

Ecological Impact Assessment

July 2025

**Land off St Mary's Road,
Hayling Island**

Prepared by
CSA Environmental

On behalf of
Gladman Developments Ltd

Report No: CSA/4956/14

This report may contain sensitive ecological information. It is the responsibility of the Local Authority to determine if this should be made publicly available.

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CONTENTS

Page

Executive Summary	1
1.0 Introduction	2
2.0 Legislation, Planning Policy & Standing Advice	4
Legislation	4
National Planning Policy	4
Local Planning Policy	4
Standing Advice	4
3.0 Methods	5
Desk Study	5
Field Surveys	6
Limitations	7
Evaluation and Assessment	8
4.0 Baseline Ecological Conditions	9
Nature Conservation Designations	9
Habitats and Flora	14
Fauna	20
Future Baseline	27
Summary of Ecological Features	28
5.0 Assessment of Effects	29
Potential Impacts and Ecological Effects	30
Mitigation by Design	34
Additional Mitigation	34
Residual Effects	36
Cumulative Effects	38
Compensation	42
Enhancement	43
Monitoring	44
6.0 Conclusions	45
7.0 References	46

Appendices

Appendix A: Habitats Plan

Appendix B: Legislation, Planning Policy and Standing Advice

Appendix C: Desk Study Information

Appendix D: Photographs

Appendix E: Habitats and Flora Species List

Appendix F: Evaluation and Assessment Methods

Appendix G: Bat Survey Report

Appendix H: Breeding Bird Survey Report

Appendix I: Reptile Survey Report

Appendix J: Great crested newt eDNA result

EXECUTIVE SUMMARY

Residential development is proposed at land off St Mary's Road, Hayling Island, for which planning permission is sought.

CSA Environmental was instructed by Gladman Developments Ltd to undertake an Ecological Impact Assessment (EclA) of the proposed development. To inform this assessment, a desktop study followed by a suite of targeted species and habitat surveys were undertaken.

The Site comprises two cropland fields with areas of neutral grassland, alongside parcels of dense scrub, an on-site pond and stretches of native species hedgerows and ditches. The illustrative proposals seek to retain the pond and the hedgerows, with new tree and hedgerow planting and creation of large grassland areas within the proposed green infrastructure. A moderate population of slow-worm have been identified within the Site, as well as common and widespread bat species which utilise the Site for foraging and dispersal. Mitigation has been proposed to address potential impacts on these protected species and ensure compliance with applicable legislation.

In the absence of any mitigation measures, the proposed development would have the potential to result in significant negative effects on the European site designations of the East Solent system, including but not limited to the Chichester and Langstone and Portsmouth Harbours SPAs and Ramsar sites, and the Solent Maritime SAC. Potential impact pathways include the loss of functionally linked supporting habitats for wintering birds, increased recreational pressure at coastal sites and eutrophication of the water environment. Mitigation measures will include the establishment of a permanent off-site brent goose refuge and financial contributions toward the Solent Recreation Mitigation Strategy. The proposed development has also been found to be nitrogen negative (i.e. a betterment on neutrality).

The proposals are projected to deliver a measurable net gain in biodiversity exceeding the mandatory 10%, and further opportunities for ecological enhancement may be secured by planning condition.

Based on successful implementation of the proposed avoidance, mitigation and enhancement, the proposed development is anticipated to result in no significant residual negative effects on important ecological features. The scheme is considered to accord with all relevant nature conservation legislation, as well as with the provisions of Policy DM8 of the adopted Havant Borough Local Plan.

1.0 INTRODUCTION

- 1.1 This report has been prepared by CSA Environmental on behalf of Gladman Developments Ltd. It sets out the findings of an Ecological Impact Assessment (EclA) of proposed development at Land off St Mary's Road, Hayling Island (hereafter 'the Site'). Residential development is proposed at the Site, for which planning permission is sought.
- 1.2 The scope of this assessment has been determined with consideration of best-practice guidance provided by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) and the Biodiversity: Code of practice for planning and development published by the British Standards Institute (BS 42020:2013).
- 1.3 The Site occupies an area of c. 11.77ha comprising two large cropland fields, parcels of neutral grassland and dense scrub, with a central pond and farm building (see Habitats Plan in Appendix A). The Site is located around central grid reference SZ 7192 9978, to the South of Hayling Island. The Site is bounded by residential properties to the south and east, open greenspace adjoining Hayling Island Holiday Park to the west, and an agricultural field connected to the grounds of the Church of St Marys to the north. The wider landscape context of the Site is dominated by developed land with scattered agricultural and arable fields.
- 1.4 An initial desk study and field survey, including an extended Phase 1 Habitats survey, were undertaken for the Site in August 2021 as part of a Preliminary Ecological Appraisal. An update field survey and desk study were undertaken in January 2024, and subsequently a further update desk study undertaken in February 2025, to assist in identifying any shifts in baseline ecological conditions, and to inform reclassification of habitat types under the updated UK Habitats (UK Hab) classification system. In addition, the following further survey work was undertaken between April 2021 and March 2022:
 - Breeding bird surveys (April-June 2021)
 - Bat surveys (May-September 2021)
 - Reptile surveys (April-August 2021)
 - Great crested newt eDNA survey (May 2021)
 - Habitat Condition Assessment (August 2021)
 - Winter bird surveys (November 2021 – March 2022)
- 1.5 The following update survey work has been undertaken between January and October 2024:
 - Update winter bird surveys (January 2024)
 - Update breeding bird survey (April-July 2024)

- Update bat surveys (April-October 2024)
 - Update reptile surveys (May-June 2024)
 - Update great crested newt eDNA survey (April 2024)
 - Update Habitat Condition Assessment (July 2024)
- 1.6 This EclA is an update of that submitted in support of the planning application for development at the Site dated 14 December 2021 (Planning reference APP/21/01434; EclA document reference CSA/4956/05 RevC). The Site was previously allocated under the draft Havant Borough Local Plan 2036, however, the draft plan has since been withdrawn.
- 1.7 This updated EclA aims to:
- Establish any changes in baseline ecological conditions at the Site.
 - Factor in changes to the relevant legal and planning policy contexts.
 - Re-evaluate the importance of ecological features which could be affected by the proposed scheme in light of updated information, where relevant.
 - Identify any likely significant impacts or effects of the proposed development on important ecological features, in the absence of mitigation, including cumulative impacts.
 - Set out any measures necessary to effectively avoid or mitigate likely significant effects, and identify residual impacts.
 - Identify any compensation measures required to offset residual impacts.
 - Set out potential ecological enhancement measures that may be secured by the proposed scheme, and quantify the overall net change in biodiversity using the Statutory Biodiversity Metric.
 - Confirm how proposed mitigation, compensation and enhancement measures could be secured.
 - Provide sufficient information to determine whether the project accords with relevant nature conservation policies and legislation, and where appropriate, to allow conditions or obligations to be imposed by the relevant authority.
- 1.8 An EclA can be used for the appraisal of projects of any scale. This is a best practice evaluation process, recommended by CIEEM (2018). It is intended that the evaluation of findings presented here-in will aid the Havant Borough Council in their review of the planning application.
- 1.9 This report should be read in conjunction with the Biodiversity Net Gain Assessment: Design Stage report (CSA/4956/15) which details further ecological assessment undertaken in respect of Biodiversity Net Gain (BNG), and the predicted net effect of the proposed development on biodiversity.

2.0 LEGISLATION, PLANNING POLICY & STANDING ADVICE

Legislation

- 2.1 Legislation relating to wildlife and biodiversity of particular relevance to this EclA includes:
- The Conservation of Habitats and Species Regulations 2017 (as amended)
 - The Wildlife and Countryside Act 1981 (as amended)
 - The Natural Environment and Rural Communities (NERC) Act 2006
 - The Protection of Badgers Act 1992
 - The Environment Act 2021
- 2.2 This legislation has been addressed, as appropriate, in the production of this report with further information provided in Appendix B.

National Planning Policy

- 2.3 The National Planning Policy Framework (NPPF) (Department for Levelling Up, Housing & Communities, 2024) sets out the government planning policies for England and how they should be applied. Chapter 15: Conserving and Enhancing the Natural Environment, is of particular relevance to this report as it relates to ecology and biodiversity. Further details are provided in Appendix B.
- 2.4 Accompanying the NPPF, central government guidance on the implementation of planning policies is set out within online Planning Policy Guidance (PPG). The Natural Environment PPG addresses biodiversity conservation, from individual site and species protection through to the supporting of ecosystem services. Further guidance in respect of statutory obligations for biodiversity conservation within the planning system is provided by Government Circular 06/2005.

Local Planning Policy

- 2.5 A number of local planning policies relate to ecology, biodiversity and/or nature conservation. These are summarised in Appendix B.

Standing Advice

- 2.6 Natural England Standing Advice regarding protected species aims to support local authorities and forms a material consideration in determining applications in the same way as any individual response received from Natural England following consultation. Standing advice has therefore been given due consideration, alongside other detailed guidance documents, in the scoping of ecological surveys and production of this report.

3.0 METHODS

Desk Study

- 3.1 An initial ecological desk study was undertaken in August 2021 comprising a review of online resources and biological records centre data as detailed below. This was subsequently updated in January 2024 and February 2025, with all information being reviewed.
- 3.2 The Multi-Agency Geographic Information for the Countryside (MAGIC) online database was reviewed to identify the following ecological features (based on the Site's likely 'zone of influence' in respect of such features):
 - Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar sites within 10km of the Site (including possible/proposed sites)
 - Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Local Nature Reserves (LNR) within 3km of the Site
 - Other relevant data e.g. Ancient Woodland Inventory within 1km of the Site
- 3.3 A review was undertaken of the location of any such designations, their distance from and connectivity with the Site, and the reasons for their designation. This information was used to determine whether they may be within the proposed development's Zone of Influence (Zol).
- 3.4 Hampshire Biodiversity Information Centre (HBIC) was contacted for details of any non-statutory nature conservation designations and records of protected/notable habitats and species. This information was requested for an area encompassing the Site and adjacent land within c. 2km of its central grid reference. This search area was selected to include the likely zone of influence of effects upon non-statutory designations and protected or notable habitats and species.
- 3.5 Further online resources were reviewed for information which may aid the identification of important ecological features. The Woodland Trust's online Ancient Tree Inventory was reviewed for known ancient or veteran trees within the Site and adjacent land. Interactive online mapping provided by the charity 'Buglife' was used to determine whether the Site falls within an Important Invertebrate Area.
- 3.6 Consultation has taken place with Natural England (through their Discretionary Advice Service) as well as Havant Borough Council regarding mitigation requirements for the on-site Core Area under the Solent Wader and Brent Goose Strategy. This is addressed further within the accompanying Brent Goose Mitigation Strategy (CSA/4956/09).

- 3.7 In accordance with Natural England's Great Crested Newt Mitigation Guidelines (2001), a desktop search was undertaken to identify ponds within 500m of the Site which may have potential to support breeding great crested newts *Triturus cristatus*, using Ordnance Survey (OS) mapping, the MAGIC database and aerial photography.
- 3.8 Where possible under the terms of the data provider, relevant desk study data are presented in Appendix C.

Field Surveys

- 3.9 An extended Phase 1 Habitat survey was carried out in dry, overcast weather conditions on 27th August 2021 by Sophie Vines, encompassing the Site and immediately adjacent habitats that could be viewed.
- 3.10 In view of the passage of time, and the importance of planning decisions being based upon up-to-date evidence, a follow-up site walkover was undertaken in fine and dry weather conditions on 11 January 2024 by Sophie Vines (FISC Level 3) and Megan Bridgman encompassing the Site and immediately adjacent habitats that could be viewed. This survey was carried out in part to identify any significant changes in baseline habitat conditions, which could compromise the reliability of targeted species surveys undertaken in 2021 and 2022, as well as to assist in the translation of the previous Phase 1 habitat classifications to the updated UK Habitats (UKHab) classification system.
- 3.11 UKHab is a unified and comprehensive system for mapping and classifying habitats, designed to provide a simple and robust approach to surveying and monitoring, and replaces Phase 1 Habitat survey methods. The method allows for identification of important habitat types, including habitats of Principal Importance under Section 41 (S41) of the NERC Act (2006) and Habitats Directive Annex I habitats. This method also allows for direct translation of habitats into the current Biodiversity Metric (Natural England, version 4.0).
- 3.12 The following parameters were adopted for the UKHab survey undertaken for this PEA:
- UKHab Professional edition (Butcher *et al.*, 2020, commercial End User Licence Agreement (EULA))
 - Minimum Mappable Unit (MMU):
 - 10m²/0.001ha (polygons)
 - 5m (linear)
 - Primary Habitats recorded to a minimum of Level 2 (see below) with UKHab codes provided
 - Mandatory secondary codes used
 - Base-mapping comprising a combination of aerial imagery and topographic information

- 3.13 Primary Habitats are recorded to a minimum of Level 2. Where the survey is conducted at an appropriate time of year (e.g. May to July for grassland) habitats may be recorded to Level 3, 4 or 5, only if conditions and the experience of the surveyor allow.
- 3.14 To assist with classification of grassland habitats quadrat samples were taken on 09 July 2024 as part of the Habitat Condition Assessments to inform the Biodiversity Net Gain assessment by Megan Bridgman and Jessica Forest. Representative sample locations were identified within each grassland parcel, spread evenly to avoid habitat transitions or ecotones, following a 'W' shape through the parcel and covering a minimum of five sampling locations.
- 3.15 Quadrats of 1m x 1m were used, repeated four times in each sample location (i.e. 2m x 2m or 4m²). This technique assists, for example, with distinguishing between modified (g4) and other neutral (g3c) grasslands (using the threshold of nine species per m², reporting an average of the four samples) and of lowland meadows (g3a) (using the threshold of 35 species per 2m x 2m samples).
- 3.16 The UKHab classifications are presented on the Habitats Plan in Appendix A. Appendix D provides photographs of the habitats at the Site and Appendix E provides a list of floral species recorded in each habitat parcel. Nomenclature for higher plants within this report is consistent with the fourth edition of The New Flora of the British Isles (Stace, 2019).

Further Survey Work

- 3.17 The following update detailed survey work was carried out between January to October 2024, with full methods and results provided in the relevant Appendices:
- Habitat Condition Assessment (see accompanying Biodiversity Net Gain Assessment; CSA/4956/15)
 - Bat Activity Surveys (Appendix G)
 - Breeding Bird Surveys (Appendix H)
 - Winter Bird Surveys (see accompanying Brent Goose Mitigation Strategy; CSA/4956/09)
 - Reptile Surveys (Appendix I)
 - Great Crested Newt eDNA result (Appendix J)

Limitations

- 3.18 The update site walkover was undertaken outside of the optimum flowering time for the habitats present within the Site, however, this was subsequently informed by in-season Habitat Condition Assessments of the on-site habitats, which was used to confirm habitat type classifications. Limitations to specific surveys are addressed in the relevant appendices.

Evaluation and Assessment

- 3.19 Ecological features are identified, evaluated and assessed in accordance with the CIEEM Guidelines for Ecological Impact Assessment (2018), with detailed methods provided in Appendix F.
- 3.20 It is an established principle (CIEEM, 2018) that EcIA is an iterative process. Specialist advice on the avoidance and mitigation of the potential negative effects of the proposed development has been input from an early design stage.

4.0 BASELINE ECOLOGICAL CONDITIONS

Nature Conservation Designations

Statutory

- 4.1 There are no statutory designations covering any part of the Site.
- 4.2 Eight international statutory designations were identified within 10km of the Site. These were the Chichester and Langstone Harbours Ramsar & SPA (c. 750m east of the Site), Solent Maritime SAC (c. 860m south-east), Solent and Dorset Coast SPA (c. 880m south), Solent and Isle of Wight Lagoons SAC (c. 5.4km north-west), Portsmouth Harbour Ramsar & SPA (c. 8km north-west) and South Wight Maritime SAC (c. 8.9km south-west). There are two further designations present beyond 10km of the Site which are also of relevance to this assessment: the Solent and Southampton Water SPA and Ramsar located c. 11.2m west of the Site at their closest point.
- 4.3 Given the legislative frameworks underpinning international designations, these are considered to be important at the International level.
- 4.4 Potential impact pathways identified in relation to these international designations include increased visitor pressure/disturbance, loss of functionally linked land, changes in air quality and increases in nitrogen deposition which could result in habitat degradation. These impact pathways and the potential for likely significant effects on qualifying features of these designations are discussed further in Section 5 of this report, with full details provided within the Habitats Regulations Assessment (CSA/4956/06), which should be read in conjunction with this report.
- 4.5 Three national statutory designations were identified within 3km of the Site. These were the Sinah Common SSSI (c. 710m south of the Site), Chichester Harbour SSSI (c. 750m east) and Langstone Harbour SSSI (c. 800m west). As SSSIs are administered and designated under national legislation, these sites are considered to be important at the National level.
- 4.6 The Chichester Harbour and Langstone Harbour SSSIs both form part of the Chichester and Langstone Harbour SPA and Ramsar designations and share special interests/qualifying features. Therefore, the impact pathways identified in relation to the international designations are of relevance and are discussed in Section 5 of this report.
- 4.7 Sinah Common SSSI is a stretch of varying coastal habitats which comprises the western side of south Hayling Beach, Hayling Golf Course and Sinah Common. It is primarily designated for botanical interest and

includes a primary support area for the Solent Waders and Brent Geese Strategy (SWBGS). The designation contains public footpaths and road access to the beach and car parks along the south Hayling Island coast. The potential effects on this SSSI are discussed in Section 5.

- 4.8 Five local statutory designations were identified within 3km of the Site. These were the Hayling Billy LNR (c. 800m west of the Site), Gutner Point LNR (c. 1.8km north-east), The Kench, Hayling Island LNR (c. 2.3km west), West Hayling LNR (c. 2.8km north-west) and Sandy Point LNR (c. 3.0km south-east). These sites are considered important at the Local level.
- 4.9 The Hayling Billy LNR, Kench, Hayling Island LNR, West Hayling LNR and Gutner Point LNR all overlap with international designations associated with the Chichester and Langstone Harbours, and support common interest features. Further assessment of the potential effects of development on such features is therefore not repeated in Section 5. On consideration of the interest features of Sandy Point LNR and its spatial relationship to the Site, significant impact pathways are not anticipated, and this site is scoped out of further assessment.
- 4.10 The above statutory designations are described in Table 1 below.

Non-Statutory

- 4.11 A total of 11 non-statutory designations were identified within 2km of the Site. These were the Beachlands East SINC (c. 810m south of the Site), Mill Rythe Lane Saltmarsh SINC (c. 1.1km north-east), Hayling Island Beach SINC (c. 1.1km south-east), Mill Rythe Holiday Village SINC (c. 1.4km north-east), Sinah Warren Village Marsh SINC (c. 1.4km west), Mengham Salterns SINC (c. 1.5km south-east), Selsmore Boating Lake SINC (c. 1.7km south-east), Hayling Billy Line SINC (c. 1.8km north-west), Long Marsh SINC (c. 1.8km north-west), Pill Box Field SINC (c. 1.8km north-west) and Fields & Saltmarsh South of Copse Lane SINC (c. 1.9km north-east). These non-statutory designations are described in Table 1 below.
- 4.12 The Beachlands East SINC forms part of the main beach to the south of Hayling Island and forms an extension to the aforementioned Sinah Common SSSI. The SINC spatially overlaps with the Solent Maritime SAC and shares common interest features, therefore further assessment in Section 5 of this report will be led by the SAC designation. The remaining SINC's are either not publicly accessible or are sufficiently separated from the Site such that no potential impact pathways are envisaged. They have, therefore, been scoped out of further assessment.

Table 1. Statutory and non-statutory designations within search radii

Site Name & Designation	Distance & Direction from Survey Area	Special Interests or Qualifying Features
International Designations within 10km		
Chichester and Langstone Harbours Ramsar	c. 750m east	Large estuarine basins comprising extensive mud and sand flats exposed at low tide. Of particular significance for over-wintering wildfowl and waders, as well as providing a diversity of coastal and transitional habitats supporting important plant and animal communities.
Chichester and Langstone Harbours SPA	c. 750m east	Supports important assemblages of breeding birds, including little tern <i>Sterna albifrons</i> and sandwich tern <i>Sterna sandvicensi</i> . The site also supports the migratory species of ringed plover <i>Charadrius hiaticula</i> , black-tailed godwit <i>Limosa limosa islandica</i> , dark-bellied brent goose <i>Branta bernicla bernicla</i> , dunlin <i>Calidris alpina alpina</i> , grey plover <i>Pluvialis squatarola</i> and redshank <i>Tringa tetanus</i> . The area also regularly supports an assemblage of at least 20,000 waterfowl.
Solent Maritime SAC	c. 860m south-east	Contains several Annex I habitats including estuaries, spartina swards, Atlantic salt meadows, sandbanks, mudflats and sandflats exposed at low tide, coastal lagoons, annual vegetation of drift lines, perennial vegetation of stony banks, <i>Salicornia</i> and other annuals colonising mud and sand, and shifting dunes along the shoreline with marram grass <i>Ammophila arenaria</i> .
Solent and Dorset Coast SPA	c. 880m south	Regularly supports internationally important breeding populations of sandwich tern, common tern <i>Sterna hirundo</i> and little tern.
Solent and Isle of Wight Lagoons SAC	c. 5.4km north-west	Designation for the presence of a series of Annex I coastal lagoons.
Portsmouth Harbour SPA	c. 8km west	Supports internationally important populations of overwintering migratory brent geese, red-breasted merganser <i>Mergus serrator</i> and black-tailed godwit.
Portsmouth Harbour Ramsar	c. 8km north-west	Large industrialised estuary comprising one of the four largest expanses of mudflats and tidal creeks on the south coast of Britain. The site support large beds of narrow-leaved and dwarf eelgrass, extensive green alga and sea lettuce, as well as internationally important numbers of wintering dark-bellied brent geese and nationally

		important numbers of grey plover, dunlin and black-tailed godwit.
South Wight Maritime SAC	c. 8.9km south-west	Contains three Annex I habitats, including reefs, vegetated sea cliffs of the Atlantic and Baltic Coasts, and submerged or partially submerged sea caves.
International Designations of Relevance beyond 10km		
Solent and Southampton Water SPA/Ramsar	c. 11.2km west	The site supports internationally important populations of Mediterranean gull <i>Larus melanocephalus</i>, sandwich tern <i>Sterna sandvicensis</i>, common tern <i>Sterna hirundo</i>, little tern <i>Sterna albifrons</i>, roseate tern <i>Sterna dougalli</i>, dark-bellied brent geese <i>Branta bernicla bernicla</i>, teal <i>Anas crecca</i>, ringed plover <i>Charadrius hiaticula</i> and black-tailed godwit <i>Limosa limosa islandica</i>. The site is regularly used by over 20,000 waterfowl and over 20,000 waders.
National Designations within 3km		
Sinah Common SSSI	c. 710m south	Comprises a variety of notable coastal habitats supporting important plant assemblages, including the endangered chiding pink <i>Petrorhagia nauteuillii</i> and numerous nationally scarce species.
Chichester Harbour SSSI	c. 750m east	Large estuarine basin with extensive mud and sandflats exposed at low tide. Of particular significance for wintering waders and waterfowl, as well as breeding birds within the harbour and surrounding pasture and woodland. This diversity of habitats support important plant communities.
Langstone Harbour SSSI	c. 800m west	Tidal basin with extensive mud and sandflats exposed at low tide. The site supports high densities of intertidal invertebrates, as well as significant populations of migrant and overwintering wildfowl and waders.
Local Designations within 3km		
Hayling Billy LNR	c. 800m west	Part of the route of the old Hayling Billy train, the site provides exceptional views of the most unspoilt sections of Langstone Harbour and contains a variety of rare plants.
Gutner Point LNR	c. 1.8km north-east	The site contains grassland, saltmarsh and inter-tidal mudland which extends into Chichester Harbour.
The Kench, Hayling Island LNR	c. 2.3km west	A small area of inter-tidal mud and saltmarsh within Langstone Harbour which supports feeding waders and wildfowls at low tide and provides roosting opportunities at high tide.
West Hayling LNR	c. 2.8km north-west	Supports permanent and migratory populations of seabirds within the

		intertidal mudflats, which contains an impressive assemblage of marine invertebrates.
Sand Point LNR	c. 3.0km south-east	A sensitive area of rare maritime heathland, sand dune and seasonally-grazed grassland. The site contains rare plant species and supports breeding whitethroat <i>Sylvia communis</i> , linnet <i>Linaria cannabina</i> and Dartford warbler <i>Sylvia undata</i> .
Non-statutory Designations within 2km		
Beachlands East SINC	c. 810m south	Semi-natural coastal and estuarine habitats, including saltmarsh, intertidal mudflats, sand dunes, shingle, brackish ponds, grazing marsh and maritime grasslands. Supports notable species including sand couch grass <i>Elytrigia juncea</i> , burr medic <i>Medicago polymorpha</i> , bulbous bluegrass <i>Poa bulbosa</i> , suffocated clover <i>Trifolium suffocatum</i> and burr chervil <i>Anthriscus caucalis</i> .
Mill Rythe Lane Saltmarsh SINC	c. 1.1km north-east	Semi-natural coastal and estuarine habitats, including saltmarsh, intertidal mudflats, sand dunes, shingle, brackish ponds, grazing marsh and maritime grasslands.
Hayling Island Beach SINC	c. 1.1km south-east	Semi-natural coastal and estuarine habitats, including saltmarsh, intertidal mudflats, sand dunes, shingle, brackish ponds, grazing marsh and maritime grasslands. Supports notable flora, including sand fescue <i>Vulpia fasciculata</i> , sea holly <i>Eryngium maritimum</i> , sea spurge <i>Euphorbia paralias</i> , smooth cat's-ear <i>Hypochaeris glabra</i> , sand cat's-tail <i>Phleum arenarium</i> , sea knotgrass <i>Polygonum maritimum</i> , stiff saltmarsh-grass <i>Puccinellia rupestris</i> , sand couch grass, suffocated clover, mat-grass fescue <i>Vulpia unilateralis</i> , mossy stonecrop <i>Crassula tillaea</i> and houndstongue <i>Cynoglossum officinale</i> .
Mill Rythe Holiday Village SINC	c. 1.4km north-east	Semi-natural coastal and estuarine habitats, including saltmarsh, intertidal mudflats, sand dunes, shingle, brackish ponds, grazing marsh and maritime grasslands. Supports notable spiny restharrow <i>Ononis spinosa</i> .
Sinah Warren Village Marsh SINC	c. 1.4km west	Semi-natural coastal and estuarine habitats, including saltmarsh, intertidal mudflats, sand dunes, shingle, brackish ponds, grazing marsh and maritime grasslands. Supports notable species, including sea wormwood <i>Seriphidium maritimum</i> and golden samphire <i>Inula crithmoides</i> .

Mengham Salterns SINC	c. 1.5km south-east	Semi-natural coastal and estuarine habitats, including saltmarsh, intertidal mudflats, sand dunes, shingle, brackish ponds, grazing marsh and maritime grasslands. Supports notable species, including spiny retharrow and sago pondweed <i>Potamogeton pectinatus</i> .
Selsmore Boating Lake SINC	c. 1.7km south-east	Semi-natural coastal and estuarine habitats, including saltmarsh, intertidal mudflats, sand dunes, shingle, brackish ponds, grazing marsh and maritime grasslands.
Hayling Billy Line SINC	c. 1.8km north-west	Supports notable divided sedge <i>Carex divisa</i> .
Long Marsh SINC	c. 1.8km north-west	Semi-natural coastal and estuarine habitats, including saltmarsh, intertidal mudflats, sand dunes, shingle, brackish ponds, grazing marsh and maritime grasslands. Supports the notable species divided sedge, marsh samphire <i>Salicornia europaea</i> and sea wormwood.
Pill Box Field SINC	c. 1.8km north-west	Supports notable divided sedge.
Fields & Saltmarsh South of Copse Lane	c. 1.9km north-east	Semi-natural coastal and estuarine habitats, including saltmarsh, intertidal mudflats, sand dunes, shingle, brackish ponds, grazing marsh and maritime grasslands.

Habitats and Flora

- 4.13 Habitats recorded on-site are illustrated in Appendix A and D with detailed species lists provided in Appendix E. Relevant UKHab codes are provided within parentheses for each habitat type recorded e.g. Other Neutral Grassland (g3c).
- 4.14 No invasive non-native plant species were identified during the extended Phase 1 Habitat survey or subsequent visits to the Site.
- 4.15 The biodiversity value of baseline habitat units has been determined through assessment using the Biodiversity Metric (see accompanying Biodiversity Net Gain assessment; CSA/4956/15).

Notable Flora Records

- 4.16 A total of 1102 records of 161 notable plant species were identified within the search area. Those recorded on-site during the field survey are the non-native species *Cotoneaster* sp. within hedgerow H3 and cherry laurel *Prunus laurocerasus* within boundary hedgerows B1 and B3. Of potential relevance to the on-site habitats, although not recorded during the field survey are early meadow-grass *Poa infirma*, field

woundwort *Stachys arvensis*, corn buttercup *Ranunculus arvensis*, bird's-foot clover *Trifolium ornithopioides*, short-styled field rose *Rosa stylosa* and nettle-leaved goosefoot *Chenopodium murale*.

Irreplaceable habitats

- 4.17 There is no ancient woodland covering any part of the Site or immediately adjacent land. Two trees within the adjacent St Mary's Churchyard to the north of the Site are listed on the ancient tree inventory. Both are yew trees *Taxus baccata*; one is listed as 'ancient' and the other as 'notable'.
- 4.18 While buffer zones of at least 15m around ancient and notable trees to avoid structural and root damage during construction are required, the trees are at least 30 metres from the Site boundary, ensuring that buffer zones will not be encroached upon. The trees have, therefore, been scoped out of further discussion.

Cropland (c1)

- 4.19 Arable fields are the dominant habitat present on-site. At the time of the Phase 1 survey, the fields were planted with a mature broad bean crop with arable weeds encroaching from field margins, including fat hen *Chenopodium album*, field horsetail *Equisetum arvense*, knotgrass *Polygonum aviculare* and trefoil *Lotus* sp. The same fields were planted with a young brassica crop at the time of the update field survey in 2024. Due to the time of year that the update survey was completed, the species identified within the field margins was limited, however, it remained relatively consistent with what was previously recorded.
- 4.20 Where narrow, uncultivated field margins are present around Field F1 and, to a lesser extent, F2, they are primarily grass-dominated with ruderal species present throughout. Coarse grass species including false oat *Arrhenatherum elatius*, Yorkshire fog *Holcus lanatus*, annual meadow-grass *Poa annua*, and perennial ryegrass *Lolium perenne* dominate the eastern boundary of Field F1 and the central margin which divides Fields F1 and F2, with common or typical arable herb species present including ribwort plantain *Plantago lanceolata*, bristly oxtongue *Helminthotheca echioides*, scented mayweed *Matricaria chamomilla*, knotgrass *Polygonum* sp., black medick *Medicago lupulina*, redshank *Persicaria maculosa*, common fleabane *Pulicaria dysenterica*, nipplewort *Lapsana* sp., cat-'s-ear *Hypochaeris radicata*, scarlet pimpernel *Anagallis arvensis*, burdock *Arctium* sp. and common nettle *Urtica dioica*. The western margin of Field F1 and the northern margin of Field F2 steadily become dominated by bracken *Pteridium aquilinum* and common nettle with occasional dock *Rumex* sp. and hogweed *Heracleum sphondylium* also present. Although adopted as a Habitat of Principal Importance in England in respect of the NERC Act 2006, arable field margins are common and widespread in the local

landscape, and where present on-site they are narrow and dominated by common species.

- 4.21 The overarching cropland habitat is common and widespread on Hayling Island, particularly to the west and is, therefore, considered to be important at less than the Local level.

Neutral grassland (g3)

- 4.22 A large area of what was classified as semi-improved grassland under the Phase 1 system lies to the east of the Site. This former private allotment garden is now dominated by false oat-grass, cock's-foot *Dactylis glomerata*, Yorkshire fog and creeping thistle *Cirsium arvense*. Herb species recorded include spear thistle *Cirsium vulgare*, field bindweed *Convolvus arvensis*, willowherb *Epilobium* sp., cleavers *Galium aparine*, bristly oxtongue, St John's-wort *Hypericum* sp., common ragwort *Jacobaea vulgaris*, creeping buttercup *Ranunculus repens*, and clover *Trifolium* sp. It maintains a tussocky sward due to the species composition and appears to be minimally managed, with scattered bramble *Rubus fruticosus* scrub frequent within the sward as a result of encroachment from large discreet parcels which are present centrally within the grassland. The species composition present is indicative of a neutral grassland under UK Hab classification.
- 4.23 A small area of grassland is present between the current eastern access point and Field F2 and contains a species assemblage consistent with the parcel of grassland described above, with the addition of yarrow *Achilles millefolium*, crane's-bill *Geranium* sp., vetches *Vicia* spp., oxeye daisy *Leucanthemum vulgare*, common knapweed *Centaurea nigra*, and wild carrot *Daucus carota*.
- 4.24 These parcels of neutral grassland are small and in an unfavourable condition due to the lack of management, as well as being dominated by common species. The habitat itself is common and widespread in the local area and those parcels present on-site are concluded to be important at less than Local level.

Bramble scrub (h3d)

- 4.25 Areas of dense bramble scrub are present within the parcels of neutral grassland to the east of the Site. These discreet patches of scrub do not appear to be managed and were found to have further encroached into both grassland areas during the update site walkover. Scattered scrub is heavily present within the surrounding grassland habitats.
- 4.26 While bramble scrub provides myriad opportunities for foraging, sheltering, nesting and dispersing wildlife, it is a common and widespread habitat and the parcels present within the Site have relatively limited connectivity to surrounding habitats of benefit to

wildlife. The habitat is therefore considered to be important at less than the Local level.

Mixed scrub (h3h)

- 4.27 Two parcels of mixed scrub are present within the Site. These are located to the immediate south of boundary hedgerow B2 within the larger parcel of neutral grassland and surrounding the on-site pond. These parcels are dominated by blackthorn *Prunus spinosa*, alongside hawthorn *Crataegus monogyna*, elder *Sambucus nigra* and bramble.
- 4.28 The parcel surrounding the pond contains shrubs of a variety of ages, including some mature shrubs and standard semi-mature trees. The outward growth of the parcel is limited by regular management of the surrounding cropland, with a resultant dense structure and tall canopy c. 5m high.
- 4.29 The area of mixed scrub adjacent to B2 forms a gradient between the native hedgerow and surrounding grassland. This parcel has been allowed to further encroach to the south in the intervening time since the habitat survey in 2021, allowing young shrubs to succeed and creating a habitat interface intertwined with the tussocky grassland and scattered bramble scrub.
- 4.30 As discussed in relation to bramble scrub, mixed scrub provides opportunities for a variety of wildlife, however the parcels on-site are assessed to be important at less than the Local level due to the lack of connectivity and the frequency of the habitat in the wider landscape.

Pond (r1; 41)

- 4.31 The pond present within the Site is located at the north-eastern corner of Field F1, centrally along the southern edge of Field F2 and to the west of the large parcel of neutral grassland, giving it a relatively central location within the Site. It is approximately 150m² and is surrounded on all aspects by dense scrub and ruderal vegetation. A large area of the pond was dominated by Bulrush *Typha latifolia* at the time of the field surveys in both 2021 and 2024. This pond directly connects to the field drain which divides Field F1 and F2, which receives run-off from the surrounding cropland. The pond maintains water throughout the year but becomes smothered by surrounding scrub and aquatic vegetation during the summer months.
- 4.32 Ponds are scarce in the local landscape and, while the on-site pond is in unfavourable condition due to the surrounding environment, Policy DM8 of the adopted Havant Borough Local Plan sets out ponds as a habitat which should be protected and enhanced as part of development proposals. The on-site pond is, therefore, considered to be important as the Local level.

Buildings (u1b5)

- 4.33 A farm building comprising a metal frame, roof and sides is present on the north-eastern edge of Field F1, to the south of the on-site pond. The building is discussed in relation to bats below, however, it is generally of negligible ecological interest and scoped out of further discussion.

Boundary vegetation

Native hedgerow with trees (h2a)

- 4.34 Boundary hedgerow B4 is a native species hedgerow which runs along the northern boundary, dividing the Site from the St Mary's Churchyard to the north. It predominantly contains hawthorn, with standard Scot's pine *Pinus sylvestris* and beech *Fagus sylvatica* trees occasionally present along its length. Spindle *Euonymus europaeus*, Japanese honeysuckle *Lonicera japonica* are infrequently present towards the east of its length. Gaps in the hedge canopy and base are frequent and the ground vegetation on the Site side is dominated by common nettle.

Native hedgerow – associated with ditch (h2a; 50)

- 4.35 Boundary hedgerow B2 partially encircles the large area of neutral grassland at its northern edge and is dominated by blackthorn. At the time of the field survey, it had not been recently cut but signs of management were visible on the western and northern edges. To the south and east, the hedgerow adjoins a parcel of dense scrub. There are no gaps along its course and the vegetation has a dense composition. A seasonally wet ditch with steep sides runs along its length, dividing it from the adjacent cropland field.
- 4.36 Hedgerows are a Habitat of Principal Importance in England in respect of the NERC Act 2006 and a LBAP priority habitat in Hampshire and are a specified habitat within Policy DM8 of the adopted Havant Borough Local Plan to be protected and enhanced alongside development. While Hedgerows H2 and H4 are short stretches, when reviewed in a local landscape context where hedgerows and natural linear features appear to be infrequent, they provide a connectivity and refuge for wildlife in an otherwise open and built-up landscape. The two native species hedgerows are, therefore, considered to be important at a Local level.

Ornamental hedgerow (h2b)

- 4.37 Hedgerow B1 to the south of the Site is a fragmented, non-native hedgerow which divides the Site from residential gardens. It contains discreet sections of cherry laurel *Prunus laurocerasus*, Leyland cypress *Cupressus x leylandii* and non-native privet *Ligustrum* sp., with occasional bramble, hedge bindweed *Calystegia sepium* and honeysuckle *Lonicera periclymenum*.

- 4.38 Boundary hedgerow B3 is a short section of non-native species hedgerow along the north-eastern edge of the Site. It contains buddleia *Buddleia* sp., cotoneaster, cherry laurel and hawthorn. These hedgerows are of negligible importance in a Local context and have been scoped out of further assessment.

Line of trees (w; 33)

- 4.39 Boundary tree line B5 runs along the southern border between the western-most edge of the off-site residential gardens to the Site's western boundary. It is dominated by blackthorn, wych elm *Ulmus glabra* and damson *Prunus insititia*. While this tree line is a short stretch, it comprises a semi-mature to early mature trees, as well as a dense undergrowth at the base which provides connective opportunities for wildlife. This treeline is considered to be important at the Local level.

Ditch (r1; 50) seasonally wet (502)

- 4.40 A seasonally wet ditch which runs centrally east to west through the Site, dividing Field F1 from the large parcel of semi-improved grassland to the east and Field F2, continuing south along the western boundary of Field F2. This ditch does not maintain consistent water levels and becomes smothered with vegetation during the summer months. Aquatic and marginal vegetation is absent, reflecting its dry condition for the majority of the year.
- 4.41 A second seasonally wet drainage ditch runs along the northern boundary of Field F1. The ditch slopes downward towards the eastern extent, resulting in greater inundation levels to the east, while the western extent remains predominantly dry year-round. This is evidenced by the grass-dominated vegetation within the channel of the western extent, where vegetation indicative of wetter conditions is absent. By contrast, the easternmost extent of the ditch presents iris *Iris* sp., sedges *Carex* sp. and hemlock water dropwort *Oenanthe crocata* within the channel and along bank faces. This ditch becomes smothered by bracken and bramble scrub along the majority of its length over the summer months.
- 4.42 While the on-site ditches frequently dry out and become smothered by common grasses and ruderal vegetation in the summer months, making them unlikely to support a rich or diverse fauna, ditches are a habitat identified within Policy DM8 of the adopted Havant Borough Local Plan to be protected and enhanced alongside development, and opportunities to enhance those on-site are available. The on-site ditches are, therefore, considered to be important at the Local level.

Fauna

Bats

- 4.43 A total of 457 bat records were identified within the search area, dating from 1983 to 2022. These include common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared *Plecotus auritus*, unconfirmed long-eared bats *Plecotus* sp., Nathusius's pipistrelle *Pipistrellus nathusii*, noctule *Nyctalus noctule*, Leisler's bat *Nyctalus leisleri*, Natterer's bat *Myotis nattereri*, whiskered bat *Myotis mystacinus*, Daubenton's bat *Myotis daubentonii*, Bechstein's bat *Myotis bechsteinii*, unconfirmed *Myotis* sp. and serotine *Eptesicus serotinus*.
- 4.44 These records are widely distributed around the Site, predominantly within the surrounding residential areas.
- 4.45 Notable records include a small cluster c. 40m north of the Site from within the grounds of St Mary's Churchyard immediately adjacent to the northern boundary of the Site. This cluster contains roost records for brown long-eared, serotine and unconfirmed pipistrelle bats, as well as common pipistrelle passes. Further roost records are present across the search area, all except one dating prior to 2013, including a common pipistrelle roost dating from 2001 c. 360m south of the Site with a peak count of 347 individuals.
- 4.46 Records present on-site relate to bat activity surveys undertaken by CSA in 2021 as part of the current application. The Site was found to be regularly utilised by foraging common and soprano pipistrelle, with occasional recordings of brown long-eared, Nathusius' pipistrelle and *Myotis* sp., likely to be utilising the boundary vegetation for foraging and general dispersal.
- 4.47 There are no granted EPS licenses returned within 1km of the Site, with the closest present c. 1.1km north of the Site permitting the destruction of a resting place in relation to brown long-eared bat, common pipistrelle and soprano pipistrelle, dating between 2018 and 2019.
- 4.48 On-site roosting opportunities are limited, with a single on-site building comprising a metal frame, roof and sides, with negligible roosting potential. The boundary vegetation to the north and south of the Site contains semi-mature to mature trees which may have potential roost features; however, these were not specifically assessed as part of a ground level tree assessment.
- 4.49 The majority of the Site is open cropland and grassland with parcels of dense scrub, hedgerows and boundary treelines providing relatively disconnected corridors of connectivity. The on-site pond, as well as the aforementioned habitats, support foraging opportunities for bats due to associated higher invertebrate densities.

Bat Activity Surveys

- 4.50 The Site was assessed to be of 'moderate' suitability for foraging bats, therefore the following survey effect was undertaken in line with the prevailing Bat Survey Guidelines (Collins, 2023)
- 4.51 Three seasonal night-time bat walkover surveys have been undertaken at the Site in spring (May), summer (July) and autumn (September) 2024. During these surveys, at least two species of bat were recorded at the Site, comprising common pipistrelle, accounting for 64.66% of the total contacts, and soprano pipistrelle, accounting for 35.34%. Overall, each the of three transect surveys experience low activity levels, with activity concentrated around the western boundary of the southern field, the on-site pond and north-eastern boundary adjacent to the off-site churchyard. During the vantage point element of the May survey, the surveyor observed the western boundary of the southern field (Boundary B5, see Habitats Plan in Appendix A) being utilised as a commuting corridor by up to 19 individual common pipistrelle flying from the south in a northern/north-western direction.
- 4.52 Automated static monitoring was conducted monthly between April and October 2024, using three static detectors on each occasion, located along the northern, central and southern boundaries of the Site. Consistent with the results of the transect surveys, bat activity during the static monitoring was dominated by common pipistrelle (70.37% of total bat contacts), followed by soprano pipistrelle (22.08%). However, a greater diversity of species was recorded during the remote monitoring surveys, including Nathusius' pipistrelle, noctule, Leisler's bat, barbastelle *Barbastella barbastellus*, brown long-eared bat, serotine and unconfirmed *Myotis* sp.
- 4.53 A total of five barbastelle contacts were detected across the remote monitoring surveys, recorded relatively evenly across the Site. Although widespread in Hampshire, barbastelle are nationally rare and noted for their susceptibility to disturbance by artificial light. The Site is anticipated to be used as part of a wider territory, with no indication of habitual use by the species.
- 4.54 Full survey methods and results are provided in Appendix G.
- 4.55 Determination of importance of bat species recorded at the Site is based upon the surveys undertaken as detailed above, with regard to the scoring system published in updated guidance by Reason and Wray (2023), which review the bat assemblage at the Site in relation to its diversity and the rarity of the species present. Based on the species recorded on-site throughout the surveys, a combined score of 20 is reached, on the assumption that *Myotis* bat activity most likely comprised of two widespread species, such as Daubenton's bat and

Natterer's bat. This total score is indicative of a bat assemblage of up to County importance.

Table 2. Valuation of bat species and assemblages using the Site for commuting/ foraging, adapted from Reason & Wray, 2023.

Rarity in Southern England (score assigned per species present)	Common Name	Comment	Importance in Geographical Context
Widespread in all geographies (1)	Common pipistrelle	Most frequently recorded bat species during bat activity surveys with 75 contacts during the transect surveys and 14177 during static monitoring surveys.	Local
	Brown long-eared bat	A total of 81 contacts recorded during the static monitoring surveys. No contacts recorded during the transect surveys.	Local
	Soprano pipistrelle	Second most frequently recorded bat species with 41 contacts recorded during the transect surveys and 4449 contacts recorded during the static monitoring surveys.	Local
Widespread in many geographies, but not as abundant in all (2)	Noctule	A total of 13 contacts recorded during the static monitoring surveys. No contacts recorded during the transect surveys.	Local
	<i>Myotis</i> sp.	A total of 717 contacts recorded during the static monitoring surveys. No contacts recorded during the transect surveys.	Local
Rarer or restricted distribution (score 3)	Leisler's bat	A total of 1 contact recorded during the static monitoring surveys. No contacts recorded during the transect surveys.	Local
	Nathusius' pipistrelle	A total of 2 contacts recorded during the static monitoring surveys. No contacts recorded during the transect surveys.	Local
	Serotine	A total of 41 contacts recorded during the static monitoring surveys. No contacts recorded during the transect surveys.	Local
Rarest Annex II species and very rare (4)	Barbastelle	A total of 5 contacts recorded during the static monitoring surveys. No contacts recorded during the transect surveys.	County

- 4.56 Barbastelle bats are some of the rarest bat species in England and are restricted in their distribution, and as such their presence at the Site is of greater significance. However, the south of England remains a stronghold for barbastelle, and the species is widely recorded across Hampshire. Barbastelle contacts were recorded relatively equally across

the Site, with no obvious temporal pattern, which provides no strong evidence of roosting within adjacent habitats, and indicates that the Site is utilised occasionally as part of their foraging and dispersal area.

- 4.57 The remaining assemblage of bats utilising the Site was dominated by common and widespread species, with lower passes of the remaining species.
- 4.58 All British bat species are European Protected Species (EPS) under the Conservation of Habitats and Species Regulations 2017 (as amended) and the populations of the remaining bat species utilising the Site are each considered to be important at the Local level. However, in line with the Bat Mitigation Guidelines (Reason and Wray, 2023), the combined assemblage of bat species utilising the Site is considered to be collectively important at up to the County level.

Badger

- 4.59 No records of badger *Meles meles* were returned within the search area. While there are small pockets of grassland, dense scrub and stretches of hedgerow which may provide suitable badger habitat, no signs of badger have been detected on-site to date, therefore, no further assessment for the species is undertaken.

Dormouse

- 4.60 No records of dormouse *Muscardinus avellanarius* were provided within 2km of the Site. Furthermore, no granted protected species applications were found within 5km of the Site. There is limited suitable habitat and connectivity within the Site and surrounding landscape to support dormice, therefore they are concluded to be likely absent from the Site and are scoped out from further discussion.

Riparian Mammals

- 4.61 A single record of water vole *Arvicola amphibius* was identified in the search area, associated with Farlington Marshes (c. 1.5km north-west of the Site) and dating from 2006. No records of otter *Lutra lutra* were identified within the search area. While water vole will utilise ditch networks to construct burrows and disperse, those present within the Site do not maintain water levels over the active season for the species and are poorly connected to surrounding watercourses. The on-site habitats are wholly unsuitable for otter which require extensive and well-connected watercourse and riparian habitats. Both species have, therefore, been scoped out of further assessment within this report.

Hedgehog

- 4.62 A total of 21 records of hedgehog *Erinaceus europaeus* were returned from within the search area, widely distributed within the residential areas surrounding the Site, dating between 1998 and 2020. The closest record is c. 85m west of the Site, dating from 2020.

- 4.63 The Site offers good opportunities for hedgehog within the grassland, scrub and hedgerow bases, however, due to the dominance of cropland which is likely to be treated with insecticides which limit invertebrate prey for hedgehog, the Site is unlikely to represent a key resource in the landscape. This species is not considered further within the impact assessment, however it will be important at the detailed design stage for permeability measures to be incorporated (see Enhancements).

Birds

- 4.64 A total of 2867 records of 162 bird species were identified within the search area, dating from 1983 to 2022. Three records are present on-site, including dark-bellied brent geese *Branta bernicla* and curlew *Numenius arquata*, both dating from 2017 and listed under Section 41 of the NERC Act 2006, the latter also an IUCN Red List species, and firecrest *Regulus ignicapilla* dating from 2011. The most records relating to a single species are of dark-bellied brent geese, which is reflective of the Site's location in relation to the surrounding SPA designations, followed by Mediterranean gull *Ichthyaeetus melanocephalus*.
- 4.65 There is habitat on-site suitable for supporting foraging, roosting and nesting birds. The hedgerows and treelines, grassland and scrub provide opportunities for generalist species, while the arable cultivation may be used by farmland specialists subject to crop rotations.

Breeding Bird Surveys

- 4.66 Breeding bird surveys were undertaken between April and June 2021 to understand the Site's usage by breeding birds. A total of 17 species were recorded as breeding within the Site, including 11 birds listed as S41 Species of Principal Importance and those listed on the Birds of Conservation Concern Red and Amber Lists.
- 4.67 Update breeding bird surveys were undertaken between April and July 2024, during which a total of 40 species were recorded at the Site, of which 21 species were recorded to have breeding status (either 'confirmed', 'probable' or 'possible', including 10 birds listed on the Birds of Conservation Concern Red and Amber Lists, in addition to the Wildlife and Countryside Act Schedule 1 listed barn owl *Tyto alba*.
- 4.68 Of note, a single individual barn owl was recorded after dark during the sixth survey visit flying through the Site before spending ten minutes hunting over the southern field, and then leaving to the west. Barn owls are protected under Schedule 1 of the 1981 Wildlife & Countryside Act (as amended). The on-site farm building is considered largely unsuitable for nesting barn owls, with no evidence of their use of the barn identified during the Preliminary Roost Assessment, nor any further incidental sightings during dusk survey work. On balance, it is considered that the

on-site habitats are not preferential for foraging barn owl, with optimal habitat comprising rough, open grassland.

- 4.69 Full details of the breeding bird surveys are provided in Appendix H.
- 4.70 The surveys reflect a breeding bird assemblage that is important at less than Local level, with all species recorded as breeding being nationally and locally common and widespread. The habitat on-site does not, therefore, constitute an important breeding habitat resource for local bird populations.
- 4.71 Notwithstanding the above, all wild birds and their nests and eggs receive legal protection under the Wildlife and Countryside Act 1981. This assessment assumes industry-standard good construction management to avoid direct impacts on birds and their nests (see 'Assumptions').

Wintering Bird Surveys

- 4.72 Populations of dark-bellied brent goose *Branta bernicla* have previously been recorded within the Site, with a peak count of 1100 individuals feeding during the winter of 2017 and, as a result, the entirety of the Site is adopted as a 'Core Area' under the Solent Waders and Brent Goose Strategy (SWBGS), which is reflected on Hampshire Ecological Network mapping.
- 4.73 Conversely, winter bird surveys carried out at the Site by Ecology Solutions Ltd in 2017/18 concluded that, at the time of the surveys, the overall habitat was unsuitable for brent geese as the arable fields had been recently ploughed, leaving expansive bare ground, and no brent geese were recorded during the surveys. This exemplifies that the presence of brent geese is dependent upon the management of any site, particularly the status of the arable fields over the course of the winter season, with stubble or short improved grassland habitat being preferred.
- 4.74 Winter bird surveys undertaken by CSA over the winter of 2021/22 recorded flocks of 500-600 dark-bellied brent geese when the fields were planted with a short grass/cereal crop. Other species recorded at the Site during these surveys, including 12 species of conservation significance, were recorded in low numbers. Update winter bird surveys carried out in 2024 recorded no dark-bellied brent geese on-site, which is likely to be reflective of the brassica crop occupying the cropland fields. Full details of the winter bird surveys are provided in the accompanying Brent Goose Mitigation Strategy (CSA/4956/09).
- 4.75 Dark-bellied brent geese represent a qualifying feature of the Chichester and Langstone Harbours SPA c. 750m east of the Site at its closest point. Further assessment of the potential development effects on this species is therefore presented in Section 5, and the

accompanying Habitats Regulations Assessment (CSA/4956/06), in connection with this and other nearby European site designations.

Reptiles

- 4.76 A total of nine records of three reptile species were returned from within the search area, dating from 1999-2021. These included slow worm *Anguis fragilis*, grass snake *Natrix helvetica* and adder *Vipera berus*. The closest record to the Site is of six slow worm associated with a residential garden (c. 470m south-east), dating from 1999. Suitable reptile habitat on-site is limited to the narrow arable field margins and hedgerow bases, as well as the areas of tussocky neutral grassland and scrub.

Reptile Surveys

- 4.77 Surveys undertaken by CSA in 2021 determined there to be a moderate population of slow worm to be present at the Site, in particular along the northern boundary which adjoins the St Mary's Churchyard, with a peak adult count of 69 individual slow worm found along this boundary during one survey. The species was found across the wider site, albeit in much lower densities than were found along the northern boundary. No other reptile species were recorded on-site during the surveys, suggesting likely absence.
- 4.78 Update reptile surveys comprised seven survey visits undertaken between May and July 2024, which resulted in peak counts of 39 adult slow worm and 22 juvenile slow worm. The species were recorded in all locations where refugia were present, with the greatest number recorded within the neutral grassland present within the eastern portion of the Site. No other reptile species were recorded within the Site. The Site is believed to support a moderate population of slow worm. Full methods and results of these surveys are provided in Appendix K.
- 4.79 Slow worm are a S41 species of principal importance and are afforded protection against killing and injury under the Wildlife and Countryside Act 1981. The population of slow-worm present at the Site is considered to be important at the Local level.

Amphibians

- 4.80 Seven records of common toad *Bufo bufo* were identified within the search area, dating from 1986 to 2019. Closest to the Site is a record of three individual common toad associated with a residential garden (c. 160m south-east), dating from 2014. The on-site farmland, grassland, scrub and pond habitats provide suitable terrestrial and aquatic habitat for toads.
- 4.81 A more detailed appraisal of the Site in respect of great crested newt is provided below.

Great Crested Newt

- 4.82 No records of great crested newts were identified within the search area. Furthermore, only one class survey license return was identified within Hayling Island, over 3km north of the Site. Despite spending much of their annual lifecycle within the terrestrial environment, great crested newts are dependent upon the presence of suitable aquatic breeding habitat in order for a population to persist. One potential breeding pond is present on on-site, with no further ponds appearing to be present within a dispersible range of the Site. Suitable terrestrial habitat in the form of tussocky grassland, scrub and hedgerow bases are present across the Site, including dense scrub surrounding the on-site pond. Previous presence/likely absence surveys undertaken of the on-site pond by Baker Consultants in 2016 returned negative results for great crested newts, with only smooth newts *Lissotriton vulgaris* found to be present.
- 4.83 Environmental DNA (eDNA) analysis of the on-site pond carried out in 2021, and subsequently updated in 2024, by CSA Environmental also returned a negative result for great crested newts (See Appendix J). This result, in addition to the lack of surrounding ponds in a dispersible range and absence of records for the species indicates that great crested newt are likely absent from the Site.

Invertebrates

- 4.84 A total of 1210 records of 278 invertebrate species were identified within the search area. Those of potential relevance to the on-site grassland and hedgerow habitat include grey dagger moth *Acronicta psi*, knot grass moth *Acronicta rumicis*, ruddy flat-body moth *Agonopterix subpropinqua*, cinnabar moth *Tyria jacobaea*, little grass-veneer moth *Platytes cerussella* and swallowtail butterfly *Papilio machaon*.
- 4.85 The Site falls within the South Downs Important Invertebrate Area (IIA), however, no information is provided in regards to the species, assemblages and specific hotspots within the IIA.
- 4.86 The habitats on-site are common and widespread and are, therefore, likely to support a typical invertebrate assemblage, and are not considered to represent a key resource in the local landscape. The assemblage of invertebrates using the Site is considered to be important at less than the Local level.

Future Baseline

- 4.87 The Site is presently under active arable management, including the periodic cutting of field margins and hedgerows. Notwithstanding the rotation of crop-type, these management interventions maintain the majority of on-site conditions in a relatively stable state. There is no known intention to cease this management, other than to

accommodate the proposed development should planning permission be granted. While the peripheral areas of grassland and scrub do not appear to be routinely managed, leading to a natural state of succession and encroachment, the habitats themselves have remained consistent over the intervening time period between the 2021 and 2024 field surveys. As such, the future baseline status of important ecological features is not anticipated to vary significantly from that at present.

- 4.88 Notwithstanding the above, it will be important for any future reserved matters application to be informed by an up to date understanding of baseline ecological conditions (see Assumptions below).

Summary of Ecological Features

- 4.89 Table 2 below summarises all important ecological features identified within the respective zones of influence, together with the geographic context of their importance:

Table 2. Summary of important ecological features and their geographic context

Ecological Feature	Geographic Context of Importance and/or Protection Status
Chichester and Langstone Harbours SPA and Ramsar	International
Solent Maritime SAC	International
Solent and Isle of Wight Lagoons SAC	International
Portsmouth Harbour SPA and Ramsar	International
South Wight Maritime SAC	International
Solent and Southampton Water SPA and Ramsar site	International
Sinah Common SSSI	National
Hedgerows	Local
Ditches	Local
Pond	Local
Bats	County
Reptiles	Local

5.0 ASSESSMENT OF EFFECTS

The Proposed Development

- 5.1 Outline planning permission is sought for residential development at the Site. The following impact assessment is based on the Development Framework Plan prepared by FPCR on behalf of Gladman Developments (7478-P-02 Rev C).
- 5.2 The construction phase of the proposed development will comprise the following:
- Cessation of arable cultivation
 - Removal of sections of scrub along the eastern access point from St Mary's Road and adjacent to the central pond for vehicular access
 - Construction of up to 300 residential dwellings
 - Removal of grassland to the east of the Site
 - Construction of associated gardens, parking, access infrastructure, a play area and teenage provision area
 - The establishment of Public Open Space (POS) totalling c. 3.74ha, including grass pitches and playing fields, amenity greenspaces, parks, gardens, allotments & community gardens and natural greenspace primarily to the north of the developed area
 - Establishment of Sustainable Drainage Systems (SuDS) including two large attenuation basins set within the greenspace to the west and in the south-east corner of the development
- 5.3 The operational phase of the proposed development will comprise the following:
- Occupation of new residential dwellings
 - Increase in human activity, including use of vehicles and presence of domestic pets
 - Increased artificial lighting and anthropogenic noise

Assumptions

- 5.4 The following assumptions have been made during the assessment of potential effects of the proposed development on important ecological features. Although 'assumed' and therefore taken as part of the pre-mitigation scenario, these measures are referenced in the proceeding sections where integral to the mitigation strategy.
- 5.5 In accordance with BS42020:2013, it is assumed that a Construction Environmental Management Plan (CEMP) will be secured by planning condition and prepared at the detailed design stage. In addition to the construction phase impact avoidance and mitigation measures identified in the following sections, the CEMP will detail standard environmental control measures, including though not limited to the following:

- Implementation of strict protection measures for the root protection areas of retained trees and hedgerows, in accordance with BS5837:2012
 - Standard best practice construction phase pollution prevention and control measures
 - Sensitive working methods and timing to avoid direct impacts to nesting birds (generally vegetation removal outside nesting season of March through August)
 - Updated ecological surveys, where necessary, to identify shifts in the baseline ecological condition in order that revised impact avoidance and mitigation measures can be adopted as required
- 5.6 In accordance with BS42020:2013, it is assumed that a Landscape and Ecology Management Plan (LEMP) will be secured by planning condition and prepared at the detailed design stage. The LEMP will set out measures for the establishment and long-term management of newly created and retained habitats to maximise benefits for biodiversity.

Potential Impacts and Ecological Effects

Statutory Conservation Designations

European sites

- 5.7 An assessment of potential effects of the proposed development, both alone and in combination with other plans and projects, is presented separately as Information to Inform Habitats Regulations Assessment (CSA/4956/06). The assessment is not repeated here, however the identified potential impact pathways in the absence of mitigation are summarised.
- 5.8 The qualifying habitats and species of the Chichester and Langstone Harbours SPA and Ramsar site (which are shared with the special interests of the overlapping SSSI designations) are known to be vulnerable to recreation pressure. The proposed development will contribute to an increase in the local population, and therefore has the potential to act in combination with the projected increase in housing within Havant and adjacent districts to increase recreation pressure at these European sites.
- 5.9 The Site's importance for feeding waterfowl associated with the SPA and Ramsar designations of Chichester and Langstone Harbours, Portsmouth Harbour and the Solent and Southampton Water is recognised through its adoption as a Core Area under the Solent Wader and Brent Goose Strategy. Even beyond the spatial extent of a designation, any damage, deterioration or loss of supporting habitat has the potential to undermine conservation objectives.

- 5.10 Furthermore, foul water discharges from the Site will be treated at the Budds Farm WWTW, which itself returns treated effluent to the water environment of the East Solent system and its associated European site designations. The qualifying features of these designations are known to be sensitive to and already suffering from eutrophication. Nutrient (principally nitrogen) loading within treated foul effluent resulting directly from the proposed development is unlikely to have a significant effect on the qualifying habitats and species in isolation, however may act in combination with wider projected housing growth to undermine conservation objectives.
- 5.11 Conversely, assessment presented in full within the Habitats Regulations Assessment (CSA/4956/06) determined that no significant negative effect on the designated sites would likely result from traffic-derived air quality impacts or hydrological changes brought about by increased water abstraction. Increased traffic flows resulting from the scale and location of the proposed development and wider projected housing growth are capable of giving rise to localised air quality impacts. Areas of each of the Chichester and Langstone Harbours SPA and Ramsar site, Solent Maritime SAC and Portsmouth Harbour SPA and Ramsar site exist within 200m of a major road (A-road or motorway), and could therefore experience localised increases in atmospheric and deposited pollutants. However, the effects of increased traffic resulting from the proposed development in isolation are unlikely to be appreciable, given the intervening distances and diffusion of traffic. Furthermore, findings of air quality dispersion modelling (see Chapter 6 of the Environmental Statement) found that potentially significant increases in pollutant nitrogen resulting from the proposed development, in combination with other committed development, would be limited to a single modelled location within Emsworth Harbour, adjacent to Langstone Road. At this location, however, the habitat is intertidal and regularly inundated with tidal water, with the result that air pollutants are unlikely to be capable of adversely affecting the habitats present.
- 5.12 Residential growth drives increases in water consumption and waste water production, which are associated with negative environmental effects. Increased abstraction could, in principle, impact fresh water inputs to European sites, with corresponding effects on salinity gradients, water circulation, vegetation communities and the waterfowl they support. However, in their 2017 Draft Water Resources Management Plan, Portsmouth Water confirm that there is currently a surplus of supply for the period to 2044, therefore impacts on site features arising from increases in water abstraction are unlikely.

Sinah Common SSSI

- 5.13 The Sinah Common SSSI comprises a large stretch of the west side of Hayling Beach and neighbouring leisure grounds, including Hayling Golf

Club and Hayling Ferry Sailing Club. One potential impact pathway has been identified in the form of recreational pressure.

- 5.14 The SSSI is made up of two units. Unit 2 supports the Hayling Golf Club in the west of the SSSI, and the East Winner Sandbank to its south. Unit 1 to the east includes Hayling Island Beach, a popular tourist location which is likely to face the greatest recreational pressure.
- 5.15 Both Units were most recently assessed by Natural England (2010) as being in unfavourable but recovering condition. In respect of Unit 2 it is remarked that the, *"shingle bank in the southern part of the unit is remarkably species-rich despite the high visitor pressure."* Concern is raised over heavy trampling in Unit 1, however this is limited to a discrete area where visitor pressure is channelled by fencing. Overall, there is no indication that visitor pressure is having a limiting effect on the special interests of the designation, and a minor increase in the local population brought about by the proposed development is therefore unlikely to result in a significant negative effect via this pathway.

Hedgerows

- 5.16 The native species hedgerows and line of trees on-site provide connectivity for wildlife both within the Site and the wider landscape. The DFP provides for the retention of these features alongside development, with their incorporation within strategic green infrastructure. With good construction management practises (see 'Assumptions'), no adverse effects upon the existing hedgerows are anticipated to result from the proposed development.

Ditches

- 5.17 The on-site ditches are to be retained in their entirety alongside development and will benefit from the cessation of arable production as they will no longer receive run-off from agrochemical inputs such as fertilizers and insecticides. Moreover, enhancement opportunities are available through targeted management practices. No adverse effects upon the on-site ditches are anticipated as a result of the proposed development.

Pond

- 5.18 The on-site pond has been retained alongside proposed development as part of the conceptual layout shown in the DFP. No significant negative effect on the local pond habitat resource will result from the proposed development; rather an opportunity is created to enhance the biodiversity value of the feature through introduction of appropriate management, as well as new aquatic and seasonally wet habitat creation as part of the drainage strategy (the DFP identifies 0.5ha for indicative SuDS basins).

Bats

- 5.19 The Site supports a moderate assemblage of predominantly common and widespread species which utilise the area for foraging and general dispersal. The majority of bat activity is concentrated to features of connectivity, such as boundary vegetation, and to areas of increased foraging opportunities, including the on-site pond, which are all to be retained within strategic green infrastructure as shown on the DFP. The creation of new areas of habitat suitable for bats is proposed, including tree lines extending through the centre of the Site, connecting the off-site woodland west of the Site to the central retained pond and the area of proposed greenspace to the north of the Site, where more favourable habitat for bats will be created. The two proposed attenuation basins, if appropriately landscaped and managed, will provide an increase in aquatic invertebrate habitat, which will, in turn, deliver greater foraging opportunities to bats within the Site.
- 5.20 Negative effects on bats could in principle be encountered as a result of the increase in artificial lighting within the residential area, which is situated near the Site's main hotspots in the southern and western boundaries of Field F1. However, on balance of the fact that baseline activity at the Site is heavily dominated by species which adapt readily to the suburban environment (exemplified here by the concentrations of their activity at the residential interfaces in the south of the Site), the cessation of arable cultivation and new habitat creation shown in the DFP, no significant negative effects on local bat populations are anticipated to result from the proposed development.

Reptiles

- 5.21 All native British reptile species are listed within Schedule 5 of the Wildlife and Countryside Act 1981 and are afforded protection against killing and injury. In addition, all native British reptile species are Section 41 Species of Principle Importance for the Conservation of Biodiversity in England.
- 5.22 The majority of the Site is unsuitable for reptiles, supporting homogenous arable cultivation. The narrow field margins and area of grassland and scrub in the east however provides foraging, basking and refuge opportunities for these species, which surveys have confirmed to support a concentrated population of slow worms.
- 5.23 Much of these habitats will be lost to accommodate the proposed development. However, the DFP allocates 4.24ha of the 11.77ha Site for green infrastructure which, subject to suitable habitat creation and management and in combination with the new residential gardens, has the potential to result in a significant increase in suitable slow worm habitat at the Site level. New habitat creation within public open space and its future management will be determined at the detailed design stage.

- 5.24 Notwithstanding this, Site preparation works will directly impact upon slow worm habitats and could, in the absence of mitigation, result in the killing and injury of individual slow worms. While such an impact would be unlikely to undermine local population viability, and is not therefore taken to represent a significant negative effect, it would constitute an offence under the Wildlife and Countryside Act 1981.

Mitigation by Design

- 5.25 It is an established principle (CIEEM, 2018) that, wherever possible, potential negative effects should be avoided through 'Mitigation by Design', as this gives greater certainty over deliverability, demonstrates a well-designed scheme and ensures the correct application of the 'Mitigation Hierarchy' (as advocated by BS42020:2013, Defra 2019 and CIEEM, CIRIA & IEMA 2016).
- 5.26 The proposed development will retain both native species hedgerows as well as planting an additional c. 394m of new hedgerows within the Site (as shown on the conceptual DFP) to enhance connectivity within the Site and to the surrounding landscape. Strategic green infrastructure will be created, which will incorporate varying habitats including grassland and scrub, as well as new planted trees. These features will provide habitats for a variety of species, as well as providing areas of connectivity for wildlife through the Site to the surrounding landscape.
- 5.27 As has been described, while much of the existing on-site suitable reptile habitat will be removed to accommodate construction, the DFP represents an overall increase in suitable reptile habitat. New structural landscape planting in the north-west of the Site will address the present lack of connective features, which are likely the cause of the reduced baseline bat activity in this part of the Site, while existing features of value such as the hedgerows and pond will be retained.
- 5.28 Details of the establishment and long-term management of newly created and retained habitats, to maximise benefits for biodiversity, will be set out in a LEMP at the detailed design stage.

Additional Mitigation

International Designations

- 5.29 It has been ascertained within the accompanying HRA (CSA/4956/06) that, in the absence of mitigation, the proposed development has the potential to either result in or contribute toward significant negative effects on European site designations (as well as two overlapping SSSIs) of the East Solent system.
- 5.30 In summary, however, subject to payment of the applicable financial contribution to the Solent Recreation Mitigation Strategy prior to occupation of the proposed development, which will be used to fund

strategic measures, it can be concluded that the proposed development will have no significant residual negative effect on the Chichester and Langstone Harbours SPA or Ramsar site as a result of impacts associated with recreation pressure.

- 5.31 Furthermore, subject to the proposed creation of a permanent bird refuge and its management funded by the applicant for the specific purpose of supporting wintering brent geese, it can be concluded that the proposed development will have no significant residual negative effect on the Chichester and Langstone Harbours SPA and Ramsar Site, Portsmouth Harbour SPA and Ramsar site and Solent or Southampton Water SPA and Ramsar site as a result of impacts associated with loss of supporting habitat. Establishment of the bird refuge site and its management in perpetuity, which will involve land take from present arable cultivation, will additionally ensure that the proposal as a whole is 'nitrogen-negative' (i.e. a betterment on neutrality), and will therefore have no negative effect on the European sites of the East Solent system as a result of eutrophication linked to foul drainage impacts to water quality.
- 5.32 Full details are provided in the accompanying shadow Habitats Regulations Assessment.

Reptiles

- 5.33 A large portion of existing suitable slow worm habitat within the Site will be lost to the proposed development; primarily the large area of neutral grassland to the east. It is illegal to recklessly kill or injure a reptile under the Wildlife and Countryside Act 1981, therefore a Reptile Mitigation Strategy will be required.
- 5.34 The Reptile Mitigation Strategy will be prepared at the detailed design stage, however, broadly, it is envisaged that this will entail a capture, exclusion and translocation exercise to an on-site receptor area. The receptor area will need to be created in advance, and enhanced to suitable condition such that its carrying capacity will not be exceeded by the donor population. It is envisaged that the receptor area will be located within informal open space in the north-west of the Site, which shares connectivity with suitable off-site habitats. Exclusion fencing will be maintained in-situ for the duration of construction activities for each phase of development.
- 5.35 The Reptile Mitigation Strategy will need to operate in tandem with the LEMP, to ensure that high quality habitat is maintained on-site such that reptiles are not displaced, and the carrying capacity of adjacent land exceeded.

Residual Effects

5.36 Table 3 below summarises the assessment of potential impacts on each important ecological feature, proposed mitigation and the assessed residual effects.

Table 3. Summary of effects

Important Ecological Feature	Potential Impacts and Effects	Avoidance & Mitigation Measures	Mechanism by which Measures are Secured	Residual Effects
Chichester and Langstone Harbours SPA and Ramsar site	Increased recreational pressure	Developer funding of SRMS	S106	No significant effect
	Loss of supporting habitat	Hayling Island Brent Goose and Wader Refuge	Planning condition	
	Air quality (vehicle emissions)	No significant effect	N/A	
	Eutrophication	Land-use changes associated with on-site & off-site land	N/A	
Portsmouth Harbour SPA and Ramsar site	Loss of supporting habitat	Hayling Island Brent Goose and Wader Refuge	Planning condition	No significant effect
	Air quality (vehicle emissions)	No significant effect	N/A	
	Eutrophication	Land-use changes associated with on-site & off-site land	N/A	
Solent Maritime SAC	Air quality (vehicle emissions)	No significant effect	N/A	No significant effect
	Eutrophication	Land-use changes associated with on-site & off-site land	N/A	
Solent and Dorset Coast SPA	Eutrophication	Land-use changes associated with on-site & off-site land	N/A	No significant effect

Important Ecological Feature	Potential Impacts and Effects	Avoidance & Mitigation Measures	Mechanism by which Measures are Secured	Residual Effects
Solent and Southampt on Water SPA and Ramsar site	Loss of supporting habitat Air quality (vehicle emissions) Eutrophication	Hayling Island Brent Goose and Wader Refuge No significant effect Land-use changes associated with on-site & off-site land	Planning condition N/A N/A	No significant effect
Solent and Isle of Wight Lagoons SAC	Eutrophication	Land-use changes associated with on-site & off-site land	N/A	No significant effect
Sinah Common SSSI	No significant effect	N/A	N/A	No significant effect
Hedgerows	Damage during construction	Arboricultural Method Statement	Planning condition	No significant effect
Ditches	Damage / pollution during construction phase	Pollution control measures during construction phase	CEMP secured by planning condition	No significant effect
Pond	Damage / pollution during construction phase	Pollution control measures during construction phase	CEMP secured by planning condition	No significant effect
Bats	No significant effect	N/A	N/A	No significant effect
Reptiles	Loss of habitat for slow-worm population Injury or killing of individual reptiles	Green infrastructure to secure net gain in suitable reptile habitat On-site translocation and exclusion during construction	Reptile Mitigation Strategy and LEMP secured through planning condition	No significant effect

- 5.37 Subject to the implementation of the above mitigation, no significant residual effects on any important ecological features are anticipated to result from the construction or operation of the proposed development.

Cumulative Effects

- 5.38 Table 4 below identifies the plans/projects that have been scoped in for assessment of potential additive or synergistic effects on the ecological features identified in Table 3 above.

Table 4. Summary of potential cumulative effects

Reference, distance from Site and materials reviewed	Potential impact/effect of plan or project in isolation	Potential for significant cumulative effect?
APP/20/01093 c. 800m west Land at Sinah Lane, Hayling Island Extended Phase 1 Habitat Survey – WYG, November 2020 Reptile Survey Report – WYG, November 2020 Bat Survey Report – WYG, November 2020 Winter Bird Mitigation Strategy – WYG, February 2021 Habitats Regulations Assessment: Screening & Appropriate Assessment – Havant Borough Council, March 2021	<i>Winter birds</i> – site is designated as a Core Area within the SWBGS, the southern part of which will be lost as a result of development	Yes, though will not be realised as negative effects of both developments will be fully compensated
	<i>Solent European Sites</i> – likely increases in recreational pressure and eutrophication	N/A – these are in any event cumulative impact pathways, with appropriate mitigation secured
	<i>Reptiles</i> - the site supports a low population of slow-worm which would be impacted upon in the absence of mitigation	No, as subject to mitigation no negative impacts anticipated for the land off St Mary's Road development
	<i>Bats</i> - site considered important at the local level for foraging and dispersing bats. Disruption via lighting may have negative effects upon local populations	No, as subject to mitigation no negative impacts anticipated for the land off St Mary's Road development
	<i>Winter birds</i> – site adjacent to Core Area within the SWBGS. Increases in residents using footpaths will lead to disturbance to dark-bellied brent geese using parcel of land	The loss of H46B as a Core Area as part of the current proposed development removes the cumulative impact pathway, however this is offset by the creation of a bespoke Refuge Site for brent geese.

Reptile Survey & Mitigation Report – Ecosupport, June 2022 Bat Activity Survey Report – Ecosupport, June 2022	<i>Solent European Sites</i> – likely increases in recreational pressure and eutrophication	N/A – these are in any event cumulative impact pathways, with appropriate mitigation secured
	<i>Reptiles</i> – site found to support low numbers of slow worm important at the local level which would be impacted upon in the absence of mitigation at the construction and operational phases	No. While both sites likely to support same population of slow worm, subject to mitigation no negative impacts anticipated for the land off St Mary's Road development
	<i>Bats</i> – site found to support a foraging and commuting bat assemblage important at the County/Regional level, which would be impacted upon in the absence of mitigation	No, as subject to mitigation no negative impacts anticipated for the land off St Mary's Road development
APP/21/01351 c. 480m north-west Saltmarsh Lane, Hayling Island EcIA – Tyler Grange, October 2021	<i>Winter birds</i> – site is designated as a Low Use Site within the SWBGS which will be lost to facilitate development	Yes, though will not be realised as negative effects of both developments will be fully mitigated
	<i>Solent European Sites</i> – likely increases in recreational pressure and eutrophication	N/A – these are in any event cumulative impact pathways, with appropriate mitigation secured
	<i>Bats</i> – site found to support an assemblage of foraging and commuting bats of local importance, which would be impacted in the absence of mitigation	No, as subject to mitigation no negative impacts anticipated for the land off St Mary's Road development
APP/21/01350 c. 570m west North of Oysters, Hayling Island EcIA – Tyler Grange, October 2021	<i>Reptiles</i> – site found to support a population of slow worm important at the local level which would be impacted in the absence of mitigations	No, as subject to mitigation no negative impacts anticipated for the land off St Mary's Road development
	<i>Winter birds</i> – site is designated as a Secondary Support Area within the SWBGS which will be lost to facilitate development	Yes, though will not be realised as negative effects of both developments will be fully mitigated
	<i>Solent European Sites</i> – likely increases in recreational pressure and eutrophication	N/A – these are in any event cumulative impact pathways, with

		appropriate mitigation secured
	<i>Bats</i> – site found to support assemblage of foraging and commuting bats important at the local level which will be affected by the development in the absence of mitigation	No, as subject to mitigation no negative impacts anticipated for the Rook Farm development
	<i>Reptiles</i> – site found to support an assemblage of reptiles important at the local level which will be impacted by the development in the absence of mitigation	No, as subject to mitigation no negative impacts anticipated for the Rook Farm development
APP/22/00669 c. 6.2km north-west Kingscroft Farm, Havant Preliminary Ecological Appraisal – Ecosupport, June 2022	<i>Solent European Sites</i> – likely increases in recreational pressure and eutrophication	N/A – these are in any event cumulative impact pathways, with appropriate mitigation secured
APP/22/01231 c. 6.5km north-west Palk Road, Havant EcIA – ACD Environmental, November 2022	<i>Solent European Sites</i> – likely increases in recreational pressure and eutrophication	N/A – these are in any event cumulative impact pathways, with appropriate mitigation secured
APP/22/01039 c. 7km north 26 New Lane, Havant Preliminary Ecological Appraisal – Delta-Simons Ltd, September 2022	No potential impacts for this project in isolation were determined	N/A
APP/23/00076 c. 810m west Tournbury Lane Shadow Habitat Regulations Assessment – Hampshire Ecological Services Ltd, April 2020 EcIA – Hampshire Ecological Services Ltd, June 2020 Shadow Appropriate Assessment – Holbury Consultancy Services, November 2021	<i>Solent European Sites</i> – likely increases in recreational pressure and eutrophication	No. Development is required to pay contributions towards the SWRS and nutrient neutrality, mitigate noise pollution and potential.

APP/24/00968 c. 860m north-east Beachlands, Hayling Island Preliminary Ecological Appraisal – arbtech, September 2024	No potential impacts for this project in isolation were determined	N/A
APP/22/00669 c. 6.2km north Land at Kingscroft Farm adjacent to Ridgway and Marples Way, Havant Preliminary Ecological Appraisal – Ecosupport, 2022	<i>Solent European Sites</i> – likely increases in recreational pressure and eutrophication	N/A – these are in any event cumulative impact pathways, with appropriate mitigation secured
Reptile Mitigation Strategy – Ecosupport, 2023 Solent Nutrient Budget Calculator – N.A, n.d. Biodiversity, Enhancement & Management Strategy – Ecosupport, 2023	<i>Reptiles</i> – site found to support an assemblage of reptiles important at the local level which will be impacted by the development in the absence of mitigation	No, as subject to mitigation no negative impacts anticipated for the Rook Farm development
APP/22/00172 c. 5.9km north Langstone Technology Park, Langstone Road, Havant Preliminary Ecological Appraisal – Phlorum, 2022	No potential impacts for this project in isolation were determined	N/A
APP/20/00533 c. 6.3km north B.M. Scaffolding, Brockhampton Road, Havant	No potential impacts for this project in isolation were determined	N/A
Havant Local Plan Policy HB2 Havant & Bedhampton Employment Allocations – Site Ref: BD10 c. 6km north Land north of Regional Business Centre	<i>Solent European Sites</i> – likely increases in recreational pressure and eutrophication	N/A – these are in any event cumulative impact pathways, with appropriate mitigation secured

- 5.39 Several of the projects included with the cumulative assessment have the potential to act in-combination with the proposed development to have cumulative effects on the nearby Solent European sites, through recreational pressures, loss or degradation to functionally linked land and eutrophication. However, these impact pathways have all been addressed in detail within this EclA and the accompanying documents (impacts associated with these pathways are generally only ever considered significant when assessed in combination).
- 5.40 The neighbouring application of APP/22/00001 49-71 Fathoms Reach, Hayling Island adjoins the south-western boundary of the Site and is likely to support the same populations of slow worm present within the Site and may, in the absence of mitigation, have a cumulative impact upon this ecological feature at the local level. However, through the incorporation of landscaping features of benefit to reptiles, as well as the implementation of reptile mitigation strategies as part of both schemes, such cumulative effects are unlikely to be realised.
- 5.41 No other potential cumulative negative effects have been identified.

Compensation

- 5.42 As illustrated in the Biodiversity Net Gain Assessment (CSA/4956/15), to accommodate the proposed development c. 6.04 Habitat Units will be permanently lost on-site.
- 5.43 As detailed above in 'Mitigation by Design' the proposed development will, however, provide an opportunity to secure the following elements of habitat creation. Although designs are at this stage illustrative, the Development Framework Plan demonstrates that alongside development the Site can accommodate:
- Informal grassland (c. 0.8ha equating to 5.53 Biodiversity Units)
 - Formal grassland (c. 2.33ha equating to 8.06 Biodiversity Units)
 - Scrub (c. 0.36ha equating to 2.44 Biodiversity Units)
 - New tree planting (c. 90 small trees equating to 0.8 Biodiversity Units)
- 5.44 The above measures will contribute to an overall net gain of 0.77 Watercourse Units (+32.21%) and 3.51 Hedgerow Units (+321.30%), however the on-site habitat creation is not sufficient to achieve an on-site net gain. An off-site offsetting parcel has been identified to contribute to the Site's Biodiversity Net Gain, which will result in an overall net gain of 23.54 Habitat Units (+75.84%).
- 5.45 Full details on the establishment and long-term management of these habitats will be set out in the LEMP at the detailed design stage. Such details will include a description of the proposed habitats, their target condition, timescales over which condition will be achieved, management prescriptions, implementation responsibilities and funding mechanisms.

Enhancement

- 5.46 The Development Framework Plan includes landscape planting enhancements which will make positive contributions to on-site biodiversity.
- 5.47 New habitat creation will provide opportunities for species confirmed to be present on-site at baseline, such as nesting birds and slow worm. In addition to these enhancements which are embedded into development proposals, a range of additional ecological enhancement measures will be delivered as part of the proposed development, as identified below. Further details will be set out in a LEMP at the detailed design stage, however as an indicative guide:
- Improvement of a stretch of on-site ditch running centrally through the Site, incorporating aquatic and marginal planting, removal of smothering vegetation and engineering of the ditch to allow for water retention for the majority of the year
 - Native species rich hedge planting along the periphery of the residential parcels, incorporating standard trees along the length to provide connectivity across the Site
 - Inclusion of plant species of known wildlife value within the landscaping scheme, including night-scented varieties to benefit bats.
 - Provision of new bat roosting opportunities: Bat boxes will be erected on mature trees or new builds. These will be a purpose-built, durable and long-lasting variety such as available from Schwegler or Habitat. Where possible, these will be incorporated into the fabric of new builds.
 - Provision of new bird nesting opportunities: Bird nesting boxes will be provided in new/retained planting to benefit generalist bird species. This is to include a single barn owl box within a suitable location (e.g. mature tree) within the off-site compensatory land.
 - Creation of log piles: Timber generated from any scrub or tree clearance works at the Site will be used to make log piles for wildlife benefit. These will be sited within boundary vegetation where they will be least disturbed. New material can be added as required following any future management works.
 - Provision of hedgehog gaps: Hedgehogs have been scoped out of detailed assessment and no specific mitigation is proposed, however it is important that opportunities for hedgehogs to move through the landscape are preserved. Although not strictly an 'enhancement' measure, provision of hedgehog-friendly gravel boards or equivalent, providing a minimum 5 x 5 inch gap, will be used to maintain permeability for hedgehogs across the development and associated gardens. The number and location of hedgehog gaps will be determined at the detailed design stage and set out within the LEMP.

Monitoring

- 5.48 There will be ongoing monitoring of newly established and enhanced habitats as part of POS. This commitment will be made, and further detail provided, within the LEMP to be prepared at the detailed design stage.
- 5.49 To monitor the effectiveness of the proposed refuge site for brent geese mitigation, wintering bird surveys will be completed from the first winter following establishment and will continue until year 10 post-establishment. Details of the monitoring programme are provided within the Brent Goose Mitigation Strategy (CSA/4956/09).

6.0 CONCLUSIONS

- 6.1 In the absence of any mitigation measures, the proposed development would have the potential to result in significant negative effects on ecological features of up to international importance. However, with the implementation of the prescribed avoidance and mitigation strategies, as well as precautionary measures as proposed here, the development is not anticipated to result in any significant residual negative effects on important ecological features.
- 6.2 The Development Framework demonstrates the potential to deliver net benefits for wildlife in the form of additional habitats, with the opportunity to provide additional biodiversity enhancement measures alongside the new housing. A Biodiversity Net Gain assessment has determined that the proposed development could secured a net gain of +75.84% in Habitat Units, 321.30% in Hedgerow Units and 32.21% in Watercourse Units.
- 6.3 The measures set out herein can be secured through appropriate conditions attached to any planning consent, and the development may therefore be delivered without harm to nature conservation interests. Specifically, it is anticipated that planning conditions would be used to secure:
- Construction Environmental Management Plan (CEMP): In addition to wider environmental controls and best practice construction management, the CEMP will set out construction-phase impact avoidance measures with respect to nesting birds and badgers
 - Landscape and Ecology Management Plan (LEMP): The LEMP will detail the establishment and long term management of retained and newly created habitats to maximise benefits for wildlife. It will include a graphical Ecological Enhancement Plan, setting out the number, type and position of enhancement features.
 - Reptile Mitigation Strategy: The Reptile Mitigation Strategy will provide details of the translocation exercise to be undertaken prior to the commencement of construction works, as well as information relating to habitat creation and features for reptiles.
- 6.4 Based on the successful implementation of avoidance, mitigation and enhancement measures set out herein, the scheme is considered to accord with all relevant nature conservation legislation, as well as with the provisions of Policy DM8 of the adopted Havant Borough Local Plan.

7.0 REFERENCES

Baker, J., 2016. *Biodiversity Net Gain: Good practice principles for development*. CIEEM, CIRIA & IEMA.

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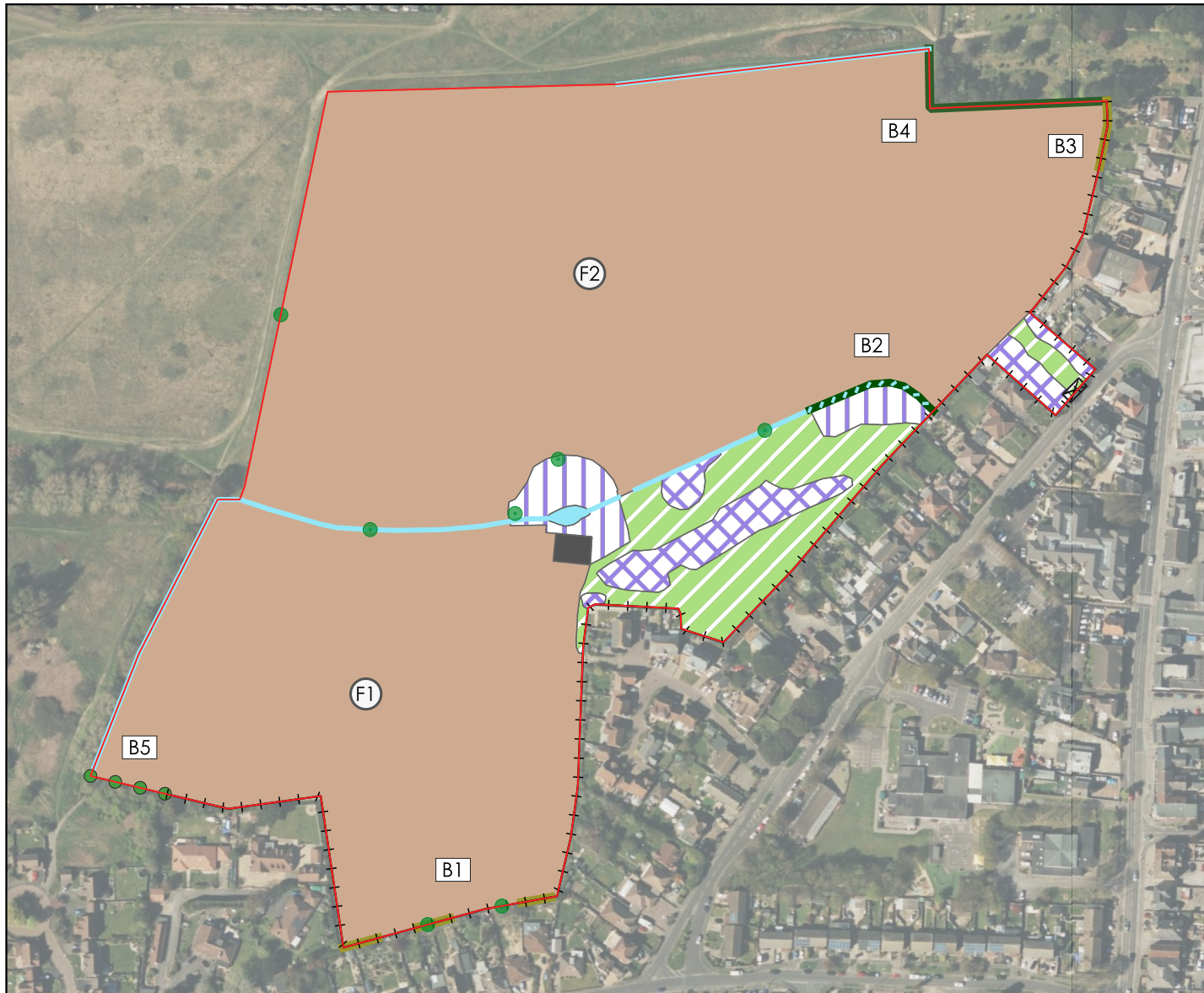
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Appendix A

Habitats Plan



Indicative site boundary

Habitats

Cropland (c)

Other neutral grassland (g3c)

Bramble scrub (h3d)

Mixed scrub (h3h)

Pond (Non-priority) (r1)

Buildings (u1b5)

Native hedgerow (h2a)

Native hedgerow associated with ditch (h2a; 50)

Ornamental hedgerow (h2b)

Line of trees (w1g; 33)

Seasonally wet ditch (r1; 50, 502)

Individual tree

Fence

Field reference

Boundary reference

Gate

0 50 100 m



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Appendix B

Legislation and Planning Policy

- 1.1. The **Conservation of Habitats and Species Regulations 2017** (as amended) make prescriptions for the designation and protection of Sites of Community Importance ('European sites', i.e. Special Areas of Conservation and Special Protection Areas) and European Protected Species (EPS). The latter include all native bats, great crested newts, dormice, otters and certain reptiles, listed under Annex II of the Regulations. Following the UK's departure from the European Union, the provisions of the Regulations have been retained through enactment of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, which came into force on 31 December 2020.
- 1.2. The **Wildlife and Countryside Act 1981** (as amended, principally by the Countryside and Rights of Way Act 2000) forms the basis for protection of statutory designated sites of national importance (e.g. Sites of Special Scientific Interest; SSSIs) and native species that are rare and vulnerable in a national context. Additionally, badgers are protected under the **Protection of Badgers Act 1992**.
- 1.3. The **Environment Act 2021** received Royal Assent in November 2021. Through an amendment to the Town and Country Planning Act 1990 the Environment Act introduced a mandatory requirement for all planning permissions to be conditional upon the submission of a Biodiversity Gain Plan for approval by the Local Planning Authority. The Plan will need to demonstrate a net gain of at least 10% in the biodiversity value of the development site. These provisions are in force for all new applications from 12 February 2024.
- 1.4. Section 40(1) of the **Natural Environment and Rural Communities (NERC) Act 2006** states that each public authority, "must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity." This legislation makes it clear that planning authorities should consider impacts to biodiversity when determining planning applications, with particular regard to the Section 41 (S41) lists of 56 habitats and 943 species of principal importance. The UK Biodiversity Action Plan (BAP) has been superseded by the Biodiversity 2020 Strategy, however Local BAPs continue to influence biodiversity management and conservation effort, including through the spatial planning system, at the local scale.
- 1.5. The **National Planning Policy Framework (2023)** (NPPF) sets out the government planning policies for England and how they should be applied. With regards to ecology and biodiversity, Chapter 15: Conserving and Enhancing the Natural Environment, paragraph 187, states that the planning system and planning policies should minimise impacts on and provide net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

- 1.6. Paragraph 193 sets out the principles that local planning authorities should apply when determining planning applications:
- 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 improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.
- 1.7. Accompanying the NPPF, central government guidance on the implementation of planning policies is set out within online Planning Policy Guidance (PPG). The Natural Environment PPG addresses principles across a broad spectrum of topics targeting biodiversity conservation, from individual site and species protection through to the supporting of ecosystem services, and the use of local ecological networks to support the national Nature Recovery Network. In particular, the PPG promotes the delivery of measurable Biodiversity Net Gain through the creation and enhancement of habitats alongside development.
- 1.8. The **Government Circular 06/2005**, which is referred to within the NPPF, defines statutory nature conservation sites and protected species as a material consideration in the planning process.
- 1.9. Local planning policies of relevance to ecology, biodiversity and/or nature conservation have been set out in Table 1 below.

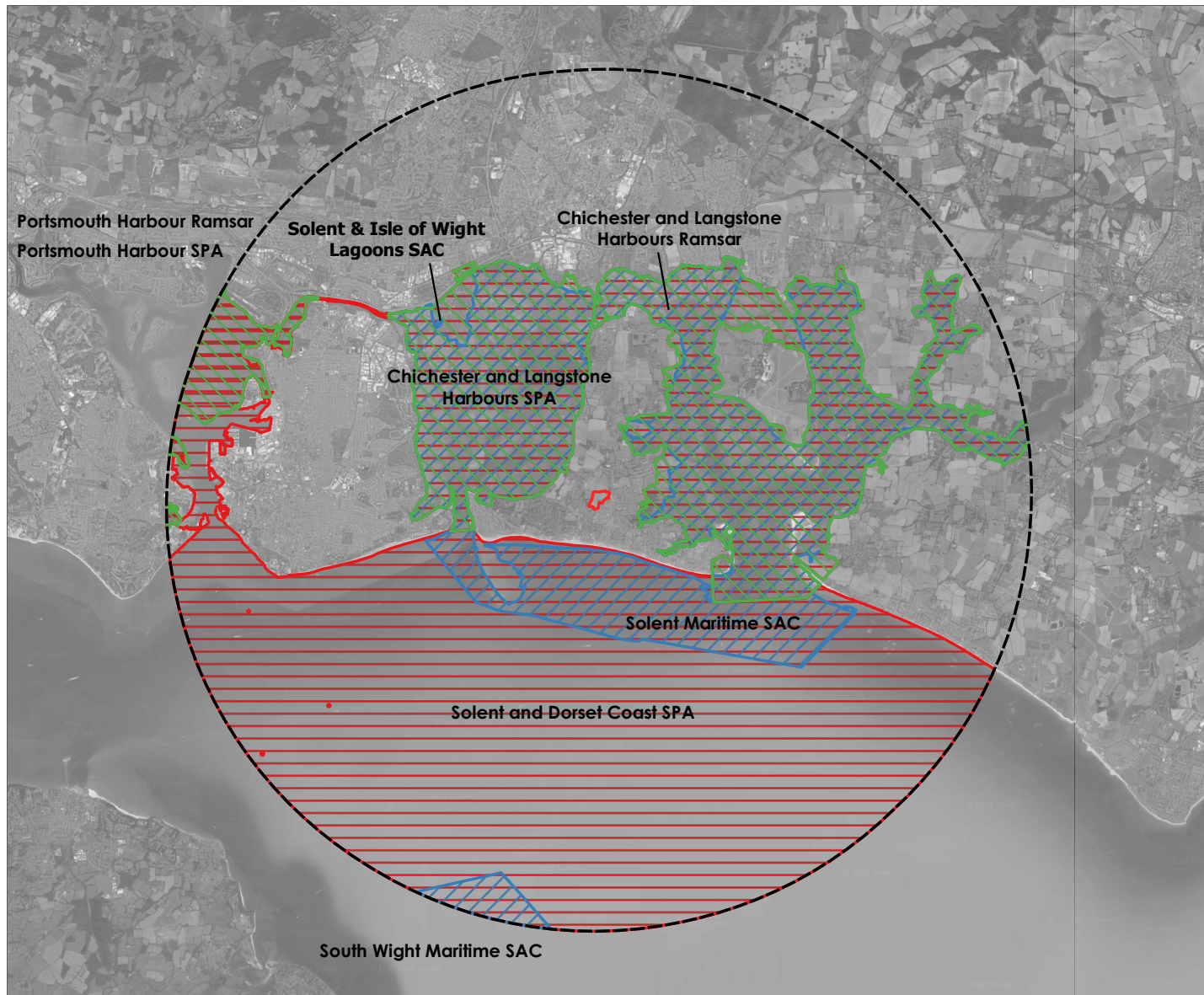
Table 1. Summary of regional and local planning policy relating to ecology

Policy	Summary
Havant Borough Local Plan (Allocations) July 2014	
Policy DM23: Sites for Brent Geese and Waders	Planning permission will be granted for developments that avoid important sites for Brent Geese and/or waders outside of the statutory designated areas, identified on the Policies Map. Where this cannot be avoided, development proposals on or adjacent to an important Brent Goose and/or wader site outside of the statutory designated areas will need to demonstrate levels of impact, alone and in combination with other proposals subject to the tests of the Habitats Regulations. Where a negative impact upon a site cannot be avoided or satisfactorily mitigated, and the tests of the Habitats Regulations are met as necessary, replacement feeding/roosting habitat, on a no net loss basis, will be sought. Where a negative impact upon an important site cannot be avoided or mitigated and replacement feeding/roosting habitat is not or cannot be provided on a no net loss basis, the proposal will be refused. Planning permission will be granted for development on or adjacent to uncertain sites for Brent Geese and/or waders outside of the statutory designated areas, where appropriate surveys are undertaken and it is determined that the site has no importance.
Policy DM24: Recreational Disturbance to Special Protected Areas (SPAs) from Residential Development	Planning permission will be granted for residential developments that avoid or mitigate a likely significant effect on the SPAs, caused by recreational disturbance through the in-combination effect of net additional dwellings. This mitigation can be provided through: a) A financial contribution. b) A developer provided package of measures associated with the proposed development designed to avoid or mitigate any significant effect on the SPAs subject to meeting the tests of the Habitats Regulations. c) A combination of measures in (a) and (b) above. Where these measures cannot be provided development proposals will be refused, unless the applicant can show, subject to meeting the tests of the Habitats Regulations, that there would not be an adverse effect on the integrity of the SPAs. The provisions of this policy do not exclude the possibility that some residential schemes, due to their size/and or location, may require individual assessment under the Habitats Regulations on advice from Natural England and additional site specific avoidance or mitigation measures.
Havant Borough Local Plan (Core Strategy) March 2011	
Policy DM8: Conservation, Protection and Enhancement of Existing Natural Features	Development will only be permitted where it protects and enhances local habitats and landscape distinctiveness and which addresses all of the relevant criteria as set out below: 1. Protects natural features of nature conservation and/or amenity importance on the site, for example trees, woodlands,

Policy	Summary
	hedgerows, soils, streams, stream corridors, springs, ditches or ponds from damage, destruction and a deterioration in quality. 2. Sympathetically incorporates existing features into the overall design of the scheme including measures taken to ensure their continued survival. 3. Provides new landscape works that integrate successfully with the local environment and existing natural features, using local materials and plant species and making provision for future maintenance of new landscape works associated with new developments. 4. Ensures sequences of greenspaces are maintained and protects the attractiveness and visual amenity of all green open spaces that contribute to the identity of the borough.

Appendix C

Desk Study Information



- Indicative site boundary
- 10km search radius
- Ramsar site
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)

0 2.5 5 km



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Project	Land off St Mary's Road, Hayling Island	Date	February 2025	Drawing No.	CSA/4956/106
Drawing Title	International Designations within 10km of the Site	Scale	Refer to scale	Rev	A
Client	Gladman Developments Ltd	Drawn	MB	Checked	MR



-  Indicative site boundary
-  3km search radius
-  Site of Special Scientific Interest (SSSI)
-  Local Nature Reserve (LNR)

0 1 2 km



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Project	Land off St Mary's Road, Hayling Island	Date	February 2025	Drawing No.	CSA/4956/107
Drawing Title	National and Local Designations within 3km of the Site	Scale	Refer to scale	Rev	A
Client	Gladman Developments Ltd	Drawn	MB	Checked	MR



 Indicative site boundary



0 100 200 m



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Project	Land off St Mary's Road, Hayling Island	Date	February 2025	Drawing No.	CSA/4956/108
Drawing Title	Priority Habitats Plan	Scale	Refer to scale	Rev	A
Client	Gladman Developments Ltd	Drawn	MB	Checked	MR

Appendix D

Photographs



Photograph 1. View of Field F1 taken from the centre of the Site facing south-west.



Photograph 2. View of Field F2 taken from the centre of the Site facing north.



Photograph 3. Larger parcel of neutral grassland present along the eastern boundary of the Site.



Photograph 4. Shorter sward of neutral grassland leading south-west from the larger grassland parcel towards Field F1.



Photograph 5. Smaller parcel of neutral grassland surrounded by dense bramble scrub adjacent to the gate access on the eastern boundary.



Photograph 6. Pond present between Fields F1 and F2, connected from the west to the ditch traversing the Site centrally.



Photograph 7. A large area of the pond is dominated by bulrush.



Photograph 8. Seasonally wet ditch traversing the Site centrally taken facing west.



Photograph 9. Seasonally wet ditch present along the western boundary of Field F1 taken facing south.



Photograph 10. Boundary treeline B5 present in the south-west corner of the Site.

Appendix E

Habitats and Flora Species List

Table 1. Habitat Polygons

Site Name	Land off St Mary's Road, Hayling Island					
Survey Date and Surveyor(s)	11/01/2024 Sophie Vines					
Scientific Name	Common Name	Habitat Parcel Number/Habitat Type				
		Field F1 margins	Field F2 margins	Mixed scrub	Small neutral grassland	Large neutral grassland
Ferns						
<i>Pteridium aquilinum</i>	Bracken	X	X			
Herb Species						
<i>Chenopodium album</i>	Fat-hen	X	X			
<i>Achillea millefolium</i>	Yarrow				X	
<i>Anagallis arvensis</i>	Scarlet pimpernel	X				
<i>Arctium</i> sp.	Burdock	X				
<i>Brassica</i> sp.	Cabbage	X				
<i>Calystegia arvensis</i>	Field bindweed	X	X		X	X
<i>Centaurea nigra</i>	Common knapweed				X	
<i>Cirsium arvense</i>	Creeping thistle					X
<i>Cirsium vulgare</i>	Spear thistle	X	X		X	X
<i>Daucus carota</i>	Wild carrot				X	
<i>Epilobium</i> sp.	Willowherb	X			X	X
<i>Epilobium tetragonum</i>	Square-stalked willowherb					
<i>Equisetum arvense</i>	Field horsetail	X	X			X
<i>Euphorbia</i> sp.	Spurge	x				
<i>Galium aparine</i>	Cleavers	x			x	x
<i>Galium</i> sp.	Bedstraw	x	x			x
<i>Galium verum</i>	Lady's bedstraw					
<i>Geranium</i> sp.	Crane's-bill	X	X		X	
<i>Helminthotheca echioides</i>	Bristly oxtongue	X	X			X
<i>Heracleum sphondylium</i>	Hogweed	X	X		X	
<i>Hypericum</i> sp.	St John's-wort	X				X
<i>Hypochaeris radicata</i>	Cat's-ear	X				
<i>Lapsana</i> sp.	Nipplewort	X				
<i>Leucanthemum vulgare</i>	Oxeye daisy				X	
<i>Lotus corniculatus</i>	Common bird's-foot-trefoil	X				
<i>Malva sylvestris</i>	Common mallow	X	X			
<i>Matricaria chamomilla</i>	Scented mayweed	X	X			
<i>Medicago lupulina</i>	Black medick	X	X			
<i>Persicaria maculosa</i>	Redshank	X	X			
<i>Plantago lanceolata</i>	Ribwort plantain	X	X			
<i>Plantago major</i>	Greater plantain	X	X			
<i>Polygonum</i> sp.	Knotgrass	X	X			
<i>Pulicaria dysenterica</i>	Common fleabane	X				
<i>Ranunculus repens</i>	Creeping buttercup				X	X
<i>Rumex acetosa</i>	Common sorrel				X	
<i>Rumex</i> sp.	Dock	X	X		X	X
<i>Senecio jacobaea</i>	Common ragwort	X	X		X	X
<i>Sonchus oleraceus</i>	Smooth sowthistle	X	X			
<i>Taraxacum officinale</i> agg.	Dandelion	X	X			X
<i>Trifolium pratense</i>	Red clover	X				
<i>Trifolium</i> sp.	Clover				X	X
<i>Tripleurospermum inodorum</i>	Scentless mayweed		X			
<i>Urtica dioica</i>	Common nettle	X	X		X	X
<i>Veronica persica</i>	Common field-speedwell	X				
<i>Vicia</i> sp.	Vetch	X			X	
Sedges and Rushes						
<i>Carex pendula</i>	Pendulous sedge	X				X
Grasses						
<i>Agrostis</i> sp.	Bent grass				X	X
<i>Arrhenatherum elatius</i>	False oat-grass	X	X		X	X
<i>Cynosurus cristatus</i>	Crested dog's-tail					X
<i>Dactylis glomerata</i>	Cock's-foot	X	X		X	X
<i>Elytrigia repens</i>	Common couch	X				
<i>Holcus lanatus</i>	Yorkshire-fog	X	X		X	X
<i>Lolium perenne</i>	Perennial rye-grass	X				X

Scientific Name	Common Name	Habitat Parcel Number/Habitat Type				
		Field F1 margins	Field F2 margins	Mixed scrub	Small neutral grassland	Large neutral grassland
<i>Poa infirma</i>	Early meadow-grass	X	X			
Crops						
<i>Avena sativa</i>	Oat	X				
Woody Species						
Coniferous						
<i>Pinus sylvestris</i>	Scots pine		X			
Broadleaved						
<i>Acer campestre</i>	Field maple	X				
<i>Acer pseudoplatanus</i>	Sycamore	X				
<i>Buddleja davidii</i>	Butterfly-bush	X				
<i>Crataegus monogyna</i>	Hawthorn			X		X
<i>Fraxinus excelsior</i>	Ash	X	X			
<i>Juglans regia</i>	Walnut			X		X
<i>Lonicera periclymenum</i>	Honeysuckle	X				
<i>Prunus spinosa</i>	Blackthorn		X	X	X	X
<i>Quercus</i> sp.	Oak		X			
<i>Rosa</i> sp.	Rose	X	X			
<i>Rubus fruticosus</i> agg.	Bramble	X	X	X	X	X
<i>Salix matsudana Tortuosa</i>	Contorted willow					X
<i>Salix caprea</i>	Goat willow					X
<i>Sambucus nigra</i>	Elder	X		X	X	

Table 2. Linear Habitats

Site Name	Land off St Mary's Road, Hayling Island					
Survey Date and Surveyor(s)	11/01/2024 Sophie Vines					
Scientific Name	Common Name	Habitat Parcel Number/Habitat Type				
		B1 Ornamental hedgerow	B2 Native hedgerow with ditch	B3 Ornamental hedgerow	B4 Native hedgerow	B5 Line of trees
Herb Species						
<i>Calystegia arvensis</i>	Field bindweed	X			X	X
<i>Cotoneaster</i> sp.	Cotoneaster			X		
<i>Urtica dioica</i>	Common nettle			X		
Woody Species						
<i>Cupressus</i> × <i>leylandii</i>	Leyland cypress	X				
<i>Pinus radiata</i>	Monterey pine			X		X
<i>Pinus</i> sp.	Non-native pine	X				
<i>Pinus sylvestris</i>	Scots pine					X
<i>Thuja plicata</i>	Western red cedar	X				
Broadleaved						
<i>Betula</i> sp.	Birch	X				
<i>Buddleja davidii</i>	Butterfly-bush			X		
<i>Crataegus monogyna</i>	Hawthorn			X	X	
<i>Euonymus europaeus</i>	Spindle				X	
<i>Fagus sylvatica</i>	Beech				X	
<i>Fraxinus excelsior</i>	Ash				X	X
<i>Hedera helix</i>	Ivy	X			X	X
<i>Ilex aquifolium</i>	Holly				X	
<i>Ligustrum ovalifolium</i>	Garden privet	X				
<i>Prunus laurocerasus</i>	Cherry laurel	X		X		
<i>Prunus spinosa</i>	Blackthorn		X			X
<i>Quercus</i> sp.	Oak					X
<i>Rubus fruticosus</i> agg.	Bramble		X	X	X	X
<i>Sambucus nigra</i>	Elder	X				X
<i>Ulmus procera</i>	English elm					X

Appendix F

Evaluation & Assessment Methods

- 1.1. Ecological features are evaluated and assessed in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) 2018 Guidelines for Ecological Impact Assessment (EclA). For clarity, the evaluation and assessment process adopted within this EclA is set out below.

Establishing Potentially Important Ecological Features

- 1.2. Ecological features are assessed where they are considered to be important, and where they may be impacted by a proposed development. A feature may be considered important for a variety of reasons, such as quality, extent, rarity and/or statutory protection. Table 1 below sets out a non-exhaustive list of ecological features that are typically considered, along with key examples:

Table 1. Potentially important ecological features (adapted from CIEEM 2018)

Potentially Important Ecological Features	Typical examples
Statutory designated sites under international conventions or European Legislation	Wetlands of International Importance (Ramsar sites), Special Areas of Conservation (SAC), Special Protection Areas (SPA)
Statutory designated sites under national legislation	Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR, Local Nature Reserves (LNR)
Non-statutory, locally designated wildlife sites	Local Wildlife Sites (LWS), County Wildlife Sites (CWSs), Sites of Importance for Nature Conservation (SINCs)
National biodiversity lists	Habitats or Species of Principal Importance for the Conservation of Biodiversity (Section 41, NERC Act 2006), Ancient Woodland Inventory
Local biodiversity lists	Local Biodiversity Action Plan (BAP) priority species or habitats
Red Listed / Rare Species	Species of conservation concern, Red Data Book (RDB) species, Birds of Conservation Concern, nationally rare and nationally scarce species
Legally Protected Species	E.g. species listed under Sch.5 of the W&C Act 1981, or Sch.2 of the Hag. Regs. 2017
Legally Controlled Species	E.g. species listed under Sch.9 of the W&C Act 1981

- 1.3. It should also be noted that the social, community, economic or multi-functional importance attributed to ecological features are not assessed as they fall outwith the scope of this assessment.

Establishing Likely Zone of Influence

- 1.4. The 'zone of influence' for a project is the area over which ecological features may be subject to significant effects as a result of the project and associated activities. The project's zone of influence varies across different ecological features, which have different vulnerabilities and

sensitivities. For the purposes of this assessment, the following zones were considered:

- International statutory nature conservation designations up to 10km from the Site
 - National and local statutory nature conservation designations up to 3km from the Site
 - Non-statutory locally designated wildlife sites up to 1km from the Site
- 1.5. These arbitrary distances are considered sufficient for identifying the nature conservation designations which could be subject to significant effects. However, it is acknowledged that in certain circumstances effects beyond these distances are possible and should be considered as far as is reasonably practicable to do so.
- 1.6. For other ecological features, such as habitats and species, the appropriate zone of influence is described and justified as appropriate within the report, depending on their respective sensitivity to an environmental change.
- 1.7. The results of professionally accredited or published scientific studies have been used and referenced, where available, to establish the spatial and temporal limits of the biophysical changes likely to be caused by specific activities, and to justify decisions about the zone of influence.

Geographic Context and Significance Criteria

- 1.8. The importance of ecological features, as well as the significance of any likely impacts and their effects, are considered here within a defined geographic context:
- International
 - National
 - Regional
 - County
 - Local
- 1.9. The size, conservation status and the quality of features are all relevant in determining their importance and assigning this to the geographic scale. Where the importance of a feature is considered to fall below the Local scale, they are scoped out of detailed assessment.
- 1.10. Impacts and their effects are taken to be significant where they support or undermine biodiversity conservation objectives, with the scale of significance defined according to the above geographic context. Where an impact or effect is unlikely to be perceptible at a Local scale, this is taken to be not significant.

Characterising Ecological Impacts and their Effects

- 1.11. Where likely significant ecological impacts and effects are identified in connection with the proposed project, these are considered and described with reference to the following characteristics (where this is helpful in accurately portraying the ecological effect and determining the scale of significance):
- Positive or negative (i.e. does the anticipated change accord with nature conservation policies and objectives?)
 - Extent (i.e. the spatial area over which the impact or effect may occur)
 - Magnitude (i.e. the quantified size, amount, intensity or volume)
 - Duration (i.e. the timeframe over which the impact or effect may occur, in both human and ecological terms)
 - Frequency and timing (i.e. the number of times an activity occurs, where this is likely to influence the effect)
 - Reversibility (i.e. is spontaneous recovery possible or may the effect be counteracted by mitigation?)

Appendix G

Bat Survey Report

1.0 Introduction

- 1.1 This report has been prepared on behalf of Gladman Developments Ltd to provide details of bat survey work undertaken at Land off St Mary's Road, Hayling Island (hereafter referred to as 'the Site'). It is intended to inform an evidence-based Ecological Impact Assessment in relation to proposed development at the Site.

2.0 Legislation

- 2.1 All British bat species are legally protected under Regulation 43 of the Conservation of Habitats and Species Regulations 2017 (as amended). These Regulations make it an offence to:
- Deliberately capture, injure, or kill a bat
 - Deliberately disturb bats, impairing their ability to survive, breed, reproduce or rear/nurture their young, or which significantly affects the local distribution or abundance of the species
 - Damage or destroy a breeding site or resting place used by bats
- 2.2 All bats and their roosts in the UK were previously fully protected under the Wildlife & Countryside Act 1981 (as amended). Amendments to the Act have removed most provisions as they relate to bats, however it remains an offence to:
- Intentionally or recklessly disturb a bat while it is occupying a structure or place which it uses for shelter or protection
 - Intentionally or recklessly obstruct access to any structure or place used for shelter or protection
- 2.3 It is important to note that bat roosts are protected throughout the year, regardless of whether or not bats are present at the time. Under the Regulations, the offence of damaging or destroying a breeding site or resting place is subject to 'strict liability', i.e. an offence is committed irrespective of whether the causal act was deliberate or otherwise.
- 2.4 Where development is proposed that would result in an offence under the Regulations, a European Protected Species (EPS) statutory derogation licence (often termed 'EPS Mitigation Licence') will need to be secured from Natural England to permit an act that would otherwise be unlawful. Such a licence can only be granted following receipt of planning permission with all relevant conditions discharged, and where it has been demonstrated that specific statutory derogation tests have been met.

3.0 Methods

- 3.1 The following survey methods, design, data analysis and interpretation have been undertaken with due consideration of the Bat Conservation Trust (BCT) guidelines 4th edition (Collins, 2023).

Activity Surveys

Night-time Bat Walkover/Vantage Point Surveys

- 3.2 Night-time Bat Walkover (NBW) surveys were undertaken in May, July and September 2024. On each occasion, surveyors were stationed at specific points within the Site prior to sunset (see Figure 1); stationed on potential flight lines close to potential roost sources such as groups of buildings or woodland.



Stationed Surveyor Locations  SSL1  SSL2

Figure 1. Stationed surveyor locations (SSL) during the Night-time Bat Walkover Surveys undertaken in May, July and September 2024.

- 3.3 The surveys were led by Megan Bridgman in suitable weather conditions (see Table 1).

Table 1. Night-time Bat Walkover survey timings and weather conditions

Survey Date	Sunset Time	Start Time	End Time	Temp. (°C)		Cloud Cover (oktas)		Wind (Beaufort Scale)		Precipitation
				Start	End	Start	End	Start	End	
23/05/24	20:58	20:58	22:58	14	11	3	7	1	1	None
09/07/24	21:15	21:15	23:00	16	15	8	5	0	1	None
19/09/24	19:06	19:06	21:06	20	19	0	0	4	3	None

- 3.4 Surveyors remained in position to count, observe behaviour and make acoustic recordings of commuting (or foraging) bats for up to an hour after sunset. Any observations of bat activity such as feeding or commuting behaviour was noted, or identification of key flightlines (such as height, direction of travel, numbers of bats and response to weather or other features on-site). Alternatively, if streams of commuting bats were noted elsewhere on-site, surveyors used back-tracking methods to move towards a roost, responding to live observations. Surveyors were equipped with BatLogger M2 bat detectors to assist with observations after sunset and allow any bat contacts to be recorded.
- 3.5 As part of the stationed observation, whilst surveyors are positioned across the Site at the start of the survey, vantage point observations were undertaken, including notes on early emerging/high-flying bats such as noctule. Notes made on behaviour include flight height, numbers of bats and direction of travel.
- 3.6 Following a minimum of 30 minutes of stationed observations, surveyors walked a single transect route, which aimed to cover all accessible areas, features and habitats at the Site. Each transect route was repeated at least once during each survey to minimise temporal bias and walked at a moderate and consistent speed with qualitative observations of bat behaviour made by the surveyor.
- 3.7 Transect surveys are intended to gather data on the spatial distribution of bat activity across the Site, identifying areas of relative importance for bats, including key flight lines. In addition direct observation of bats allows for qualitative assessments of how bats use the Site to be made complementing quantitative data collected through remote monitoring.

Automated/Static Surveys

- 3.8 Three Wildlife Acoustics Songmeter Mini (SMM2) detectors were deployed monthly from April to October 2024 to provide seven datasets. The position of these Monitoring Locations (ML) are shown on Figure 2 below.

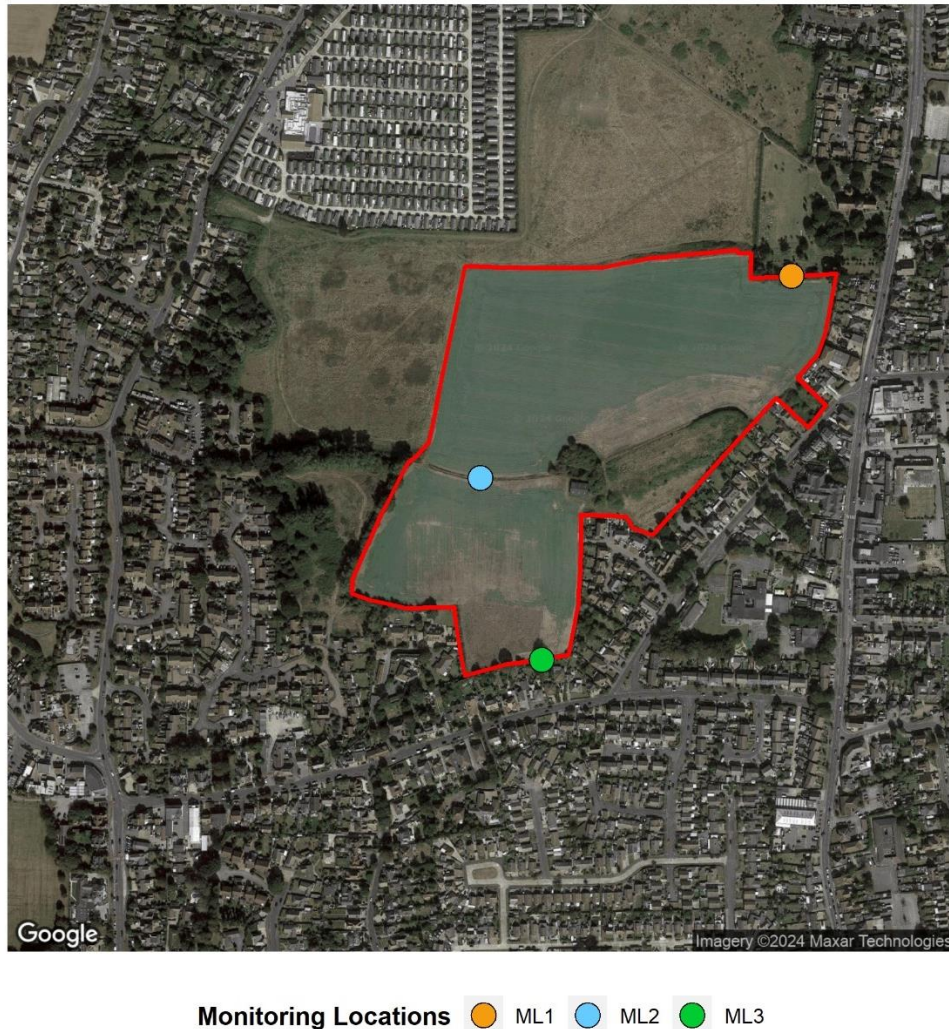


Figure 2. The position of each Monitoring Location (ML) surveyed during monthly remote monitoring surveys between April and October 2024.

- 3.9 The detectors were setup to automatically record ultrasonic signals for the period from half an hour before sunset to half an hour after sunrise each night, with each monitoring period spanning at least five consecutive nights.
- 3.10 Static detectors were deployed within the northern, southern and central boundary vegetation to provide a representative sample across the Site, encompassing all habitats that could be impacted by the proposals.
- 3.11 Weather conditions were obtained for each night surveyed using historic weather data from the World Weather Online website, with weather observations taken from the nearest weather station in Hayling Island. The five nights showing the most optimal weather conditions (in terms of temperature, precipitation and wind speed, see Table 3) were taken forward for analysis.
- 3.12 Recordings are triggered when a bat echolocation call is detected and will contain a variable number of call 'pulses'. Each file containing call

pulses by a bat is designated as a 'bat contact' for each species present. The maximum recording duration is 15 seconds after which time a new recording file, and thus a new bat contact, is generated if echolocation calls are still being detected. This means that periods of prolonged bat activity near a detector is represented as multiple bat contacts, rather than a single one.

Analysis of Data

Call Analysis

- 3.13 Bat calls were recorded using Elekon Batlogger M2 detectors. This detector automatically records ultrasonic signals with a one second delay between recordings. Recordings of bat contacts were subsequently analysed using BatExplorerPro software, with sonograms reviewed to confirm bat identification to genera, or where possible, species level.
- 3.14 Each of the recorded files, which contain a variable number of call 'pulses', was designated a 'bat contact'. At the point of contact, each sound file is assigned a GPS location.
- 3.15 For analysis of data recorded during static monitoring, quantitative analysis of bat activity was then undertaken by calculating the average bat contacts per hour on each night monitored, for each species.
- 3.16 Bat activity can show considerable inter-night variability and is dependent on a number of variables, including temperature, wind, and seasonality, amongst others. To account for this variability the median values for the average hourly bat contacts per night are reported, rather than a mean value which would misrepresent the average activity.

Limitations

- 3.17 It should be noted that the findings described herein for remote monitoring surveys are based on the bat activity recorded at the location immediate to each detector, and therefore only describe localised activity at the Site.
- 3.18 In addition, comparisons drawn on the number of detector activations by different species/genera can only give an indication of relative species abundance at the Site, as detectability varies between species.
- 3.19 It is acknowledged that the quantum of bat contacts recorded during a survey may not give a true reflection of the abundance of bats using the Site. For example, a single bat foraging close to a detector may trigger several hundred activations in the course of one night. However, this activity level does provide a proxy for the level of use by bats, and therefore its relative importance.

- 3.20 Due to equipment failure, no data was recorded at ML3 during the static deployment in June. This is not anticipated to impact the overall conclusions of the bat activity surveys, with the survey data on balance still providing a representative sample of activity across the Site overtime. Furthermore, very light/light rain was experienced for either part or the entirety of the night on 15 out of the 35 recording nights, however, this is not anticipated to have significantly impacted bat activity.

4.0 Results

Activity Surveys

Night-time Bat Walkover

- 4.1 During the vantage point element in May at SSL1, a total of 153 contacts were recorded comprising both common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus* bats. The surveyor observed the western boundary of the southern field (Boundary B5, see Habitats Plan CSA/4956/103) being utilised as a commuting corridor by up to 19 individual common pipistrelles flying from the south in a northern/north-western direction. Consistent pipistrelle foraging activity was recorded from 21:20 till the end of the vantage point element (21:38) at the south-western corner of the Site. At SSL2, a total of 157 contacts were recorded, the majority of which were common pipistrelle. Frequent pipistrelle foraging activity was recorded over the on-site pond, with over 10 individual pipistrelle bats observed flying in from the east along the ditch that transverses the Site and connects to the pond.
- 4.2 During the vantage point element in July at SSL1, a total of 20 contacts were recorded, the majority of which comprising common pipistrelle, with a single serotine *Eptesicus serotinus* contact recorded. Occasional soprano pipistrelle foraging activity was observed along Boundary B5. At SSL2, a total of 96 contacts were recorded, the majority of which were soprano pipistrelle. Frequent pipistrelle foraging activity was recorded around the on-site pond, with bats flying in from various directions. No key commuting behaviour was observed during this survey.
- 4.3 During the vantage point element in September, only two contacts were recorded, both of which of soprano pipistrelle at SSL2, and no commuting behaviour was observed.
- 4.4 For the transect element of the surveys, at least two species of bat were recorded at the Site, comprising common pipistrelle, accounting for 64.66% of the total contacts, and soprano pipistrelle, accounting for 35.34%. Overall, each of the three transect surveys experienced low activity levels, with no further key flight lines or commuting corridors observed.

- 4.5 The number of bat contacts recorded for each species are summarised in Table 2 below. The locations of each bat contact and the overall distribution of activity across the Site are illustrated in Figures 3 and 4.

Table 2. Summary of bat contacts recorded during transect surveys.

Month	Common pipistrelle	Soprano pipistrelle
May	23	26
July	11	6
September	41	7
Total	75	41
Percentage of Total (%)	64.66	35.34



Figure 3. Locations of bat contacts recorded across all transect surveys.

- 4.6 Consistent with the results of vantage point element, activity was concentrated around the western boundary of the southern field and the on-site pond, in addition to the north-eastern boundary of the Site adjacent to the off-site churchyard. These hotspots are illustrated in Figure 4 below.



Figure 4. Indicative 'Utilisation Distribution' (UD) of all bat species/genera at the Site estimated from all transect data combined. The UD illustrates the relative probability of a bat in flight being present at a given point at the Site, with higher/central contours having a greater probability, and lower/peripheral contours having less probability.

Static/Automated Monitoring

- 4.7 The weather conditions experienced during the five nights where data was analysed are provided in Table 3 below.

Table 3. Overnight weather conditions during remote monitoring.

Survey Month	Dates Sampled (2024)	Temp. (°C)		Cloud Cover (%)		Wind (km/h)		Precipitation
		Min	Max	Min	Max	Min	Max	
Apr	18/04	8	10	32	100	21	30	None
Apr	19/04	5	8	30	81	12	19	Very light rain at 21:00
Apr	20/04	4	7	7	100	13	24	None
Apr	21/04	4	6	2	100	10	17	Very light rain at 21:00
Apr	22/04	5	6	72	100	9	13	None
May	16/05	11	13	3	66	3	6	None
May	17/05	13	13	16	100	1	10	Light rain between 03:00 – 06:00

May	18/05	12	14	31	87	9	14	Light rain at 21:00
May	19/05	11	14	5	66	13	19	None
May	20/05	9	13	21	100	13	16	Light rain at 06:00
Jun	14/06	12	13	60	100	24	41	Light rain between 21:00 and 00:00
Jun	15/06	10	11	58	85	30	32	Light rain at 6:00
Jun	16/06	11	12	37	87	13	30	None
Jun	17/06	12	14	17	49	6	13	None
Jun	18/06	10	15	18	42	10	27	None
Jul	09/07	16	17	44	100	21	28	None
Jul	10/07	13	16	5	13	6	15	None
Jul	11/07	15	16	61	100	7	25	Light rain throughout
Jul	12/07	12	13	16	46	10	17	None
Jul	13/07	13	14	8	13	8	12	None
Aug	16/08	14	18	0	3	12	17	None
Aug	17/08	14	16	4	30	13	23	None
Aug	18/08	14	16	2	22	6	15	None
Aug	19/08	18	18	98	100	23	32	Light rain throughout
Aug	20/08	13	15	4	20	19	29	None
Sept	19/09	16	17	9	83	25	29	None
Sept	20/09	15	16	0	45	19	24	Very light rain at 00:00
Sept	21/09	17	19	47	100	13	24	Light rain throughout
Sept	22/09	15	17	50	81	7	10	Light rain throughout
Sept	23/09	14	16	68	100	13	22	Light rain throughout
Oct	16/10	14	16	26	100	17	24	Light rain at 21:00
Oct	17/10	11	13	4	9	5	12	None
Oct	18/10	13	15	10	100	16	30	Light rain from 00:00
Oct	19/10	13	14	20	55	2	40	None
Oct	20/10	14	15	32	59	22	35	None

4.8 The total number of bat contacts recorded across all monitoring locations and monitoring periods for each bat species/genera are provided in Figure 5 below.

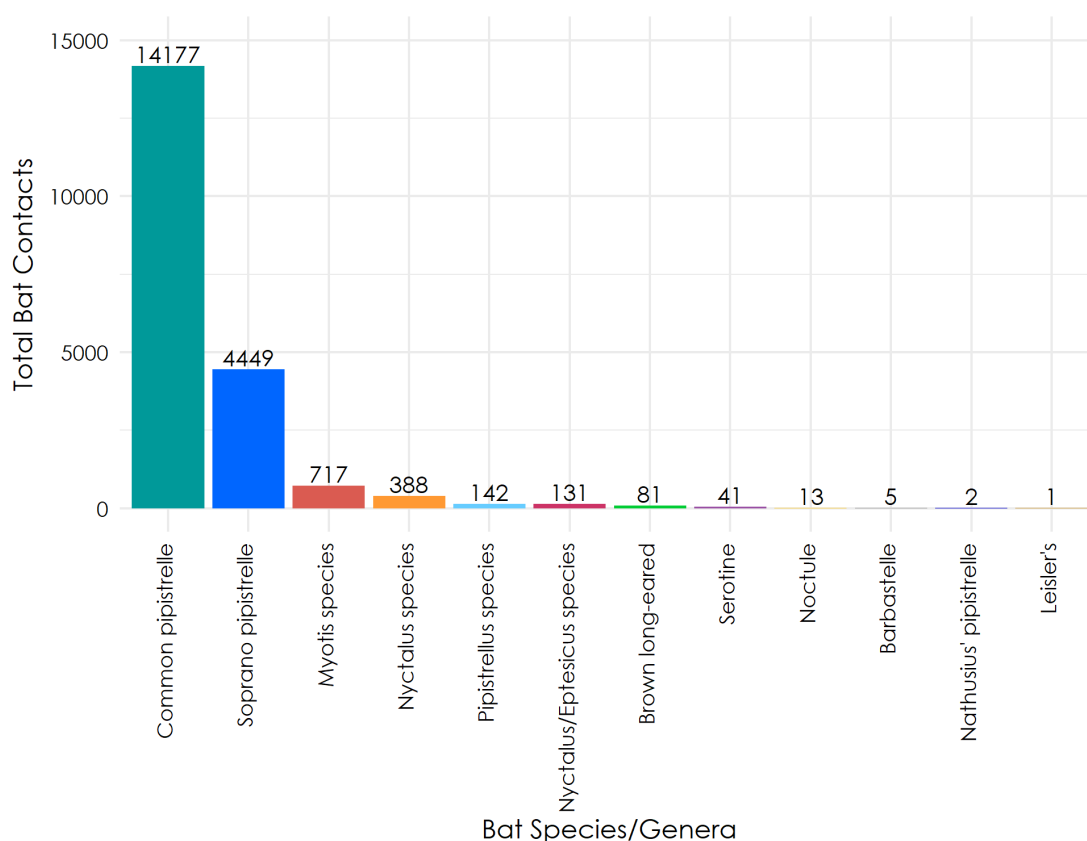


Figure 5. Total bat contacts by species/genera recorded across all remote monitoring periods and monitoring locations.

- 4.9 Consistent with the results of the transect surveys, bat activity during the static monitoring was dominated by common pipistrelle (70.37% of total bat contacts), followed by soprano pipistrelle (22.08%). However, a greater diversity of species was recorded during the remote monitoring surveys, including Nathusius' pipistrelle *Pipistrellus nathusii*, noctule *Nyctalus noctula*, Leisler's bat *Nyctalus leisleri*, barbastelle *Barbastella barbastellus*, brown long-eared bat *Plecotus auritus*, serotine and unconfirmed *Myotis* sp.
- 4.10 Figures 6 and 7 below shows the variance in nightly activity levels for each of these bat species recorded on-site, with results of pipistrelle bats (Figure 6) displayed separately from that of the other species (Figure 7) to account for the markedly higher number of pipistrelle contacts recorded. More detailed data describing the figures are provided in Table 4. The activity data in Figure 6 and 7 is presented as boxplots for each bat species, which show the inter-night variability in bat activity across the 35 nights monitored. The median value (middle line of the boxplot) is taken as the typical level of activity for that species on-site at the point monitored. The length of each coloured boxplot is the interquartile range which shows the variance in nightly activity around the median value. The ends of each whisker line define the minimum and maximum nightly activity values recorded at the monitoring location. Outlying values are nightly activity levels that are greatly

different when compared to the distribution of the remaining nightly activity levels. Outliers are illustrated as black points away from the boxplot. While important to note, these outliers do not represent the bat activity more commonly found at the Site for the species in question.

- 4.11 Common pipistrelle activity was markedly higher at ML3 and ML1 compared to ML2, with nearly five times more contacts recorded at the southern boundary of the Site than at ML2 present along the central ditch transversing the Site. This same pattern was observed in soprano pipistrelle contacts, with nearly four times more contacts recorded at ML1 than ML2. Furthermore, contacts of *Myotis* sp. were lowest at ML2, with six times more contacts recorded at ML1 and ML3. This is likely due to ML1 and ML3 both being associated with linear boundary vegetation providing foraging and dispersal opportunities, where as ML2 was present on an individual shrub, with no further vegetation present. However, it could have been assumed that the ditch along which ML2 was located would provide equal foraging opportunities to the boundary vegetation, with the surveyor at SSL1 during the May vantage point element observing at least 10 common pipistrelles flying along the ditch to the on-site pond to forage. A similar level of contacts across the remaining bat species/genera was observed between monitoring locations.

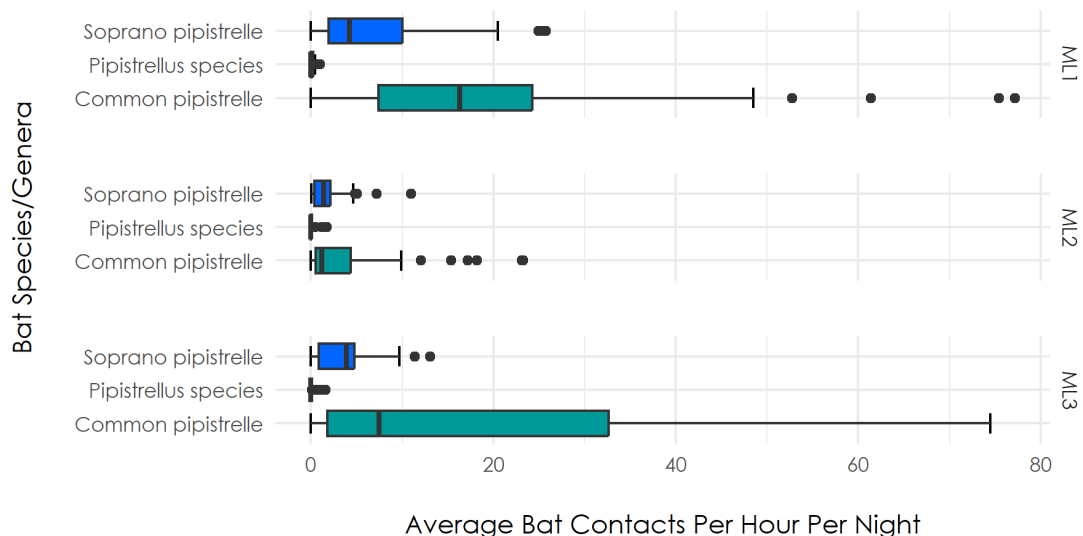


Figure 6. Average bat contacts per hour per night for pipistrelle bats recorded across all remote monitoring.

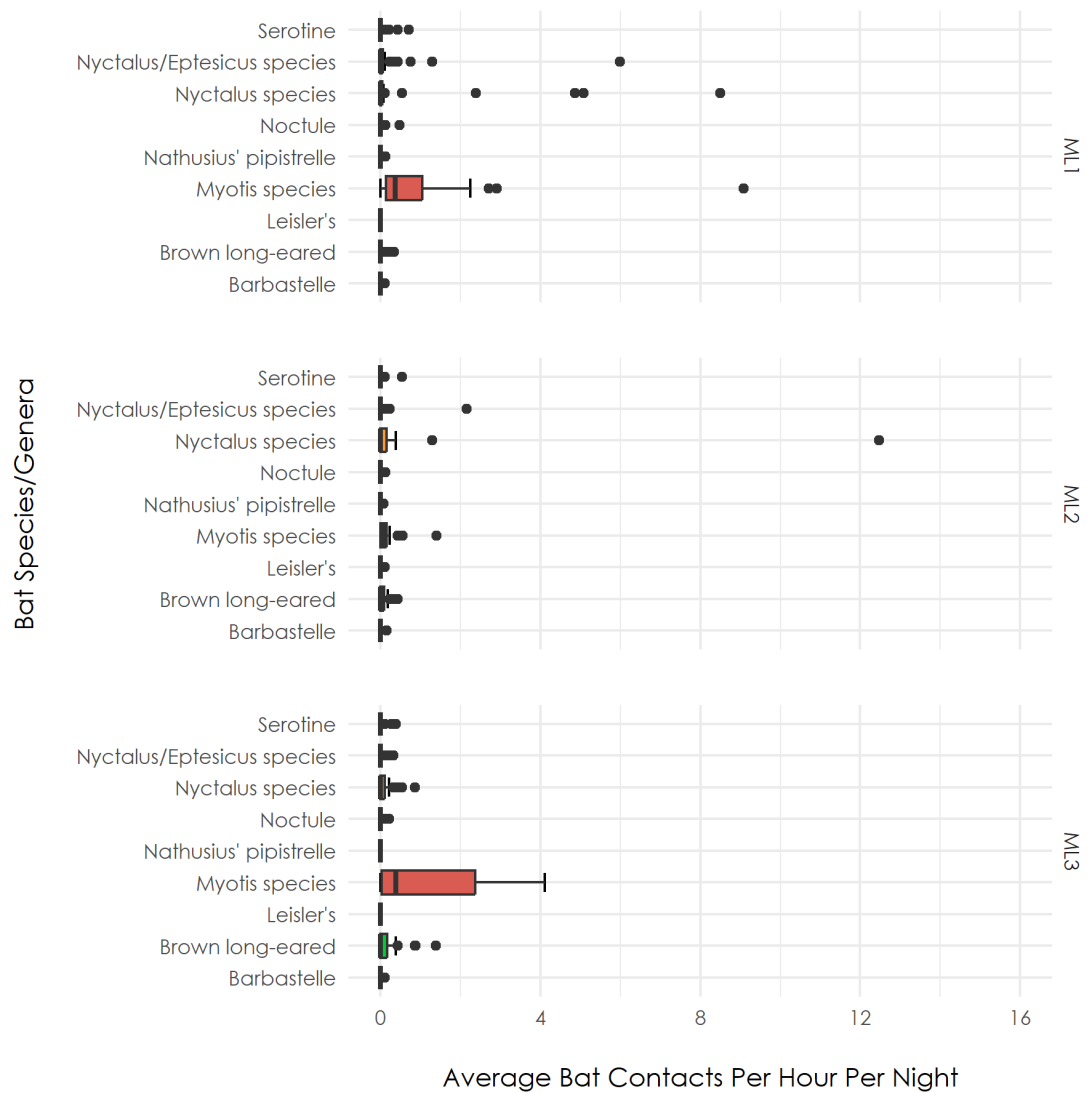


Figure 7. Average bat contacts per hour per night for each remaining bat species/genera recorded across all remote monitoring.

- 4.12 A total of five barbastelle contacts were detected across the remote monitoring surveys, divided relatively evenly across the three monitoring locations. One contact was recorded each in July and May, with 3 contacts recorded in September. Although widespread in Hampshire, barbastelle are nationally rare and noted for their susceptibility to disturbance by artificial lightning.
- 4.13 Barbastelle were detected at various times throughout the night and relative to sunset and sunrise, displaying no obvious temporal pattern. Furthermore, the species was detected across 4 of the 35-night monitoring suggesting the Site is used as part of wider territory, with no indication of habitual regular use by the species.

Table 4. Average bat contacts per hour per night recorded during remote monitoring surveys.

ML	Species	Average bat contacts per hour per night				Total bat contacts	Number of nights monitored
		Minimum	Maximum	Median	IQ range		
ML1	Barbastelle	0.00	0.113	0.000	0.000	2	35
ML1	Brown long-eared	0.00	0.339	0.000	0.000	15	35
ML1	Common pipistrelle	0.00	77.176	16.309	16.842	7528	35
ML1	Leisler's	0.00	0.000	0.000	0.000	0	35
ML1	Myotis species	0.00	9.082	0.373	0.912	334	35
ML1	Nathusius' pipistrelle	0.00	0.118	0.000	0.000	1	35
ML1	Noctule	0.00	0.472	0.000	0.000	7	35
ML1	Nyctalus species	0.00	8.495	0.000	0.039	204	35
ML1	Nyctalus/Eptesicus species	0.00	5.989	0.000	0.056	90	35
ML1	Pipistrellus species	0.00	0.968	0.000	0.217	45	35
ML1	Serotine	0.00	0.703	0.000	0.000	20	35
ML1	Soprano pipistrelle	0.00	25.788	4.245	8.127	2582	35
ML2	Barbastelle	0.00	0.157	0.000	0.000	2	35
ML2	Brown long-eared	0.00	0.430	0.000	0.086	20	35
ML2	Common pipistrelle	0.00	23.231	1.167	3.825	1527	35
ML2	Leisler's	0.00	0.108	0.000	0.000	1	35
ML2	Myotis species	0.00	1.405	0.094	0.147	55	35
ML2	Nathusius' pipistrelle	0.00	0.078	0.000	0.000	1	35
ML2	Noctule	0.00	0.118	0.000	0.000	2	35
ML2	Nyctalus species	0.00	12.473	0.000	0.151	149	35
ML2	Nyctalus/Eptesicus species	0.00	2.151	0.000	0.000	27	35
ML2	Pipistrellus species	0.00	1.730	0.000	0.088	42	35
ML2	Serotine	0.00	0.538	0.000	0.000	10	35
ML2	Soprano pipistrelle	0.07	10.967	1.413	1.724	653	35
ML3	Barbastelle	0.00	0.108	0.000	0.000	1	30
ML3	Brown long-eared	0.00	1.386	0.000	0.169	46	30
ML3	Common pipistrelle	0.00	74.506	7.445	30.862	5122	30
ML3	Leisler's	0.00	0.000	0.000	0.000	0	30
ML3	Myotis species	0.00	4.108	0.383	2.352	328	30
ML3	Nathusius' pipistrelle	0.00	0.000	0.000	0.000	0	30
ML3	Noctule	0.00	0.216	0.000	0.000	4	30
ML3	Nyctalus species	0.00	0.860	0.000	0.112	35	30
ML3	Nyctalus/Eptesicus species	0.00	0.324	0.000	0.000	14	30
ML3	Pipistrellus species	0.00	1.622	0.000	0.000	55	30
ML3	Serotine	0.00	0.391	0.000	0.000	11	30
ML3	Soprano pipistrelle	0.00	13.047	3.865	3.851	1214	30

5.0 Summary

5.1 Activity at the Site is dominated by common and soprano pipistrelle bats; both of which are common and widespread species, with actively largely associated with boundary vegetation, in particular to the north-

east and within the south-western corner. The south-western boundary of the Site was identified as a commuting corridor occasionally used by common pipistrelle. The on-site pond was identified as a pipistrelle foraging hotspot, as well as the off-site churchyard to the north. Of note, a total of five contacts were recorded of the nationally rare barbastelle, alongside a small number of less common species.

- 5.2 As bat activity can change rapidly over time, the results within this appendix are considered to be valid for two years. After this period survey work will need to be updated.

6.0 References

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Appendix H

Breeding Bird Survey Report

1.0 Introduction

- 1.1 This report has been prepared on behalf of Gladman Developments Ltd to provide details of breeding bird survey work undertaken at land off St Mary's Road, Hayling Island (hereafter referred to as 'the Site'). It is intended to inform an evidence-based Ecological Impact Assessment in relation to proposed development at the Site.

2.0 Legislation

- 2.1 All wild birds, their nests and eggs are protected under subsection 1(1) of the Wildlife and Countryside Act 1981 (as amended). It is an offence to kill or injure any wild bird, to take or destroy their eggs, or to take, damage or destroy their nests while in use or being built.
- 2.2 In addition, certain species of wild bird, listed within Schedule 1 of the Wildlife and Countryside Act, receive additional protection under subsection 1(5) of the Act. This makes it an offence to disturb any wild bird included in Schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young. It is also an offence to disturb the dependent young of such a bird.
- 2.3 Consideration is also taken of Birds of Conservation Concern ('BoCC 5') (Stanbury *et al.*, 2021) which assigns bird species to a Red, Amber or Green list depending on factors such as their rarity, importance in an international context and severity of declines in population or range. Species on the Red list are of greatest conservation concern whilst those on the Green list do not fulfil any of the BoCC assessment criteria and are not currently of conservation interest. Full details can be found in Stanbury *et al.* (2021).

3.0 Methods

Breeding Birds

- 3.1 Breeding bird surveys were carried out by Ecology Surveys on behalf of CSA Environmental over six visits between April and July 2024 to gain an understanding of the breeding bird assemblage at the site. Surveys were conducted with the following aims:
- To determine the potential for breeding species of birds across the survey area;
 - To review the rarity and conservation status of each species found;
 - To review the likely breeding potential within the habitats present;
 - To assess the impacts of the proposed developments with regards to the species/ likely species determined; and
 - To recommend appropriate mitigation and protection measures where necessary.

- 3.2 The survey area included all accessible areas of the Site and immediately adjacent land visible from the Site. On each survey the surveyor walked a slow route across the whole site which ensured that both species of open and boundary habitats would be detected. Alternative versions of the route were taken on each visit so that different parts of the site would be surveyed at different parts of the morning, thus avoiding temporal bias associated with bird activity. Five surveys commenced in the morning with varying start times, as well as one being undertaken in the evening, in order to ensure that the vast majority of species using the site would be recorded, although some species that may use the Site as part of a larger territory may be missed, particularly nocturnal species such as owls. Surveys continued for approximately 2 – 2.5 hours during suitable weather conditions. Birds were detected by sound or sight, using a pair of binoculars.
- 3.3 The survey methodology used considers the recommended mapping conventions given within the Bird Survey Guidelines published by the Bird Steering and Assessment Group (2022). All birds detected at the site were recorded using standardised codes to map their distribution and behaviour, and to differentiate between individuals for the purposes of territory mapping (adapted from the standard Common Birds Census method). A full map of all species is created for each survey visit, with a consolidated map of priority species created for all survey visits combined.
- 3.4 Priority species are classified using the following hierarchy:
- 1) Species listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
 - 2) Species listed under Section 41 of the Natural Environment and Rural Communities Act 2006;
 - 3) Red & Amber listed by the 5th Birds of Conservation Concern Review (Stanbury *et al*, 2021).
 - 4) Localised or highly specialised species regardless of inclusion above (e.g. crossbill in coniferous woodland);
 - 5) Nationally- or locally-declining species regardless of inclusion above
 - 6) Colonial nests or roost sites containing more than one individual of any species; or,
 - 7) Exceptional counts or aggregations of any species.
- 3.5 On each survey visit the following objectives were met:
- Identification of potential breeding species within the habitats present;
 - Identification of all birds seen and heard;
 - Breeding status of each bird seen and heard;
 - Total numbers of birds, including juveniles recorded.

- 3.6 The criteria used during the 'Bird Atlas' surveys of 2007-2011 were used to ascertain the breeding status of birds at the Site (as given in Table 1 below).

Table 1. Categories of Breeding Bird Evidence

Breeding Status Categories	Evidence Criteria
Confirmed breeding:	• Distraction display or injury feigning • Used nests or eggshells found (occupied or laid within the survey period) • Recently fledged young or downy young • Adults entering or leaving a nest site in circumstances indicating occupied • Nest or an adult sitting on nest • Adults carrying food for young or faecal sacs • Nest containing eggs • Nest with young seen or heard
Probable breeding:	• Pairs observed in suitable nesting habitat in breeding season • Permanent territory presumed through registration or territorial behaviour (song etc.) on at least two different days, a week apart, at the same place • Display and courtship • Visiting probable nest site • Agitated behaviour or anxiety calls from adults • Building nest or excavating nest hole
Possible breeding:	• Species observed in breeding season in possible nesting habitat • Singing male(s) present or breeding calls heard in breeding season

Limitations

- 3.7 Only a proportion of individuals of each species will be detected on each visit, and some particularly secretive or low-density species, can be elusive and require several visits to detect. Furthermore, the importance of a site for birds can change depending on factors such as food availability, presence of roosting/nesting features and weather conditions.

Evaluation

- 3.8 The importance of the breeding bird assemblage at the Site was assessed using the criteria suggested by Fuller (1980) (see Table 3 below).

Table 2. Assessment criteria for breeding bird assemblage at a Site

Importance	Number of Breeding Species
Local	25-49
County	50-69
Regional	70-84
National	85+

4.0 Results

Breeding Birds

- 4.1 The weather conditions during the breeding bird surveys are summarised in Table 3 below.

Table 3. Weather conditions for breeding bird surveys

Date	Start time	Temp (°C)	Cloud (Oktas)	Wind (Beaufort scale)
13/04/2024	07:00	14	4	3
03/05/2024	04:00	9	7	3
24/05/2024	10:50	16	4	3
06/06/2024	08:45	17	5	3
28/06/2024	06:30	15	7	3
07/07/2024	20:00	16	2	3

- 4.2 A total of 40 species of birds were recorded at the Site across the surveys, of which 21 species were recorded to have a breeding status of either 'confirmed', 'probable' or 'possible' and are thus considered as breeding species.
- 4.3 A summary of observations for each species recorded to have breeding status on-site is included in Table 4, including the estimated number of territories which incorporate at least part of the Site (with 2021 results for comparison). The distribution of breeding birds is shown in Figure 1 at the end of this report.

Table 4. Bird species recoded on-site across the Breeding Bird surveys.

Systematic List of Species (and BTO species code)	RSPB listed	Est. no. pairs	Notes
Stock dove <i>Columba oenas</i> (SD)	Amber	0-1	
Woodpigeon <i>Columba palumbus</i> (WP)	Amber	2	
Barn owl <i>Tyto alba</i> (BO)	Sch.1	0-1	One after dark in July.
Magpie <i>Pica pica</i> (MG)		1	
Blue tit <i>Cyanistes caeruleus</i> (BT)		2	
Great tit <i>Parus major</i> (GT)		2	
Skylark <i>Alauda arvensis</i> (S.)	Red	2	Both territories cover on- and off-site habitat.
Long-tailed tit <i>Aegithalos caudatus</i> (LT)		0-1	
Chiffchaff <i>Phylloscopus collybita</i> (CC)		1	
Blackcap <i>Sylvia atricapilla</i> (BC)		1	
Whitethroat <i>Sylvia communis</i> (WH)	Amber	3	
Wren <i>Troglodytes troglodytes</i> (WR)	Amber	2	
Blackbird <i>Turdus merula</i> (B.)		4	
Song thrush <i>Turdus philomelos</i> (ST)	Amber	1	
Robin <i>Erithacus rubecula</i> (R.)		2	
Stonechat <i>Saxicola rubetra</i> (SC)		1	Associated with bramble scrub

			(mostly off-site to the west).
Dunnock <i>Prunella modularis</i> (D.)	Amber	4	
House sparrow <i>Passer domesticus</i> (HS)	Red	3+	Associated with adjacent housing.
Greenfinch <i>Chloris chloris</i> (GR)	Red	2	
Linnet <i>Linaria cannabina</i> (LI)	Red	1	
Goldfinch <i>Carduelis carduelis</i> (GO)		1	

4.4 The remaining 19 non-breeding species, as follows, were either recorded incidentally flying over the Site only, or there is no suitable breeding habitat to support these species:

- Swift *Apus apus* (SI)
- Feral pigeon *Columba livia* (FP)
- Collared dove *Streptopelia decaocto* (CD)
- Black-headed gull *Chroicocephalus ridibundus* (BH)
- Mediterranean gull *Ichthyaetus melanocephalus* (MU)
- Herring gull *Larus argentatus* (HG)
- Sandwich tern *Thalasseus sandvicensis* (TE)
- Cormorant *Phalacrocorax carbo* (CA)
- Sparrowhawk *Accipiter nisus* (SH)
- Buzzard *Buteo buteo* (BZ)
- Green woodpecker *Picus viridis* (G.)
- Kestrel *Falco tinnunculus* (K.)
- Jackdaw *Coloeus monedula* (JD)
- Swallow *Hirundo rustica* (SL)
- House martin *Delichon urbicum* (HM)
- Carrion crow *Corvus corone* (C.)
- Mallard *Anas platyrhynchos* (MA)
- Starling *Sturnus vulgaris* (SG)
- Meadow pipit *Anthus pratensis* (MP)

4.5 The Site supports a relatively modest assemblage of breeding birds, which is anticipated given its relatively small size and low availability of suitable habitat for all but farmland species, with most breeding activity associated with areas of more mature vegetation.

4.6 The most significant species recorded was an individual barn owl recorded after dark during the sixth survey visit flying through the Site before spending ten minutes hunting over the rough field to the west, and then leaving to the west. Barn owls are protected under Schedule 1 of the 1981 Wildlife & Countryside Act (as amended).

4.7 The only declining farmland species present are skylark, with two territories that include part of the northern field (Field F2) in the Site, and a pair of linnets surrounding the central scrub and on-site pond. Both species are included on the RSPB Red List having undergone major declines in their UK populations. Nevertheless, both remain abundant and widespread both locally and nationally.

- 4.8 Other species breeding at the Site include woodpigeon, whitethroat, wren, song thrush, dunnock, house sparrow, greenfinch and possibly stock dove. All of these species are included on the RSPB Red or Amber Lists, although they all remain abundant and widespread both locally and nationally, as are all the remaining species recorded breeding at the Site.

5.0 Summary

- 5.1 In summary, breeding status of either 'confirmed', 'probable' or 'possible' was recorded for 21 species with the Site, with a further 19 species recorded as incidentally flying over. In accordance with Fuller (1980), this is considered to be of ecological importance at the less than local level.

6.0 References

Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D. and Win, I. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds*, 114, pp 723-747.

Fuller, R.J. 1980. A method for assessing the ornithological interest of sites for conservation. *Biological Conservation*. 17. 229-239. 10.1016/0006-3207(80)90058-0.

Rodewald, P. & Shumar, M. 2013. *Bird Atlas 2007-11: The Breeding and Wintering Birds of Britain and Ireland*. The Auk: Ornithological Advances. 131. 252-254. 10.1642/AUK-14-22.1.

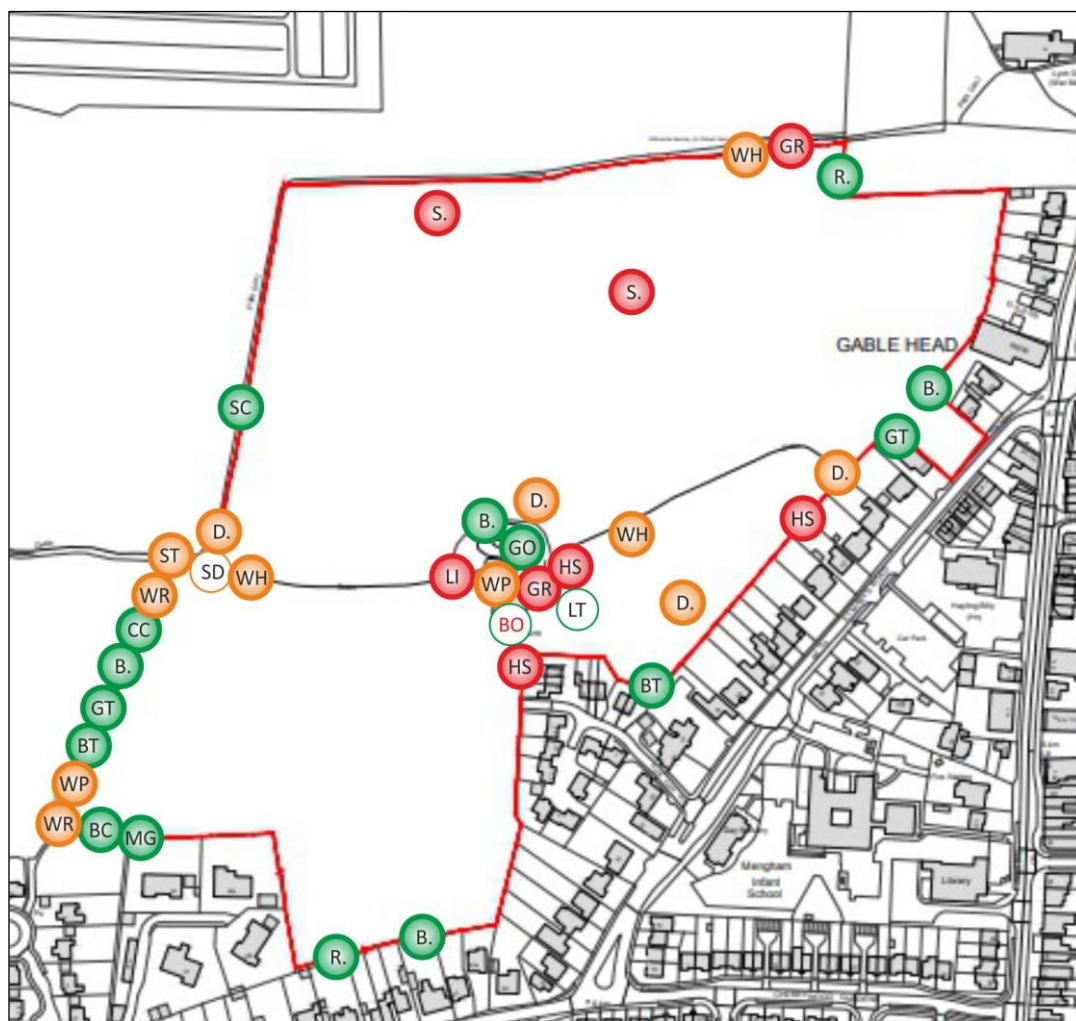


Figure 1: Distribution of breeding birds at land off St Mary's Road, Hayling Island. Red, Amber and Green List species are shown in their respective colour, with Schedule 1 species shown in red font. Infilled circles indicate species breeding or probably breeding, unfilled circles those possibly breeding. Species locations do not necessarily show nest-sites but show the location of each species within its presumed territory. For the key to species, see Table 4 above.

Appendix I

Reptile Survey Report

1.0 Introduction

- 1.1 This report has been prepared on behalf of Gladman Developments Ltd to provide details of reptile survey work undertaken at land off St Mary's Road, Hayling Island (hereafter referred to as 'the Site'). It is intended to inform an evidence-based Ecological Impact Assessment in relation to proposed development at the Site.

2.0 Legislation

- 2.1 All native British reptile species are listed within Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are afforded protection against killing and injury under parts of sub-section 9(1) of the Act. In addition, all native British reptile species are adopted as Species of Principal Importance for the Conservation of Biodiversity in England in respect of Section 41 of the Natural Environment and Rural Communities Act 2006.

3.0 Methods

- 3.1 A total of 116 reptile refugia, comprising rectangles of roofing felt measuring 0.5m x 0.5m, were installed in areas of suitable habitat present at the Site on 18 April 2024 by Megan Bridgman and Jessica Forest. The location of these refugia is shown on the Reptile Survey Plan (CSA/4956/113).
- 3.2 Following an initial 2-week 'bedding-in' period for refugia, surveys were carried out on seven occasions during favourable weather conditions (e.g. intermittent or hazy sunshine, not too windy, sunny spells following wet or cloudy weather) between May and June 2024. The surveys were led by Jessica Forest. Each survey visit comprised a slow walk of the Site to visually and physically check refugia for the presence of reptiles. On each occasion a visual search was also carried out within areas of suitable habitat whilst walking between refugia locations.
- 3.3 The primary aim of the reptile survey was to establish the presence or likely absence of widespread reptile species within the survey area, rather than to estimate abundance or population size. To this end, seven survey checks, an effort generally considered 'reasonable effort' in establishing the presence or likely absence of reptiles at a Site, were carried out.
- 3.4 Given the inherent problems in detecting reptiles, greater survey effort and/or identification or marking of individuals would be required to establish the actual or relative abundance of reptile populations. However, an approximation of population size is useful in guiding reptile mitigation strategies and has therefore been reported below.
- 3.5 There are several published methods for broadly 'categorising' reptile population sizes in the UK, with the most commonly employed by

ecological consultants being HGBI (1998), Froglife (1999) and/or Natural England (2011 [now rescinded]). These three approaches vary in their application, assumptions and limitations, and therefore outputs have been reported for all three methods for comparison below.

Limitations

- 3.6 The three metrics referenced below, HGBI (1998), Froglife (1999) and/or Natural England (2011; now rescinded), rely on varying proxies to calculate/estimate reptile populations. The HGBI categories are based on adult population densities, as opposed to peak counts. Moreover, the categorisation by HGBI is intended to inform capture effort for translocation exercises and, therefore, is not directly applicable to providing a population size class estimate, though it is widely applied within the industry for this purpose.
- 3.7 The Froglife method is based on peak adult counts where surveys have used refugia densities of 10 per hectare. Surveys carried out by CSA used densities of c. 83 refugia per ha of suitable reptile habitat to maximise site coverage and opportunities to confirm the presence or likely absence of reptiles. Therefore, to enable a comparison with the Froglife categories, peak counts have been divided by a factor of 8.3 so that they are proportionate to the Froglife survey effort of 10 refugia per ha.
- 3.8 Finally, the Natural England methods provide population class size estimates based upon a refugia density of 100 per ha and, in addition, goes on to consider habitat suitability. As with the Froglife method, survey results have been scaled to be proportionate to a survey effort of 100 refugia per ha. The consideration of peak counts and habitat suitability may be the most ecologically sound, or holistic, of the three indices. However, in light of the guidance having been rescinded, this metric cannot be exclusively relied upon.
- 3.9 Three of the surveys were undertaken during intermittently light rain, however, the results of these surveys are comparable to those conducted in dry weather conditions. Due to a fallen tree along the northern hedgerow of the Site adjacent to St Mary's churchyard, four of the 11 refugia located along this boundary were not accessible during the final survey. Moreover, due to the tall sward height of the field margins, five of the 24 refugia located along the northern boundary of the Site were not found during the final survey and therefore could not be checked. The above is not anticipated to impact the overall conclusions of the surveys, with relatively high numbers of a single species encountered throughout.

4.0 Results

- 4.1 Slow worm were recorded during every survey, with a peak count of 39 adult slow worm *Anguis fragilis* was recorded during the sixth survey visit, and a peak count of 22 juvenile slow worm were recorded during the

fifth survey visit. No other reptile species were recorded throughout the surveys. Slow worm were recorded in all locations where refugia were present. Only a single individual slow worm was recorded on one occasion within the small parcel of grassland and scrub through which access to the Site is available from St Mary's Road. The greatest number of slow worm were recorded within the neutral grassland present within the eastern portion of the Site, with a peak count of 28 adults identified in this area during the sixth survey.

- 4.2 Full survey conditions and results are provided at the end of the report.
- 4.3 It should be noted that although the Site is c. 11.77ha, suitable reptile habitat is limited to field margins and parcels of grassland and scrub, accounting for c. 1.4ha within the Site. Within this area 116 artificial refugia were used to provide a survey refugia density of c. 83 refugia per ha suitable reptile habitat.

Table 1. Reptile population size category estimates

Method	Species
	Slow worm
Peak count between May and June 2024	39
HGBI (1998)	Low
Froglife (1999)	Low
Natural England (2011)*	Large

*Rescinded

5.0 Summary

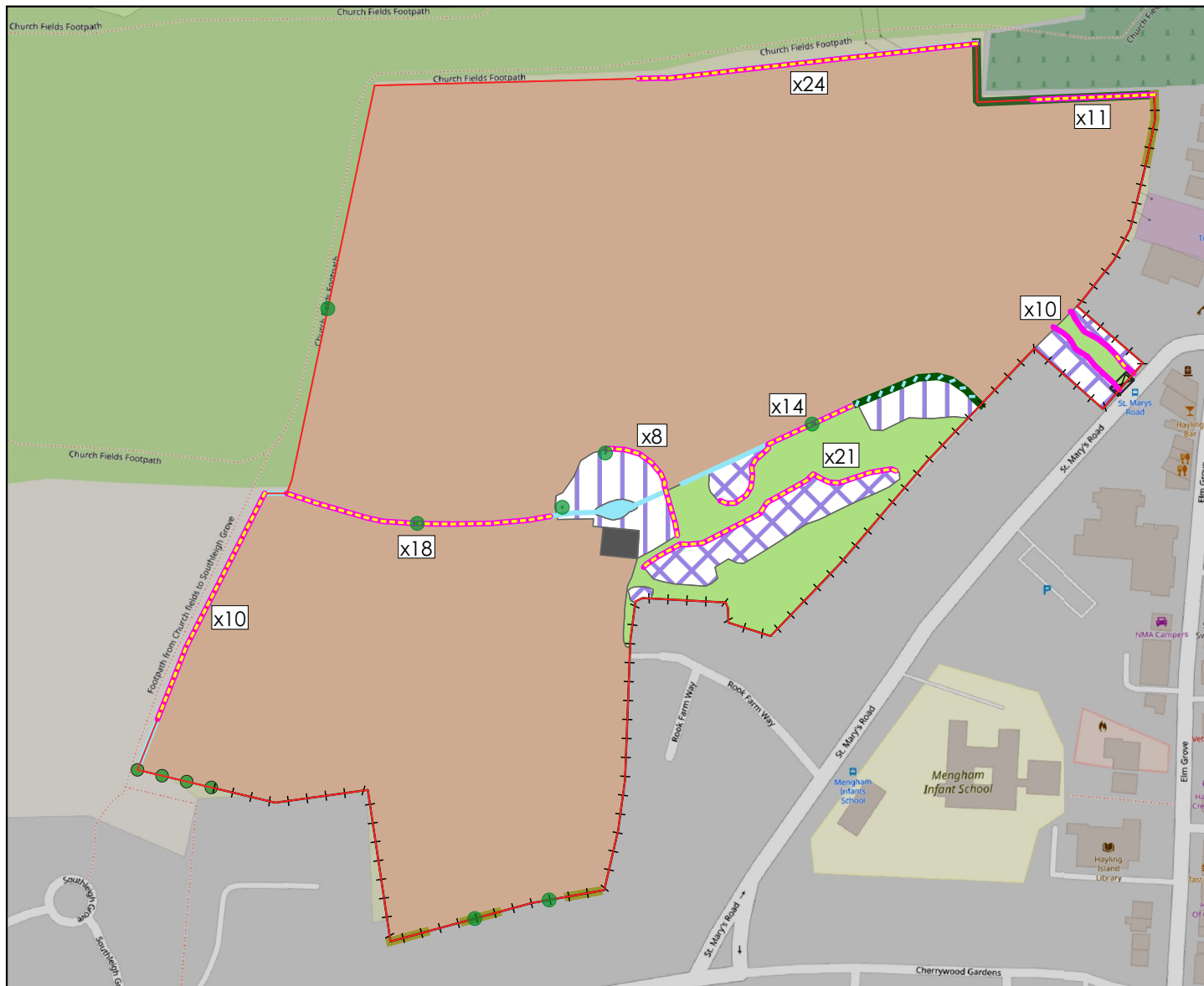
- 5.1 It is acknowledged that the above metrics have their limitations. However, in consideration of this information, balanced against an ecological understanding of the Site and survey findings (and with consideration of the survey limitations described above), it is estimated that the Site supports a 'medium' population of slow worm, which are likely to be distributed across the discrete areas of suitable habitat within the Site. Other reptile species are determined to be likely absent.

6.0 References

Froglife, 1999. *Reptile Survey: an introduction to planning and interpreting surveys for snake and lizard conservation*. Froglife Advice Sheet 10. Halesworth: Froglife.

HGBI, 1998. *Evaluating local mitigation/translocation programmes: Maintaining Best Practice and lawful standards*. HGBI advisory notes for Amphibian and Reptile Groups (ARG's). Halesworth: Herpetofauna Groups of Britain and Ireland.

Natural England, 2011. *Reptile Mitigation Guidelines*. Natural England Technical Information Note TIN102. York: Natural England.



- Indicative site boundary
- Refugia location
- Number of refugia
- Location of refugia under which slow worm were recorded

0 50 100 m



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Project Land off St Mary's Road, Hayling Island

Drawing Title Reptile Survey Plan

Client Gladman Developments Ltd

Date September 2024

Scale Refer to scale

Drawn MB

Drawing No. CSA/4956/113

Rev -

Checked MR

Job Name & No.		4956 Land off St Mary's Road, Hayling Island						Beaufort Scale: 0. Calm. Vertical smoke, 1. Light air. Smoke drifts, 2. Light breeze. Leaves rustle, 3. Gentle breeze. Small twigs constantly move, 4. Moderate breeze. Small branches begin to move, 5. Fresh breeze. Small trees in leaf begin to sway. Precipitation: [Type] No Rain / Light / Moderate / Heavy [Duration] Intermittent / Continuous							
Set-up Surveyor/ Project Manager		MB/JF													
Set-Up Date		18/04/2024		Total Number of Refugia			116								
Date	Start/End Times	Surveyor	Weather				Area/ Field No.	Slow worm <i>Anguis fragilis</i>					Other Notes		
			Temp (°C)	Cloud Cover (Okta; n/8)	Wind (Beaufort Scale)	Rain (Type & Duration)		Adult Male (≥230mm)	Adult Female (≥230mm)	Unidentified Adult	Sub- adult	Newborn			
Survey 1															
02/05/2024	10:00 - 12:00	JF	15	8	1	Light intermittent	Access grassland/scrub								
							Adjacent to churchyard	1	5						
							Northern boundary of F2				1				
							Neutral grassland/scrub	1	3		1				
							Northern boundary of F1	1	2						
							Western boundary of F1		3						
Survey 2															
09/05/2024	9:00 - 10:00	MB	13	0	1	None	Access grassland/scrub								
							Adjacent to churchyard	1	1						
							Northern boundary of F2		1		1	1			
							Neutral grassland/scrub		2		1				
							Northern boundary of F1	1	1						
							Western boundary of F1		1						
Survey 3															
16/05/2024	10:15 - 12:15	JF	16	8	1	Light intermittent	Access grassland/scrub								
							Adjacent to churchyard	2	5		3				
							Northern boundary of F2				2				
							Neutral grassland/scrub	4	5						
							Northern boundary of F1				1				
							Western boundary of F1	2	2						
Survey 4															
21/05/2024	09:50 - 12:10	JF	16	8	2	None	Access grassland/scrub								
							Adjacent to churchyard	2	1		3				
							Northern boundary of F2	1	1		2				
							Neutral grassland/scrub	2	6						
							Northern boundary of F1	3	5		4				
							Western boundary of F1	1	1						
Survey 5															
29/05/2024	09:30 - 11:00	SV	16	5	2	None	Access grassland/scrub								
							Adjacent to churchyard								
							Northern boundary of F2		3			1			
							Neutral grassland/scrub	2	9		7	5			
							Northern boundary of F1		2		2	2			
							Western boundary of F1		2		3	2			
Survey 6															
06/06/2024	09:30 - 11:30	JF	14	3	1	None	Access grassland/scrub								
							Adjacent to churchyard		1						
							Northern boundary of F2	1			1				
							Neutral grassland/scrub	8	20		1				
							Northern boundary of F1	2	4		2				
							Western boundary of F1	1	2						
Survey 7															
14/06/2024	09:30 - 11:30	JF/MB	14	4	2	Light intermittent between 9:45 and 10:00	Access grassland/scrub		1						
							Adjacent to churchyard		4		1		Four of the mats inaccessible to check due to fallen tree.		
							Northern boundary of F2		1				Five of the mats could not be found.		
							Neutral grassland/scrub	4	15		1				
							Northern boundary of F1	3	2		2				
							Western boundary of F1		1						
								Total Adult		Total Juvenile					
								155		50					

Appendix J

Great Crested Newt eDNA result

Client: Sophie Vines,
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Sample ID: ADAS-3440 Condition on Receipt: Good Volume: Passed
Client Identifier: P1, 4956 Description: pond water samples in preservative
Date of Receipt: 23/04/2024 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	29/04/2024
Degradation Control [§]	Within Limits	Real Time PCR	29/04/2024
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	29/04/2024
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by: Dr Helen Rees Report Issued by: Dr Ben Maddison

Signed:

Signed:

Position: Director: Biotechnology Position: MD: Biotechnology

Date of preparation: 01/05/2024 Date of issue: 01/05/2024

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#] Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

Appendix 1: Interpretation of results

Sample Condition

Upon sample receipt we score your samples according to quality: good, low sediment, medium sediment, high sediment, white precipitate, and presence of algae.

There are three reasons as to why sediment should be avoided:

1. It is possible for DNA to persist within the sediment for longer than it would if it was floating in the water which could lead to a false positive result i.e. in this case GCN not recently present but present a long time ago
2. In some cases sediment can cause inhibition of the PCR analysis used to detect GCN eDNA within samples which could lead to an indeterminate result.
3. In some cases sediment can interfere with the DNA extraction procedure resulting in poor recovery of the eDNA which in turn can lead to an indeterminate result.

Algae can make the DNA extraction more difficult to perform so if it can be avoided then this is helpful.

Sometimes samples contain a white precipitate which we have found makes the recovery of eDNA very difficult. This precipitate can be present in such high amounts that it interferes with the eDNA extraction process meaning that we cannot recover the degradation control (nor most likely the eDNA itself) at sufficient levels for the control to be within the acceptable limits for the assay, therefore we have to classify these type of samples as indeterminate.

What do my results mean?

A positive result means that great crested newts are present in the water or have been present in the water in the recent past (eDNA degrades over around 7-21 days).

A negative result means that DNA from the great crested newt has not been detected in your sample.

On occasion an inconclusive result will be issued. This occurs where the DNA from the great crested newt has not been detected but the controls have indicated that either: the sample has been degraded and/or the eDNA was not fully extracted (poor recovery); or the PCR inhibited in some way. This may be due to the water chemistry or may be due to the presence of high levels of sediment in samples which can interfere with the DNA extraction process. A re-test could be performed but a fresh sample would need to be obtained. We have successfully performed re-tests on samples which have had high sediment content on the first collection and low sediment content (through improved sample collection) on the re-test. If water chemistry was the cause of the indeterminate then a re-test would most likely also return an inconclusive result.

The results will be recorded as indeterminate if the GCN result is negative and the degradation result is recorded as:

1. evidence of decay - meaning that the degradation control was outside of accepted limits
2. evidence of degradation or residual inhibition - meaning that the degradation control was outside of accepted limits but that this could have been due to inhibitors not being removed sufficiently by the dilution of inhibited samples (according to the technical advice note)



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