

**LAND WEST OF OLD MANOR FARM,
SOUTH OF LOWER ROAD, BEDHAMPTON**

ECOLOGICAL ASSESSMENT

SEPTEMBER 2021

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LAND WEST OF OLD MANOR FARM, SOUTH OF LOWER ROAD, BEDHAMPTON ECOLOGICAL ASSESSMENT

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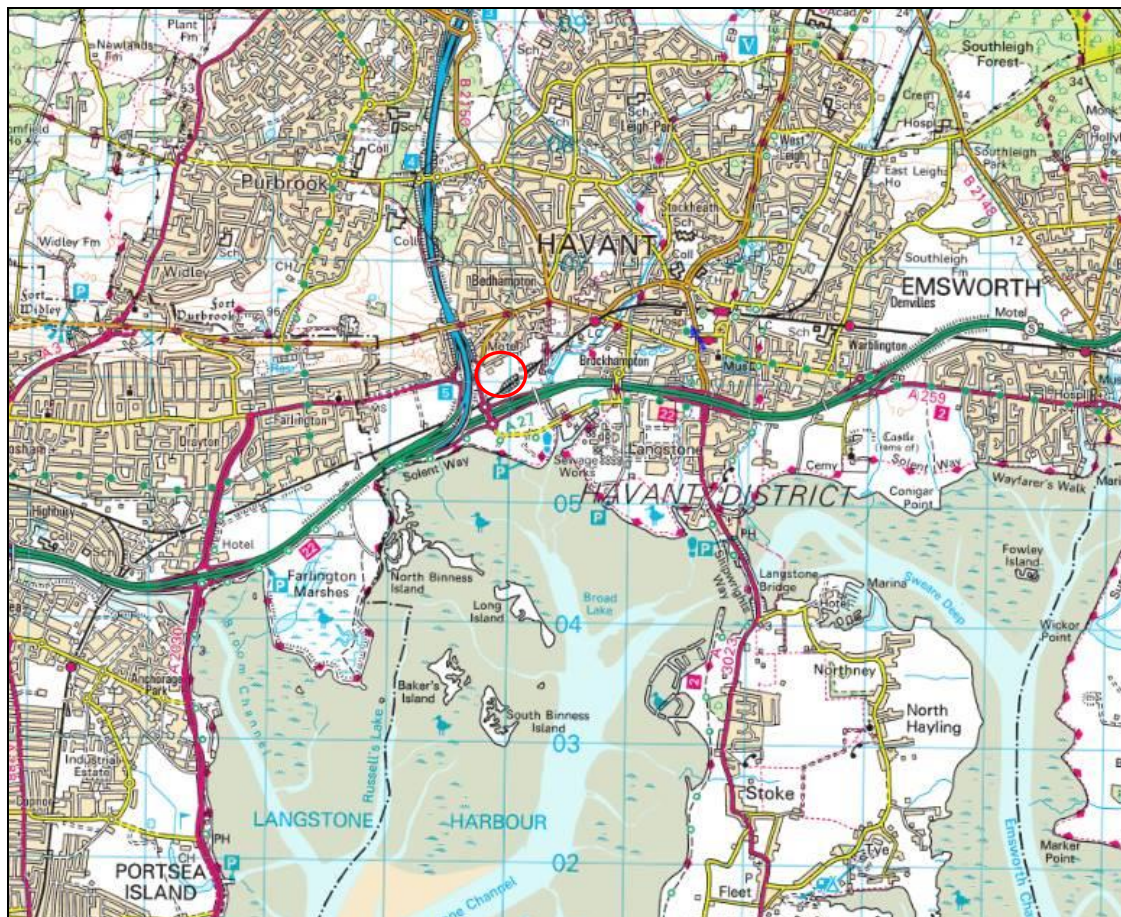
1.0 INTRODUCTION

1.1 Background

- 1.1.1 Aluco Ecology Ltd was commissioned to carry out an ecological assessment of Land West of Old Manor Farm, South of Lower Road, Bedhampton for Bargate Homes. The site is immediately west of a site that was subject to a Planning Application in 2019 and 2020, with ecology survey work for that site being undertaken between 2014-2020 (see Aluco Ecology 2014, 2017, 2019 & 2020). That site was granted planning permission at appeal in 2021.
- 1.1.2 The aim of an assessment is to survey and document baseline ecology data on the site and study area, and then evaluate and assess the impacts of the proposals for Planning Permission against this baseline. The assessment therefore:
- highlights any features of particular ecological value;
 - identifies potential impacts to ecology as a result of the proposed works;
 - identifies any ecological issues that may have legal or planning implications such as the presence of protected species; and
 - recommends potential for mitigation and/or compensation that can be undertaken to avoid, reduce or offset the potential for impacts.
- 1.1.3 The Government sets out its objectives for conserving and enhancing biodiversity in the National Planning Policy Framework (Revised NPPF, 2019). The Government's objectives for planning include an environmental objective 'to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.'
- 1.1.4 The Framework goes on to state that at the heart of the planning system is a presumption in favour of sustainable development. Planning Practice Guidance on the Natural Environment provides information on taking biodiversity into account in planning (see Section 15 of the revised NPPF, 2019).

1.2 Outline of the Scheme and Site Location

- 1.2.1 The site is located in Bedhampton, Havant. The location is shown at **Figure 1** below. It comprises the western part of an arable field.



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Figure 1: Location of the site

- 1.2.2 An Outline planning application for up to 43 dwellings, associated landscaping, open space and allotments with access from Lower Road is proposed on site. **Figure 2** below shows the red line boundary of the site and proposed development illustrative Masterplan. The red line boundary is 4.07ha (including access from Lower Road through the eastern scheme that has been granted permission) and 3.67ha – the red line shown on **Figure 2** showing the main site.

1.3 Relevant Legislation and Policy

- 1.3.1 The outcomes of this ecological assessment will be tested against relevant legislation and policy; namely the Habitat Regulations 2017 (as amended) in relation to the protection of European sites (Special Protection Areas SPA, and Special Areas of Conservation SAC) and European protected species (eg bats, dormouse, great crested newts) (**Technical Appendix 1**) and the Wildlife & Countryside Act 1981 (as amended) and Countryside & Rights of Way Act (CRoW) 2000 for protected species and the designation and protection of SSSIs (**Technical Appendix 1**). The Protection of Badgers Act 1992 gives protection to Badgers *Meles meles*.
- 1.3.2 In addition to the National Planning Policy Framework and the legislation outlined above, the strategic and local planning policies are also considered; Havant Borough Council Local Plan contains policies relating to ecology, these are outlined at **Technical Appendix 2**.
- 1.3.3 Under the Governments duty to conserve Biodiversity, a number of Biodiversity Action Plans have been prepared for habitats and species of conservation concern, including national BAPs and a Biodiversity Action Plan for Hampshire, and this is considered in the general ecological site appraisal. The Council has also recently published its updated Biodiversity Strategy (HBC, 2019), which has been considered in the assessment. Consideration should also be given to emerging Environment Act. A core element of this is biodiversity net gain through development. Local Planning Authorities are beginning to adopt the principals of demonstrated ‘net gain’ in planning decisions.



Figure 2: Illustrative Masterplan (Mosaic Urban Design & Masterplanning, 2021)

2.0 ASSESSMENT METHODOLOGY

2.1 Introduction

- 2.1.1 The methodology for this Appraisal has regard to the Guidelines for Ecological Impact Assessment (EcIA) in the United Kingdom published by the Chartered Institute of Ecology and Environmental Management (IEEM, 2006 & CIEEM 2016 & 2018), and on the guidelines for ecological appraisal (IEEM, 2012), and report writing guidelines (CIEEM, 2015).

2.2 Site Survey Methodology

- 2.2.1 The first stage is a desk study of the site and associated Zone of Influence. This provides background information on the site and local environment in order to effectively target field survey and further desk research. This includes a data search from the Hampshire Biological Records Centre. The aims of the field survey are to record land-use and broad vegetation types present on the site and in the surrounding areas, and to evaluate the habitats and vegetation communities' potential ecological value along with their potential to support protected species, species of principal importance, and any other notable species. Further details of the methodology used can be found in **Technical Appendix 3**.
- 2.2.2 Additional detailed phase 2 survey work undertaken is subject to methodologies set out in linked Technical Appendices for each section of the report.

3.0 BIOPHYSICAL CHANGES AND THE ZONE OF INFLUENCE

3.1 Introduction

3.1.1 In order to be able to target relevant ecological survey and assess the impacts of a proposed development, it is necessary to identify the activities that may result in biophysical changes from the development and the area these cover (i.e. the zone of influence). There are three stages of this development scheme that include activities that may have an impact on features of ecological value; namely site preparation, construction and operation / use.

3.1.2 **Figure 2** shows the extent of the site and proposed development illustrative Masterplan.

3.2 Biophysical Changes associated with the Development Scheme – Determination of the Zone of Influence

3.2.1 It is anticipated that change of use of the site would result in the physical structure of the present site being altered. The potential zone of influence of the proposal is determined from the predicted biophysical changes brought about by activities associated with construction and post-construction phases. Therefore, the zone is predicted to extend across the development footprint and locally along the edge of the site, and immediately adjacent to the site. Consequently, survey has been carried out within this zone.

3.3 Site Preparation / Construction Activities and Biophysical Changes

3.3.1 During the construction phase, it is predicted that site preparation activities will include some earthworks and earth stripping associated with the building and road footprints. This phase may affect habitat suitable for wildlife. Without appropriate mitigation, site clearance work may result in death or injury to protected species (if they are present), or damage to other features of ecological value. Construction could result in the loss of features of ecological value and/or the loss of habitat of protected species resulting in a net decrease in biodiversity.

3.3.2 The construction of the site has the potential to affect adjacent habitats, where present, through noise, air and run off pollution.

3.4 Predicted Operational Activities during Use Phase and Biophysical Changes

3.4.1 The operational phase will need to consider how protected species and species of conservation concern may use the site and zone of influence, and what effect the proposals may have on their conservation status locally.

4.0 BASELINE CONDITIONS WITHIN THE ZONE OF INFLUENCE

4.1 Introduction

- 4.1.1 The ecological baseline describes the site in the context of the characteristic habitats of the area, and includes descriptions of designated sites and ecological features present within the potential zone of influence of any proposed development.

4.2 Designated Sites

Statutory Designated Sites

- 4.2.1 There is one Site of Special Scientific Interest (SSSI) designated of regional to national importance present within 2km of the site. This is Langstone Harbour SSSI, which at its closest point is about 570m from the site, and is designated for coastal habitats and associated species including waterfowl. SSSIs are afforded protection under the Wildlife & Countryside Act 1981 (as amended)
- 4.2.2 A number of International and European designated sites are present within 7km of the site. These sites are afforded protection under the Habitat Regulations (2010). These include Chichester & Langstone Harbours Special Protection Area (SPA) and Ramsar Site (c410m from the site); Portsmouth Harbour SPA and Ramsar Site (c4.7km from the site); Solent Maritime Special Area of Conservation (SAC) (c410m from the site); Solent & Isle of Wight Lagoons SAC (c2.3km from the site) and the Solent & Dorset Coast SPA (a marine component SPA). The citations for the European Solent designated sites are provided in **Technical Appendix 4**, which detail the interest features of each site.
- 4.2.3 A single Local Nature Reserve (LNR) is present within 1km of the site. Farlington Marshes LNR, is approximately 910m from the site at its closest point. LNRs are afforded protection under the National Parks and Access to the Countryside Act 1949 (as amended by the Natural Environment and Rural Communities Act 2006). Farlington Marshes is part of Langstone Harbour SSSI.

Non Statutory Designated Sites

- 4.2.4 Sites of Importance for Nature Conservation (SINCs) are afforded protection under the Havant Borough Council Local Plan. There are three SINCs present within 1km radius of the field's central point (See map at **Technical Appendix 4**).
- 4.2.5 The site is at its closest point just over 220m from the Mean High Water mark, as it comes up the Hermitage Stream channel at Bedhampton, south east of the site.
- 4.2.6 The site and surrounding fields were originally classed as 'Uncertain' value to waders in the Solent Brent Goose Strategy (HWT, 2010). Guidance from the updated Brent Goose Strategy (SWBGS, 2018) shows that the site is now classified as a 'Secondary Support Area.' A field south of the A27 and railway corridor about 250m from the site is also classed as a 'core area'

for Brent Geese (SWBGS, 2018). For waterfowl. These are shown in a Figure in **Technical Appendix 5**.

4.3 Habitats and Vegetation

Introduction

- 4.3.1 The following description is based on a survey visits between September 2020, and February and September 2021. The site consists of land that has been in arable production for many years, left uncultivated in 2020 and cultivated again in 2021. Broad habitats types and boundary numbers are illustrated on **Figure 3** below.

Arable

- 4.3.2 The site consists of the western part of an arable field unit. Arable flora recorded included Field Horsetail *Equisetum arvense*, Field Madder *Sherardia arvensis*, Scentless Mayweed *Tripleurospermum inodorum*, Scented Mayweed *Matricaria recutita*, Redshank *Persicaria maculosa*, Shepherd's Purse *Capsella bursa-pastoris*, Common Fumitory *Fumaria officinalis*, Common Knotweed *Polygonum arenastrum*, Scarlet Pimpernel *Anagallis arvensis*, Cut-leaved Cranesbill *G. dissectum*, Sun Spurge *Euphorbia helioscopia*, Petty Spurge *Euphorbia peplus*, Annual Mercury *Mercurialis annua*, Fat Hen *Chenopodium album*, Many-seeded Goosefoot *Chenopodium polyspermum*, Wall Speedwell *Veronica arvensis*, Common Field Speedwell *Veronica persica*, Groundsel *Senecio vulgaris*, Greater Plantain *Plantago major*, Pinappleweed *Matricaria discoidea*, Cleavers *Galium aparine*, Wild Radish *Raphanus raphanistrum*, Black Nightshade *Solanum nigrum*, Field Forget-me-not *Myosotis arvensis*, Field Bindweed *C. arvensis*, Black Bindweed *Fallopia convolvulus*, Nipplewort *Lapsana communis*, and Hoary Willowherb *Epilobium parviflorum*. Taller ruderal species included Broad-laved Dock *Rumex obtusifolia*, Creeping & Spear Thistles *Cirsium arvense* & *C. vulgare*, Bristly Oxtongue *Helminthotheca echioides*, Common Mugwort *Artemisia vulgaris*, Nettles *Urtica dioica* and Smooth Sow-thistle *Sonchus oleraceus*.
- 4.3.3 Arable grasses were also present including Annual Meadow Grass *Poa annua*, Wild Oat *Avena fatua*, Soft Brome *Bromus hordeaceus*, Barren Brome *Bromus sterilis* and the neophyte Cockspur *Echinochloa crus-gallii*, which with the lack of arable cultivation in 2020 was dominant over parts of the field. No scarce species were noted, and a single local species of arable/disturbed ground, Sharp-leaved Fluellin *Kickxia spuria*, was present in small quantities along the western boundary. The arable habitats are shown at **Photos 1-2** below.



Photo 1: Arable Habitats on Site (September 2020)



Photo 2: Arable Habitats showing abundance of Cockspur (September 2021)

Grasslands/Tall Herb

- 4.3.4 There is only very limited grassland habitats on site, restricted to a small c1m strip the northern boundary, and less than 1m strip along the eastern site boundary of grassland and tall herb edge habitat. The grasslands comprise False Oat Grass *Arrhenatherum elatius*, Wood

False Brome *Brachypodium sylvaticum*, and Creeping Bent *Agrostis stolonifera*. Other grasses present included Common Couch *Elymus (Elytrigia) repens*, Soft Brome, Barren Brome, and Cocksfoot *Dactylis glomerata*. Herbs present included locally abundant to dominant Creeping Thistle *Cirsium arvense*, and Nettles *Urtica dioica*, as well as occasional Wild Carrot *Daucus carota*, Mugwort *Artemisia vulgaris*, Common Mallow *Malva sylvestris*, Fleabane *Pulicaria dysenterica*, Field Horsetail, Curled Dock *Rumex crispus*, Spear Thistle *Cirsium vulgare*, Great Willowherb *Epilobium hirsutum*, Bristly Ox-tongue *Helminthotheca echinoides*, and Common Ragwort *Senecio vulgaris*.

4.3.5 The grasslands are shown at **Photos 3-4** below.



Photo 3: Small Strip of Grassland Along Parts of Northern Boundary (September 2020)



Photo 4: Eastern Boundary Grassland Strip (September 2020)

Boundaries

- 4.3.6 The boundaries are labelled on **Figure 3** and detailed below.

Boundary 1 – Northern Boundary

- 4.3.7 The boundary comprises a 1-2m tall herb/ruderal strip alongside the farm yard at Manor Farm. Species include Nettles, Bramble *Rubus fruticosus* agg. Common Mugwort, Common Ragwort, Large Bindweed, Wild Carrot and Common Mallow. Offsite a small number of shrubs are present including Elder *Sambucus nigra*, Hawthorn *Crataegus monogyna*, Buddleia *Buddleia davidii* and Sycamore *Acer pseudoplatanus*. The boundary is shown at **Photo 5** below.

Boundary 2 – Western/North Western Boundary

- 4.3.8 The western/north western boundary is demarcated by a stock fence with a small grassland/tall herb strip within the site as described above. Outside the site is a strip of secondary deciduous woodland with a ditch running alongside the boundary that was mostly dry during the survey. The woodland strip is present between the A3(m) and the site and is dominated by mature Sycamore, with occasional Norway Maple *Acer platanoides* and Ash *Fraxinus excelsior*, and a small amount of Beech *Fagus sylvatica*. The understorey comprises Hawthorn (abundant), Field Maple *Acer campestre*, Blackthorn *Prunus* sp. (occasional), Elder (occasional), Dogwood *Cornus sanguineus* (rare), Elm *Ulmus* sp. (very locally abundant), Holly *Ilex aquilinum* (occasional) and Yew (one small bush noted). The understory is dominated by bare ground and Ivy *Hedera helix*, but with some Nettles and Brambles in places. Woodland herbs included small amounts of Dogs Mercury *Mercurialis perennis*, Wood Avens *Geum urbicum*, Lesser Celandine *Ficaria verna*, Wild Arum *Arum maculatum*. Pendulous Sedge *Carex pendula* was also noted along with small amounts of the ferns; Harts Tongue *Asplenium scolopendrium*, Male Fern *Dryopteris filix-mas*, Broad-buckler Fern *Dryopteris dilatata*, and

Soft-shield Fern *Polystichum setiferum* (rare). Although mature woodland, the boundary is relatively recent, having been established since the construction of the A3(m) in the latter half of the 20th Century. It is shown at **Photo 6 & 7** below.

Boundary 3 – Southern (Railway) Boundary

- 4.3.9 This boundary is a chain-link fence along the railway line that is overgrown with Nettles, Brambles and Wild Clematis. The railway bank off-site, is dominated by Nettles with patches of Bramble and Wild Clematis. A couple of young Oak trees and mature Hawthorns are present along the boundary. Off-site a number of other occasional shrubs/trees are present along the railway bank. The base of the fence line contains some ruderal vegetation with abundant Nettles in places, Ivy, and Perennial Sow-thistle. The boundary is shown at **Photo 8** below.

Boundary 4 – Eastern Boundary

- 4.3.10 This boundary is not present on the ground, and is part of the arable field.



Photo 5: Northern Boundary tall ruderal edge habitat (September 2020)



Photo 6: Woodland Strip from site side (looking north from southern end of site) (Sept. 2020)



Photo 7: Secondary Woodland Strip Off Site (September 2020)



Photo 8: Southern (Railway) Boundary Brambles developing over railway fence and tall ruderal habitat (September 2020)

Waterbodies

- 4.3.11 No waterbodies are present on site. A small garden pond exists off site to the north east in the garden of the dwelling at Old Manor Farm. This was described in detail in ecological survey work for the proposed development to the eastern half of the field (see Aluco Ecology, 2019 & 2020). It is a small (c1m x c2m) lined pond with formal paved edges and has some ornamental lilies and non-native aquatic vegetation, a water fountain, and given its ornamental nature, it is likely to contain fish (eg Goldfish). Historical aerial photography suggests it was created within the last c15 years or less.
- 4.3.12 A road drain is present along the A3(m) junction, which empties into the secondary woodland strip creating an area of wet woodland floor that is approximately 20m long and 10m wide but only c10-15cm deep when wet. No aquatic vegetation is present apart from a clump of Pendulous Sedge, and the puddling of water appears to be polluted by road silt and other run off. It is shown at **Photo 9** below. During winter 2020/21 the wet woodland extent remained broadly similar, extending perhaps to 25m length at its greatest extent, but only shallow water, and fluctuating relating to road surface water run-off in wet conditions. It is ephemeral, and dries out relatively quickly.



Photo 9: Run off from A3(m) temporary pooling within the Secondary Woodland Strip following rain (Sept. 2020)

Flora

- 4.3.13 No rare or legally protected species were recorded during the survey.

Evaluation

- 4.3.14 The arable habitats on site are relatively intensely managed, and only a single local species was recorded in the arable flora, it is therefore considered to be of **value within the zone of influence**. The grasslands along the northern and western boundary are considered to be of **value within the zone of influence**.

5.0 BIRDS

5.1 Breeding Bird Survey

- 5.1.1 Nesting birds are protected under the Wildlife & Countryside Act, with certain species given additional protection (see **Technical Appendix 1**).
- 5.1.2 A detailed breeding bird survey was undertaken on site in spring 2021. This was undertaken according to the methodology set out in **Technical Appendix 5**. The survey recorded a total of 38 species (see **Technical Appendix 5**), with birds of conservation concern set out in **Table 1** below.
- 5.1.3 The breeding bird survey work on the eastern site recorded a small number of widespread species of conservation concern were noted on or around site, including the Red Listed: House Sparrow *Passer domesticus*; Starling *Sturnus vulgaris*, Song Thrush *Turdus philomelos*; as well as the Amber listed Dunnock *Prunella modularis*. These are Red listed for a greater than 50% decline in populations and/or range in 25 years and Amber listed as a result of national population declines of 25-50% (see Eaton *et al*, 2015). No typical farmland bird species were recorded on site during the breeding bird survey. The farmland is relatively isolated in suburban Havant. The results are similar to a breeding bird survey undertaken in 2017 for the eastern parcel of the field (Aluco Ecology, 2019).
- 5.1.4 The data search has returned records of a number of protected species (see **Technical Appendix 4**). There are records of the Schedule 1 species Barn Owl *Tyto alba* from the wider landscape, and they may occasionally hunt along the edges of the site, although there is only limited grassland habitat for their favoured prey and none were recorded during survey work, including evening and pre-dawn bat survey work.
- 4.4.5 The site is considered to be **value within the zone of influence to local value** for the breeding bird populations.

5.2 Wintering Birds

- 5.2.1 The value of the site to Waders was listed as 'Uncertain' in 2010 Solent Brent Goose Strategy (HWT, 2010). The emerging Local Plan policy on support sites for waterfowl to the SPA follows updated assessments from the interim Brent Goose Strategy (SWBGS, 2018) which assesses the site (H05A) as a 'Secondary Support Area' under the new guidelines for determining the value of non-SPA sites.
- 5.2.2 There is potential for waterfowl to use the site during the winter period as it is c500m from the Solent designated sites, and arable farmland can be used by waterfowl. A winter waterfowl survey was undertaken in winters 2013-2014 and in 2016/2017 (see Aluco Ecology, 2014, 2017). No waterfowl were recorded on site during 17 survey visits during 2013/14 and 25 visits during 2016/17, over the period October to March. Over winter 2020/21 three update visits have been undertaken, recording wintering bird numbers. No waterfowl were recorded

during these visits and the habitat remained as a non-cultivated field with arable plant die back. This weedy structure during winter 2020/21 provided a winter resource for some farmland bird species, including; Stock Dove, House Sparrow, Reed Bunting, Linnet, Chaffinch, Goldfinch, Skylark and Meadow Pipit. Data for these visits is provided in **Technical Appendix 6**, with birds of conservation concern summarised in **Table 1** below.

- 5.2.3 Data is also held for use of the site by waterfowl with HBIC. Data provided as part of the data search is set out in **Technical Appendix 4** below. This includes positive records from the 2002 Brent Goose Strategy survey work for H05A; a single record of 150 Brent Geese recorded at Manor farm in 2003; and a single record of 50 Lapwing using H05A in 2013, and a record of a single Little Egret using the adjacent count area H05B in 2012 (See **Technical Appendix 4** for details). For H05A a total of 7 visits are on record during the winter 2012/13; and 5 visits during the winter 2013/14. For H05B the totals for each winter is 5 and 4 visits respectively (see tables in **Technical Appendix 4**).
- 5.2.4 The field has been regularly maintained as intensive arable farmland and as such is of lower value to wintering waterfowl being generally stubble or ploughed land or young crops during winter periods. In addition, it is bordered to the south by the railway (and further south the A27 dual carriageway), to the west by a tall secondary woodland strip to the east by tall fir trees, and to the north by residential development. This gives it an enclosed site feeling for waterfowl.

Table 1: Birds of Conservation Concern Recorded during Winter 2020/21 and Spring 2021 Bird Survey

Species (BOU vernacular name - IOC International name - scientific name - category)	Sch1	BAP	Red	Amber	Notes from Survey in 2020/21
Black-headed Gull <i>Chroicocephalus ridibundus</i> A				1	Mostly flyovers but also recorded feeding/loafing on site (max 32) during winter
Common Gull ‡ Mew Gull <i>Larus canus</i> A				1	Flyover only
Herring Gull European Herring Gull <i>Larus argentatus</i> A		1	1		Flyovers and occ. feeding/loafing on site in small numbers
Stock Dove <i>Columba oenas</i> A				1	Winter/early spring flock with maximum number of 8 recorded. Likely to breed locally off site
Tawny Owl <i>Strix aluco</i> A				1	Likely to breed locally off site
Swift Common Swift <i>Apus apus</i> A				1	Flyover
Skylark Eurasian Skylark <i>Alauda arvensis</i> A		1	1		Winter only, max recorded in fallow plot of winter 2020/21 of 5 birds
House Martin Common House Martin <i>Delichon urbicum</i> A				1	Flyover
Starling Common Starling <i>Sturnus vulgaris</i> A		1	1		Occasionally feeding in field, breeding off site locally
Song Thrush <i>Turdus philomelos</i> A		1	1		Occasionally feeding in field, breeding off site locally, with 3 territories noted adjacent to the site in 2021
Redwing <i>Turdus iliacus</i> A	1		1		Winter flyover
Dunnock <i>Prunella modularis</i> A		1		1	Breeds around site boundary (3-4 territories estimated around Site in 2021)
House Sparrow <i>Passer domesticus</i> A		1	1		Breeds around site boundary a number of pairs in housing north of the site, mostly using the eastern end of the field, but also on Site occasionally.
Grey Wagtail <i>Motacilla cinerea</i> A			1		Winter flyover
Meadow Pipit <i>Anthus pratensis</i> A				1	Winter only, max recorded in fallow plot of winter 2020/21 of 27 birds
Linnet Common Linnet <i>Linaria cannabina</i> A		1	1		Winter only (and into early April as flyover). No breeding records. Max count 3
Reed Bunting Common Reed Bunting <i>Emberiza schoeniclus</i> A		1		1	Winter only, max recorded in fallow plot of winter 2020/21 of 28 birds
Total =	1	9	8	9	

References:

The British List (BOU) = British Ornithologists' Union. 2013. The British List: A Checklist of Birds of Britain (8th edition). Ibis 155: 635-676

Sch1 WCA = Schedule 1 Wildlife & Countryside Act 1981 (as amended) - <http://jncc.defra.gov.uk/page-1377>

BAP = Section 41 of the Natural Environment and Rural Communities Act 2006 UK Biodiversity Action Plan Priority Species - <http://jncc.defra.gov.uk/page-5163>

BoCC4 (Red & Amber listed) = Birds of Conservation Concern 4: Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708-746 - <http://www.bto.org/science/monitoring/psob>

6.0 BATS

6.1 Methodology

6.1.1 Bats are protected under the Wildlife & Countryside Act and the Habitat Regulations (see **Technical Appendices 1**). The habitats on site were assessed for potential value to local bat populations.

6.1.2 A bat survey of the site was undertaken during May – September 2021 with monthly transect visits and remote monitoring undertaken according to the methodology set out in **Technical Appendix 7**.

6.2 Desktop Data and Data Search

6.2.1 Detailed survey work in 2016 and 2017 on the eastern half of the field (Aluco Ecology, 2019 & 2020) and data search results have provided a number of bat records from the zone of influence. A total of seven species have been recorded including: Common & Soprano Pipistrelle *Pipistrellus pipistrellus* & *P. pygmaeus*, Serotine *Eptesicus serotinus*, Myotis Bats *Myotis* sp including *M. mystacinus* & *M. daubentonii*, Brown Long-eared Bat *Plecotus auritus* and Noctule Bat *Nyctalus noctula*.

6.2.2 The revised consultation draft Local Plan (Havant BC, 2019 – See **Technical Appendix 2**) provides a map showing potential Bechstein's Bat *Myotis bechsteinii* areas in the District, which covers the majority of open spaces that are connected to wider countryside, including the current site. This rare species has known roosts in ancient woodland areas towards the northern end of the District.

6.3 Survey Results

6.3.1 No bat roost potential exists on site as there are no buildings and no mature trees. The majority of habitats on site are of lower value to foraging and commuting bats being intensively managed open arable farmland. The northern, western and southern boundaries adjoin linear woody semi-natural habitat that is of moderate value to foraging and commuting bats, and the bat survey effort during May-September 2021 has shown that c8 species have been recorded using these moderate value habitats in relatively low numbers.

6.3.2 The species recorded were Common Pipistrelle, Soprano Pipistrelle, (Brown) Long-eared Bat, Noctule, Serotine and Myotis species considered likely to be Natterer's Bat and Whiskered type Bat, with two recordings analysed from July considered more referable to Brandt's Bat. The majority of bat passes on site refer to Common Pipistrelle, with Soprano Pipistrelle the next most frequently recorded species. Other species were only recorded at a very low frequency during the survey period. From transect survey work on site, it is likely that the majority of bat passes relate to only small numbers of Common Pipistrelle and generally very low use of the site by the other species.

- 6.3.3 Common Pipistrelle commuting down the western edge of the field by about c6 bats was noted on a number of surveys. These bats are likely to be roosting in the dwellings somewhere north of the site, and mostly appear to commute through the site heading further south past the railway line. Some use of the western site edge is also likely, as July monitoring recorded some higher levels of foraging at the south west corner of the site.

6.4 Evaluation

- 6.4.1 The site lacks substantial good quality woody habitat for bats, with survey results in the zone of influence showing a reasonable species diversity but low bat activity, with the majority of activity coming from Common Pipistrelle. The woody boundary habitats on site (mainly western/north western boundaries) is considered to be of **local value** as a habitat for these bat populations. Bat survey work has only recorded low *Myotis* use of the site, and no potential records of Bechstein's Bat use of the site. Given results, and lack of woodland habitats present on site, any regular use of the site is considered unlikely.

Table 2: Bat Survey Results

Date	Survey	Weather	Results Summary																																																																						
18/05/2021	Emergence/transect	Cloud 50 Wind SW1 Temp 9.5c Precip 0	Nil emergence. First bat from north of the site along site boundary at 21:24 and commuting along western boundary to railway. Northern boundary PP foraging on and off by ind. PP. Southern boundary PP foraging along railway edge infrequently. PP, PS NN recorded during transect, low activity. <table><tr><th>Transect</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>Total Passes</th></tr><tr><td>PP</td><td>1</td><td></td><td>1</td><td>3</td><td>3</td><td>3</td><td></td><td></td><td>11</td></tr><tr><td>PS</td><td></td><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td>1</td></tr><tr><td>NN</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>2</td><td>2</td></tr><tr><td>Total</td><td>1</td><td>0</td><td>1</td><td>3</td><td>4</td><td>3</td><td>0</td><td>2</td><td>14</td></tr></table>	Transect	1	2	3	4	5	6	7	8	Total Passes	PP	1		1	3	3	3			11	PS					1				1	NN								2	2	Total	1	0	1	3	4	3	0	2	14																				
Transect	1	2	3	4	5	6	7	8	Total Passes																																																																
PP	1		1	3	3	3			11																																																																
PS					1				1																																																																
NN								2	2																																																																
Total	1	0	1	3	4	3	0	2	14																																																																
19/05/2021 – 26/05/2021	Remote Detector north western boundary	Some showers overnight during period, fresh feeling and lows to 8c	<table><tr><th>Date</th><th>Passes</th><th>PP</th><th>PS</th><th>My</th><th>1st</th><th>Lst</th></tr><tr><td>19/05/2021</td><td>23</td><td>17</td><td>6</td><td>0</td><td>20:24</td><td>03:24</td></tr><tr><td>20/05/2021</td><td>1</td><td>0</td><td>1</td><td>0</td><td>21:26</td><td>21:26</td></tr><tr><td>21/05/2021</td><td>2</td><td>2</td><td>0</td><td>0</td><td>20:27</td><td>20:27</td></tr><tr><td>22/05/2021</td><td>9</td><td>2</td><td>6</td><td>1</td><td>20:28</td><td>22:28</td></tr><tr><td>23/05/2021</td><td>0</td><td>0</td><td>0</td><td>0</td><td></td><td></td></tr><tr><td>24/05/2021</td><td>2</td><td>2</td><td>0</td><td>0</td><td>20:31</td><td>22:31</td></tr><tr><td>25/05/2021</td><td>0</td><td>4</td><td>2</td><td>0</td><td>21:32</td><td>23:32</td></tr><tr><td>26/05/2021</td><td>0</td><td>35</td><td>18</td><td>1</td><td>20:33</td><td>23:33</td></tr><tr><td>AVG</td><td>5</td><td>8</td><td>4</td><td>0</td><td></td><td></td></tr></table> Myotis species recorded during period considered to be MyM	Date	Passes	PP	PS	My	1st	Lst	19/05/2021	23	17	6	0	20:24	03:24	20/05/2021	1	0	1	0	21:26	21:26	21/05/2021	2	2	0	0	20:27	20:27	22/05/2021	9	2	6	1	20:28	22:28	23/05/2021	0	0	0	0			24/05/2021	2	2	0	0	20:31	22:31	25/05/2021	0	4	2	0	21:32	23:32	26/05/2021	0	35	18	1	20:33	23:33	AVG	5	8	4	0		
Date	Passes	PP	PS	My	1st	Lst																																																																			
19/05/2021	23	17	6	0	20:24	03:24																																																																			
20/05/2021	1	0	1	0	21:26	21:26																																																																			
21/05/2021	2	2	0	0	20:27	20:27																																																																			
22/05/2021	9	2	6	1	20:28	22:28																																																																			
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24/05/2021	2	2	0	0	20:31	22:31																																																																			
25/05/2021	0	4	2	0	21:32	23:32																																																																			
26/05/2021	0	35	18	1	20:33	23:33																																																																			
AVG	5	8	4	0																																																																					
07/06/2021	Emergence/transect	Cloud 15 Wind W1 Temp 14c Precip 0	Nil emergence. First bat on site PS on northern boundary at 21:53. PP shortly after at 21:57. Low foraging along northern boundary and commuting down western edge of field by PP (6 bats from north between 22:00 and 22:10). Low activity on transect by PP & PS <table><tr><th>Transect</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>Total Passes</th></tr><tr><td>PP</td><td>1</td><td>1</td><td>4</td><td>2</td><td>6</td><td>6</td><td>2</td><td></td><td>22</td></tr><tr><td>PS</td><td>1</td><td></td><td></td><td></td><td>3</td><td></td><td></td><td></td><td>4</td></tr><tr><td>Total</td><td>2</td><td>1</td><td>4</td><td>2</td><td>9</td><td>6</td><td>2</td><td>0</td><td>26</td></tr></table>	Transect	1	2	3	4	5	6	7	8	Total Passes	PP	1	1	4	2	6	6	2		22	PS	1				3				4	Total	2	1	4	2	9	6	2	0	26																														
Transect	1	2	3	4	5	6	7	8	Total Passes																																																																
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PS	1				3				4																																																																
Total	2	1	4	2	9	6	2	0	26																																																																

01/06/2021 - 08/06/2021	Remote Detector south esatern boundary	Weather settled and warm lows to 11.5c light to mod SW	<table><tr><th>Date</th><th>Passes</th><th>PP</th><th>PS</th><th>My</th><th>NN</th><th>1st</th><th>Lst</th></tr><tr><td>01/06/2021</td><td>11</td><td>4</td><td>7</td><td>0</td><td>0</td><td>21:59</td><td>01:46</td></tr><tr><td>02/06/2021</td><td>22</td><td>18</td><td>3</td><td>1</td><td>0</td><td>21:32</td><td>02:43</td></tr><tr><td>03/06/2021</td><td>7</td><td>4</td><td>3</td><td>0</td><td>0</td><td>21:57</td><td>02:28</td></tr><tr><td>04/06/2021</td><td>8</td><td>4</td><td>3</td><td>0</td><td>1</td><td>22:03</td><td>00:17</td></tr><tr><td>05/06/2021</td><td>13</td><td>7</td><td>6</td><td>0</td><td>0</td><td>21:59</td><td>04:12</td></tr><tr><td>06/06/2021</td><td>12</td><td>5</td><td>5</td><td>1</td><td>1</td><td>22:01</td><td>04:09</td></tr><tr><td>07/06/2021</td><td>3</td><td>0</td><td>3</td><td>0</td><td>0</td><td>21:55</td><td>22:08</td></tr><tr><td>AVG</td><td>11</td><td>6</td><td>4</td><td>0</td><td>0</td><td></td><td></td></tr></table>	Date	Passes	PP	PS	My	NN	1st	Lst	01/06/2021	11	4	7	0	0	21:59	01:46	02/06/2021	22	18	3	1	0	21:32	02:43	03/06/2021	7	4	3	0	0	21:57	02:28	04/06/2021	8	4	3	0	1	22:03	00:17	05/06/2021	13	7	6	0	0	21:59	04:12	06/06/2021	12	5	5	1	1	22:01	04:09	07/06/2021	3	0	3	0	0	21:55	22:08	AVG	11	6	4	0	0		
			Date	Passes	PP	PS	My	NN	1st	Lst																																																																	
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AVG	11	6	4	0	0																																																																						
Myotis species recorded during period considered to be MyM																																																																											
16/07/2021	Dawn re-entry/transect	Cloud 0 Wind SW1 Temp 22 Precip 0	Nil re-entry. Last bat PP on western edge of field heading north at 04:36. Prior to this reg PP foraging by small number of bats along field edges. PA at 03:55 northern edge of field.																																																																								
			<table><tr><th>Transect</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>Total Passes</th></tr><tr><td>PP</td><td>2</td><td></td><td>4</td><td></td><td>12</td><td>3</td><td></td><td></td><td>21</td></tr><tr><td>Total</td><td>2</td><td>0</td><td>4</td><td>0</td><td>12</td><td>3</td><td>0</td><td>0</td><td>21</td></tr></table>	Transect	1	2	3	4	5	6	7	8	Total Passes	PP	2		4		12	3			21	Total	2	0	4	0	12	3	0	0	21																																										
			Transect	1	2	3	4	5	6	7	8	Total Passes																																																															
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Total	2	0	4	0	12	3	0	0	21																																																																		
02/07/2021- 07/07/2021	Remote Detector south western boundary	Showers overnight during end of period, otherwise dry. Lows to 14c. Wind light	<table><tr><th>Date</th><th>Passes</th><th>PP</th><th>PS</th><th>My</th><th>NN</th><th>1st</th><th>Lst</th></tr><tr><td>02/07/2021</td><td>72</td><td>64</td><td>8</td><td>0</td><td>0</td><td>21:38</td><td>03:53</td></tr><tr><td>03/07/2021</td><td>54</td><td>46</td><td>4</td><td>1</td><td>2</td><td>21:42</td><td>04:46</td></tr><tr><td>04/07/2021</td><td>60</td><td>51</td><td>6</td><td>1</td><td>0</td><td>21:33</td><td>04:23</td></tr><tr><td>05/07/2021</td><td>58</td><td>56</td><td>1</td><td>1</td><td>0</td><td>21:36</td><td>02:09</td></tr><tr><td>06/07/2021</td><td>3</td><td>3</td><td>0</td><td>0</td><td>0</td><td>00:50</td><td>02:29</td></tr><tr><td>AVG</td><td>49</td><td>39</td><td>3</td><td>1</td><td>1</td><td></td><td></td></tr></table>	Date	Passes	PP	PS	My	NN	1st	Lst	02/07/2021	72	64	8	0	0	21:38	03:53	03/07/2021	54	46	4	1	2	21:42	04:46	04/07/2021	60	51	6	1	0	21:33	04:23	05/07/2021	58	56	1	1	0	21:36	02:09	06/07/2021	3	3	0	0	0	00:50	02:29	AVG	49	39	3	1	1																		
			Date	Passes	PP	PS	My	NN	1st	Lst																																																																	
			02/07/2021	72	64	8	0	0	21:38	03:53																																																																	
			03/07/2021	54	46	4	1	2	21:42	04:46																																																																	
			04/07/2021	60	51	6	1	0	21:33	04:23																																																																	
			05/07/2021	58	56	1	1	0	21:36	02:09																																																																	
			06/07/2021	3	3	0	0	0	00:50	02:29																																																																	
			AVG	49	39	3	1	1																																																																			
Myotis species recorded during period considered to be MyM & MyBr																																																																											
07/08/2017	Dusk Emergence/transect	Cloud 70 Wind S1 Temp 15c Precip 0	Nil emergence. First bat PP 21:12 on northern boundary. Occ. PP along northern boundary foraging after this. PP commuting south along western field edge (5 bats between 21:12-21:27). Transect recorded low activity of PP, PS, NN																																																																								
			<table><tr><th>Transect</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>Total Passes</th></tr><tr><td>PP</td><td>3</td><td></td><td>5</td><td>2</td><td>15</td><td>2</td><td></td><td>1</td><td>28</td></tr><tr><td>PS</td><td>1</td><td>1</td><td></td><td></td><td>4</td><td></td><td></td><td></td><td>6</td></tr><tr><td>NN</td><td></td><td></td><td></td><td></td><td></td><td>1</td><td></td><td></td><td>1</td></tr><tr><td>Total</td><td>4</td><td>1</td><td>5</td><td>2</td><td>19</td><td>3</td><td>0</td><td>1</td><td>35</td></tr></table>	Transect	1	2	3	4	5	6	7	8	Total Passes	PP	3		5	2	15	2		1	28	PS	1	1			4				6	NN						1			1	Total	4	1	5	2	19	3	0	1	35																						
			Transect	1	2	3	4	5	6	7	8	Total Passes																																																															
			PP	3		5	2	15	2		1	28																																																															
			PS	1	1			4				6																																																															
NN						1			1																																																																		
Total	4	1	5	2	19	3	0	1	35																																																																		

02/08/2021 – 07/08/2021	Remote Detector North eastern boundary	Dry at start of period and warm overnight, heavy showers by end of period.		Total	Species							
			Date	Passes	PP	PS	My	NN	PA	1st	Lst	
			02/08/2021	1	1	0	0	0	0	23:14	23:14	
			03/08/2021	7	5	1	0	1	0	21:21	05:05	
			04/08/2021	22	19	0	0	2	1	21:11	03:20	
			05/08/2021	0	0	0	0	0	0			
			06/08/2021	0	0	0	0	0	0			
			AVG	6	5	0	0	1	0			
01/09/2021	Dusk Emergence/transect	Cloud 95 Wind N1 Temp 18c Precip 0	Nil emergence. First bat PP commuting down western boundary early after sunset at 20:06. In total 6xPP commuting from north of site to south along western boundary between 20:06-20:20. 1xPS commuting south at 20:25. ES foraging around site boundaries, mostly northern boundary, but also other boundaries – considered 1 bat or at most 2 bats. NN at 20:15 high over. Transect recorded PP, ES, PA. Low activity apart from single ES constantly foraging.									
			Transect	1	2	3	4	5	6	7	8	Total Passes
			PP	2		2					2	6
			ES	2	12	6	1	1	1			23
			PA	1								1
			Total	5	12	8	1	1	1	0	2	30
01/09/2021 – 06/09/2021				Total	Species							
			Date	Passes	PP	PS	My	ES	NN	PA	1st	Lst
			01/09/2021	22	1	4	0	17	0	0	20:13	05:57
			02/09/2021	25	0	5	8	19	1	0	20:16	04:19
			03/09/2021	24	1	4	0	19	0	0	20:12	23:15
			04/09/2021	23	5	4	0	14	0	0	20:12	01:50
			05/09/2021	39	25	7	5	7	0	0	20:06	05:48
			AVG	27	6	5	3	15	0	0		
			Myotis species recorded during period considered to be MyN									

Key: PP = Common Pipistrelle, PS = Soprano Pipistrelle, NN = Noctule, ES = Serotine, PA = Long-eared Bat, My = Myotis sp. MyM = Whiskered/Brandts/Alcathoe type Myotis, MyN = Natterer's Bat

7.0 OTHER MAMMALS

7.1 Badgers

7.1.1 Badgers *Meles meles* are protected under the Protection of Badgers Act 1992. Signs of use of the site by Badger were searched for during the site survey work. No evidence of Badgers Setts was noted on site. Mammal tracks are present along the site boundaries, but no direct evidence of use of these tracks was noted during the walkover survey. Evidence of Fox *Vulpes vulpes* was recorded during the survey.

7.1.2 The data search has not returned any records of Badgers from within 1km of the site.

7.2 Dormice

7.2.1 Dormouse *Muscardinus avellanarius* and their habitat are afforded protection under the Wildlife & Countryside Act and the Habitat Regulations (See **Technical Appendix 1**). The data search has returned records for Dormice just over 1km to the north of the site at Littlepark Wood – Johnston’s Coppice – Neville’s Park wooded complex by the A3(m). This is north of the suburban extent of Bedhampton.

7.2.2 There are no woody habitats on site, and therefore no habitats suitable for Dormice on site. Off site, a strip of secondary woodland is present along the western and north western site boundary. Although this is potentially suitable habitat for Dormice, it is isolated to other habitats by the busy A3(m) junction and the suburban area of Bedhampton to the north. The railway boundary off site has some Bramble scrub and isolated woody bushes but does not contain a high quality continuous woody corridor.

7.2.3 A Dormouse nest tube survey was undertaken on the boundary habitat, with the northern and western edge to the woody strip covered and less suitable habitat further east along the field boundaries to ensure that 50 tubes were deployed (27 on the red line site boundaries (especially north west/western boundaries) and 23 on adjacent remainder of the field boundary). The tubes were set out in April according to the methodology set out in **Technical Appendix 8** and checked monthly from May 2021 until September 2021. No evidence of Dormouse was recorded, with tubes being used by Wood Mouse *Apodemus sylvaticus* and roosting birds.

7.3 Other Protected Mammals

7.3.1 No other legally protected mammal species are likely to occur on site. There are records locally for Hedgehog *Erinaceus europaeus*, and there is some limited habitat on site for this species around the site hedge boundaries.

8.0 REPTILES & AMPHIBIANS

8.1 Reptiles

- 8.1.1 Commoner reptile species are protected from harm under the Wildlife & Countryside Act (see **Technical Appendices 1**). The data search has returned records of Slow Worm *Anguis fragilis* from the A27 road corridor south of the site. Small amount of suitable habitat for reptiles exists along the woody boundaries/grassland edges of the site. This is mostly present along the northern and western boundaries, which are described in section 4.2 above. The suitable habitat is generally restricted to a c1m grassland strip along these boundaries.
- 8.1.2 A detailed reptile survey was undertaken during autumn 2016 on the eastern part of the field (off site – see Aluco Ecology, 2019 & 2020). This recorded a small population of Slow Worm along the northern boundary of the field.
- 8.1.3 A reptile survey of suitable habitats on site was undertaken during April – June 2021 according to the methodology set out in **Technical Appendix 9**. A total of c35 refugia were placed along the northern, western and southern site boundaries and checked a total of 7 times during suitable weather conditions.
- 8.1.4 The results of the survey are set out in **Table 3** below. A low number of Slow Worm were recorded from the northern/north western site boundary. No other reptiles or herptofauna were recorded.
- 8.1.5 Given the habitats on site and the presence of Slow Worm at the eastern end of the field, the boundary habitats on site are considered likely to be of **value in the zone of influence to local value** for reptile populations.

Table 3: Reptile Survey Results

Date	Time	Slow Worm
12/04/2021	Set Up	0
26/04/2021	am	0
30/04/2021	pm	0
07/05/2021	am	1F
18/05/2021	am	1F
28/05/2021	am	1F, 1sub
01/06/2021	am	1 sub
07/06/2021	pm	1 sub

Key: ad = adult, sub = sub adult/juv, f = Female, m = Male,

8.2 Amphibians

- 8.2.1 No waterbodies suitable for the legally protected Great Crested Newt *Triturus cristatus* to breed exist on site. The single small (c1m x c2m) lined pond with formal paved edges just off the northern boundary of the site in the garden of the dwelling at Old Manor Farm had a habitat suitability assessment (HSI) undertaken as part of the proposed development east of

the field. The score for the pond was poor (See **Technical Appendix 10**). This was re-considered during survey in 2020/21 from the site boundary, and there were no significant changes noted.

- 8.2.2 The pooling of water from run off within the secondary woodland strip west of the site is of low suitability for Great Crested Newt, being ephemeral (only fills for short periods), very shallow, lacking in emergent/aquatic vegetation, and heavily shaded. It was mostly dry during May 2021, but with some fluctuations to storm events noted through the survey period.
- 8.2.3 Ordnance Survey mapping and aerial photography was examined for potentially suitable waterbodies within 500m of the site. No additional waterbodies were recorded. The data search has not returned any records of Great Crested Newt from within 1km of the site.
- 8.2.4 The majority of the site (arable habitats) is of limited value to amphibians, with potentially suitable amphibian terrestrial habitat present along the woody boundaries and associated grassland strips. The small and relatively isolated nature of the garden pond off site, its relatively recent, ornamental and formal nature, and lack of additional potentially suitable waterbodies nearby, suggests it is unlikely to be of value for Great Crested Newt; and the species is not considered likely to be present on site.

9.0 INVERTEBRATES

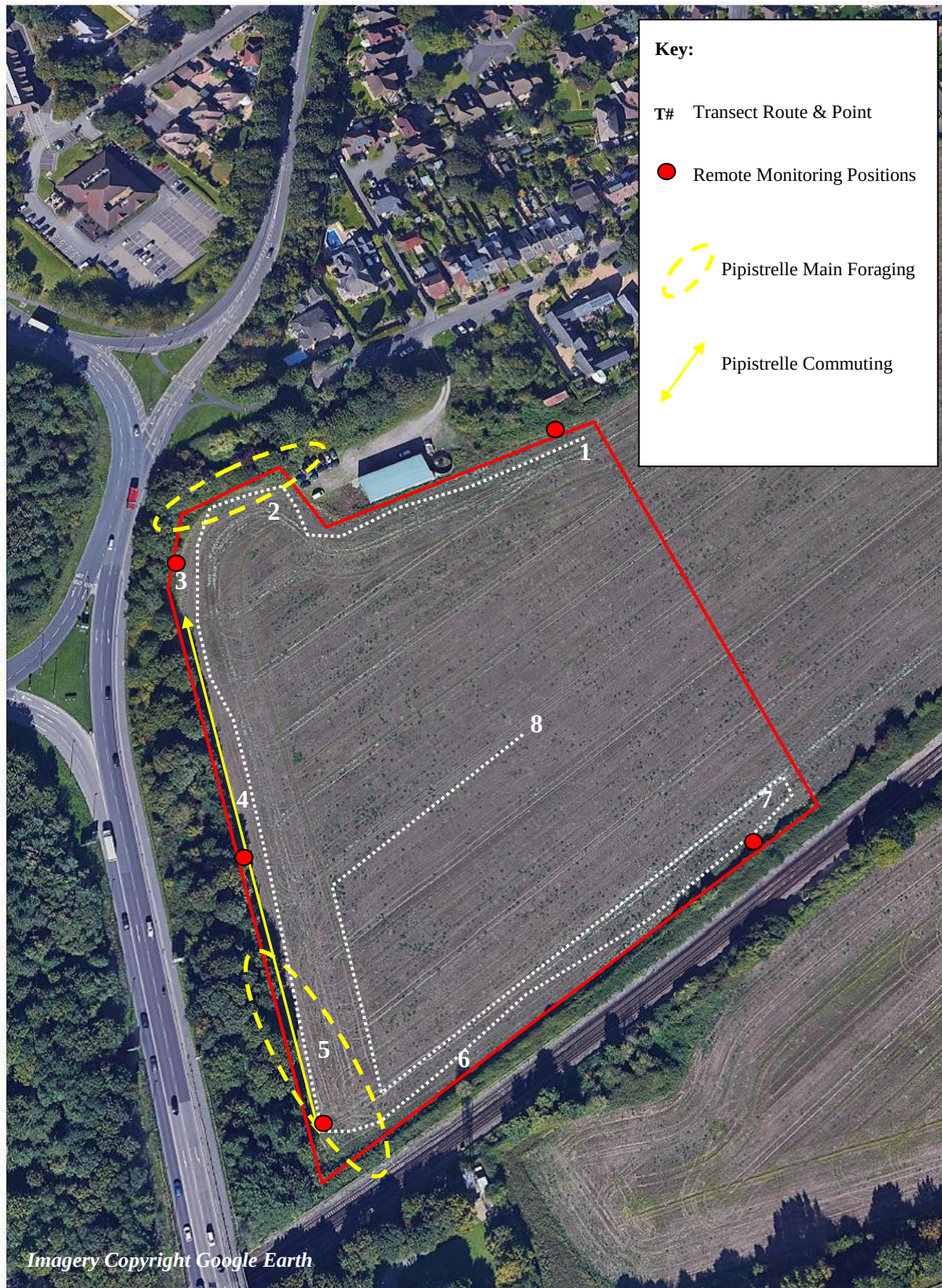
- 9.1 The grassland and hedgerow habitats on site are considered of **value within the zone of influence** for invertebrates being generally species poor, but containing some rough grassland and hedgerow edge habitats for commoner invertebrates. The boundaries contained a standard wayside orthopteran fauna with Field Grasshopper *Chorthippus brunneus*, Roesel's, Dark & Speckled Bush Cricket *Metrioptera roeselii*, *Pholidoptera griseoaptera* & *Leptophyes punctatissima* & Long-winged Conehead *Conocephalus fuscus* noted during survey work.
- 9.2 There is very little dead wood present on site, suggesting limited potential habitat for the legally protected Stag Beetle *Lucanus cervus*, which is known from the wider local area. A male Stag Beetle was recorded during the June bat survey, attracted to a street light on Lower Road just off site, confirming presence locally.



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Figure 3: Habitats on Site (Red Line boundary with boundary numbers)



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Figure 4: Bat Survey Results



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Figure 5: Reptile Survey Results

10.0 ASSESSMENT OF LIKELY IMPACTS

10.1 Introduction

- 10.1.1 In view of the predicted activities and the resultant biophysical changes associated with the proposal, as described in Section 3, this section identifies potential ecological impacts within the predicted zone of influence.

10.2 Protected Sites

Solent Designated Sites

- 10.2.1 The site is within 600m - 4.9km of a number of Solent designated Sites (see Section 4.2 and **Technical Appendix 4**). The adopted Local Plan and revised consultation draft Local Plan provides development policies relating to development within proximity to the designated sites (in this case at their closest 570m) and potential for significant effects on these designated sites (relevant development policies are set out in **Technical Appendix 2**). In summary, the proximity of the site and proposed development to the designated sites is likely to have a significant effect, caused by recreational disturbance through the in-combination effect of net additional dwellings. Mitigation options should be considered via the policies outlined in the Core Strategy Habitat Regulations Assessment & Appropriate Assessment (UE Associates, 2010 & Lepus Consulting, 2013) and policy CS11/DM24 of the Local Plan, plus the emerging Local Plan 2036 and its Habitats Regulations Assessment & Appropriate Assessment (HBC, 2020a). Avoidance/mitigation measures include financial contribution towards the Solent Mitigation Project and/or 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 Habitat Regulations (as stated in Local Plan policy – see **Technical Appendix 2**).
- 10.2.2 The Solent Waders & Brent Goose (SWBG) Strategy lists the site as a ‘secondary support area’ for waders & Brent Geese (SWBGS, 2018), and this is transferred into draft policy in the latest consultation draft Local Plan (see **Technical Appendix 2**). This SWBG strategy provides updated guidance to Local Authorities in development planning, with criteria for mitigation where allocated sites are listed as ‘secondary support areas’ and this is provided in Policy E17 of the emerging Local Plan.
- 10.2.3 The site is also within the coastal zone as defined by the Local Plan Proposals Map produced as part of the Core Strategy (2012). Policy DM9 states that development within the coastal zone should not have a harmful effect on the Solent designated sites (SSSIs, SPA, SAC, Ramsar and any SINC or LNR). See **Technical Appendix 2** for further detail.
- 10.2.4 On the basis of the above, there is the potential, without avoidance and mitigation measures for the development to have a significant effect on the features of the Solent designated sites (SSSI, SPA, Ramsar, SAC, SINC and LNR) particularly in relation to recreational disturbance created by the additional net dwelling increase in proximity to these sites; and from development on land recorded as a ‘secondary support area’ to Brent Geese and/or Waders. Other potential for impacts may include run off and noise impacts during construction.

- 10.2.5 Recent research into nutrient neutrality within the Solent has determined that nutrient loads from development and other land uses is having an adverse impact on the designated European Sites. On this basis Natural England are requesting nutrient neutrality on developments within the zone of influence of the Solent designated sites (Natural England, 2019). Supplementary Planning Guidance at Havant Borough Council has provided further advice on calculating nutrient loads and procedure for mitigation within the District and a policy is provided in the emerging Local Plan (Policy EX1 – See **Technical Appendix 2**). A nutrient calculation for the current development has been undertaken using the nitrogen budget calculator, and it shows that the removal of arable production combined with additional green space south of the proposed development footprint will result in a negative nutrient loading from the operational scheme (see Bargate Homes, 2021). On this basis, adverse impacts on the designated sites in the Solent and Chichester Harbour are not predicted to occur.

10.3 Habitats & Species on Site

Potential Impacts on Habitats and Vegetation

- 10.3.1 The arable land on the whole is considered to be of lower intrinsic value, and loss of habitats would not be considered significant in terms of vegetation and flora.
- 10.3.2 The woody boundaries include a woodland edge and narrow grassland strip. The woodland itself is off site. This and existing boundary features, including the associated small linear grassland strip are to be retained in situ, and therefore no direct impacts are predicted. The habitats would be buffered substantially by the open space creation so in direct impacts are also considered to be not significant.

Potential Impacts on Breeding Birds

- 10.3.3 If vegetation is removed during the breeding season there is potential to destroy bird nests unless assessed prior to works, which would be contrary to Section 1 of the Wildlife and Countryside Act 1981 (as amended). No woody vegetation is proposed to be removed. Given no ground nesting birds were recorded in the field and no use by farmland birds species during the nesting season (see also Aluco Ecology, 2019 & 2020), this impact is considered unlikely to possible during construction phases.

Potential Impacts on Bats

- 10.3.4 No bat roosts have been recorded on site and there are no features that could support a roost on site. Bat foraging habitat is present along the boundaries of the site, and six bat species have been recorded in the zone of influence. The development scheme will retain this habitat, with extensive buffering of the north western and western tree lined edges, as well as further informal green space along the southern edge of the field.
- 10.3.5 Without mitigation, street lighting has the potential to create an adverse impact on bat foraging and commuting habitats on site, particularly if it were located on the main foraging areas on the north western/western/southern boundaries.

- 10.3.6 Although not recorded during the survey effort within the eastern section of the field (just east of the site), the site is part of a landscape wide potential Bechstein's Bat *Myotis bechsteinii* foraging habitat area (see **Technical Appendix 2**). The development is retaining boundary woody habitats and the masterplan provides potential higher quality boundary habitats and new grassland and woody habitats along the western and southern parts of the site. On this basis there is not likely to be an adverse impact on Bechstein's Bats, and the proposals within the green space parts of the site are likely to enhance existing habitat for foraging and commuting.

Potential Impacts on Reptiles

- 10.3.7 A small population of Slow Worm has been recorded in the field on its northern boundary on. This habitat is connected to a small strip of edge habitat along the northern and western boundaries of the site (0.5m to 1m in width along the boundaries). It is proposed to retain this habitat within the proposed scheme so no impacts are predicted where measures are put in place during construction to protect this habitat (see below). The proposed green space to the southern edge of the site and the buffers to the existing site edges along the western/northern boundaries have potential to provide a benefit to local populations of herptofauna through new habitat creation and associated management.

Potential Impacts on Invertebrates

- 10.3.8 Habitats for invertebrates are mostly restricted to the boundaries. Retention of this habitat and enhancement or creation of new semi-natural open space habitats will provide opportunities for enhancing the value of the site for invertebrates.

11.0 MITIGATION MEASURES

11.1 Introduction

- 11.1.1 Section 10 above considered ecological features present that may be impacted by a development without mitigation. This section proposes mitigation measures for each ecological feature to ensure that residual impacts are not significant and that the development has regard to best practice principles and provides biodiversity gain.

11.2 Waterfowl & SPA Avoidance & Mitigation Measures

- 11.2.1 The impacts have determined the potential for two areas of impacts on the designated coastal sites. These are through increases in populations within 5.6km from the sites creating indirect impacts; and direct impacts on a secondary support area for waterfowl.

Contribution to the Solent Mitigation Project for increases in population

- 11.2.2 The proposed development site in the eastern section of the field sought pre-Application advice from Natural England on impacts on the European Designated sites (including Chichester & Langstone Harbour SPA & Ramsar Site, Solent Maritime SAC, Solent & Isle of Wight Lagoon SAC, Portsmouth Harbour SPA & Ramsar). This suggested that such impacts can be avoided and offset using the Solent Mitigation Project, whereby development within proximity to the coastal designated sites pays a levy to projects within the District and coastal zone to help reduce and avoid impacts of disturbance from urbanisation impacts. This levy is set out in Havant Council Local Planning Policy, which has been subject to Appropriate Assessment (HBC, 2020a). With appropriate contributions to this scheme, the current development of Land West of Old Manor Farm is also considered unlikely to have an adverse effect on the integrity of the European Sites.

Contribution to Measures to Mitigate for Loss of Secondary Support Area

- 11.2.3 Survey work on site and adjacent areas has not recorded use by waterfowl in recent winters surveyed (see Aluco Ecology 2014, 2017 & 2019). The site was listed as ‘uncertain’ for waders in the Brent Goose Strategy; however, updated guidance now lists the site as a ‘secondary support area’ and is therefore considered functionally linked land to the SPA for Waterfowl (SWBGS, 2018). Again, as part of the pre-Application process for the proposed development at the eastern end of the field, Natural England’s Discretionary Advice Service was consulted to agree a mitigation package to ensure that the development does not have an adverse impact on resources in the local area that waterfowl may use. That package considered the guidance from the Solent Wader & Brent Goose Strategy (SWBGS, 2018), which is being incorporated into the emerging Local Plan policy (see eg HBC, 2020a and emerging Local Plan).
- 11.2.4 The guidance provides for a number of options for mitigation and compensation for impacts on secondary support areas. This includes a biodiversity compensation framework funding calculation for projects in the Borough/Solent area. This calculation is expected to follow that proposed in the guidance (see SWBGS, 2018), allowing for a monetary payment under the policy to avoid/mitigate impacts from the development (see emerging Policy E17 of the

Havant Local Plan). On this basis (as recommended by Natural England for the adjacent development of the eastern part of the secondary support area), the following calculations on area of the proposed development of the western part of the secondary support area are provided below to allow the proposed development scheme to contribute a payment to appropriate avoidance measures through a Section 106 type agreement, and for a Habitat Regulations Assessment Appropriate Assessment by the Competent Authority:

- Total area within the Red Line of Development = 36700m²;
- Built Development = 14600 m²;
- Open & Green Space = 22100m²;

11.2.5 These calculations have been used so that the Competent Authority can secure a suitable financial contribution (using the SBGW strategy calculator for secondary support sites) towards protection/maintenance of the wider SWBG strategy network locally, as per the Havant Borough Council mitigation scheme under the emerging Local Plan 2036 (Policy E17 and HBC 2020a Appropriate Assessment). Natural England accepted this mitigation approach to the proposed development at the eastern part of the field in their letter to the original Planning Application in 2019 (Natural England 18 November 2019 Ref 299916 for APP/19/00427).

Construction Mitigation Recommendations

11.2.6 Construction of the site should have regard to pollution prevention measures, to avoid run off and dust pollution into surrounding habitats off site. This should be delivered through a Construction Environmental Management Plan, and should consider impacts such as run off, noise and dust pollution. Given the separation of the site by Railway line and A27, both generating noise thought to be in excess of the usual residential construction methods (for example no piling etc) winter construction works are not thought to impact on SPA or SPA support sites.

11.2.7 With appropriate measures and contributions to the offsetting measures for impacts on the coastal designated sites, and emerging policy on secondary support sites, the development is unlikely to have an adverse effect on the integrity of the European Sites.

11.3 Habitats & Vegetation

11.3.1 A substantial amount of informal and formal open space (c2.2ha) is provided on site See **Figure 2**. In addition, the woody boundary features are to be retained. The Illustrative Masterplan shows that these are to be enhanced with additional open space planting, including semi-natural habitats, but also retaining existing habitats, including the small grassland strip along the boundaries.

11.3.2 It is recommended that the new planting is of native locally sourced species. **Technical Appendix 11** provides a suggested species mix for the open spaces on site. Existing tall grassland edges to the woody vegetation on the site boundaries are proposed to be retained in situ, and allowed to develop through long term management. This should be to at least existing extent (0.5-1m along base of boundaries), but will be greater where the western and

southern open space areas provide substantial buffering to allow development of a mosaic of complementary habitats along the site edges. This will continue to provide habitats for reptiles in the zone of influence (see also below).

11.3.3 New habitat planting is proposed along the southern and western edges of the site, which is currently open arable farmland. This includes new sections of hedgerow, scrub, wildflower grassland, SUDS, community orchard and other amenity space.

11.3.4 It is recommended that new hedges comprise a native species mix based on species in **Technical Appendix 11**. Recommendation for new hedge planting include:

- To be staggered double line with a native species mix (see **Technical Appendix 11** below). To be planted naturally with diversity through the hedge line.
- Management to allow for natural style hedge with cutting on a two-three year rotation. This will allow the hedge to grow out wider, where space allows such as fronting onto shared open space areas;
- Base of hedges in shared open space areas should be allowed to grow a tall grassland strip in long term management of no less than 0.5m. This should be managed to retain the rough grassland edge with cutting of woody material in this line only.

11.3.54 In the remaining open space areas a mosaic of newly created habitats is recommended including semi-natural grasslands, scrub/woody features. Appropriate seed mixes for habitats are provided in **Technical Appendix 11**. The habitat set out below are developed according to the Illustrative Masterplan. The following ecology prescriptions for creation and management of these areas is recommended to be incorporated in to these habitats via a Landscape and Ecology Management Plan (LEMP):

- **Woody Scrub Habitats** – Woody habitats should be planted using native species as suggested at **Technical Appendix 11**. Once established management should be undertaken on a two-three year interval with cutting undertaken in the late winter. Management of scrub should be to maintain extent in a relevant management compartment, and late winter cutting (Jan-Feb) preferred. Care in cutting should be taken having regard to protected species such as reptiles at the bases and tall grassland edges of the woody vegetation. In this regard tracking of vehicles should not be permitted in tall grassland edges and cutting of woody vegetation should not be lower than 10-15cm from the ground, leaving the ground undisturbed;
- **Hay Meadow Grassland habitats**. Wildflower hay meadow seed mixes are recommended (see **Technical Appendix 11**). Creation of grassland habitats will require the ground to be prepared and during the autumn period with tilling and seed sowing is the best period for wildflower uptake. The grasslands will take a number of years to establish but should be monitored annually, with problem weeds such as extensive thistle and dock encroachment spot treated or pulled as necessary. Where wildflower uptake is low, additional scarifying of the ground should take place in the second or third autumn period and additional wildflower seeding, including Yellow Rattle *Rhinanthus minor* to be sown to try to reduce grass vigour. Management should include annual cutting in the late summer/autumn of the extent of the meadow

with cuttings removed and bailed for hay, or composted at a suitable location on site. The edges of the meadow with eg boundary woody habitat will be graded into tall and less managed grassland as per tall grassland prescription below. Where grasses are becoming more vigorous than wildflowers, an early spring cut can be carried out in dry weather to reduce grass vigour, with cuttings removed, bailed or composted. (given that grazing of the site is unsuitable at this location).

- **Tall Grassland habitats.** Tall grassland habitats can be created by cessation of cutting of existing grasslands, or by non-management of newly created grasslands. Management will include creation of habitat from either non-cutting of previously cut retained grasslands, or grassland creation. Annual or two year cutting of encroaching woody vegetation to maintain an area of grasslands that are left uncut themselves to form tussocky grassland edges. This will allow existing tall grassland habitats to develop into more complete habitats around the site. This habitat type is good for wildlife, to provide a diversity of habitats and for reptiles and invertebrates particularly. A community orchard could also include this type of habitat;
- **Wetland/SUDS habitats.** The surface water basin is to be sown with a native species mix suitable for damp grasslands and will be managed in part as per hay meadow grassland habitat recommendations above, no more than a third of the basin cut per year, allowing for taller grassland/wetland areas to also establish.

11.4 Protected Species

Birds

- 11.4.1 Mitigation measures for birds include carrying out works on any woody vegetation at an appropriate time of year, usually considered to be between September to February. It may be possible to remove small amounts of vegetation at other times of year, where it can be checked that no nesting birds are present by a suitably qualified ecologist beforehand. There is a small potential for presence of ground nesting birds such as Skylark *Alauda arvensis*. No breeding Skylark were recorded during site survey work on the field in 2021 or previous breeding bird survey work for the scheme on the eastern part of the field (Aluco Ecology, 2019 & 2020) however some suitable habitat exists. Management of grassland to keep it unsuitable for ground nesting birds (eg ploughed/stripped bare ground) where works will take place over the breeding season would ensure that ground nesting species are not be disturbed. This should be combined with checks by a suitably experienced ecologist where there is potential for habitat to be present.
- 11.4.2 New woody habitat is to be provided on site. Native species would provide additional benefit for wildlife. New nesting opportunities is recommended to be incorporated within a scheme design, by placing bird boxes on retained mature trees or on new dwellings (eg Sparrow terrace boxes/Swift & House Martin bricks/boxes). A total of 6 bird nest boxes are recommended, with designs shown in **Technical Appendix 12**.
- 11.4.3 New woody planting and grassland mosaic habitats will provide new nesting opportunities and foraging resources for local populations of birds.

Bats

- 11.4.4 Foraging and commuting routes along the site boundaries will be retained with substantial buffering of the southern and western/north western site boundaries. Street lighting is a matter to be secured by an appropriately worded condition, which could require inclusion of details in a relevant Landscape (including open space) and Ecological Management Plan (LEMP). Any proposals for street lighting should consider potential impacts on bats and should be designed to be directional, pointing away from the boundary woody features including any newly created landscaping, to retain dark corridors allowing bats to move along the edges the site and have regard to best practice guidance on bats and external lighting (see BCT & ILP, 2018).
- 11.4.5 In addition, new planting and management of informal areas (see above) will enhance connectivity in the local landscape and provide new foraging opportunities for bats. Biodiversity gain/mitigation will be further provided through the provision of bat boxes in retained boundary habitat, and/or as part of new buildings, suitably located by an ecologist. A total of 6 bat boxes/features are recommended, with designs shown in **Technical Appendix 12**.

Reptiles

- 11.4.6 In order to ensure that reptiles are not harmed as a result of the scheme construction site fencing of the retained boundary habitat excluding construction works and storage will continue to provide protection of the retained habitat from construction intrusion.

Invertebrates

- 11.4.7 The development of new woody habitats and edge habitat will provide opportunities for populations of invertebrates in the zone of influence.

12.0 CONCLUSIONS

- 12.1 Ecology survey work and assessment has been undertaken on Land at Lower Road West, Bedhampton during 2013-2021. The survey work has recorded arable, grassland and woody boundary habitats on site and in the zone of influence. Potential habitat for protected species has been recorded on site, or known adjacent to the site (with detailed assessment of the eastern half of the field and associated wider zone of influence from work for an earlier scheme to the east). These include potential for and records of birds, bats, reptiles and invertebrates. The Solent designated sites, and associated feeding/loafing sites for Waders and Waterfowl are also present within the Zone of Influence of the site. The site itself is also listed as a secondary support area for waterfowl.
- 12.2 A proposed development scheme has the potential, without mitigation, to affect some or all of these features. As such details of ecology avoidance and mitigation measures, as well as opportunities for biodiversity gain have been provided above to address potential for adverse impacts on ecology features recorded. These include creation of new habitats on the site's open space areas, including 2.21ha of open space to the southern and western edges of the site; mitigation method statements for protected species during construction phases of the development; as well as adherence to local plan policy/emerging policy on payment contributions to local offsetting and avoidance projects on the adjacent protected coastal designated wildlife sites, and secondary support site and features of those sites. Where such mitigation and avoidance measures are taken into account, the development will not have an adverse impact on ecological features recorded by the assessment.

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Report Authors
Gareth Knass LLb (Hons) MSc MCIEEM
Report Review:
Anthony Blunden MSc MCIEEM CEnv
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Technical Appendix 1

Wildlife & Countryside Act Habitats Regulations and Schedule 2 Species Natural Environment & Rural Communities Act 2006

WILDLIFE & COUNTRYSIDE ACT 1981 (AS AMENDED)

The Wildlife and Countryside Act 1981 (as amended) (WCA) is the principle legislation in Britain for the protection and conservation of our wildlife and its habitats of national importance. The legislation adopts a habitat and species based approach to nature conservation. Habitats and some species are protected in designated Sites of Special Scientific Interest (SSSI). Other species are afforded some protection from harm or disturbance by way of inclusion in either Section 1 (birds), Schedule 1 (specially protected birds), Schedule 5 (specially protected animals) or Schedule 8 (specially protected plants).

Protection Afforded to SSSIs

The presence of an SSSI on or near to a development is a material consideration, and this is discussed further in planning policy (see National Planning Policy Framework)

Law Relating to Protected Species

The WCA provides protection to such species in Part 1 of the Act. These sections provide protection from intentionally:

- killing, injuring or taking any wild bird or taking, damaging or destroying the nest or eggs of a wild bird
- disturbing any wild bird in Schedule 1 whilst building, on or near a nest, or disturbing dependant young of such birds
- damaging, destroying or obstructing access to any structure or place of shelter or protection of a schedule 5 animal, or disturbs any such animal whilst it is occupying a structure or place it uses for that purpose
- killing, injuring or taking any animal listed in Schedule 5
- Having in possession or control any live or dead wild bird or egg, or any wild animal in Schedule 5, or trading in any animal under Schedule 5.
- Damage to plants listed in Schedule 8 or uprooting of wild plants unless an authorised person.

Exemption and licences for development can be obtained in certain circumstances. Protected species are also a material consideration in planning applications.

Disturbance & Recklessness

The Countryside and Rights of Way Act 2000 (CRoW Act 2000) adds to protected species legislation in the WCA. The lesser test of 'Recklessness' is added to the protection from disturbance in three circumstances. These are:

- disturbance to Schedule 1 birds and their nests, eggs and dependant young,
- disturbance to Schedule 5 animals in their place of shelter/protection, and
- disturbance to the places of shelter/protection of Schedule 5 animals.

This addition means that any person who deliberately takes an unacceptable risk or fails to notice an obvious risk is falls under the Section irrespective of intention. The CRoW Act also provides greater protection to SSSIs from operations (and non operations) of owners, occupiers and third party users of the SSSI.

For further information see: <https://www.legislation.gov.uk/ukpga/1981/69>

HABITAT REGULATIONS 2017

General

The Conservation of Habitats and Species Regulations 2017 ('The Habitat Regulations') consolidate the Conservation of Habitats and Species Regulations 2010 with subsequent amendments. The Regulations transpose Council Directive 92/43/EEC, on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive), into national law. They also transpose elements of the EU Wild Birds Directive in England and Wales. The Regulations provide for the designation and protection of 'European sites', the protection of 'European protected species', and the adaptation of planning and other controls for the protection of European Sites.

European Protected Species

Species listed under Schedule 2 of the Habitats Directive were formally afforded protection by the Habitat Regulations. European protected species include the great crested newt, dormice and all species of bats. The provision relating to wild animal offences is reproduced below:

Protection of certain wild animals: offences

43.—(1) A person who—

- (a) deliberately captures, injures or kills any wild animal of a European protected species,
 - (b) deliberately disturbs wild animals of any such species,
 - (c) deliberately takes or destroys the eggs of such an animal, or
 - (d) damages or destroys a breeding site or resting place of such an animal,
- is guilty of an offence.

(2) For the purposes of paragraph (1)(b), disturbance of animals includes in particular any disturbance which is likely—

- (a) to impair their ability—
 - (i) to survive, to breed or reproduce, or to rear or nurture their young; or
 - (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate;or
- (b) to affect significantly the local distribution or abundance of the species to which they belong.
- (3) It is an offence for any person—
 - (a) to be in possession of, or to control,
 - (b) to transport,
 - (c) to sell or exchange, or
 - (d) to offer for sale or exchange,anything to which this paragraph applies.
- (4) Paragraph (3) applies to—
 - (a) any live or dead animal or part of an animal—
 - (i) which has been taken from the wild, and
 - (ii) which is of a species or subspecies listed in Annex IV(a) to the Habitats Directive;and
 - (b) anything derived from such an animal or any part of such an animal.
- (5) Paragraphs (1) and (3) apply regardless of the stage of the life of the animal in question.
- (6) Unless the contrary is shown, in any proceedings for an offence under paragraph (1) the animal in question is presumed to have been a wild animal.
- (7) In any proceedings for an offence under paragraph (3), where it is alleged that an animal or a part of an animal was taken from the wild, it is presumed, unless the contrary is shown, that that animal or part of an animal was taken from the wild.
- (8) A person guilty of an offence under this regulation is liable on summary conviction to imprisonment for a term not exceeding six months or to a fine, or to both.
- (9) Guidance as to the application of the offences in paragraph (1)(b) or (d) in relation to particular species of animals or particular activities may be published by—
 - (a) the appropriate authority; or
 - (b) the appropriate nature conservation body, with the approval of the appropriate authority.
- (10) In proceedings for an offence under paragraph (1)(b) or (d), a court must take into account any relevant guidance published under paragraph (9).
- (11) In deciding upon the sentence for a person convicted of an offence under paragraph (1)(d), the court must in particular have regard to whether that person could reasonably have avoided the damage to or destruction of the breeding site or resting place concerned.

Section 44 provides certain defences to the above.

The granting of a licence under Part 5 Section 55 of the Habitat Regulations

In order to carry out a lawful operation (e.g. development work which has full planning permission) that may result in any of the offences above, it is necessary to obtain a licence from Natural England to allow the operation to proceed.

However, in accordance with the requirements of the Habitats Regulations, a licence can only be issued after the following conditions have been satisfied:

- *that there is no satisfactory alternative, and*
- *that the action authorized will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.*
- *that the action is required in preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment;*

Full planning permission is required to apply for a Natural England licence (where such a consent is necessary for the work to be carried out). In addition, a method statement which details the survey results, methodology of work to be undertaken, mitigation and compensation measures, must be submitted to Natural England with the licence application.

Plans and Projects & Designated Sites

The Regulations provide procedure whereby designated SAC or SPA and other European Protected Sites are afforded protection from plans and projects that may be likely to have a significant effect on the Features for which these sites are designated. Where a significant effect is considered likely in combination with other projects an appropriate assessment is required to be undertaken. Details of this procedure can be found at Part 6 of the Act onwards, see link below.

For Full details of the 2017 Habitat Regulations see:

http://www.legislation.gov.uk/ukxi/2017/1012/pdfs/ukxi_20171012_en.pdf

NATURAL ENVIRONMENT AND RURAL COMMUNITIES ACT 2006

This Act places a specific duty to conserve biodiversity on all public bodies, including Local Planning Authorities. In order to aid with this process Section 41 of the Act requires the Secretary of State to publish lists of living organisms and habitats which are of principal importance for the purpose of conserving biodiversity. These are the national Biodiversity Action Plan (BAP) lists, and BAP projects are also undertaken at a County, Borough or District level.

For further information see: <https://www.legislation.gov.uk/ukpga/2006/16/part/3>

Technical Appendix 2

Local Planning Policy

Havant Borough Local Plan

Havant Borough Council Local Plan 2036 Pre-submission Draft 04 Feb-18 March 2019

E14 | The Local Ecological Network

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

- a. The development results in biodiversity net gain;
- b. The development avoids the fragmentation of the Local Ecological Network including across administrative boundaries;
- c. The applicant has identified and assessed the level of ecological value of the site through adequate and proportionate information and any matters arising have been addressed through an avoidance or mitigation plan; and
- d. Any necessary mitigation plan includes provision for ongoing management and maintenance.

In addition to the above, priority habitats in the Borough are afforded protection by specific nature conservation designations. Development proposals which could affect a designated site will need to consider the impact and respond appropriately.

International Nature Conservation Designations

Development which has the potential to have an impact on an international nature conservation designation will be subject to a Habitats Regulations Assessment and, if necessary, an Appropriate Assessment, to determine the potential for likely significant effects. Development that is likely to have an adverse effect, either alone or in combination with another project/plan, on the integrity of an international site will not be permitted unless it can be demonstrated that:

- e. Necessary avoidance or mitigation is secured such that in combination with other development there will be no adverse effects on the integrity of the designated sites; or
- f. There are no alternative sites for the proposal, there are reasons of overriding public benefit/interest and compensatory provision is secured.

National Nature Conservation Designations

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

- g. Development is unlikely to have an adverse effect either individually or in combination with other developments.

An exception to j) will only be made where:

- h. The benefit of development clearly outweighs the likely impact on the feature(s) of the designation; and

- i. Mitigation and/or compensation measures are secured to offset any likely impacts.

Local Nature Conservation Designations

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

- j. The value of the designation is retained and, where possible, enhanced in line with its original criteria for designation through avoidance and/or mitigation measures; or
- k. The benefit of the development can be shown to clearly outweigh the substantive nature conservation value of the site, and where the impact cannot be avoided nor mitigated, compensation is provided.

Joint working

The Council will continue to work collaboratively with partner authorities and bodies to develop a strategic approach towards air quality, green infrastructure and ecological networks.

Under duty-to-cooperate, the Council is committed to further investigating the adverse effect of nitrogen identified at the Solent Maritime SAC within Langstone Harbour and if necessary, the preparation of a Nitrogen Action Plan for air quality in partnership with Portsmouth City Council and other appropriate partners.

E15 | Protected Species

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

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

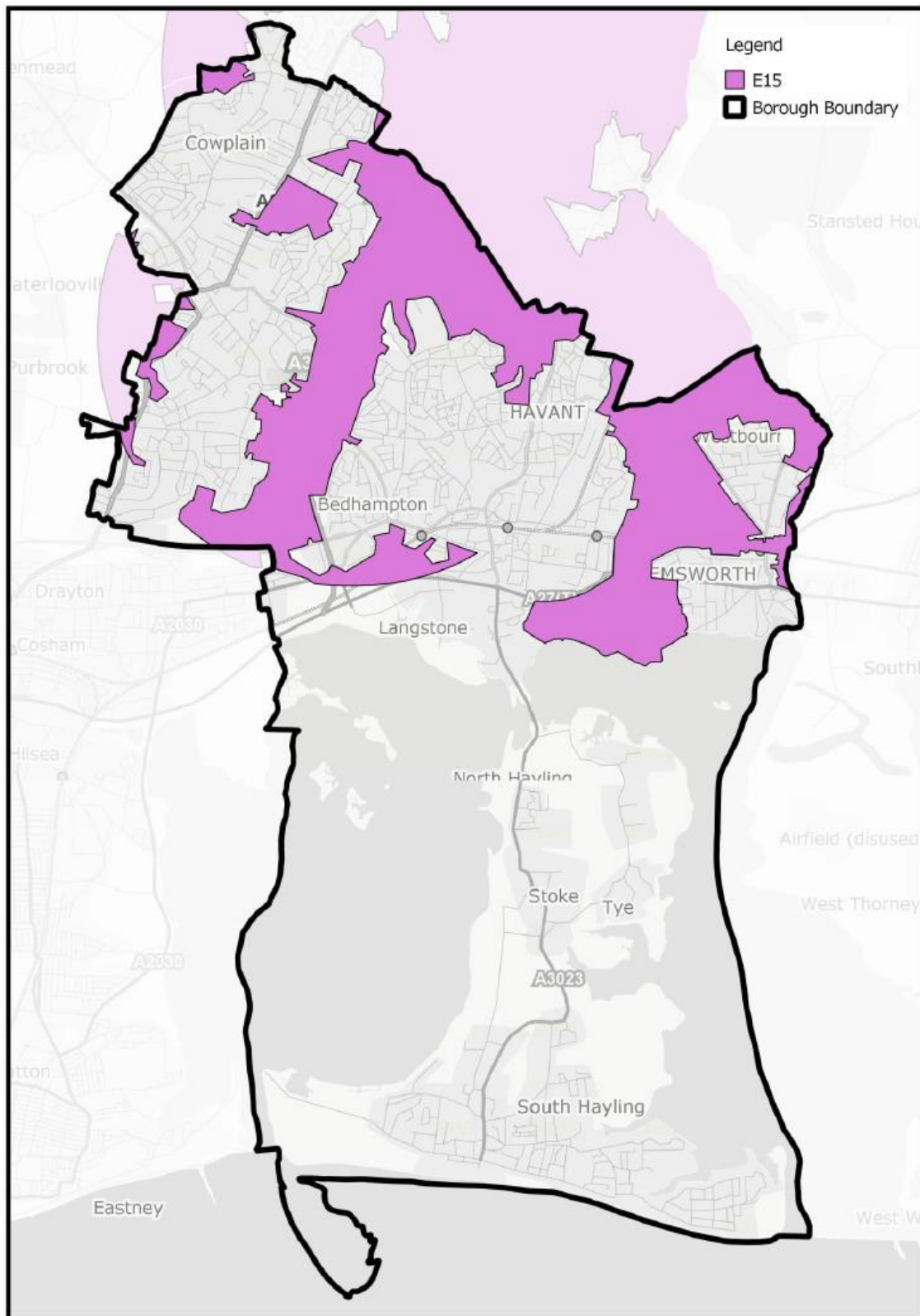
Bechstein's Bat

In instances where Bechstein's bat is likely to be found on site and/or nearby, survey methods appropriate to Bechstein's bat must be used and undertaken by a suitably qualified ecologist. If the presence of Bechstein's bat is established on site and/or nearby, planning permission will only be granted where:

- c. Impacts on Bechstein's bat breeding habitat (i.e. net loss of/significant disturbance to woodland or trees containing roosts) are avoided;
- d. Proposals include appropriate buffers to woodlands, trees, hedgerows and other flight corridors, considering the location of roosts and foraging/commuting habitats; and
- e. Review and monitoring plans are put in place.

Where the above measures cannot be met planning permission 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 population of the relevant protected species.

Figure 20: Bechstein's Bat area of search



E16 | Recreation impact on the Solent European Sites

Planning permission will be granted for new dwellings and/or overnight accommodation that mitigates the likely significant effect on the Solent European Sites. This mitigation can be provided through either:

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

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

EX1 | Water Quality impact on Solent European Sites

New dwellings and/or development resulting in a net gain in overnight accommodation which would cause a likely significant effect on the designated sites will need to provide a nutrient budget.

Planning permission will only then be granted if a mitigation package is provided which will remove the likely significant effect. This mitigation can be provided through either:

- a. A financial contribution towards the Council's strategic mitigation package; or
- b. A developer provided package of measures associated with the proposed development supported by evidence that it will avoid or mitigate any likely significant effect on the Solent European Sites; or
- c. A combination of measures in (a) and (b) above.

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

E17 | Solent Wader and Brent Goose feeding and roosting sites

Development proposals on, or adjacent to, sites which are used by Solent waders and/or Brent Geese will be assessed in line with the appropriate regulations. These proposals will, therefore, require a project level Habitats Regulations Assessment and, if necessary, an Appropriate Assessment. The Council will consider the Solent Waders and Brent Goose (SWBG) Strategy and the latest survey data when making such an assessment. **Allocations**

Rook Farm (H27)

Development proposals at Rook Farm (H27), which is located on a Core Area, will only be permitted where suitable replacement habitat is provided in perpetuity as part of the Hayling Island Brent Goose Refuge (E26), or alternative provision agreed in consultation with the local planning authority which:

- a. Contributes to a biodiversity net gain to the SWBG network;
- b. Is of an equal or, where possible, greater size and quality to the Core Area being lost or damaged; and
- c. Is secured through a costed Habitat Management and Monitoring Plan.

Land north of Sinah Lane (H29)

Development proposals at Land north of Sinah Lane (H29), which is located on a Primary Support Area, will only be permitted where suitable replacement habitat is provided on-site and in perpetuity which:

- a. Contributes to a biodiversity net gain to the SWBG network;
- b. Is suitable in terms of habitat type and quality for at least the number of SWBG recorded on the site being lost; and
- c. Is secured through a costed Habitat Management and Monitoring Plan.

Campdown (H40)

Development proposals at Campdown (H40), which is located on a Primary Support Area and a Secondary Support Area, will only be permitted where suitable replacement habitat is provided in perpetuity as part of Warblington Farm (EX2), or alternative provision agreed in consultation with the local planning authority which:

- d. Contributes to a biodiversity net gain to the SWBG network;
- e. Is suitable in terms of habitat type and quality for at least the number of SWBG recorded on the site being lost; and
- f. Is secured through a costed Habitat Management and Monitoring Plan

Core Areas and Primary Support Areas

Development proposals, other than on those sites specifically allocated in this Plan, which would involve the loss of all or part of a Core Area or Primary Support Area, will be refused.

Secondary Support Areas

Development proposals on Secondary Support Areas will only be permitted where either:

- g. A suitable replacement habitat is provided on a like for like basis on or within the locality of the site which is agreed and secured through a costed Habitat Management and Monitoring Plan; or

- h. Where it can be demonstrated that criterion g) is not practicable, a smaller suitable replacement area is agreed and secured through a costed Habitat Management and Monitoring Plan and a financial contribution is provided consistent with the SWBG Strategy.

Low Use

Development proposals on Low Use Sites will only be permitted where:

- i. On site mitigation is provided which is based upon appropriate ecological assessments to the satisfaction of the Council and Natural England; or
- j. A financial contribution is provided consistent with the SWBG Strategy.

Candidate Sites

Development proposals on Candidate Sites will only be permitted where:

- k. One or two-consecutive years' survey is undertaken to determine the classification of the site; and
- l. Once the classification of the site is established, the above requirements are met according to the status of the site.

Indirect effects

Development proposals adjacent to sites used by SWBG will only be permitted where access and disturbance to the adjacent SWBG site is prevented. This can either be achieved by avoiding development close to the adjacent SWBG site, or by providing a package of avoidance and/or mitigation measures which are agreed with the Council.

Delivery and Management of Replacement Habitat

Where suitable replacement habitat is required to offset the loss or damage to a SWBG site, the replacement land will need to be provided prior to commencement of development.

The land for replacement habitat should be within the locality of the site and managed in a suitable condition for SWBG prior to the loss or damage to the SWBG area being proposed for development. The land should be secured and managed through an agreed costed Habitat Management and Monitoring Plan in perpetuity.

E18 | Trees, hedgerows and woodland

Development affecting trees, hedgerows and woodlands will only be permitted where it:

- a. Reflects, conserves or enhances the existing landscape and integrates the development into its surroundings, adding visual interest and amenity;
- b. Adequately protects existing trees and hedgerows including their root systems prior to, during and after the construction process; and
- c. Will not result in the loss or deterioration of ancient woodland and ancient or veteran trees.

The Council will refuse planning permission for proposals that threaten the retention of important trees, hedgerows, and woodland, unless the need for, and benefits of development in that location clearly outweigh the impact of the proposal.

Provision of new trees are expected as part of development proposals for new homes and commercial floorspace. Planning permission will be granted where it:

- d. Facilitates adaptation to climate change by providing shade, shelter and cooling through new tree planting; and
- e. Includes proposals for the successful implementation, maintenance and management of landscape and tree planting schemes.

Biodiversity Policy Core Strategy Adopted Allocations Plan (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.

- 9.18 Havant Borough is an internationally important wintering location for Brent Geese and wading bird species and as a result the coastal areas around Chichester and Langstone Harbours have been designated as Special Protection Areas (SPAs). Brent Geese and wading bird species are dependent on a network of habitats for feeding and roosting that fall outside of the SPAs. The sites of value have been identified in the Solent Waders and Brent Goose Strategy (2010) and identified as sites of 'important' or 'uncertain' value. These sites are critically linked to the integrity of the European and internationally designated sites and their development should be avoided where possible, and where this cannot be avoided negative impacts should be mitigated.

- 9.19 Proposals on or adjacent to important Brent Geese and wading bird sites must be assessed and subject to the tests of the Habitats Regulations, in order to demonstrate levels of impact, alone and in combination with other proposals. Suitable avoidance and mitigation measures will be required, proportionate to the level of risk to the SPA bird populations, and those measures put in place prior to development taking place. These measures may include carrying out construction works outside of the core winter period (October-March inclusive), or enhancing the feeding or roosting site to increase its capacity through favourable management. Such measures should be subject to consultation between the council and Natural England.
- 9.20 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 habitat may be considered. Replacement habitat may include the creation of new feeding or roosting sites (or 'refuges'), or improvements to the management of less frequently used sites to provide an equivalent level of resource. Given the right conditions (location, size, habitat and appropriate management), it is possible that coastal birds will exploit new sites or refuges. The important factors to consider in the creation of new sites or refuges for this purpose have been identified in the Solent Waders and Brent Goose Strategy (2010). Any replacement habitat must be subject to meeting the tests of the Habitats Regulations. Advice must also be sought from Natural England as to the most appropriate course of action on a case-by-case basis. Where a negative impact upon an important site cannot be avoided or mitigated, or appropriate replacement habitat is not or cannot be provided, the proposal will be refused.
- 9.21 Where data on sites of 'important' or 'uncertain' value is limited or out of date, site surveys should be undertaken to determine their level of importance. The authority recommends that the survey methodology set out in the Solent Waders and Brent Geese Strategy (2010) is followed. Appropriate methodologies should be approved by a professional ecologist and prepared in consultation with Natural England. For surveys to be considered valid, reasonable measures should be taken not to reduce the site's suitability for Brent Geese and waders during the survey period. In all cases, three consecutive years of recent survey data should ideally be carried out across the overwintering seasons and a record of any sightings on or adjacent to the application site will be required. Existing records for Brent Geese and wading bird species in Langstone Harbour are held by the Hampshire Biodiversity Information Centre, and records for Chichester Harbour are held by the Chichester Harbour Conservancy.
- 9.22 The Allocations Plan has been subject to an Appropriate Assessment under the Habitats Regulations, to help identify any potential negative impacts on the European wildlife sites, and means to avoid or mitigate such impacts, including those to the network of Brent Geese and wader sites outside of the SPAs. This forms part of the evidence base. It is considered that this policy provides sufficient flexibility to allow allocated sites that are designated as 'uncertain' sites for Brent Geese and/or waders to come forward for development within the plan period.

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.

Technical Appendix 3

Ecological Appraisal Method

Introduction

The methodology for this appraisal is based on the Guidelines for Ecological Impact Assessment (EcIA) in the United Kingdom published by the Chartered Institute of Ecology and Environmental Management (IEEM June 2006, CIEEM 2016). Regardless of whether a statutory Environmental Impact Assessment is required, these guidelines provide a robust framework for ecological assessment at any scale.

Desk Study

The first stage of the appraisal is a desk study of the proposed development site and associated Zone of Influence. This provides background information on the site and local environment so as to more effectively target field survey and further desk research.

The Multi Agency Geographical Information for the Countryside (MAGIC) database is searched for information regarding nationally or internationally designated sites within proximity of the development site.

The National Biodiversity Network (NBN) data base is searched to provide background information on local protected species records. The NBN provides access to a substantial volume of biodiversity data for the UK. Although rarely site specific, it does provide valuable background information on the local occurrence of protected species.

Where appropriate, the local environmental/biological records centre is consulted to provide information regarding locally identified sites and records of protected and/or notable species within the zone of influence of the proposed development.

Site Survey Methodology

The aims of the survey are to record land-use and broad vegetation types present on the site and in the surrounding areas, and to evaluate the habitats and vegetation communities ecological value along with the potential to support protected species, species of principal importance, and any other notable species.

Where relevant, habitat immediately adjacent to the site is also assessed as this can have a bearing on the possible presence of protected species on the site and the ecology of adjacent areas can be affected by development nearby.

Habitats and Vegetation

Habitats and vegetation communities are recorded on a broad scale by visually noting contrasting land uses, vegetation zones and landscape features, such as hedgerows and trees. Dominant plant species are recorded in each of the areas identified, as are any notable plant species, such as protected species and habitats or notifiable weeds.

Protected Species

Many plant and animal species are legally protected in the UK. Some, such as bats, badger, water vole and great crested-newt are commonly encountered on development sites.

Case law has established (Regina vs. The Cornwall County Council ex parte Hardy 2001) that “It is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed development, is established before the planning permission is granted.

For the most regularly encountered protected species, a brief summary of methods follows:

Bats

Bats use buildings and trees for roosting and breeding, and so the potential for any of these features on site to support bats was considered, as was the sites potential for providing bat foraging habitat. An Appraisal survey will consider potential features that could support a Bat roost, and this may include external inspections of the trees and buildings on site. The Appraisal survey will also consider bat habitats in relation to foraging and commuting potential, with semi-natural vegetation features considered and evaluated.

Where an inspection is undertaken this will look for the presence of bats as well as signs of their presence such as Bat droppings, e.g. within cavities and buildings; Staining at potential roost access points; Lack of bat evidence cannot be taken to mean the lack of use by bats because of a number of potential limitations:

- Signs of bats can be easily washed off by wind or rain;
- Droppings are hard to see where rubble and other floor debris may obscure them;
- Low numbers of droppings can easily be missed especially where they may become damp and deteriorate;
- Evidence of bats may not be apparent where bats roost out of view, such as in tree cavities etc.

Badgers

An initial inspection is undertaken during the Appraisal survey for evidence of the presence of Badgers *Meles meles*, in particular Badger setts, on or near to the site. The Appraisal will search for presence of Badger foraging activity and territorial behaviour. Such signs include foraging trails, foraging scrapes in short grass, which are commonly known as 'snuffle holes' (shallow scrapes in soft ground or even turf rolling created by foraging for ground-dwelling invertebrates such as worms and grubs), footprints, hairs caught under fences, sett entrances, and latrine sites.

Dormice

The Appraisal survey will consider the potential for presence of Dormouse on or near the site, principally through habitat suitability, combined with data on occurrence within the area from the data search. Where suitable habitat occurs, further survey for feeding signs on hazel nuts where Hazel occurs, and searches for arboreal nests. If it a site is considered suitable, further Phase 2 survey work may be required.

Other Mammals

Consideration is also given in an Appraisal survey to the potential for habitats to support other legally protected mammals, and those of nature conservation significance. Where waterbodies and watercourses occur on or near to the site, the potential presence of species including Water Vole *Arvicola amphibious* and Otter *Lutra lutra* are considered. Depending upon the geographic location consideration is also given to species such as Red Squirrel.

Breeding Birds

Any notable bird species seen during the Appraisal survey are recorded. The type and quality of breeding, foraging and roosting habitats available for birds is also considered and interpreted with particular reference to protected or notable bird species, and birds of conservation concern.

Consideration is given to any features which could support nesting birds, including buildings and other structures, and areas of vegetation that may be affected by a development.

Reptiles

Any areas of habitat considered suitable for supporting reptiles are noted (for example, areas of rough grassland and scrub, banks, burrows, and rubble piles, compost heaps). If a site is considered suitable, further Phase 2 survey is usually required if an impact from the development or project is considered likely.

Great Crested Newt

An Appraisal Survey considers habitat suitability, through the occurrence of suitable ponds and/or terrestrial habitat, and this will be combined with knowledge on their distribution from biological records for the area. If a site is considered suitable, further Phase 2 survey is usually required if an impact from the development or project is considered likely.

Invertebrates

A very small proportion of invertebrates are afforded legal protection under the Wildlife and Countryside Act 1981 (as amended), although a relatively high number of invertebrates are included within the UK and local BAPs, and many more species are identified as being Nationally Scarce. Most invertebrates require specialist knowledge in order to identify them, although some groups, including butterflies and dragonflies, can be readily identified by generalists. Therefore, apart from recording any species of these readily identifiable groups, an Appraisal Survey concentrates on recording the presence of any key habitats of nature conservation importance considered suitable for supporting more scarce and restricted invertebrates, for example bare ground, dead wood and botanically rich habitats.

Survey Constraints and Limitations

An Appraisal survey is carried out during a brief window of time. Therefore the survey can only provide a snapshot of the range of plants and animals that might be present. However, professional judgement is used to interpret the habitat features recorded, and their likely value for supporting protected and notable species, including species of principal importance. Survey was restricted through land access as it is unusual to have a landowner owning land surrounding that which is being surveyed.

Assessment Guidelines

Introduction

The IEEM guidelines (2006) and updated in 2016 (CIEEM, 2016) provide three principal reasons for an ecological feature being valued and therefore included: biodiversity value, social/community value, and economic value.

The evaluation and assessment undertaken assigns one of a number of value labels based on a geographic scale as follows:

- International
- National
- Regional
- County
- District
- Local (Parish)
- Within the zone of influence

Value is determined with reference to the following factors:

- level of designation (sites) or biodiversity-based protection (legal and policy);
- biodiversity value (e.g. inclusion in Biodiversity Action Plans, rarity, position in ecosystem, assemblages and communities, size and diversity);
- social and economic value;
- legal issues (eg protected sites).

All impacts of the scheme on features of local importance or greater are assessed in the impact assessment stage

Assessment of Likely Impacts

The ecological impact assessment methodology used is based on the following considerations.

Characterisation of Likely Impacts

The potential impacts identified as a result of the proposals are characterised according to the following parameters:

- Positive or negative
- Magnitude (and extent if not synonymous)
- Duration
- Reversibility
- Timing and frequency

Significance of Impact

A significant impact on a valued ecological feature (whether negative or positive) is defined in CIEEM's guidelines as an impact on the integrity of a defined site or ecosystem, and/or the

conservation status of habitats or species within a given geographical area. These terms are defined below.

Integrity

Integrity is defined as follows. *‘The integrity of a site is the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified.’* A site or ecosystem that achieves this is considered to be at favourable conservation status.

Conservation Status

For habitats, conservation status is determined by the sum of the influences acting on the habitat and its typical species, which may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species within a given geographical area.

For species, conservation status is determined by the sum of the influences acting on the species, which may affect the long-term distribution and abundance of its populations within a given geographical area.

Impact Prediction

For guidance as to whether an impact is likely to result in an adverse effect on the integrity or conservation status of a feature, reference has been made to the conservation objectives for that feature where they are available, for example in habitat and species action plans. Otherwise professional judgement has been made based on available information.

The confidence in the prediction that an activity will give rise to a significant adverse impact on a valued ecological feature is given based on a four point scale:

- Certain (or near-certain);
- Probable;
- Unlikely; and
- Extremely unlikely

Drawing Assessment Together

The above factors – value, integrity and conservations status of the feature, prediction and characterisation of the impact and overall significance of the impact is brought together in the final assessment. This is done without additional mitigation measures that may be proposed. An impact is then summarised as significant or not.

Mitigation, Compensation and Enhancement

Where impacts are characterised as significant mitigation or compensation may be offered to prevent, reduce or offset such impacts. In addition enhancement measures may be built into a scheme to ensure that the scheme is compliant with the proactive measures outlined in the latest Government policy on nature conservation (National Planning Policy Framework).

Technical Appendix 4

Data Search &

Designated Sites Citation Sheets

SPA description

(information as published 2001)

Chichester and Langstone Harbours

Country	England
Unitary Authority	City of Portsmouth, West Sussex, Hampshire
SPA status	Classified 28/10/1987
Latitude	50 48 23 N
Longitude	00 55 12 W
SPA EU code	UK9011011
Area (ha)	5810.03
Component	Chichester Harbour
SSSI/ASSIs	Langstone Harbour



Chichester and Langstone Harbours are located on the south coast of England in Hampshire and West Sussex. They are large, sheltered estuarine basins comprising extensive sand- and mud-flats exposed at low tide. The two harbours are joined by a stretch of water that separates Hayling Island from the mainland. Tidal channels drain the basin and penetrate far inland. The mud-flats are rich in invertebrates and also support extensive beds of algae, especially *Enteromorpha* species, and eelgrasses *Zostera* spp. The basin contains a wide range of coastal habitats supporting important plant and animal communities. The site is of particular significance for waterbirds, especially in migration periods and in winter. It also supports important colonies of breeding terns.

Qualifying species

For individual species accounts visit the [Species Accounts section](#)

This site qualifies under **Article 4.1** of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

During the breeding season;

Little Tern *Sterna albifrons*, 100 pairs representing up to 4.2% of the breeding population in Great Britain (5 year mean, 1992-1996)

Sandwich Tern *Sterna sandvicensis*, 158 pairs representing up to 1.1% of the breeding population in Great Britain (1998)

On passage;

Little Egret *Egretta garzetta*, 137 individuals representing up to 17.1% of the population in Great Britain (Count as at 1998)

Solent Maritime

Site details

Country	England
Unitary Authority	City of Portsmouth; City of Southampton; Hampshire; Isle of Wight; West Sussex
Centroid*	SU756003
Latitude	50 47 47 N
Longitude	00 55 40 W
SAC EU code	UK0030059
Status	Designated Special Area of Conservation (SAC)
Area (ha)	11325.09

* This is the approximate central point of the SAC. In the case of large, linear or composite sites, this may not represent the location where a feature occurs within the SAC.

General site character

Marine areas. Sea inlets (14%)
 Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins) (59%)
 Salt marshes. Salt pastures. Salt steppes (23%)
 Coastal sand dunes. Sand beaches. Machair (0.5%)
 Shingle. Sea cliffs. Islets (3%)
 Broad-leaved deciduous woodland (0.5%)

[Boundary map](#) and associated biodiversity information on the NBN Gateway.

[Natura 2000 data form](#) for this site as submitted to Europe (PDF format, size 30kb).

[Interactive map](#) from MAGIC (Multi-Agency Geographic Information for the Countryside).



Location of Solent Maritime SAC/SCI/cSAC

Note:

When undertaking an appropriate assessment of impacts at a site, **all** features of European importance (both primary and non-primary) need to be considered.

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

1130 Estuaries

The Solent encompasses a major estuarine system on the south coast of England with four coastal plain **estuaries** (Yar, Medina, King's Quay Shore, Hamble) and four bar-built **estuaries** (Newtown Harbour, Beaulieu, Langstone Harbour, Chichester Harbour). The site is the only one in the series to contain more than one physiographic sub-type of estuary and is the only cluster site. The Solent and its inlets are unique in Britain and Europe for their hydrographic regime of four tides each day, and for the complexity of the marine and estuarine habitats present within the area. Sediment habitats within the estuaries include extensive estuarine flats, often with intertidal areas supporting eelgrass *Zostera* spp. and green algae, sand and shingle spits, and natural shoreline transitions. The mudflats range from low and variable salinity in the upper reaches of the estuaries to very sheltered almost fully marine muds in Chichester and Langstone Harbours. Unusual features include the presence of very rare sponges in the Yar estuary and a sandy 'reef' of the polychaete *Sabellaria spinulosa* on the steep eastern side of the entrance to Chichester Harbour.

1320 Spartina swards (*Spartinion maritimae*)

Solent Maritime is the only site for smooth cord-grass *Spartina alterniflora* in the UK and is one of only two sites where significant amounts of small cord-grass *S. maritima* are found. It is also one of the few remaining sites for Townsend's cord-grass *S. x townsendii* and holds extensive areas of common cord-grass *Spartina anglica*, all four taxa thus occurring here in close proximity. It has additional historical and scientific interest as the site where *S. alterniflora* was first recorded in the UK (1829) and where *S. x townsendii* and, later, *S. anglica* first occurred.

1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

The Solent contains the second-largest aggregation of **Atlantic salt meadows** in south and south-west England. Solent Maritime is a composite site composed of a large number of separate areas of saltmarsh. In contrast to the Severn estuary, the salt meadows at this site are notable as being representative of the ungrazed type and support a different range of communities dominated by sea-purslane *Atriplex portulacoides*, common sea-lavender *Limonium vulgare* and thrift *Armeria maritima*. As a whole the site is less truncated by man-made features than other parts of the south coast and shows rare and unusual transitions to freshwater reedswamp and alluvial woodland as well as coastal grassland. Typical **Atlantic salt meadow** is still widespread in this site, despite a long history of colonisation by cord-grass *Spartina* spp.

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site

1110 Sandbanks which are slightly covered by sea water all the time**1140 Mudflats and sandflats not covered by seawater at low tide****1150 Coastal lagoons * Priority feature****1210 Annual vegetation of drift lines****1220 Perennial vegetation of stony banks****1310 *Salicornia* and other annuals colonising mud and sand****2120 Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')**

Annex II species that are a primary reason for selection of this site

Not applicable.

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

1016 Desmoulin's whorl snail *Vertigo moulinsiana*

Many designated sites are on private land: the listing of a site in these pages does not imply any right of public access.

Solent and Isle of Wight Lagoons

Site details

Country	England
Unitary Authority	City of Portsmouth; Hampshire; Isle of Wight
Centroid*	SZ608977
Latitude	50 46 30 N
Longitude	01 08 13 W
SAC EU code	UK0017073
Status	Designated Special Area of Conservation (SAC)
Area (ha)	36.24

* This is the approximate central point of the SAC. In the case of large, linear or composite sites, this may not represent the location where a feature occurs within the SAC.

General site character

Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins) (91.7%)
Salt marshes. Salt pastures. Salt steppes (8.3%)

[Boundary map](#) and associated biodiversity information on the NBN Gateway.

[Natura 2000 data form](#) for this site as submitted to Europe (PDF format, size 30kb).

[Interactive map](#) from MAGIC (Multi-Agency Geographic Information for the Countryside).



Location of Solent and Isle of Wight Lagoons SAC/SCI/cSAC

Note:

When undertaking an appropriate assessment of impacts at a site, **all** features of European importance (both primary and non-primary) need to be considered.

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

1150 Coastal lagoons * Priority feature

The Solent on the south coast of England encompasses a series of **Coastal lagoons**, including percolation, isolated and sluiced lagoons. The site includes a number of lagoons in the marshes in the Keyhaven – Pennington area, at Farlington Marshes in Chichester Harbour, behind the sea-wall at Bembridge Harbour and at Gilkicker, near Gosport. The lagoons show a range of salinities and substrates, ranging from soft mud to muddy sand with a high proportion of shingle, which support a diverse fauna including large populations of three notable species: the nationally rare foxtail stonewort *Lamprothamnium papulosum*, the nationally scarce lagoon sand shrimp *Gammarus insensibilis*, and the nationally scarce starlet sea anemone *Nematostella vectensis*. The lagoons in Keyhaven – Pennington Marshes are part of a network of ditches and ponds within the saltmarsh behind a sea-wall. Farlington Marshes is an isolated lagoon in marsh pasture that, although separated from the sea by a sea-wall, receives sea water during spring tides. The lagoon holds a well-developed low-medium salinity insect-dominated fauna. Gilkicker Lagoon is a sluiced lagoon with marked seasonal salinity fluctuation and supports a high species diversity. The lagoons at Bembridge Harbour have formed in a depression behind the sea-wall and sea water enters by percolation. Species diversity in these lagoons is high and the fauna includes very high densities of *N. vectensis*.

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site

Not applicable.

Annex II species that are a primary reason for selection of this site

Not applicable.

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

Not applicable.

Many designated sites are on private land: the listing of a site in these pages does not imply any right of public access.

SPA description

(information as published 2001)

Portsmouth Harbour

Country	England
Unitary Authority	City of Portsmouth, Hampshire
SPA status	Classified 28/02/1995
Latitude	50 49 41 N
Longitude	01 07 32 W
SPA EU code	UK9011051
Area (ha)	1248.77
Component SSSI/ASSIs	Portsmouth Harbour



Portsmouth Harbour is located on the central south coast of England. It is a large industrialised estuary and includes one of the four largest expanses of mud-flats and tidal creeks on the south coast of Britain. The mud-flats support large beds of Narrow-leaved Eelgrass *Zostera angustifolia* and Dwarf Eelgrass *Z. noltii*, extensive green algae beds, mainly *Enteromorpha* species, and Sea Lettuce *Ulva lactuca*.

Portsmouth Harbour has only a narrow connection to the sea via the Solent, and receives comparatively little fresh water, thus giving it an unusual hydrology. The site supports important numbers of wintering Dark-bellied Brent Goose *Branta b. bernicla*, which feed also in surrounding agricultural areas away from the SPA.

Qualifying species

For individual species accounts visit the [Species Accounts section](#)

This site qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

Over winter;

Dark-bellied Brent Goose *Branta bernicla bernicla*, 2,847 individuals representing at least 0.9% of the wintering Western Siberia/Western Europe population (5 year peak mean 1991/2 - 1995/6)

Note:

Many designated sites are on private land: the listing of a site in these pages does not imply any right of public access.

Note that sites selected for waterbird species on the basis of their occurrence in the breeding, passage or winter periods also provide legal protection for these species when they occur at other times of the year.

File ref:

County: Hampshire Site Name: Langstone Harbour SSSI

Local Planning Authority: Hampshire County Council, Havant Borough Council, Portsmouth City Council

National Grid Reference: SU 700030

Ordnance Survey Sheet 1:50,000: 197 1:25,000: SU 60, 70; SZ 69, 79

Area: 2,069.4 (ha) 5.113.4 (ac)

Date Notified (Under 1949 Act): 1958 Date of Last Revision: 1979

Date Notified (Under 1981 Act): 1985 Date of Last Revision: -

Other Information:

Farlington Marshes (118.9 ha) is a Local Nature Reserve owned by Portsmouth City Council and managed by the Hampshire and Isle of Wight Naturalists' Trust under a long lease; 550 ha including a series of saltmarsh islands and extensive mud flats are owned by the Royal Society for the Protection of Birds.

Reasons for Notification:

Langstone Harbour is a tidal basin which at high water resembles an almost land-locked lake. At low water extensive mud flats are exposed, drained by three main channels which unite to make a common and narrow exit to the sea. The harbour includes one of the largest areas of mixed saltmarsh on the south coast, and extensive cord-grass *Spartina anglica* marsh in an advanced state of degeneration. The Site of Special Scientific Interest including Farlington Marshes, a peninsula of grassland and marsh on reclaimed tidal silt protected by a sea wall; and a similar but much smaller area at Southmoor in the north-east of the harbour. The harbour is of international importance as a rich intertidal system supporting high densities of intertidal invertebrates and large populations of migrant and overwintering waders and wildfowl, dependent upon them and upon the extensive beds of eelgrass *Zostera* species. The *Zostera angustifolia* and *Z. noltii* beds are among the largest in Britain. The harbour is among the twenty most important intertidal areas in Britain as a summer and autumn assembly ground for waders during the moult (when they require abundant high protein food) and as a post-moult wintering ground. Dunlin *Calidris alpina* often exceed 30,000 individuals, or 6% of the British winter population, or 3% of the European and North African wintering population. Grey plover *Pluvialis squatarola* and black-tailed godwit *Limosa limosa* achieve numbers which represent 1-2% of the European and North African migration flyway population; and redshank *Tringa totanus* and ringed plover *Charadrius hiaticula* do so periodically. At times as many as 20% of the black-tailed godwit, 8% of the ringed plover and 8-10% of the grey plover wintering in Britain are present in the harbour. The total numbers of waders present sometimes exceeds 40,000. Langstone Harbour and the adjoining and connected Portsmouth and Chichester Harbours form a single, coherent ecosystem which is among the ten most important intertidal areas for waders in Britain. In the 1970s and 1980s Langstone Harbour alone has consistently supported in excess of 5,000 wintering dark-bellied geese *Branta bernicla*, or 5-10% of the world population depending on fluctuating population levels. It has supported up to 2.5% of the European winter population of shelduck *Tadorna tadorna* and regularly supports substantial numbers of other ducks in autumn and winter.

Farlington Marshes intrudes into the north-west sector of the harbour. Its vegetation is strongly influenced by drainage water from the chalk and by

brackish water infiltration. The marshes embrace a variety of habitats – brackish marsh, fresh marsh, a large lagoon with associated reed *Phragmites* beds, *Agrostis stolonifera* grassland and scrub. It is a vital high water wader roost for the Harbour and a major feeding ground for Brent geese after the *Zostera* beds in the Harbour have been consumed. Few comparable sites have survived agricultural improvement on the south and east coasts of England, where the habitat was formerly common: the grassland flora is especially rich for reclaimed silt, and includes over 50 species of grasses. Southmoor shares these characteristics but is much smaller.

Langstone Harbour has been the forum for important ecological research on estuarine eutrophication and the relationship with algal blanketing of the muds, changes in invertebrate communities and changes in the composition of vertebrate predator communities.

Local Nature Reserves

[◀ back](#)

Farlington Marshes

LNR Type:	Urban Fringe
County:	Hampshire
Natural England Regional Team:	South East
Year of Declaration:	1974
Declaring Authority:	Portsmouth City Council
Area (Ha):	Click here to open the site map (new window). Once displayed, click on the site to see area and other details.
Grid Reference:	SU 685 041
Location:	Eastern Road, Portsmouth. PO6 1UN
Owned by:	Portsmouth City Council
Managed by:	Hampshire and Isle of Wight Wildlife Trust
SSSI Type:	Biological
Link to site map:	Click here to open the site map from the MAGIC web site.
How to get there:	Nearest major road is A27. The western car park can be reached from the east Portsmouth A27 roundabout. The entrance is via small track between the A27 westbound exit and A2030 exit leading to Portsmouth. Train: nearest station is Hilsea – 1 mile.
Visitor facilities:	Farlington Marshes Car Park (Free) Guide Dogs permitted Tours available for groups There are benches at 300m intervals around the sea wall, and gates with RADAR locks at the entrances
What to see:	Farlington Marshes is the Trust's oldest nature reserve. It is 125 hectares (308 acres) of flower-rich grazing marsh on the northern shore of Langstone Harbour between Portsmouth and Havant.

Farlington is internationally important for the bird populations that it supports, as well as being a blaze of colour in spring and summer with many flowers and butterflies.

**Volunteer and
'Friends of'
groups:**

Volunteer through the Wildlife Trust
www.hiwwt.org.uk/pages/volunteering.html
Contact the Volunteering Manager, Gill Stanton
Tel 01489 774442
Email to volunteer@hwt.org.uk.

**Contacts for
further
information and
how to get
involved:**

Hampshire & Isle of Wight Wildlife Trust
Tel 01489 774446
Email WildLine@hwt.org.uk.
or try
Portsmouth City Council
Email parks@portsmouthcc.gov.uk
Tel 023 9283 4180

**Website
address and
other links:**

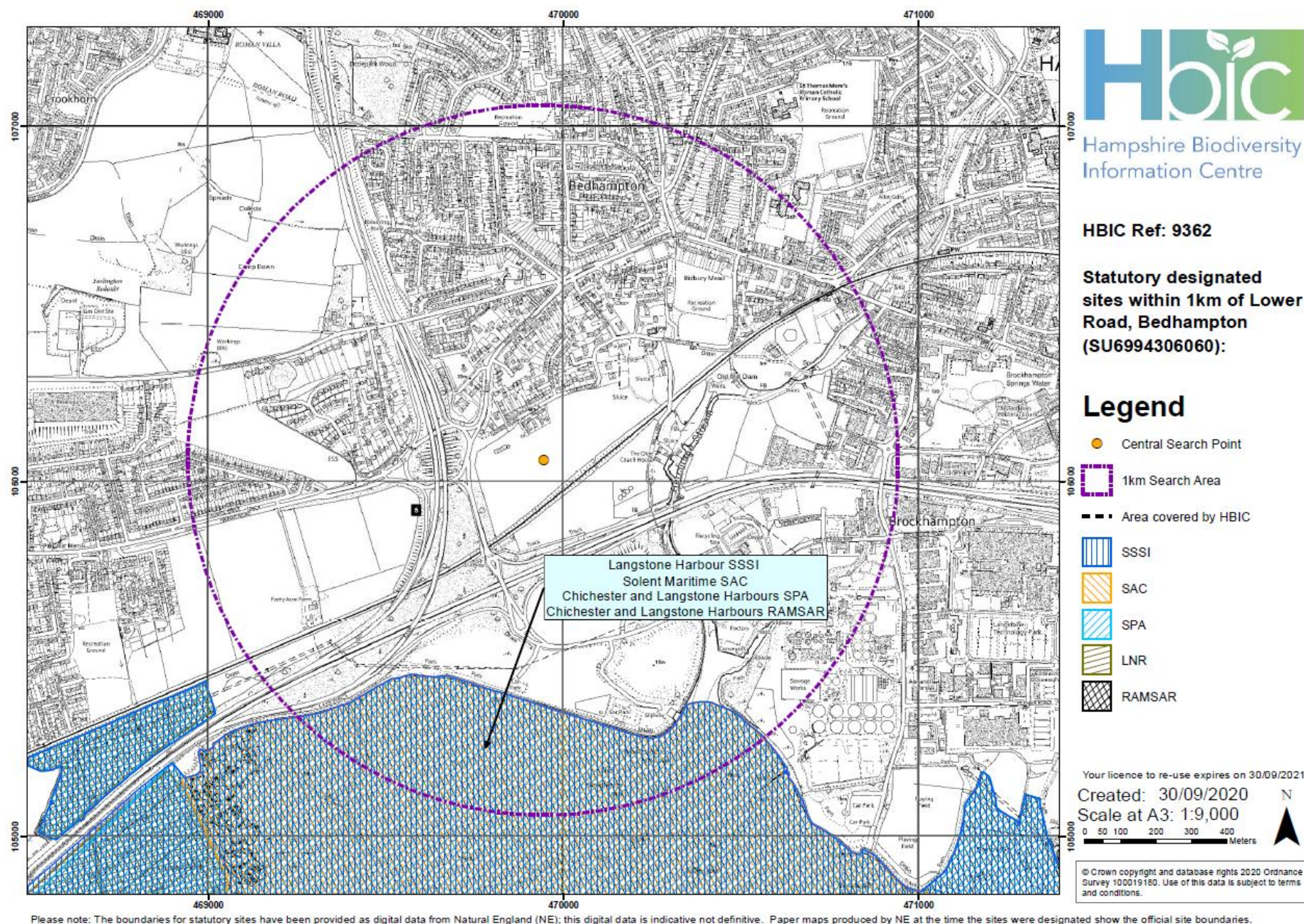
www.hiwwt.org.uk/pages/farlington-marshes-r.html
alternatively try
www.hiwwt.org.uk
www.portsmouth.gov.uk
and search for Farlington Marshes Local Nature Reserve

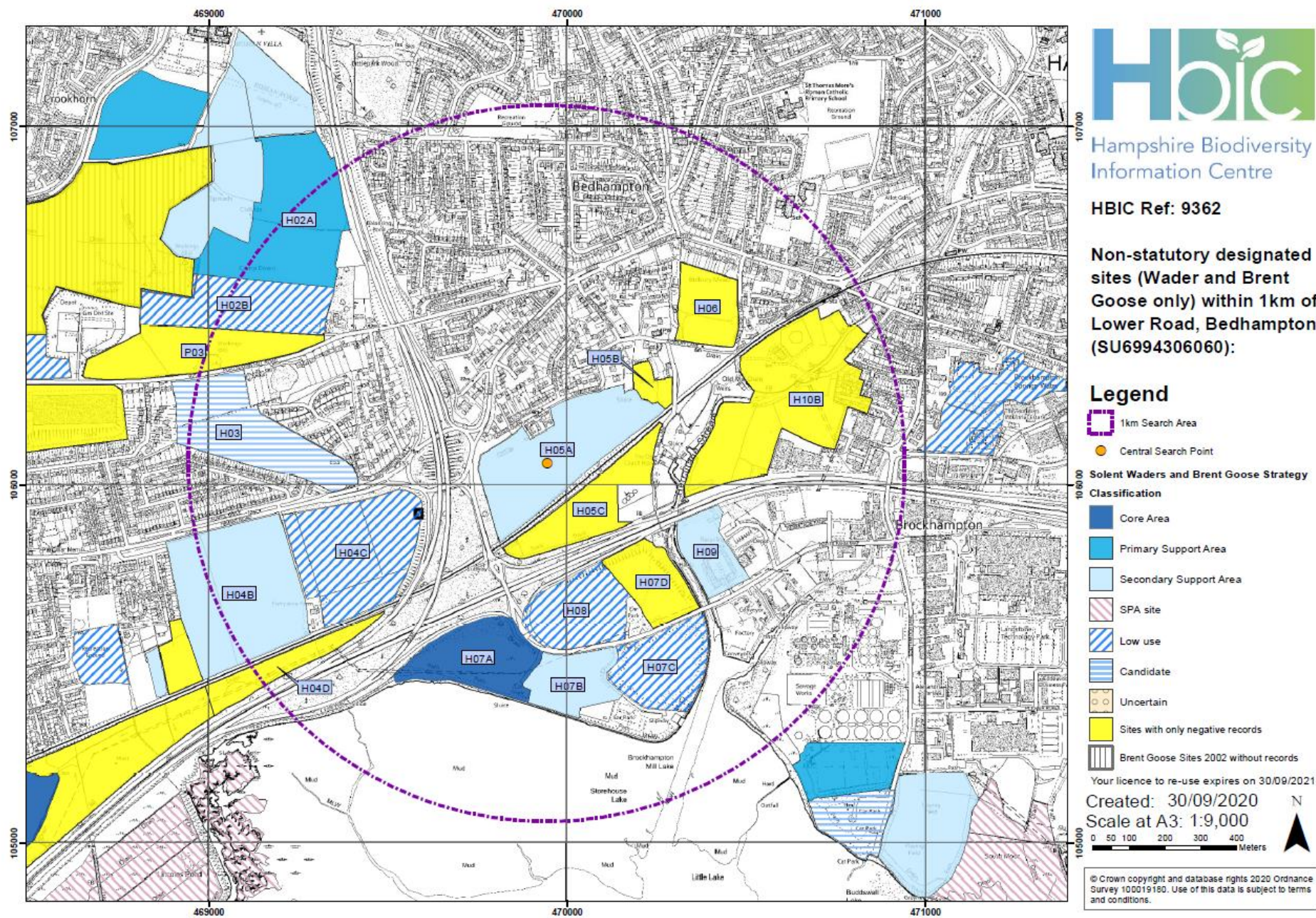
Last updated 11/03/13

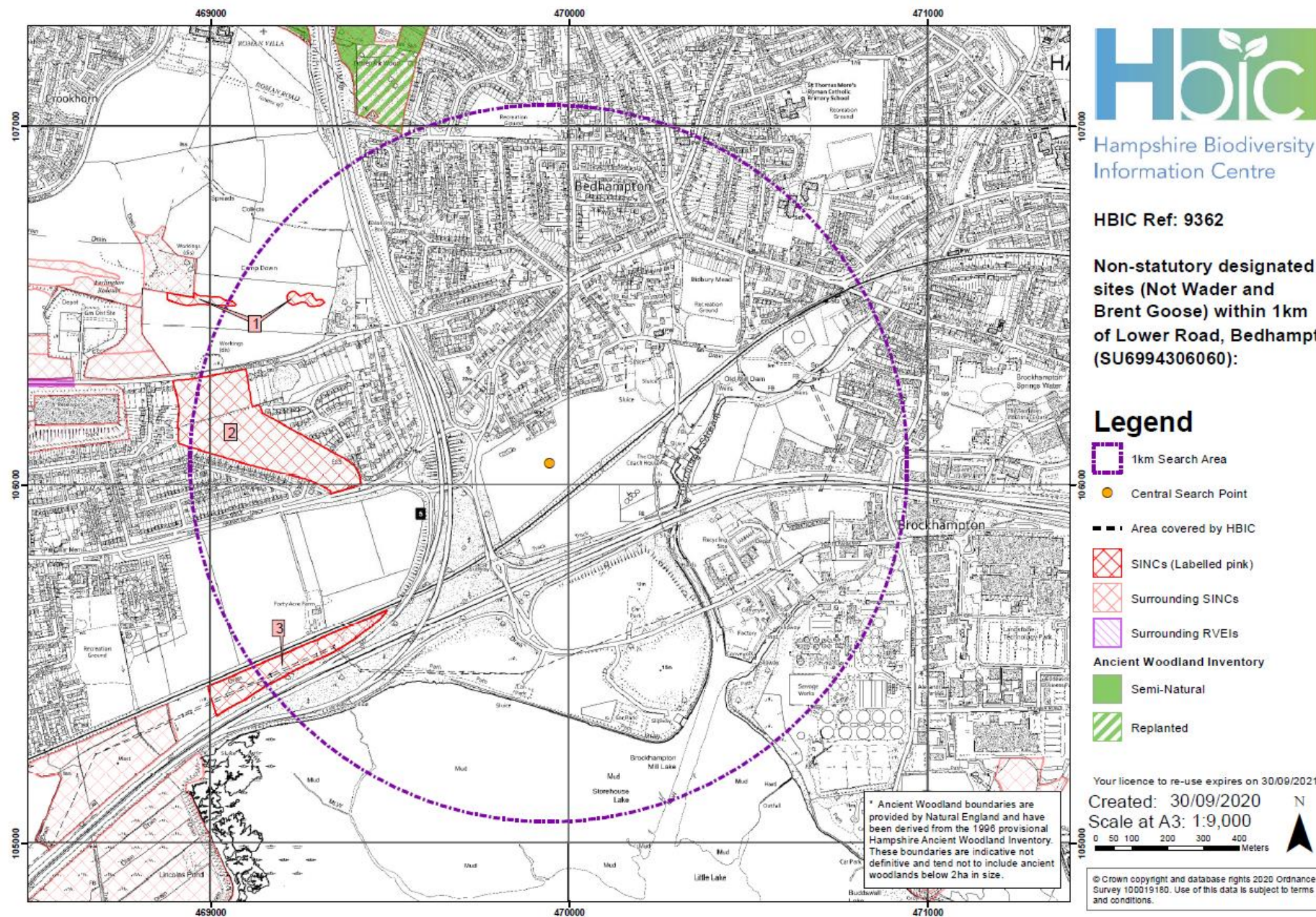
Chichester and Langstone Harbours Ramsar Site citation sheet is not reproduced, but can be accessed at: <http://jncc.defra.gov.uk/pdf/RIS/UK11013.pdf>

Portsmouth Harbour Ramsar Site citation sheet is not reproduced, but can be accessed at: <http://jncc.defra.gov.uk/pdf/RIS/UK11055.pdf>

Solent and Dorset Coast potential SPA consultation is provided here:
<https://www.gov.uk/government/consultations/solent-and-dorset-coast-potential-special-protection-area-comment-on-proposals>







Details of Sites of Importance for Nature Conservation (SINCs) within the search area (Data from HBIC):

Map Label	Status	SINC Ref	SINC Name	Central Grid Ref.	SINC Criteria	Species supported that meet Section 6 of SINC Selection Criteria	Area (ha)
1	SINC	HV0019	Camp Down Grassland Remnants	SU69000651	2D		0.66
2	SINC	HV0027	Fields off Havant Road	SU69180613	6A	Euphorbia exigua	8.11
3	SINC	HV0028	Farlington Marshes Grassland (North-East)	SU69200550	2A/4A		2.90

Please see [Criteria for SINCs in Hampshire](#) for more information on Sites of Importance for Nature Conservation in Hampshire.

Data on H05A & H05B from HBIC:**Details from the 2010 strategy-**

Site	Date	Season	Time on Site	Species	Count	Use	Disturbance
H05A	22/02/2009	2008-2009	10:35	No birds seen	0		No
H05A	03/12/2006	2006-2007	11:30	No birds seen	0		No
H05B	03/12/2006	2006-2007	11:30	No birds seen	0		No
H05B	17/03/2009	2008-2009	15:45	No birds seen	0		No

Details of further visits, since the strategy, sourced from HIWWT (HBIC)

Record_id	Source	Validated	Site	Date	Season	Time on Site	Species	Count	Use	Disturbance
1427	HIWWT	Yes	H05A	23/02/2013	2012-13		Lapwing	50	Feeding	

More recent visits-

Taxon_Comm	Taxon_Lati	No.	Sighting	Grid_Ref	Field_Code	Time_Seen	Crop_Type	Crop_Prote	Disturbanc	Submitted	SITE_ID	REFERENCE	AREA_HA
None		1	22 Nov 2013	SU70030608	null	11.50	plough	none	none	14 May 2014	H05A	SU700060	9.6162
None		1	22 Nov 2013	SU69950608	null	11.50	plough	none	none	14 May 2014	H05A	SU700060	9.6162
None		1	4 Dec 2013	SU69970605	null	10.35	plough	none	none	16 May 2014	H05A	SU700060	9.6162
None		1	14 Jan 2014	SU69950605	null	08.50	plough	none	none	20 May 2014	H05A	SU700060	9.6162
None		1	12 Feb 2014	SU69900603	null	08.40	plough	none	none	20 May 2014	H05A	SU700060	9.6162
None		1	13 Mar 2014	SU70000608	null	08:15	plough	none	none	20 May 2014	H05A	SU700060	9.6162
no waders	null	0	12 Nov 2012	SU69820609	H05A	14:45	null			17 Jun 2014	H05A	SU700060	9.6162
no brent geese	null	0	12 Nov 2012	SU69820609	H05A	14:45	null			17 Jun 2014	H05A	SU700060	9.6162
no waders	null	0	26 Nov 2012	SU69780604	H05A	09:20	null			17 Jun 2014	H05A	SU700060	9.6162
no brent geese	null	0	26 Nov 2012	SU69780604	H05A	09:20	null			17 Jun 2014	H05A	SU700060	9.6162
no waders	null	0	15 Jan 2013	SU69860616	H05A	14:20	null			17 Jun 2014	H05A	SU700060	9.6162
no brent geese	null	0	15 Jan 2013	SU69860616	H05A	14:20	null			17 Jun 2014	H05A	SU700060	9.6162
no waders	null	0	11 Feb 2013	SU69860616	H05A	12:20	null			17 Jun 2014	H05A	SU700060	9.6162
no brent geese	null	0	11 Feb 2013	SU69860616	H05A	12:20	null			17 Jun 2014	H05A	SU700060	9.6162
no waders	null	0	14 Mar 2013	SU69820612	H05A	12:20	null			17 Jun 2014	H05A	SU700060	9.6162
no brent geese	null	0	14 Mar 2013	SU69820612	H05A	12:20	null			17 Jun 2014	H05A	SU700060	9.6162

no waders	null	0	19 Dec 2012	SU69830611	H05A	12:20	null			17 Jun 2014	H05A	SU700060	9.6162
no brent geese	null	0	19 Dec 2012	SU69830611	H05A	12:20	null			17 Jun 2014	H05A	SU700060	9.6162
None		1	4 Dec 2013	SU70250626	null	11.00	scrub	none	none	16 May 2014	H05B	SU702062	0.9218
None		1	14 Jan 2014	SU70250626	null	09.20	scrub	none	none	20 May 2014	H05B	SU702062	0.9218
None		1	12 Feb 2014	SU70240625	null	08.55	scrub	none	none	20 May 2014	H05B	SU702062	0.9218
None		1	13 Mar 2014	SU70230628	null	08.35	scrub	none	none	20 May 2014	H05B	SU702062	0.9218
Little Egret	Egretta garzetta	1	26 Nov 2012	SU70270627	H05B	10:20	null			17 Jun 2014	H05B	SU702062	0.9218
no waders	null	0	26 Nov 2012	SU70160633	H05B	10:20	null			17 Jun 2014	H05B	SU702062	0.9218
no brent geese	null	0	26 Nov 2012	SU70160633	H05B	10:20	null			17 Jun 2014	H05B	SU702062	0.9218
no waders	null	0	19 Dec 2012	SU70130635	H05B	10:20	null			17 Jun 2014	H05B	SU702062	0.9218
no brent geese	null	0	19 Dec 2012	SU70130635	H05B	10:20	null			17 Jun 2014	H05B	SU702062	0.9218
no waders	null	0	14 Mar 2013	SU70130633	H05B	14:20	null			17 Jun 2014	H05B	SU702062	0.9218
no brent geese	null	0	14 Mar 2013	SU70130633	H05B	14:20	null			17 Jun 2014	H05B	SU702062	0.9218
no waders	null	0	12 Nov 2012	SU70160630	H05B	14:20	null			17 Jun 2014	H05B	SU702062	0.9218
no brent geese	null	0	12 Nov 2012	SU70160630	H05B	14:20	null			17 Jun 2014	H05B	SU702062	0.9218
no waders	null	0	11 Feb 2013	SU70140633	H05B	13:00				23 Jun 2014	H05B	SU702062	0.9218
no brent geese	null	0	11 Feb 2013	SU70140633	H05B	13:00				23 Jun 2014	H05B	SU702062	0.9218

Technical Appendix 5

Breeding Bird Survey

Legislation Relating to Birds

Part 1 of the Wildlife & Countryside Act, 1981 (as amended) protects any wild bird from intentional killing, injuring or taking whilst on the nest. In addition, it is an offence to take, damage or destroy the nest or eggs, whilst being built or in use. Furthermore 79 species listed on Schedule 1 of the Act have been afforded special protection from disturbance at the nest by way of their rarity, endangered, declining or vulnerable status.

At an international level a number of Conventions and European Union Directives have aimed to provide legal protection for wild bird species. These include the European Union Directive on the Conservation of Wild Birds, Directive 79/409/EEC, and the Berne Convention on the conservation of European wildlife and natural habitats.

The Wild Birds Directive provides across the EU a general protection for all birds occurring in a wild state, and additional protection for further species listed under Annex I of the Directive. The Directive requires the designation of Special Protection Areas (SPAs) in the most suitable habitats for Annex 1 species, and outside these areas Member States should also strive to avoid pollution or deterioration of habitats of birds.

Field Survey

Breeding bird survey work is undertaken in the spring time when birds are holding territories and are relatively easy to detect and monitor. A standard methodology involves visiting each part of a site on a minimum of two occasions at least 7-10 days apart, with further visits for complicated sites.

The breeding bird survey methods used were similar to the standard Common Bird Census (CBC) techniques adopted by the British Trust for Ornithology (BTO) and set out in Marchant (1983), Marchant *et al.* (1990), Bibby *et al.* (2000).

Time is spent on recording species present and identifying territory centres, territory range and size. This is done by noting what activity the birds recorded are undertaking. Sightings are noted on individual survey maps using standard codes for behaviour and species. Over a number of visits these maps can be collated and territories of species determined to a relative degree of accuracy. Further advice is also obtained from the methodology used by the BTO for their Breeding Bird Survey (BBS).

Visits are usually carried out one to two hours after dawn, as this is when the majority of species are most active and holding territory. A number of visits are usually also made at dusk in order to record species that are more visible at this time of day.

Survey Dates 2021:

Date	
12 April 2021	Am
26 April 2021	Am
30 April 2021	Am
07 May 2021	Am
18 May 2021	Pm
27 May 2021	Am
01 June 2021	Am

References

Bibby, C, Burgess N, Hill D, Mustoe S (2000) “Bird Census Techniques”

Marchant J H (1980) “Common Bird Census Instructions” BTO

Species Recorded on site during Spring Breeding Bird Survey 2021

Species (BOU vernacular name - IOC International name - scientific name - category)	SiteList	Sch1 Wildlife & Countryside Act	BAP Priority Species	Red	Amber	Green	
Greater Canada Goose Canada Goose Branta canadensis AC2E*	1						
Red-legged Partridge Alectoris rufa C1E*	1						
Pheasant Common Pheasant Phasianus colchicus C1E*	1						
Sparrowhawk Eurasian Sparrowhawk Accipiter nisus A	1					1	
Buzzard Common Buzzard Buteo buteo AE*	1					1	
Black-headed Gull Chroicocephalus ridibundus A	1				1		
Herring Gull European Herring Gull Larus argentatus A	1		1	1			
Stock Dove Columba oenas A	1				1		
Woodpigeon Common Wood Pigeon Columba palumbus A	1					1	
Collared Dove Eurasian Collared Dove Streptopelia decaocto A	1					1	
Tawny Owl Strix aluco A	1				1		
Swift Common Swift Apus apus A	1				1		
Great Spotted Woodpecker Dendrocopos major A	1					1	
Magpie Eurasian Magpie Pica pica A	1					1	
Jackdaw Western Jackdaw Corvus monedula A	1					1	
Carrion Crow Corvus corone A	1					1	
Goldcrest Regulus regulus A	1					1	
Blue Tit Eurasian Blue Tit Cyanistes caeruleus A	1					1	
Great Tit Parus major A	1					1	
Coal Tit Periparus ater A	1					1	
Swallow Barn Swallow Hirundo rustica AE	1					1	

House Martin Common House Martin Delichon urbicum A	1				1		
Long-tailed Tit ‡ Aegithalos caudatus A	1					1	
Chiffchaff Common Chiffchaff Phylloscopus collybita A	1					1	
Blackcap Eurasian Blackcap Sylvia atricapilla A	1					1	
Whitethroat Common Whitethroat Sylvia communis A	1					1	
Wren Eurasian Wren Troglodytes troglodytes A	1		1			1	
Starling Common Starling Sturnus vulgaris A	1		1	1			
Blackbird Common Blackbird Turdus merula A	1					1	
Song Thrush Turdus philomelos A	1		1	1			
Robin European Robin Erithacus rubecula A	1					1	
Dunnock Prunella modularis A	1		1		1		
House Sparrow Passer domesticus A	1		1	1			
Pied Wagtail ‡ White Wagtail Motacilla alba A	1					1	
Chaffinch Common Chaffinch Fringilla coelebs AE	1					1	
Greenfinch European Greenfinch Chloris chloris AE	1					1	
Linnet Common Linnet Linaria cannabina A	1		1	1			
Goldfinch European Goldfinch Carduelis carduelis A	1					1	
Total =	38	0	7	5	6	24	

Technical Appendix 6

Update Winter Bird Survey Information 2020/21

Introduction

Three update winter bird surveys were undertaken across the field on site (incorporating the whole secondary support area and adjacent field). The results are provided in **Table A5.1** below.

Field Condition – The field and adjacent fields were not cultivated in 2020 and therefore contained seed heads of arable flora during the winter period. For the final survey the field had been prepared for ploughing/tilling by removal or flattening of the bulk of the arable flora, although spilled seed was still present and the ground not broken.

Tide Conditions – All surveys were started within 1 hour of high tide.

Weather Conditions – The weather condition for each survey is set out below:

Visit Dates:

- 14/12/2020 – 10:30-11:50
Cloud 80%; Temp 7c; Wind SW3-4; Rain Brief Shower; High Tide 10:36
- 05/02/2021 – 14:40-16:00
Cloud 100%; Temp 10c; Wind W2; Rain Dry; High Tide 14:51
- 12/03/2021 – 11:30-12:45
Cloud 90%; Temp 8c; Wind SW3; Rain Dry; High Tide 10:32

Table A5.1: Winter Bird Survey Update Results		WCA	BAP	BoCC4			Survey Date			
Species (BOU vernacular name - IOC International name - scientific name - category)	Site List	Sch1 Wildlife & Countryside Act	BAP Priority Species	Red	Amber	Green	14/12/2020	05/02/2021	12/03/2021	Notes
Pheasant Common Pheasant Phasianus colchicus C1E*	1						x		x	
Buzzard Common Buzzard Buteo buteo AE*	1					1			x	
Black-headed Gull Chroicocephalus ridibundus A	1				1		3	12	32	Feeding on site on 3rd visit, otherwise flyovers
Common Gull ‡ Mew Gull Larus canus A	1				1			2		Flyover
Herring Gull European Herring Gull Larus argentatus A	1		1	1			2		3	Flyovers only
Stock Dove Columba oenas A	1				1			4	8	feeding in field
Woodpigeon Common Wood Pigeon Columba palumbus A	1					1	44	72	48	feeding in field
Collared Dove Eurasian Collared Dove Streptopelia decaocto A	1					1	x	x	x	
Great Spotted Woodpecker Dendrocopos major A	1					1	x			
Magpie Eurasian Magpie Pica pica A	1					1	x	x	28	High count following prep of field for tilling
Jackdaw Western Jackdaw Corvus monedula A	1					1	x	x	x	
Carrion Crow Corvus corone A	1					1	x	x	x	
Goldcrest Regulus regulus A	1					1	x	x	x	
Blue Tit Eurasian Blue Tit Cyanistes caeruleus A	1					1	x	x	x	
Great Tit Parus major A	1					1	x	x	x	
Coal Tit Periparus ater A	1					1	x		x	
Skylark Eurasian Skylark Alauda arvensis A	1		1	1			5	3	1	
Long-tailed Tit ‡ Aegithalos caudatus A	1					1	x	x	x	
Wren Eurasian Wren Troglodytes troglodytes A	1					1	x	x	x	

Starling Common Starling <i>Sturnus vulgaris</i> A	1		1	1			7	9	9	Mostly in suburban areas off site not feeding in field
Blackbird Common Blackbird <i>Turdus merula</i> A	1					1	x	x	x	
Song Thrush <i>Turdus philomelos</i> A	1		1	1			3	1	1	Field edges
Redwing <i>Turdus iliacus</i> A	1	1		1			x		x	Flyovers only
Robin European Robin <i>Erithacus rubecula</i> A	1					1	x	x	x	
Duncock <i>Prunella modularis</i> A	1		1		1		x	x	x	Field edges
House Sparrow <i>Passer domesticus</i> A	1		1	1			36	30	28	Good numbers along Lower Road, use of field and hedge
Grey Wagtail <i>Motacilla cinerea</i> A	1			1			x			flyover
Pied Wagtail ± White Wagtail <i>Motacilla alba</i> A	1					1	x			flyover
Meadow Pipit <i>Anthus pratensis</i> A	1				1		27	11	14	feeding in field
Chaffinch Common Chaffinch <i>Fringilla coelebs</i> AE	1					1	5	6	14	Feeding along fields western edge
Greenfinch European Greenfinch <i>Chloris chloris</i> AE	1					1	x	x	x	small numbers in local area
Linnet Common Linnet <i>Linaria cannabina</i> A	1		1	1			3			Feeding in field first visit
Goldfinch European Goldfinch <i>Carduelis carduelis</i> A	1					1	5	9	12	Feeding along fields western edge
Reed Bunting Common Reed Bunting <i>Emberiza schoeniclus</i> A	1		1		1		5	28	19	Feeding in field
Total =	34	1	8	8	6	19				

Key:

x = present on site or adjacent local area during survey

The British List (BOU) = British Ornithologists' Union. 2013. The British List: A Checklist of Birds of Britain (8th edition). Ibis 155: 635-676

Sch1 WCA = Schedule 1 Wildlife & Countryside Act 1981 (as amended) - <http://jncc.defra.gov.uk/page-1377>

BAP = Section 41 of the Natural Environment and Rural Communities Act 2006 UK Biodiversity Action Plan Priority Species - <http://jncc.defra.gov.uk/page-5163>

BoCC4 = Birds of Conservation Concern 4: Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746 - <http://www.bto.org/science/monitoring/psob>

Technical Appendix 7

Bat Survey Methodology

Bat Survey, Emergence and Activity Monitoring

(1) Trees Survey Method

Introduction

All bat species and their roosts are fully protected in Britain under the Wildlife and Countryside Act 1981(as amended) and the Habitat Regulations.

Initial Survey

Tree survey methodology involves looking for any suitable holes, cracks, niches or crevices which could be used by bats for roosting. In addition, large or apparently unhealthy trees which have a dense covering of Ivy possibly covering holes or crevices also have some potential to support bats. These are all termed potential roost features.

A survey for signs of residence by bat species consists of a slow methodical search of all aspect of the tree for actual roosting bats and their signs. Droppings around holes, on the tree trunk or on the ground beneath can be used to identify species. Scratch marks and staining at roost entry and exit holes. The presence of spider webs at a potential roost can often indicate their absence at that time although does not mean that the hole is not used at all. Careful attention is given to any sounds indicating the presence of a breeding bat roost (i.e. audible social calls). The survey is completed using binoculars from ground level and high powered torch and endoscope to inspect cavities with ladder where safe access permits.

Detailed Tree survey

Where the value of an individual tree or woodland area is found to be high during a preliminary survey, a more comprehensive survey in order to fully assess the likely value of the potential bat feature is undertaken. The scope of additional work will vary depending on a range of environmental factors.

Survey techniques are likely to include:

- Emergence survey during early evening (i.e. prior to emergence and at emergence), with the aid of a bat detector for ultrasonic calls.
- Climb-and-inspect assessment of selected trees to check for cavities and inspection with an endoscope or mirrors if appropriate.
- Foraging and transect walks through habitat surrounding potential tree roosts to understand local bat use of the site.

Survey work is tailored to each individual case, and the degree of evening emergence and foraging work undertaken is based on the following factors:

- size of the site;
- number of trees to be affected;
- habitats on site (eg water features/woodland);
- habitats and protected sites in the wider countryside;
- knowledge of bat use in local area;
- geographical range of rare species;
- proximity to known or suspected roosts.

Limitations of Tree Survey

Bats may move regularly between different tree roosts, and if used infrequently, signs to indicate the use of such trees by bats are unlikely to be evident. In addition, any signs which are left on trees by bats as a result of their use of a roost site (e.g. droppings below a roost exit) may be washed off as a result of wind and rain. Consequently, it is often difficult to confirm the presence of a bat tree roost. Surveys are best described as a sampling tool to assess presence of different bat species using the site at that time and place and general use of the area by bats.

Evaluation of Potential Suitability of Proposed Development Sites for bats (including Buildings & Trees)

The latest bat survey guidelines has provided guidance on assessing and evaluating development sites and features for bat roost potential:

The potential for trees to support roosting or breeding bats is evaluated under the following protocol for the visual inspection of trees:

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

^a For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

^b Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et al.*, 2015). This phenomenon requires some research in the UK but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.

^c This system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015).

Table from (BCT 2016 at p35)

(2) Bat Activity Survey

Introduction

The value of a site to bats can be arrived at using activity surveys to understand how many bats use the site, the degree of use and what species are involved.

Timing

An activity survey is undertaken in conditions when bats are likely to be active. Evening surveys commenced from sunset, often beginning with monitoring certain potential bat roost trees or woodland areas where such trees exist, for any emerging bats.

Dawn survey work may also be undertaken, usually recording activity up to two hours before, and sometimes up to an hour after sunrise.

Activity surveys are undertaken during the period when bats are not hibernating, this is usually between the end of April to October.

Methods

Line transects are carried out by a surveyor carrying a bat detector/s (example used, Bat box Duet , Petterson D240x, Anabat SD1) who walks at a constant speed along a planned route and records sound for subsequent analysis, and/or bat passes or species. The data collected can be used to provide an index of bat activity along the transect. Line transects are best suited to open habitats with linear features, such as hedgerows, field boundaries and woodland rides. Transect surveys, when repeated should be undertaken in opposite directions and, if possible, started from different points along the route. The number of transects required to cover the main habitat features depend on the size and complexity of the site. Transects should be sampled within 2-3 hours after sunset. The transect methodology should consider, for example identifying listening points where a minimum of 3 minutes recording is undertaken along the route and or combined with activity monitoring with recording equipment left for longer periods recording all bat passes. (BCT, 2012)

Since different species of bats echolocate using different frequencies, there is a risk that certain species will be missed if the bat detector is not tuned to the frequency used by that species at the time. Therefore, during the majority of the survey period, a surveyor scans through different frequency ranges to ensure as many bats were recorded as possible. The main frequency ranges used were as follows:

- 32-55khz to detect the smaller species of bats, such as Pipistrelle spp, Myotis spp, etc.
- Around 22-30 khz to detect the larger bat species, including Noctule and Serotine bats.

I

n addition the Anabat SD1/Songmeter SM2 Automated recorders were used to allow greater survey intensity than with manual bat detector surveys. They can allow longer periods of time coverage than

could be practically and economically covered by manual survey, providing more comparable results, or be used to provide a more flexible timetable for surveying. Automated systems are triggered by sound (via a detector) and these sounds are then recorded as event / bat passes.

Assessment of Landscape for Potentially Good Bat Foraging sites or Flight Lines

The habitats across the site are surveyed and assessed on their likely use by bats for foraging and for use in commuting across the landscape. This assessment is based upon the following main factors:

- Sheltered areas where insects are likely to gather;
- Presence of rough grassland or other habitats likely to result in higher insect numbers;
- Provision of linear links across otherwise open habitat to allow bats to following features within shadows (i.e. hidden from predators), while also providing foraging potential.

Data Collected

Time, flight direction and species of bat are recorded for each bat heard or seen and these were mapped on individual site maps. Time of sunset/sunrise and weather conditions are also recorded for each survey.

The following data is gathered for bat passes recorded:

- Location of observation (data highlighted on a map);
- Whether the bat was foraging or commuting (if commuting, in which direction was it travelling and whether the bat was following any landscape features);
- Species of bat observed (where possible).

(3) Bats in Buildings Survey Method

Introduction

Bats use buildings and trees for roosting and breeding, and so the potential for any of these features on site to support bats needs to be considered in an ecological assessment of a development site. Building survey methodology is provided below.

Methods

The survey for signs of residence by bat species consists of undertaking a slow methodical search both internally and externally for actual roosting bats and their signs which could indicate the presence of a bat roost including:

- Bat droppings – e.g. on floors, stored articles, walls, beams, tiles, windowsills entry / exit points etc. These can be used to aid species identification.
- Dark staining at well-used roost sites (e.g. ridge boards & timber joints, etc) or entry / exit points.
- Wear marks at bat roost sites and entry / exit points.(This can be a polishing and smoothing of rough wood surfaces and masonry or slight scuffing of very smooth wooden surfaces)
- Urine spots or streaking in the vicinity of bat roosts and entry / exit points.

- Similarly the presence of spider webs at a potential roost can often indicate their absence at that time, but requires careful interpretation combined with other evidence

All internal spaces of the buildings are searched, including gaps at the roof timber frame joints. External surfaces of the building are also examined for evidence of use of any potential bat access points. The surveyor uses a strong torch in dark internal areas and shaded outdoor areas, endoscope for inaccessible spaces, binoculars and, where appropriate, a ladder to examine the buildings externally.

The potential to support bat roosts either in the summer (nursery) or winter (hibernation) based previous experience of bat occupancy at other sites and upon the presence of suitable roost sites and access points is also considered. In particular, the potential for roost sites which are hidden from view is noted.

Survey Constraints and Limitations

Lack of bat evidence cannot always be taken to mean the lack of use by bats as signs of bats can be easily washed off by wind or rain. Droppings are hard to see where rubble and other floor debris may obscure them. Low numbers of droppings can easily be missed especially where they may become damp and deteriorate. Evidence of bats may not be apparent where bats roost out of view, such as in wall cavities etc.

Surveys are carried out during a brief window of time, and therefore, provide only a snapshot of the site use. As bats regularly move between different roost sites, particularly to satisfy their varying requirements at different times of the year, a bat survey often concentrates upon searching for signs to indicate the presence of roosting bats at any time of the year. Due to these survey limitations an assessment using professional judgement is also used to interpret the findings and the potential for supporting bats and is used to guide any recommendations for precautionary approaches to carrying out the proposed work.

Reference

Bat Conservation Trust. (2016) Bat Surveys Good Practice Guidelines. 3rd Edition. Bat Conservation Trust.

Bat Conservation Trust. (2012) Bat Surveys Good Practice Guidelines. 2nd Edition. Bat Conservation Trust. March 2012. ISBN-13: 9781872745985

Mitchell-Jones ed. (2006) "Bat Conservation Handbook" Third Edition, English Nature

Technical Appendix 8

Dormouse Survey Methodology

Introduction

Dormice *Muscardinus avellanarius* are protected under UK and European law. They are a mostly arboreal mammal, living in hedgerows, scrub and woodland where there is usually a diversity of plant species for them to feed on and nest within.

Quality of habitat

An assessment of the quality of the habitat for Dormice involves examining all woody habitat present on a site and connected to the site. Features looked for include:

- Presence of a high diversity of native woody plant species at a suitable nectaring and fruiting stage of their life cycle or lower diversity habitat with good food resources (nectar, insects, or fruit);
- Presence of good connectivity of wooded habitat in an area on a linear and vertical level;
- Presence of key plant species preferred by Dormice (such as Hazel coppice);
- Well structured habitat that provides niches for nesting and hibernating;
- Proximity to ancient woodland, large hedgerows, ancient scrub and any other ancient woody habitat;
- Habitat that has had consistent management over a period of time.

Nut Searches: identification of Dormouse feeding signs on Hazel Nuts

Nut searches are best carried out from mid September until late December, when the Hazel is in mast. Hazel nuts degrade over time but can persist on the woodland floor for over a year. Stands of fruiting Hazel are targeted, and nuts are searched for beneath each tree for approximately 20 minutes. Any Hazel nuts thought to have been opened by Dormice are collected.

Nest Tube Survey

Nest tubes are corrugated plastic tubes with a wooden platform that Dormice utilise to build day nests. The presence of Dormice within a habitat can be ascertained using tubes placed in intervals along the habitat. Uptake of tubes by Dormice is not fully understood, but this method provides a reliable way of determining whether Dormice utilise a given area.

Uptake in marginal habitats may be more consistent as these habitats tend to have fewer natural cavities for Dormice to be present. The Dormouse Conservation Handbook (Bright et al 2006) provides data for determining how much effort should be put into Tube survey work. The optimum period for recording use of boxes by Dormice is in spring and autumn. The use of boxes at certain times of year may be influenced by consideration of how Dormice use various habitat types. A tube survey in autumn may be more likely to locate Dormice if tubes are placed in species that Dormice use

at that time of the year (eg Hazel for nut crops). In spring they are more likely to utilise species that provide high nectar sources (eg Lime).

Nest tube survey work on a site usually involves erecting of tubes in all potentially suitable and connected habitat. Areas with high and lower potential are both surveyed, as Dormice in high potential areas may have suitable nesting opportunities and may not therefore use the tubes as regularly. The placing of the tubes is important, to ensure that Dormice are both likely to use them and that they are out of sight from tampering by the public. Dense and well concealed sites, that are sheltered, are always used in preference.

References

Bright, P., Morris, P. & Mitchell-Jones, T. (2006) *Dormouse Conservation Handbook*. English Nature Species Recovery Programme. English Nature, Peterborough.

Chanin, P and Woods, M (2003) *Surveying dormice using nest tubes. Results and experiences from the South West Dormouse Project*. English Nature, Peterborough.

Morris, P. A. (1993) *A Red Data Book for British Mammals*. The Mammal Society, London.

Technical Appendix 9

Reptile Survey Methodology

Introduction

All of the common reptile species (Grass Snake, Adder, Common Lizard and Slow-worm) native to Britain are protected by the 1981 Wildlife & Countryside Act 1981 (as amended) under Sections 9(1) and 9(5). This legislation makes it illegal to intentionally kill or injure a common reptile and also, to sell, barter, exchange or transport for sale these animals or parts of them. However, their habitat is not directly protected.

Survey Methods

Survey work involves the placing of cut up roofing felt or other flat materials such as corrugated iron sheeting, wood or plastic that reptiles hide under. The reptiles use these artificial refugia as they warm faster than the surrounding environment and are attractive to shelter beneath. In order to be effective, refugia need to be placed in the most suitable habitat and in the best locations within those habitats for reptiles. Survey refugia are placed at a minimum of 10/ha.

Reptiles can be surveyed using this technique between early spring and late autumn. The times of the year that provide optimum survey are April to late June, and late August to the end of September.

Survey work is undertaken during suitable weather conditions (i.e. between 9 and 18°C with little or no wind and no rain). High temperatures in late June to late August mean that suitable weather conditions occur the morning / late afternoon, after and even during rain in warm weather, and on overcast days.

Refugia survey is always complemented by visual searching for reptiles which are not utilising refugia.

Population Size Assessment

In order to assess the importance of a population the population size needs to be assessed. This uses standard numbers from the Herpetofauna Groups of the British Isles (HGBI, 1999) advisory notes for Amphibian and Reptile Groups (ARGs) **Table T1** below.

Table T1: Assessing Reptile Populations

Species	Population size (adult density)		
	High	Medium	Low
Slow-worm	(> 100 / ha)	(> 50 / ha)	(< 50 / ha)
Common lizard	(> 80 / ha)	(> 40 / ha)	(< 20 / ha)
Adder	(> 4 / ha)	(2 - 4 / ha)	(< 2 / ha)
Grass snake	(> 4 / ha)	(2 - 4 / ha)	(< 2 / ha)

References

Herptofauna Groups of the British Isles (HGBI) Guidelines (1998) “Evaluating Local Mitigation/Translocation Programmes: Maintaining Best Practice and Lawful Standards.” HGBI Advisory notes for Amphibian and Reptile Groups (ARGs). HGBI, c/o Froglife, Halesworth, personal collection.

Froglife, 1999. Froglife Advice Sheet 10. Reptile Survey. An introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife, Halesworth, Suffolk.

Technical Appendix 10

Habitat Suitability Index

Introduction

Great Crested Newts and their habitat are protected under the Wildlife & Countryside Act 1981 (as amended) and under European Law through the Habitat Regulations.

Habitat Suitability Index (HSI) scoring system has been developed to provide an indication of the likely value of a waterbody to Great Crested Newt. It was initially developed by Oldham et al (2000). The methodology has been adapted by the Amphibian and Reptile Groups of the UK (see ARG UK, 2010). The index is a measure of habitat suitability, but should not be used as a substitute for detailed newt survey work. Ponds with a high HSI score are more likely to support Great Crested Newt than those with a low score. HSI is therefore useful to (see ARG UK, 2010):

- Evaluate general suitability of a pond, or ponds for Great Crested Newt,
- Compare general suitability of ponds across different areas,
- Evaluating suitability of receptor ponds in a proposed mitigation scheme,
- Identifying habitat management priorities.

The HSI scoring system is graded in five steps from poor – below average – average – good – excellent. The table below provides an assessment for the pond off site.

HSI Criteria	Waterbody
1 – Geographic Location	1
2 – Pond Area	0.05
3 – Permanence	0.9
4 – Water Quality	0.67
5 – Shade	1
6 – Waterfowl	1
7 – Fish	1 (unknown so assume 1)
8 – Pond Count in 1km	0.1 (= 0 but given as 0.1 for assessment)
9 – Terrestrial Habitat	0.33
10 – Macrophyte Cover	0.9
Score: (Sum of 1-10)^{0.1}	0.49568 (=poor)

References

ARG UK (2010) Great Crested Newt Habitat Suitability Index ARG UK Advice Note 5

Frog Life (Langton, T., Beckett, C. & Foster, J.) (2001) Great Crested Newt Conservation Handbook. English Nature (2001). Great Crested Newt Mitigation Guidelines. English Nature, Peterborough.

Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). Herpetological Journal 10(4), 143-155.

Technical Appendix 11

Suggested Planting Mixes

Example Seed Mixes of Native Species Local to the Zone of Influence

The mixes set out below are basic examples of what could be provided on the more fertile and high nutrient soils on site. They are based on local native species common in the relevant habitat. Variations on seed mixes can be provided given the number of areas of habitat creation potential. The mixes below are based on native species mixes selected by Emorsgate Wild Seeds (www.wildseed.co.uk).

Example Hay Meadows and Dry Neutral/Calcareous Grassland Mix

%	Species	Common Name
1	<i>Achillea millefolium</i>	Yarrow
2	<i>Centaurea nigra</i>	Common Knapweed
0.8	<i>Daucus carota</i>	Wild Carrot
1.5	<i>Galium verum</i>	Lady's Bedstraw
1.2	<i>Knautia arvensis</i>	Field Scabious
1.5	<i>Leucanthemum vulgare</i>	Ox-eye Daisy
1	<i>Lotus corniculatus</i>	Birdsfoot Trefoil
0.5	<i>Malva moschata</i>	Musk Mallow
1	<i>Plantago lanceolata</i>	Ribwort Plantain
1	<i>Primula veris</i>	Cowslip
1.5	<i>Prunella vulgaris</i>	Selfheal
3	<i>Ranunculus acris</i>	Meadow Buttercup
2.5	<i>Rhinanthus minor</i>	Yellow Rattle
1.5	<i>Rumex acetosa</i>	Common Sorrel
	Grasses	
5	<i>Agrostis capillaris</i>	Common Bent
35	<i>Cynosurus cristatus</i>	Crested Dogstail
10	<i>Festuca rubra ssp commutata</i>	Red Fescue
25	<i>Festuca rubra</i>	Red Fescue
5	<i>Anthoxanthum odoratum</i>	Sweet Vernal Grass

(Based on a standard lowland fertile field Emorsgate Wild Seeds www.emorsgate-seeds.co.uk) This mix is based on EM2, but EM3 and other hay meadow mixes may also be of value. Standard sowing rates per m² can be obtained from preferred supplier.

Example Flowering Lawn Species Mix

%	Species (based on Emorsgate Mix)	Common name
3.4	<i>Galium verum</i>	Lady's Bedstraw
0.5	<i>Leontodon hispidus</i>	Rough Hawkbit
1	<i>Leucanthemum vulgare</i>	Oxeye Daisy
3.3	<i>Lotus corniculatus</i>	Birdsfoot Trefoil
1.5	<i>Primula veris</i>	Cowslip
5	<i>Prunella vulgaris</i>	Selfheal
3	<i>Ranunculus acris</i>	Meadow Buttercup
2	<i>Rumex acetosa</i>	Common Sorrel
0.3	<i>Trifolium pratense</i>	Red Clover
	Grasses	
8	<i>Agrostis capillaris</i>	Common Bent
40	<i>Cynosurus cristatus</i>	Crested Dogstail
28	<i>Festuca rubra</i>	Red Fescue
4	<i>Phleum bertolonii</i>	Smaller Cat's-tail

Example Damp Grassland Species Mix

%	Species (EM8 Emorsgate Mix)	Common Name
0.5	<i>Achillea millefolium</i>	Yarrow
0.5	<i>Betonica officinalis</i> - (<i>Stachys officinalis</i>)	Betony
2	<i>Centaurea nigra</i>	Common Knapweed
2	<i>Filipendula ulmaria</i>	Meadowsweet
1	<i>Galium verum</i>	Lady's Bedstraw
1.5	<i>Leucanthemum vulgare</i>	Oxeye Daisy
0.5	<i>Lotus pedunculatus</i>	Greater Birdsfoot Trefoil
1.5	<i>Plantago lanceolata</i>	Ribwort Plantain
1	<i>Primula veris</i>	Cowslip
0.5	<i>Prunella vulgaris</i>	Selfheal
3	<i>Ranunculus acris</i>	Meadow Buttercup
1.5	<i>Rhinanthus minor</i>	Yellow Rattle
1.5	<i>Rumex acetosa</i>	Common Sorrel
0.5	<i>Sanguisorba officinalis</i>	Great Burnet
1	<i>Silene silaus</i>	Pepper Saxifrage
0.5	<i>Silene flos-cuculi</i> - (<i>Lychnis flos-cuculi</i>)	Ragged Robin
1	<i>Vicia cracca</i>	Tufted Vetch
	Grasses	
12	<i>Agrostis capillaris</i>	Common Bent
5	<i>Alopecurus pratensis</i>	Meadow Foxtail (w)
1	<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass (w)
1	<i>Briza media</i>	Quaking Grass (w)

36	<i>Cynosurus cristatus</i>	Crested Dogstail
1	<i>Deschampsia cespitosa</i>	Tufted Hair-grass (w)
24	<i>Festuca rubra</i>	Slender-creeping Red-fescue

Example Scrub Planting Species Mix

%	Species	Common Name
30%	<i>Crataegus monogyna</i>	Hawthorn
30%	<i>Prunus spinosa</i>	Blackthorn
10%	<i>Corylus avellana</i>	Hazel
5%	<i>Salix cinerea oleifolia</i> / <i>Salix caprea</i>	Grey/Goat Willow
8%	<i>Rosa canina</i>	Dog Rose
10%	<i>Rosa arvensis</i>	Field Rose
5%	<i>Lonicera periclymenum</i>	Honeysuckle
2%	<i>Rubus fruticosus</i> agg	Bramble
Shade Understorey mix based on EH1 (Emorsgate Seed Mix)		
0.5	<i>Achillea millefolium</i>	Yarrow
1.5	<i>Agrimonia eupatoria</i>	Agrimony
1.2	<i>Alliaria petiolata</i>	Garlic Mustard
1	<i>Centaurea nigra</i>	Knapweed
0.4	<i>Clinopodium vulgare</i>	Wild Basil
1.7	<i>Galium mollugo</i>	Hedge Bedstraw
2.2	<i>Geum urbanum</i>	Wood Avens
1.5	<i>Leucanthemum vulgare</i>	Oxeye Daisy
0.5	<i>Plantago lanceolata</i>	Ribwort Plantain
0.5	<i>Primula veris</i>	Cowslip
2	<i>Prunella vulgaris</i>	Selfheal
2	<i>Silene dioica</i>	Red Campion
1.5	<i>Silene vulgaris</i>	Bladder Campion
1	<i>Stachys sylvatica</i>	Hedge Woundwort
1	<i>Torilis japonica</i>	Upright Hedge Parsley
1.5	<i>Vicia cracca</i>	Tufted Vetch
10	<i>Agrostis capillaris</i>	Common Bent
1	<i>Anthoxanthum odoratum</i>	Sweet Vernal Grass
6	<i>Brachypodium sylvaticum</i>	False Brome
35	<i>Cynosurus cristatus</i>	Crested Dogstail
2	<i>Deschampsia cespitosa</i>	Tufted Hair Grass
26	<i>Festuca rubra</i>	Red Fescue

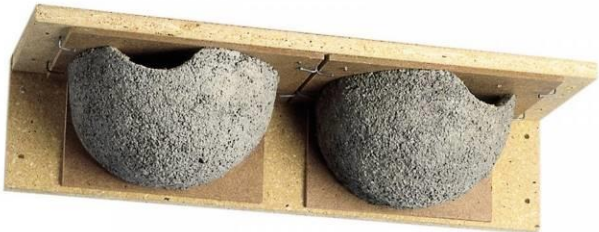
Example Native Hedgerow Species Mix (a mixture of some or all of these species is possible)

%	Species	Common Name
20%	<i>Corylus avellana</i>	Hazel
10%	<i>Ulmus procera</i>	Elm
25%	<i>Hawthorn</i>	Hawthorn
25%	<i>Prunus spinosa</i>	Blackthorn
3%	<i>Sambucus nigra</i>	Elder
12%	<i>Acer campestre</i>	Field Maple
0.5%	<i>Quercus robur</i>	Oak
1.5%	<i>Fraxinus excelsior</i>	Ash
1%	<i>Prunus avium</i>	Wild Cherry
2%	<i>Salix sp</i>	(Native) Willow species
Potential additional species can also be used to substitute or for variation: Honeysuckle <i>Lonicera periclymenum</i> Holly <i>Ilex aquilinum</i> Alder, <i>Alnus glutinosa</i> Spindle <i>Euonymus europaea</i> Buckthorn <i>Rhamnus cathartica</i> Field Rose <i>Rosa arvensis</i> Dog Rose <i>Rosa canina</i> Crab Apple <i>Malus sylvestris</i>		

Technical Appendix 12

Bat & Bird Box Mitigation Examples

Examples of Bird Nesting Opportunities for buildings

Swift Nesting Brick – It needs to be positioned near Apex or high up – position advised by ecologist. Design shown is from Ibstock Bricks. https://www.ibstockbrick.co.uk/kevington/eco-products/ see also: https://www.rspb.org.uk/globalassets/downloads/documents/conservation--sustainability/help-swifts/swift-bricks.pdf	
House Martin Schwegler Nest Placed under roof overhang, bargeboard – high up position advised by ecologist Design shown Schwegler from NHBS: https://www.nhbs.com/9a-schwegler-house-martin-nest	
House Sparrow Terrace Schwegler Usually placed under roof overhang, bargeboard – high up position advised by ecologist Design shown Schwegler from Wildcare: https://www.wildcare.co.uk/sparrow-terrace.html	

Blue/Great Tit Schwegler Nest

Design shown Schwegler from NHBS:
<https://www.nhbs.com/1b-schwegler-nest-box>

**Examples of Bat Bricks/Mitigation for buildings****Schwegler Bat Roost Unit 2FR**

This Tube system meets the characteristic behavioural requirements of the types of bats that inhabit buildings. Made with Schwegler wood-concrete, the design maintains excellent climatic conditions inside the roost unit allowing the animals to either hang onto the wooden rear or onto the wood-concrete front. The box, once installed is maintenance free and self cleaning.

The roost unit can be installed within any external walls (brick, block or panelling) either flush or beneath the wall surface (with suitable entrance ramp extension)

Dimensions: height 47.5 x width 20 x depth 12.5 cm,
 Entrance: width 15 x height 2 cm, Weight: ca. 9,8 kg

Within Brick, can also be placed within cavity with only entrance visible



