lowest necessary lighting column and ideally achieve beneath 1 lux at 2m above ground level.

- 6.57. If in the future any of the retained trees on-site require works such as pruning, as a minimum, these trees will need to be inspected using an endoscope by an ecologist with the appropriate licence, immediately prior to the works. If evidence of bats is found, a mitigation strategy will be produced and a licence from Natural England is likely to be required prior to felling the tree.
- 6.58. Much of the dense scrub and grassland is going to be lost but the boundary trees are being retained. These boundary habitats are buffered from the development and will be kept below 1 lux, therefore, there will be minimal impacts upon commuting and foraging bats, which will most likely continue to use the Application Site. Linear commuting corridors will be retained for bats around the perimeter of the development.
- 6.59. Connectivity will be retained along the southern boundary tree line by strategically managing existing mature trees to create a hop-over at tree canopy level. Lighting will be carefully designed here to provide dark areas for bats to pass over the access road.
- 6.60. If suitable protection measures are followed and the suggested mitigation put in place, the overall residual impacts will be neutral.

Birds

- 6.61. An assemblage of common and widespread birds are likely to use the Application Site all year round for nesting and feeding. The development will lead to the removal of dense scrub, which is likely to be used by numerous species for nesting and feeding and grassland, which is likely to be used by feeding birds. Suitable nesting habitat within trees and scrub around the Application Site perimeter is being retained and protected from the development.
- 6.62. Without mitigation, increased disturbance as a result of construction noise, dust and vibration is likely to affect the ability of birds nesting within the scrub and trees adjacent to the works area to hold territory and breed successfully, if construction takes place in the breeding season.

Ambient noise level increases would be variable, but at times there could be considerable increases in noise levels.

- 6.63. Without suitable mitigation, the hedgerows and trees will be subject to an increase in disturbance long-term. Management may also be conducted at unsuitable times of the year, which could negatively impact nesting birds.
- 6.64. There will be an increase in the number of domestic cats within the Application Site, which could negatively impact nesting birds if they are able to access the hedgerows and predate birds. Currently in the UK it is estimated that 24% of households have a cat, with 43% of these households having more than one cat *Felis catus*²³.
- 6.65. Buffers and RPZ fencing will help to minimise the impacts of noise, vibration and lighting on the retained bird nesting habitat.
- 6.66. Information on cat predation will be included within householder information packs. Additional suggestions such as how to appropriately provide food for birds, putting a bell on the cat's collar and keeping cats indoors overnight will also be outlined within the information pack.
- 6.67. The buildings and all areas of vegetation that needs to be cleared will be undertaken outside the bird nesting season (generally taken to be March to August inclusive). If vegetation removal or demolition must be undertaken during the bird nesting season, the area must be checked in advance, by an ecologist, for the presence of nesting birds. If there is no evidence of nesting birds, the clearance work must be completed within 48 hours of inspection. If any active nests are identified, vegetation clearance/ demolition must cease and an appropriate buffer zone (as determined by the ecologist, usually approximately 5m) must remain until it has been confirmed that the young have fledged and the nest is no longer in use.
- 6.68. Without adequate compensation, the impact on birds is likely to be non-significant negative.

Reptiles

- 6.69. A low population of slow worm was recorded, mainly in the west of the Application Site, in 2016. The majority of the Application Site currently has some suitability to support reptiles, and the majority of the habitats on-site will be cleared to facilitate the development. Without suitable mitigation, there is a risk that reptiles would be killed and/ or injured during the clearance of the Application Site.
- 6.70. A 0.185 ha area along the northern, eastern and western site boundaries has been set aside

²³ <https://www.pdsa.org.uk/get-involved/our-campaigns/pdsa-animal-wellbeing-report/uk-pet-populations-of-dogs-cats-and-rabbits>

as a reptile receptor area. Prior to the start of works in this area, management of the grassland will be relaxed to encourage a denser, tussocky sward to develop. Some scrub clearance will be required in the west of the Application Site to create more habitat niches and areas suitable for basking. Log and rubble piles will be created in the receptor area suitable for hibernating reptiles.

6.71. The following mitigation strategy will be followed prior to the start of works on-site to protect and maintain the reptile population on-site.

- Install temporary exclusion fencing between the construction works area and the reptile receptor area around the site perimeter between Spring and Autumn. Drift fencing will also be installed to compartmentalise the works area into smaller areas. Some vegetation clearance will be required during fence installation under the supervision and guidance of an ecologist.
- Carry out 30 days (minimum) of trapping using artificial refugia in either Spring (May/ June) or Autumn (September/ October), reptiles caught will be moved into the on-site receptor area by a suitably competent ecologist. During this period, some vegetation clearance/ habitat manipulation will be carried out at the discretion of the ecologist to increase capture rates.
- Following 30 days of trapping and five clear days where no reptiles are caught, carry out sensitive clearance of remaining scrub using hand tools outside of the bird nesting season (April – August inclusive). All areas identified as having high suitability for reptiles (e.g. brash/ rubble piles) will remain in-situ until the spring, when they will be dismantled by hand under an ecologists supervision.
- The internal drift fencing will be removed following completion of the translocation exercise. The perimeter fencing, which separates the works area from the receptor area will remain in-situ until completion of the development.

6.72. The receptor area will be managed long term for the benefit of reptiles. The grassland will be managed once or twice a year using a flail mower set on a high setting to avoid cutting too low. Scrub management will be required to prevent encroachment.

6.73. Providing the translocation is carried out and the receptor area is maintained long-term, the overall impact on the reptile population is considered to be neutral.

Other Ecological Features

Badger

- 6.74. Badgers have been scoped out of further assessment because no badger setts or evidence of foraging or commuting badgers has been recorded within the Application Site. An update walkover of the Application Site will be carried out in winter 2022/ 2023 to survey the entire Application Site for signs of badger when the scrub is less dense. An update survey will then be carried out within three months of the start of works on-site to ensure the conditions remain the same.
- 6.75. it is likely that badgers occasionally forage and commute through the Application Site, therefore the following precautionary measures will be followed during the construction phase of the development.
- 6.76. Connectivity for badgers will be retained around the Application Site though gaps under any fence lines to allow badgers to pass through the Application Site. Access for badgers from the Application Site into surrounding land will not be blocked or restricted in any way.
- 6.77. Good practice activities will be adopted during the construction phase. These include:
- Trenches will be covered at the end of each working day and any temporarily exposed pipes will be capped to prevent badgers or hedgehogs gaining access during the night;
 - Any trenches or deep pits which must be left open overnight will be provided with a means of escape should an animal enter. This would simply be in the form of a roughened plank of wood placed in the trench as a ramp to the surface;
 - Any trenches/pits will be inspected each morning to ensure no animals have become trapped overnight. Should a badger become trapped in a trench it may attempt to dig itself into the side of a trench and form a temporary sett. Should a trapped badger be encountered, the advice of an ecologist must be sought immediately. If necessary, the ecologist will contact the RSPCA or a vet who will move the badger to safety or provide treatment if required;
 - The storage of topsoil or other 'soft' building material within the construction site will be given careful consideration. Badgers may readily adopt such mounds as setts. To avoid this, mounds will be kept to a minimum and any essential mounds will be subject to daily inspections;
 - The site must be kept clear of food and litter, particularly overnight; and

- The storage of any chemical within the construction site will be contained in such a way that they cannot be consumed or knocked over by any wildlife.

Hedgehog

- 6.78. Areas of scrub and log piles will be cleared in the active season for hedgehog and will be checked prior to clearance.
- 6.79. Hedgehog links will be created under new close-board/solid fences (at the boundary or between plots) and existing boundary fences to maintain connectivity for hedgehog through the Application Site.

7 COMPENSATION

7.1. The following measures will be implemented to compensate for the loss of the habitats and opportunities for protected species on-site:

- Native scrub will be planted to compensate for the loss of the scrub. The following species are included in the planting scheme; field maple *Acer campestre*, dogwood *Cornus sanguinea*, hazel *Corylus avellana*, hawthorn, holly, blackthorn, field rose *Rosa arvensis*, goat willow *Salix caprea* and guelder rose *Viburnum opulus*.
- Tree planting in gardens, streetside and in areas of open space will comprise native species including field maple, birch *Betula pendula*, hornbeam *Carpinus betulus*, oak, yew, hawthorn, crab apple *Malus sp.*, apple and pear.
- To compensate for the loss of the potential roosting opportunities for bats within the Application Site, three integrated bat boxes (e.g. Schwegler 1FR, Habibat or Ibstock) will be included in the proposed buildings in suitable locations. These will be installed on south east or south west facing elevations of the buildings, at a height of over 4m and out of direct artificial light. The boxes will be positioned close to dark corridors and areas of open space to provide safe flight lines for bats to access the boxes.
- To improve the foraging potential of the Application Site for bats, the landscape planting scheme will utilise night scented plants such as jasmine *Jasminum sp.*, which will enhance the Application Site for moths and other flying insects.
- 20 integrated swift, swallow and small bird boxes will be installed within the buildings on-site to compensate for the loss of the nesting opportunities within the buildings. Additional bird nesting and feeding habitat will be provided within new hedgerow, tree and shrub planting within the development.

Table 11: Impact summary table

Feature	Scale of importance	Impact (before mitigation)	Type of impact (construction or operational)	Effect (without mitigation)	Mitigation/ Compensation	Residual effect	Means of securing mitigation
Solent Designated Sites	International	In-combination effect as a result of increased nitrates	Operational	In-combination significant negative effect	Payment into Eastleigh Borough Council Nitrates Mitigation	Non-significant minor negative	S106/ planning condition
Lines of trees/ mature trees	Local	Removal of 19 trees Accidental damage and disturbance Damage/removal by residents	Construction & Operational	Negative effect significant up to the Local level	Tree protection fencing RPZ's Managed by a management company	Neutral	Tree Protection Plan (TPP) CEMP Landscape and Ecological Management Plan (LEMP)
Scrub	Local	Loss of scrub Mismanagement of retained scrub	Construction & Operational	Negative effect significant up to the Local level	Tree protection fencing RPZ's Managed by a management company	Neutral	Tree Protection Plan (TPP) CEMP Landscape and Ecological Management Plan (LEMP)
Badnam Creek - watercourse	Local	Installation of outfall – disturbance to bank Increased pollution Change in flow rate	Construction & Operational	Negative effect significant up to the Local level	Attenuation basin and swales Permeable paving Improvements to bankside habitat	Neutral	CEMP Watercourse consent
Reptiles	Local	Loss of habitat Killing or injury of slow worms Increased predation by cats	Construction & Operational	Negative effect significant up to the Local level	Creation of onsite receptor area with long-term management Translocation of reptiles	Neutral	CEMP - Method Statement for pond works
Bats – commuting and foraging	Local	Disturbance from lighting	Construction & Operational	Negative effect significant up to the Local level	Develop lighting schedule in line with BCT guidelines on bats and lighting	Neutral	CEMP Lighting Strategy
Birds - nesting and foraging	Local	Accidental destruction of nests and disruption Disturbance by residents	Construction & Operational	Negative effect significant up to the Local level	Tree protection fencing Sensitive timing and/or ecologist supervision during vegetation removal	Neutral	LEMP

8 BIODIVERSITY NET GAIN

- 8.1. The Biodiversity Metric 3.1 has been utilised to demonstrate how the proposed development will deliver a net gain for biodiversity. Measurements for the Metric have been taken from the 2022 Habitat Plan (Appendix 1) and the Soft Landscape Proposals/ BNG Plan (Appendix 2). Full methodologies are included in Appendix 4.
- 8.2. A summary of the results are presented in Table 12 below.

On site baseline	Habitat Units	18.25
	Hedgerow Units	7.05
	River Units	0
On site post intervention	Habitat Units	11.75
	Hedgerow Units	8.35
	River units	0
Total net unit change	Habitat Units	-6.50
	Hedgerow Units	1.29
	River Units	0
Total net % change	Habitat Units	-35.61%
	Hedgerow Units	18.36%
	River Units	0%

- 8.3. Without offsite compensation in the form of biodiversity offsetting, the proposed development is achieving a -35.61% net loss in habitat units and the habitat trading is unacceptable because the loss of some of the other neutral grassland and dense scrub has not been accounted for.
- 8.4. Offsite biodiversity offsetting will be required to ensure the development delivers an overall net gain in biodiversity. Discussions with Eastleigh Borough Council will be required to agree a strategy for biodiversity offsetting within the local area.

Biodiversity Enhancements

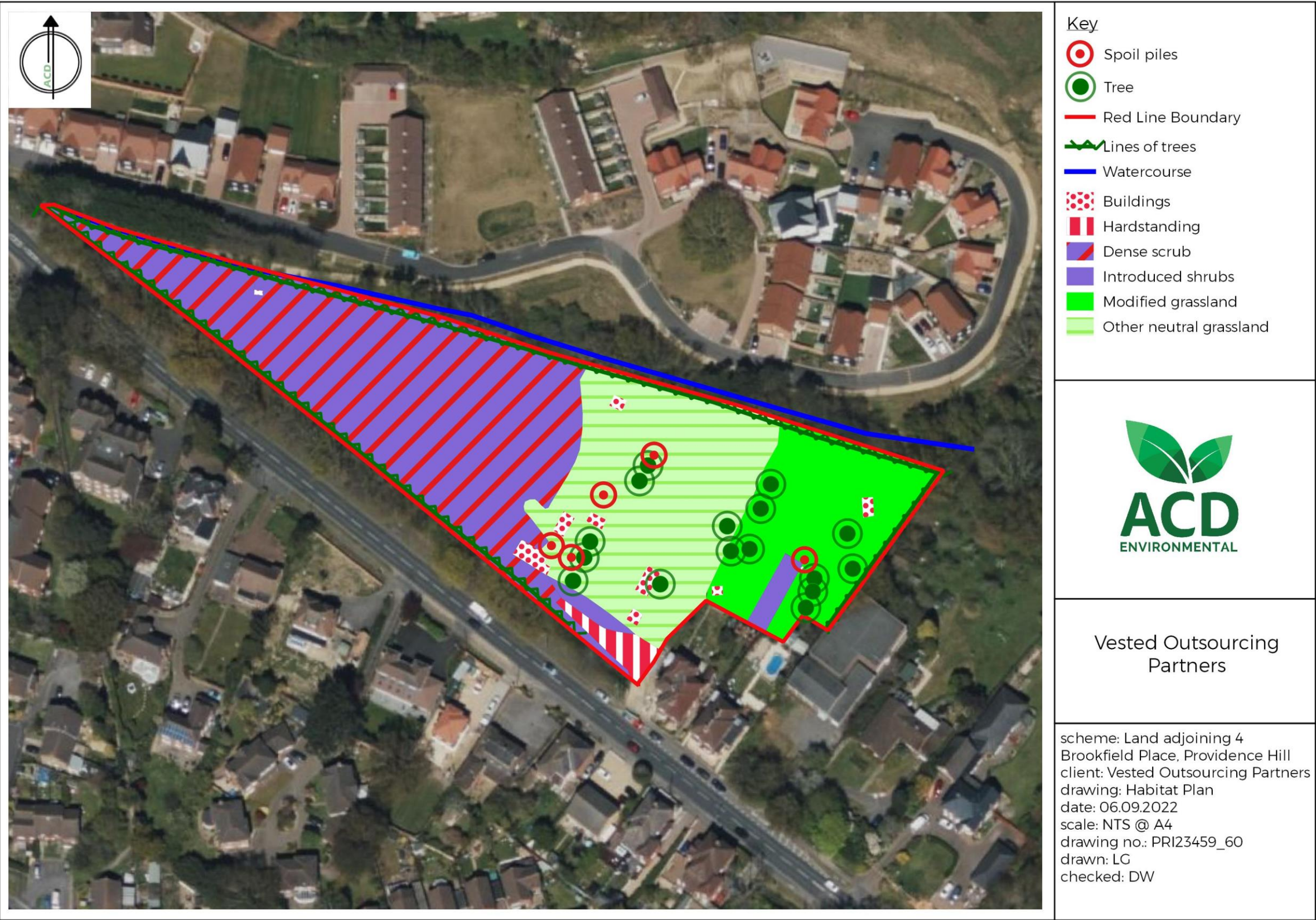
- 8.5. In order to comply with Local and National planning policy and planning policy guidance, the following enhancements will be delivered as a commitment to the planning application:

- 10 invertebrate boxes will be installed on houses and garages. Recommended boxes include: Green & Blue bee bricks and Woodstone Insect Blocks.
- Two HH7 Hogilo Hedgehog House's will be provided within boundary habitat. The boxes will be located within cover, close to vegetation and out of the prevailing wind.
- The Application Site will be enhanced for roosting bats through the provision of 10 integrated bat boxes within the new buildings. Recommended boxes include: Habitat Unfaced Bat Box or similar.
- Log piles will be incorporated into vegetated areas of the Application Site alongside the boundary habitats. Covering logs with brash will further enhance the benefit of the log piles. Log piles will be at least 1m wide, 0.5m high and be located in a discrete area. This recommendation will benefit fauna such as small mammals, amphibians and invertebrates.
- The gardens within the new development will be seeded or turfed with a high species lawn mix that tolerates mowing, such as EL1 from Emorsgate Seed.
- Shrubs, climbers and bulbs will be planted throughout the Application Site. Species included within the planting schedule of benefit to wildlife include clematis *Clematis montana*, ivy *Hedera helix*, honeysuckle *Lonicera periclymenum*, geranium 'Brookside', hazel *Corylus avellana*, Hebe 'Midsummer beauty', lavender *Lavandula angustifolia* and rose *Rosa sp.*

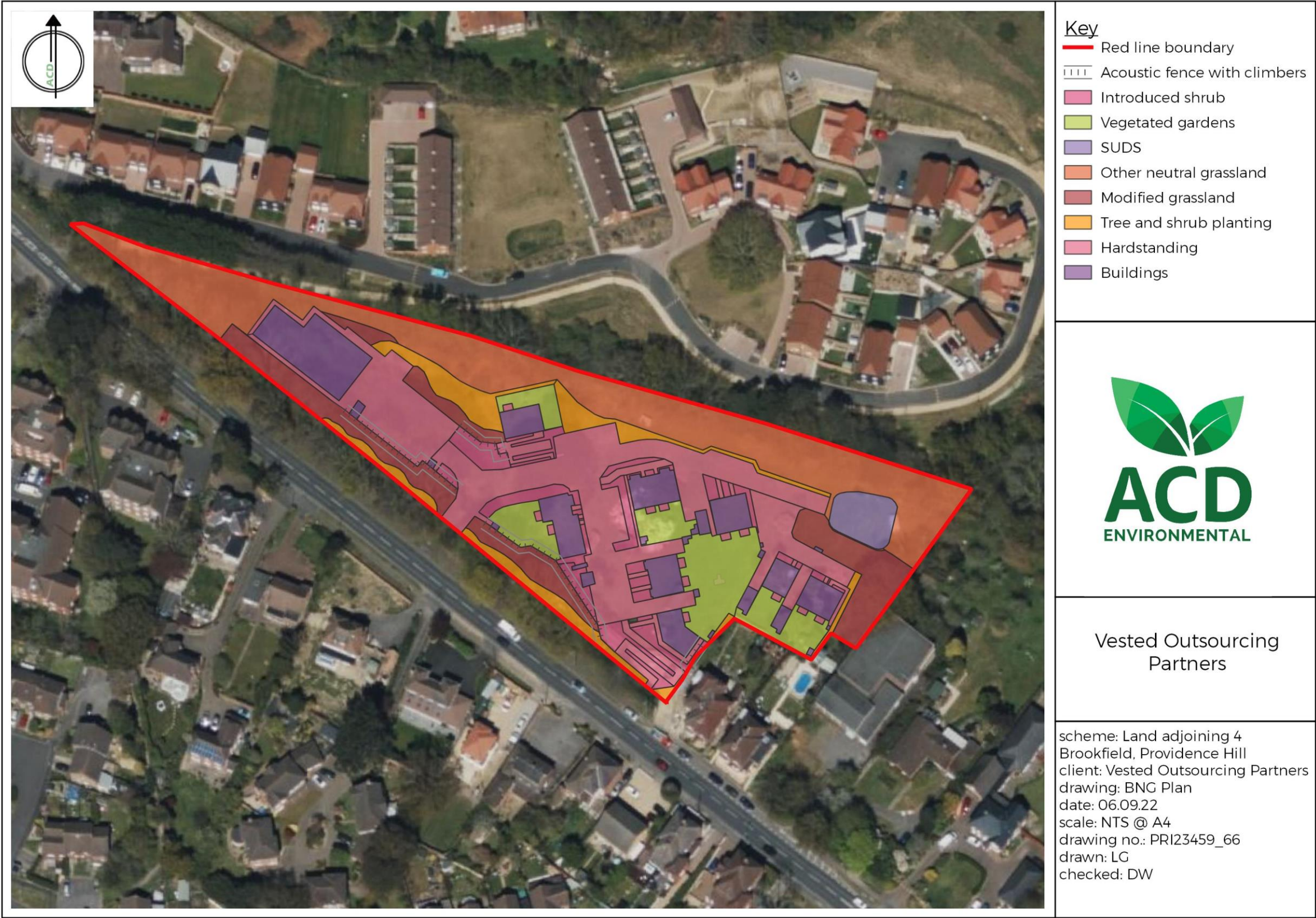
9 CONCLUSIONS

- 9.1. The Application Site mainly comprises dense scrub and grassland with numerous outbuildings in the east of the Application Site and mature tree lines on the boundaries.
- 9.2. Payments will be made to the Eastleigh Borough Council Nitrates Mitigation Scheme to mitigate for the likely cumulative effects on the Solent's designated sites. A buffer between the proposed development and the adjacent SINC woodland will help to minimise impacts during construction and operation. Drainage has been carefully designed to minimise any effects on the adjacent Badnam Creek and to prevent pollution. This can be further reinforced through the production of a CEMP.
- 9.3. A reptile translocation will be carried out to relocate the slow worm population to an on-site receptor area. Clearance of the scrub and trees will be undertaken outside of the bird nesting season and an update survey for badger will be carried out in winter 2022/ 2023 to ensure badgers have not started using the Application Site.
- 9.4. There are no legal restrictions to the timing of works with respect to bats, however, as a precaution, the mature horse chestnut tree will be felled following a soft felling methodology to account for the low likelihood of a bat being present.
- 9.5. Precautionary measures have been outlined for the protection of nesting birds, hedgehogs and badgers during site preparation and construction.
- 9.6. The proposals are delivering a -35.61% loss in habitat units, 18.36% gain in hedgerow units and 0% change in river units with the Biodiversity Metric 3.1. Therefore, offsite biodiversity offsetting will be required to ensure the development is delivering an overall net gain in biodiversity.
- 9.7. Implementing the recommendations within this report will ensure that there are no significant impacts upon protected species and that the proposals will be in conformity with relevant legislation, and National and Local policy.

APPENDIX 1: 2022 HABITAT PLAN



APPENDIX 2: BIODIVERSITY NET GAIN PLAN



APPENDIX 3: 2022 SITE PHOTOGRAPHS



Photograph 1: View buildings in east of Application Site.



Photograph 2: View of Application Site south elevation and boundary treeline



Photograph 3: View of other neutral grassland looking south



Photograph 4: Japanese Knotweed offsite along pavement of Providence Hill



Photograph 5: View of Badnam Creek in northern boundary of Application Site



Photograph 6: View of scrub and other neutral grassland to the west of Application Site



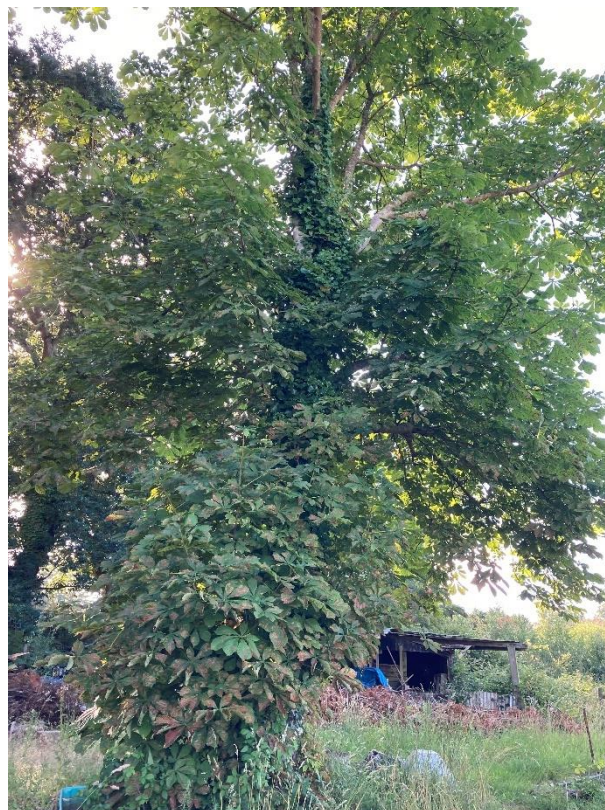
Photograph 7: View of low potential building in the south of Application Site



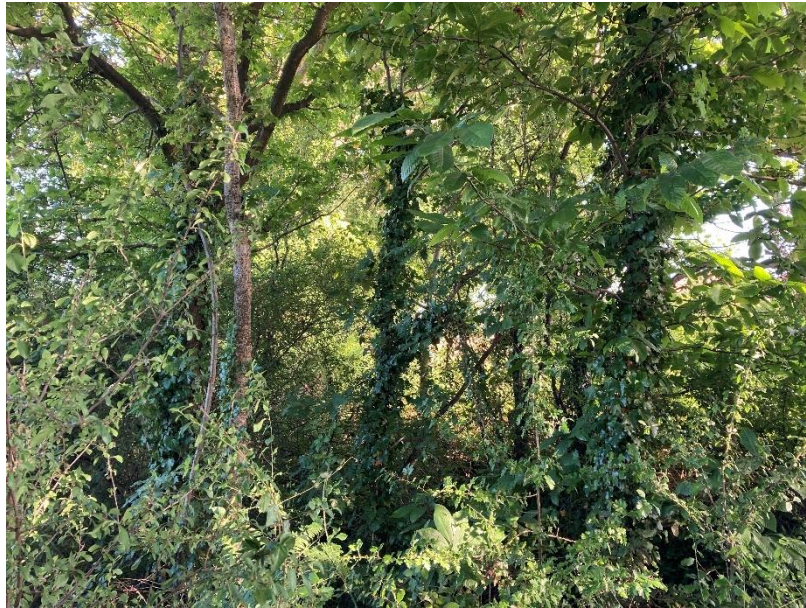
Photograph 8: View of low potential building in north-east corner of Application Site



Photograph 9: View of other neutral grassland



Photograph 10: View of horse chestnut tree to the south



Photograph 11: View of tree line along southern boundary



Photograph 12: View of mature oak and low potential building to the south



Photograph 13: View of scrub



Photograph 14: View of rubbish pile



Photograph 15: View of modified grassland and scattered trees to the north east



Photograph 16: View of mature oak and scrub

APPENDIX 4: FIELD SURVEY METHODOLOGY

Update Walkover Survey

The purpose of the update walkover survey in June 2022 was to verify the findings of the Extended Phase 1 Habitat Survey carried out by Aven Ecology in 2021 and to ensure the baseline conditions remained the same. Any change to the habitats and or evidence of or potential for protected species was recorded. The Phase 1 Habitat Survey methodology²⁴ was used to classify the Application Site into habitat types, as listed in the Phase 1 Manual. Where appropriate, dominant species codes within habitat types were recorded. Descriptive target notes were used for particular areas of interest.

Incidental records of fauna were made during the walkover survey and the habitats identified were evaluated for their potential to support legally protected species and species of Principal Importance.

Evidence of nesting birds recorded during the PRA and any incidental bird observations/birds heard were noted.

Limitations

The update survey was undertaken in June and the scrub on-site was dense and impenetrable. As a result, a large area in the west of the Application Site was not able to be searched thoroughly.

This has been taken into consideration within the recommendations given and an update survey in the winter is recommended to look for signs of badger.

Preliminary Bat Roost Assessment

An update Preliminary Roost Assessment (PRA) of the buildings and trees scheduled to be removed was carried out²⁵. This is an external and internal inspection survey, the purpose of which is to search for bats/evidence of bats and assess the likelihood of bats being present and the need for further survey and/or mitigation.

A systematic search was made of the buildings and the ground, especially below potential access points where present. Such features include windows sills, window panes, walls, tiles, weather boarding, lead flashing, eaves, behind surfacing materials and under tiles, and other cracks and crevices that provide protection from the elements. Such features are known to be used by roosting bats.

The internal inspection included searching for the following evidence of roosting bats:

²⁴ JNCC, (2010), *Handbook for Phase 1 habitat survey - a technique for environmental audit*. JNCC, Peterborough.

²⁵ Collins J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*. The Bat Conservation Trust, London.

- Roosting bats within crevices or free-hanging;
- Bat corpses e.g. on the floor, in uncovered water (header) tanks or other containers in roof voids;
- Bat droppings beneath roosting features;
- Feeding remains e.g. moth/butterfly *Lepidoptera* spp. wings and beetle *Coleoptera* spp. wing casings;
- Scratch marks and characteristic staining from urine and/or fur oil beneath roosting features e.g. on roofing timbers and walls within roof voids;
- 'Clean' gaps associated with bat roosts;
- Bat-fly *Nycteribiid* spp. pupal cases;
- Droppings, corpses, feeding remains and/or bat-fly pupal cases beneath roof insulation, which indicates use by bats before the insulation was installed; and
- Clean swept floors, which may indicate evidence has been removed.

The internal inspection included searching for the following features:

- Gaps within the structure of the roof e.g. mortise joints and junctions between roof timbers and between timbers and walls, and between the roof lining and roof covering;
- Gaps within the structure of walls and potential access points to cavity or rubble-filled walls;
- Gaps around the structure chimneys or within disused chimneys;
- Suitable locations for free-hanging bats and/or night/feeding perches e.g. timber beams;
- Gaps between lintels above windows or doors;
- Light gaps in the roof indicating access points to the outside; and
- Cool areas suitable for torpor or hibernation e.g. cellars.

The following equipment was used for the bat survey:

- Elevation and baseline drawings of the building or structure;
- Binoculars;

- Powerful torch to illuminate dark corners from the ground;
- Ladder;
- Collection pots and labels for corpses and droppings;
- Camera to record evidence and potential roosting sites; and
- Personal protective equipment (e.g. boots, gloves, helmet, mobile telephone).

In addition to the buildings, the trees were also searched for bats/evidence of bats and assessed for their potential to support roosting bats. The evidence of roosting bats searched for is detailed above with regard to buildings (e.g. bat droppings and feeding remains). The features of bats were searched for on the trees with reference to the three broad categories of Potential Roost Features (PRFs) and sub-categories of PRFs from the Bat Tree Habitat Key²⁶. These are as follows:

- Disease and decay PRFs:
 - Woodpecker and squirrel holes;
 - Knot holes;
 - Pruning-cuts;
 - Tear outs;
 - Compression forks;
 - Wounds;
 - Cankers; and
 - Butt rots.
- Association PRFs:
 - Fluting; and
 - Ivy.
- Damage PRFs:

²⁶ Bat Tree Habitat Key 2018. *Bat Roosts in Trees – A Guide to Identification and Assessment for Tree-care and Ecology professionals*. Exeter: Pelagic Publishing.

- Hazard beams;
- Frost cracks;
- Subsidence/shearing and helical splits;
- Lightning strikes;
- Desiccation fissures;
- Transverse snaps;
- Welds; and
- Lifting bark.

Great crested newt Habitat Suitability Index Assessment

An update Habitat Suitability Index Assessment of the closest pond to the Application Site at Bursledon Windmill was carried out in June 2022. This pond was assessed for its suitability to support great crested newt, using the HSI scoring system²⁷.

This method seeks to quantify the potential of a pond to support great crested newt by numerically assessing ten indices thought to influence their presence.

The indices considered are:

- Location
- Pond area
- Water quality
- Percentage shade
- Percentage water fowl
- Presence of fish
- Number of ponds in the wider landscape
- Suitability of terrestrial habitat

²⁷ Available at: <http://www.arguk.org/download-document/9-great-crested-newt-habitat-suitability-index-arg-advice-note-5>

- Percentage macrophyte cover

The HSI system is not a substitute for presence/absence surveys and is not intended to predict the occurrence of great crested newt. However, a correlation between the presence of great crested newts and a high HSI score is observed in ponds.

Limitations

There were no limitations to the HSI assessment.

eDNA Sampling for Great Crested Newts

The absence of great crested newts from Bursledon Windmill pond was determined by eDNA sample analysis following current guidance²⁸.

The field sampling was carried by a great crested newt Natural England Class licence holder on 6th July 2022. Laboratory analysis was carried out by Surescreen Scientific.

A total of 20 samples of pond water are collected and during the laboratory analysis, the pond samples are combined to produce one eDNA extract. A total of 12 separate analyses are carried out from this one extract. This results in a score for the number of positive replicates (score out of 12) and if one or more are positive then presence is confirmed.

Results are interpreted as follows:

- Positive - the results indicate that great crested newt is present within the pond. Full survey methods are required to estimate the population size;
- Negative - the result indicates that great crested newt is not within the pond. No further survey work is required; or
- Inconclusive - indicates degradation or inhibition of the sample, therefore the lack of detection of great crested newt DNA is not conclusive evidence for determining the absence of the species. Further eDNA sampling or full surveys will be required.

Bat Surveys

²⁸ Biggs J. et al (2014). *Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (Triturus cristatus) environmental DNA*. Freshwater Habitats Trust, Oxford.

An update dusk emergence/ dawn re-entry survey and transect survey was carried out on 21.06.22 and 22.06.22 as per the recommendations in the Aven Ecology Phase 1 Report. Buildings 6 and 7 and Tree 1 were covered in the surveys and a single transect was walked around accessible areas of the Application Site to record general bat activity across the Application Site.

Table 13: Survey conditions, surveyor and equipment

Date and times	Surveyor	Weather	Equipment
21st June 2022 21:06-22:51 (sunset 21:21)	Ryan Yeates Katie Crawford Lily Gilbert Anouska Laramy	<i>Temperature: 12°C - 11°C</i> <i>Cloud cover:0%</i> <i>Wind: 1</i> <i>Precipitation: Dry</i>	Anabat Scout bat detectors
22 nd June 2022 03:20- 04:50 (sunrise 04:50)	Ryan Yeates Katie Crawford Lily Gilbert Anouska Laramy	<i>Temperature: 17°C - 16°C</i> <i>Cloud cover:100%</i> <i>Wind: 1-2</i> <i>Precipitation: Dry</i>	Anabat Scout bat detectors

Biodiversity Metric 3.1

Assessment Framework

For the purposes of this assessment, the Biodiversity Metric 3.1 (JP039) has been utilised.

The Biodiversity Metric 3.1 is accompanied by a 'Calculation Tool'. This was used to calculate the biodiversity units for the Application Site before (baseline) and after development. The User Guide²⁹ has been followed.

²⁹ STEPHEN PANKS A, NICK WHITE A, AMANDA NEWSOME A, JACK POTTER A, MATT HEYDON A, EDWARD MAYHEW A, MARIA ALVAREZ A, TRUDY RUSSELL A, SARAH J. SCOTT B, MAX HEAVER C, SARAH H. SCOTT C, JO TREWEEK D, BILL BUTCHER E and DAVE STONE A (2022). *Biodiversity metric 3.1: Auditing and accounting for biodiversity – User Guide. Natural England.*

Habitat Measurements

Baseline habitat measurements were carried out in line with the results of the 2022 Walkover Survey. Measurements were predominantly made using online mapping tools (a combination of QGIS and Google Earth). However, habitats had originally been ground-truthed during the field survey.

Proposed habitat measurements were taken from the '*Landscape Proposals*' (drawing number: 2252-TF-XX-00-DR-L-1010) drawn by Terrafirma.

Measurements were entered to the nearest square metre in area.

Distinction Assessments

Habitats are assigned to distinctiveness bands automatically within the Metric. These are based on an assessment of the distinguishing features of a habitat or linear feature, including the consideration of species richness, rarity (at local, regional, national and international scales), and the degree to which a habitat supports species rarely found in other habitats.

The distinctiveness band of each habitat is preassigned in the Biodiversity Metric 3.1. The bands are based upon the UK habitat classification system. A combination of simple rules and professional judgement have been used to assign each habitat type to the appropriate distinctiveness band. The distinctiveness categories used are tailored to habitat type.

Distinctiveness Assessments are assigned according to **Table 14**.

Table 14: Distinctiveness Assessment

Category	Scores	Multiplier
Very High	8	Priority habitats as defined in Section 41 of the Natural Environment and Rural Communities (NERC) Act that are highly threatened, internationally scarce and require conservation action e.g. blanket bog
High	6	Priority habitats as defined in Section 41 of the NERC Act requiring conservation action e.g. lowland fens
Medium	4	Semi-natural habitats not classed as a Priority Habitat

Category	Scores	Multiplier
Low	2	Habitat of low biodiversity value. Temporary grass and clover ley; intensive orchard; rhododendron scrub
Very Low	0	Little or no biodiversity value e.g. hard standing or sealed surface

Condition Assessments

Condition assessments for existing habitats can be found in a separate excel document.

Strategic significance

The spatial location of a habitat is treated as a component of the quality of a habitat parcel in the same way as distinctiveness or condition. Strategic significance is used to determine whether the habitat is of increased importance due to its location.

Risk Factors

As part of any proposed habitat creation and restoration, risk factors must be taken into account to correct for disparity, delay or risk. These values are preassigned within the Biodiversity Metric 3.1 and take into consideration the following factors:

- Temporal risk; and
- Difficulty of creation and restoration.

Advance/delay in habitat creation takes into account any significant time difference in the creation of a habitat type. This time is measured in full years and is entered by the assessor.

Habitat creation in advance is rewarded by reducing the difficulty and temporal risk multipliers applied. This reflects the lower delivery risk - there is less risk of failure when a habitat is already making progress towards its target condition.

Any significant delay in the creation of a habitat type relative to loss of on-site habitats (e.g. due to phased developments and developments that temporarily require parts of the development site for construction purposes) is added to the pre-populated time to target condition and increases the effect of the risk multiplier accordingly.

River Condition Assessment

The River Condition Assessment tool evaluates river condition within a project site. It incorporates field (MoRPh module) surveys of one or more MoRPh5 subreaches (sets of five contiguous MoRPh module surveys) and a desk-based assessment of the indicative geomorphic type of the river reach containing the project site. MoRPh5 surveys are conducted to cover at least 20% of the river length within the project site, ensuring that no two subreaches are more than four subreach lengths apart, and that one of the subreaches captures the apparently most degraded part of the river channel. The length of each MoRPh module is 10, 20, 30, or 40 m depending, respectively, upon whether the river is <5 m, 5–<10 m, 10–<20 m or 20–<30 m wide.

MoRPH5 indicators are automatically calculated from a contiguous set of 5 MoRPH5 surveys. 35 indicators are calculated for each MoRPH5 survey. Three contribute to the River Type Assessment (A6, A7, A8) and describe the size and type of bed material in the MoRPH5 subreach. Thirty-two contribute to the River Condition Score and describe natural and human-influenced properties of the bank tops (B1 to B5), bank faces (C1 to C10), channel-water margins (D1 to D5) and channel bed (E1 to E12).

Positive indicators score 0 to +4 and reflect natural elements. Negative indicators score 0 to -4 and reflect human pressures and interventions.

The following indicators are extracted from the desk study and field survey data are used to estimate the indicative river type and preliminary condition score for the subreach:

- A1 – Braiding index (desk study)
- A2 – Sinuosity index (desk study)
- A3 – Anabranching index (desk study)
- A4 – Level of confinement (desk study)
- A5 – Valley gradient (desk study)
- A6 – Bedrock features (field survey)
- A7 – Coarsest bed material (field survey)
- A8 – Average alluvial bed material size class

Figure 1³⁰ shows the thirteen indicative river types (A to M) that may be found in England, reflecting their bed material, planform, and valley confinement.

³⁰ Gurnell, A. M., Scott, S. J., England, J., Gurnell, D., Jeffries, R., Shuker, L., Wharton, G. Assessing river condition: A multiscale approach designed for operational application in the context of biodiversity net gain. *River Res Applic.* 2020; 36:1559-1578.

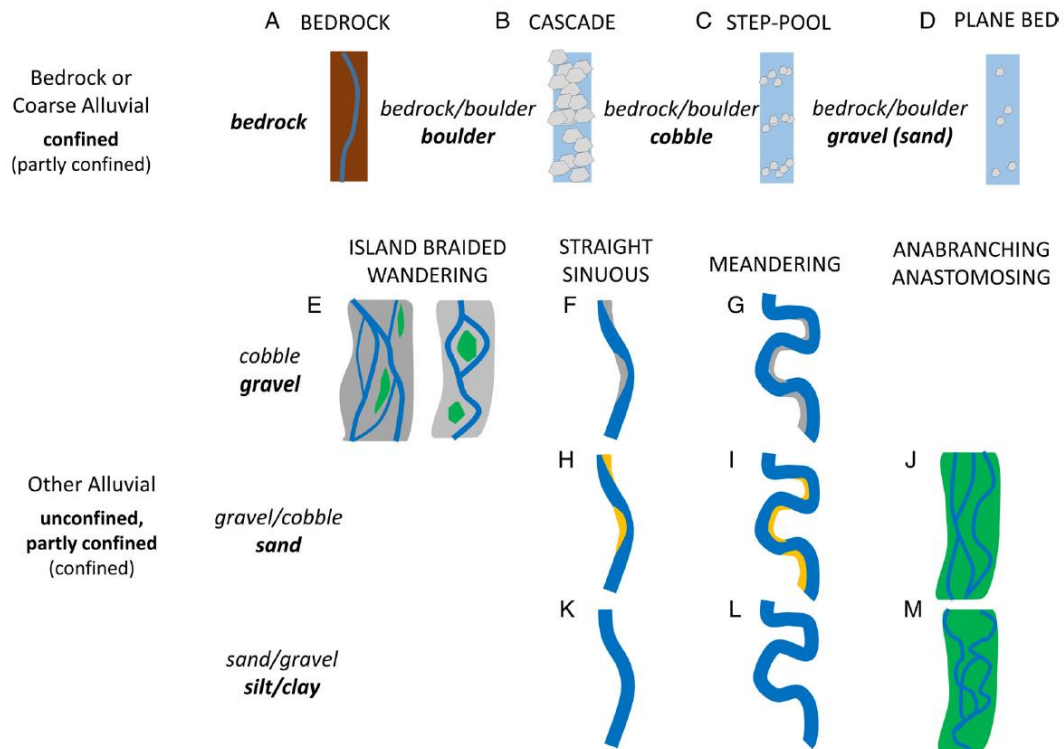


FIGURE 2 Thirteen indicative river types (A to M) that may be found in England, reflecting their bed material, planform, and valley confinement. (Bed material size is indicated in an italic font with the most likely dominant type emboldened. The most likely level of valley confinement is emboldened) [Colour figure can be viewed at wileyonlinelibrary.com]

The following indicators are extracted from the MoRPH5 field survey data and used to estimate the preliminary river condition (+ is a positive indicator and – is a negative indicator):

- B1 - Bank top vegetation structure (+)
- B2 - Bank top tree feature richness (+)
- B3 - Bank top water-related features (+)
- B4 - Bank top non-native invasive plant species (NNIPS) (-)
- B5 - Bank top managed ground cover (-)
- C1 – Bank face riparian vegetation structure (+)
- C2 – Bank face tree feature richness (+)
- C3 – Bank face natural bank profile extent (+)
- C4 – Bank face natural bank profile richness (+)
- C5 – Bank face natural bank material richness (+)
- C6 – Bank face bare sediment extent (+)
- C7 - Bank face artificial bank profile extent (-)
- C8 - Bank face reinforcement extent (-)
- C9 - Bank face reinforcement material severity (-)
- C10 - Bank top NNIPS (-)
- D1 - Channel margin aquatic vegetation extent (+)

- D2 - Channel margin aquatic morphotype richness (+)
- D3 - Channel margin physical feature extent (+)
- D4 - Channel margin physical feature richness (+)
- D5 – Channel margin artificial features (-)
- E1 – Channel aquatic morphotype richness (+)
- E2 – Channel bed tree features richness (+)
- E3 – Channel bed hydraulic features richness (+)
- E4 – Channel bed physical feature extent (+)
- E5 – Channel bed physical feature richness (+)
- E6 – Channel bed material richness (+)
- E7 – Channel bed siltation (-)
- E8 – Channel bed reinforcement extent (-)
- E9 – Channel bed reinforcement material severity (-)
- E10 – Channel bed artificial features severity (-)
- E11 – Channel bed NNIPS extent (-)
- E12 - Channel bed filamentous algae extent (-)

The MoRPH Pro system averages all the positive scores and all of the negative scores, then adds them together to give a preliminary condition score. All the scores are equally weighted, no individual indicators are given more (or less) weight than others.

The preliminary condition score, estimated from the field survey of the 5-module subreach, is combined with the indicative river type, estimated from the reach-scale desk study, to assign a final condition score.

The final condition scores are as follows:

- 1 – Poor
- 2 – Fairly Poor
- 3 – Moderate
- 4 – Fairly Good
- 5 - Good

The final condition score is inputted in the river condition assessment tool to provide an assessment of river condition.



Head Office

Rodbourn Rail Business Centre
Grange Lane
Malmesbury
SN16 0ES

Tel: 01666 825646

Surrey Office

Courtyard House
Mill Lane
Godalming
GU7 1EY

Tel: 01483 425714

Hampshire Office

Suite 6
Crescent House
Yonge Close
Eastleigh
SO50 9SX

Tel: 02382 026300

Email: mail@acdenv.co.uk

Website: www.acdenvironmental.co.uk

ECOLOGICAL SURVEYS * PROTECTED SPECIES LICENSING * MITIGATION * IMPACT ASSESSMENT
ARBORICULTURAL SITE MONITORING AND SUPERVISION * ARCHAEOLOGY
LANDSCAPE & VISUAL IMPACT ASSESSMENT * LANDSCAPE AUDIT * PROJECT MANAGEMENT
EXPERT WITNESS* LANDSCAPE DESIGN & PLANNING LANDSCAPE MANAGEMENT