

ECOLOGICAL ASSESSMENT

**LAND AT INTERBRIDGES,
NORTH OF SEAGULL LANE,
EMSWORTH**

OCTOBER 2014

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ECOLOGICAL ASSESSMENT, LAND AT INTERBRIDGES, EMSWORTH

1.0 INTRODUCTION

1.1 Background

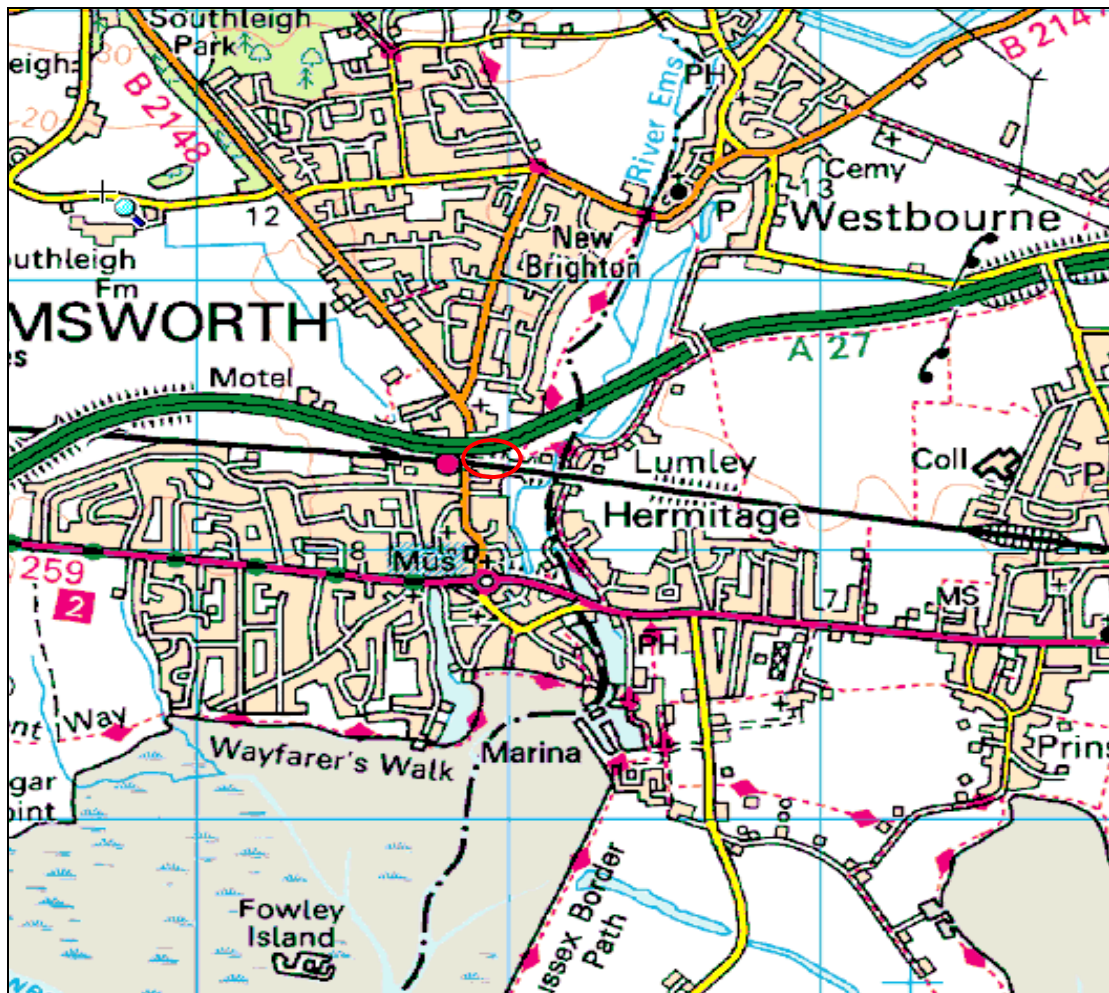
- 1.1.1 Aluco Ecology Ltd was commissioned by The Savoy Latham Partnership Ltd and Nash & Partners to carry out an ecological assessment of land north of Seagull Lane, Emsworth, known as 'Interbridges'. The site has planning permission for commercial development. As part of this permission a number of planning conditions have been provided. Condition 10 relates to ecology:

*"10 No development pursuant to the Permission hereby granted shall commence until the applicant or their agents or successors in title have undertaken a detailed Phase II ecological investigation and survey of the site at an appropriate time of year and submitted the findings to the Local Planning Authority for consideration together with a scheme of mitigation and programme of implementation of such measures. The approval in writing of the LPA shall be obtained before any work is commenced and the approved details shall be fully implemented as approved before the dwellings are occupied. **Reason:** To ensure that any ecological interest on the site is properly dealt with and having due regard to policies CS16 of the Havant Borough Core Strategy 2011 which form part of the Local Development Framework and National Planning Policy Framework, March 2012."*

- 1.1.2 This report provides the detail to fulfil the requirements laid out in Condition 10 of the planning permission. This includes details of phase II survey work on site during summer 2012 and mitigation for protected species and potential for ecological enhancements in the Zone of Influence.

1.2 Site Location

- 1.2.1 The land at Interbridges which is subject to this ecological assessment runs along the A27(T) and the south coast railway line and is located as shown in **Figure 1**. The basic plan for the proposed development of industrial units, on which this ecological assessment has been prepared, is shown in **Figure 2**.



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Figure 1: Location of the Site

1.3 Relevant Legislation and Policy

- 1.3.1 The outcomes of this assessment will be tested against relevant legislation and policy; namely the Habitat Regulations 2010 in relation to the protection of European sites (Special Protection Areas SPA, and Special Areas of Conservation SAC) and European protected species (e.g. bats, 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 2**). The Protection of Badgers Act 1992 gives protection to Badgers *Meles meles*.
- 1.3.2 The Government sets out its objectives for conserving and enhancing biodiversity in the National Planning Policy Framework and Planning Practice Guidance on the Natural Environment. The Government's objectives for planning and biodiversity are that '...the planning system should seek not just to protect, but where possible to enhance biodiversity – making sure we don't just have isolated pockets of wildlife, but rich and connected green spaces for all kinds of species to thrive.'

- 1.3.3 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 Para. 007- onwards).
- 1.3.4 In addition that outlined above, strategic and local planning policies further implement the legal and national policy. The Havant Borough Council Local Development Framework Core Strategy was adopted in March 2011 and contained policies related to ecology and biodiversity. These policies are set out in **Technical Appendix 3**.
- 1.3.5 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 and local action plans such as a Biodiversity Action Plan for Hampshire (HCC, 1998).

2.0 ASSESSMENT METHODOLOGY

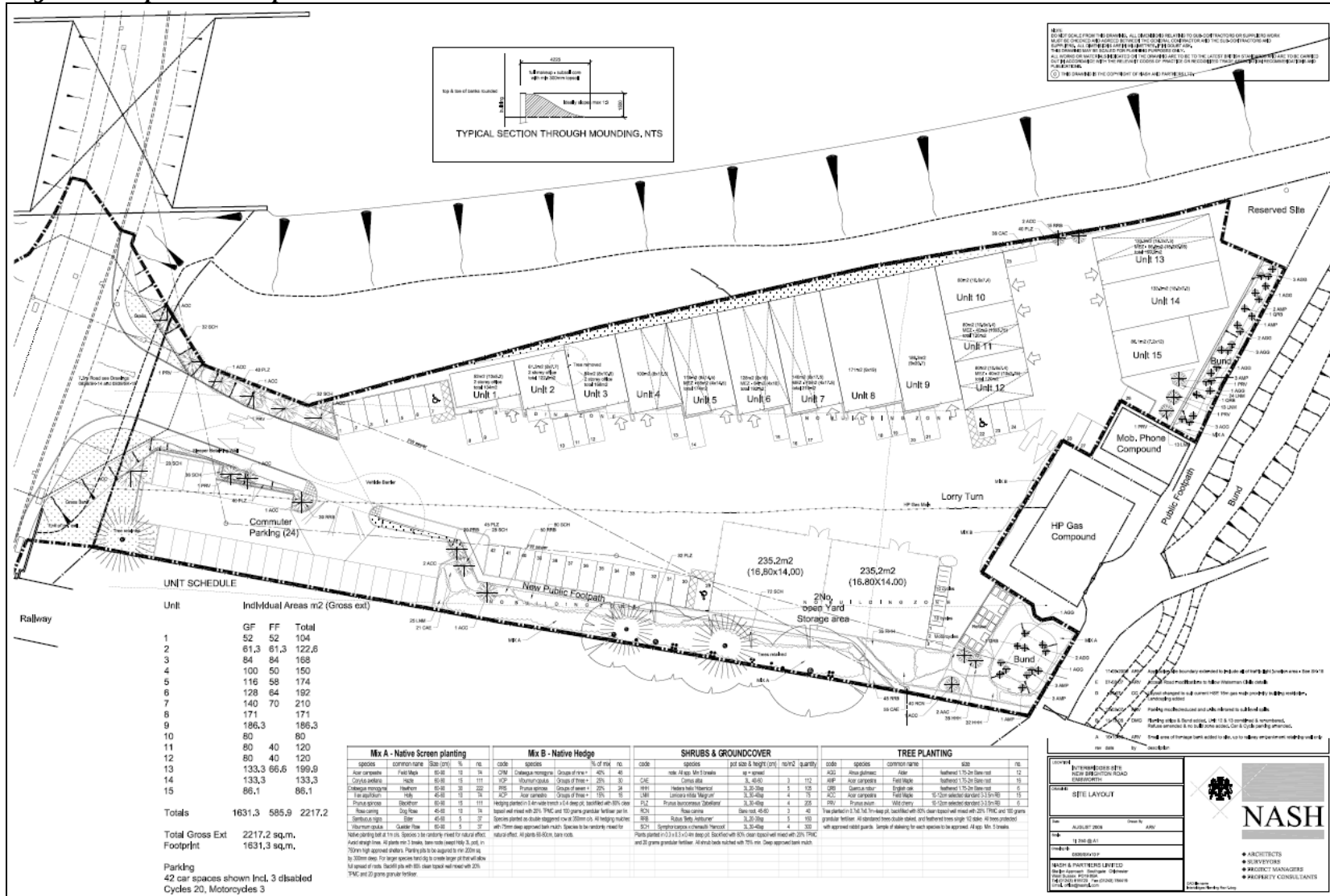
2.1 Introduction

- 2.1.1 The methodology for this appraisal is based on the Guidelines for Ecological Impact Assessment (EcIA) in the United Kingdom published by the Institute of Ecology and Environmental Management (IEEM, 2006).

2.2 Site Survey Methodology

- 2.2.1 The first stage of the appraisal 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. 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 4**.
- 2.2.2 The evaluation of ecological features highlighted by the survey work is undertaken according to IEEM guidance (see **Technical Appendix 4**).

Figure 2: Proposed Development Details



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 The plan on which this ecological appraisal has been prepared is shown in **Figure 2** above.

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

3.2.1 It is proposed that re-landscaping of the site and top soil stripping will 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 the hydrological systems in the adjacent River Ems Valley. Consequently, desk surveys have been carried out within this zone and backed up by field survey where required.

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 earthworks, vegetation clearance and topsoil stripping. This phase may affect habitat suitable for wildlife, including protected and/or notable species. 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. Construction has the potential to also create habitat suitable for some species.

3.3.2 The construction of the site has the potential to affect adjacent wildlife habitats in the Ems Valley, through noise, air and water pollution.

3.4 Predicted Operational Activities during Use Phase and Biophysical Changes

3.4.1 The operational phase will also need to consider how protected species and species of conservation concern may use the sites, and what effect this 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. The current site has planning permission for the scheme shown in **Figure 2** above. Condition 10 of the Permission states that Phase II ecology survey work should determine the mitigation and any ecological enhancement strategy that should be put in place for the development to proceed. The following chapter provides the necessary Phase II survey information to inform the mitigation strategy outlined in later chapters. This information was collected originally in summer 2008, with updated survey work in summer/autumn 2012 and summer/autumn 2014.

4.2 Designated Sites

Statutory Designated Sites

- 4.2.1 The nearest statutory Site of Special Scientific Interest (SSSI) is Chichester Harbour SSSI which is part designated as Eames Farm Local Nature Reserve and is located about 700m to the south of the site (see **Technical Appendix 5**). It is designated for its inter-tidal, wintering, passage and breeding water bird habitat. The citation for the SSSI is provided at **Technical Appendix 5**.
- 4.2.2 Within 1km of the site are a number of internationally important wetland sites designated as Special Areas of Conservation (SAC) under the Directive on the Conservation of Natural Habitats and Flora and Fauna; Special Protection Areas (SPAs) under the Wild Birds Directive 79/409/EEC and afforded protection under the Habitat Regulations 1994 (as amended); and Ramsar sites, designated under the Ramsar Convention on Wetlands of International Importance in Ramsar, Iran, 1971. These sites are the Solent Maritime SAC and Chichester and Langstone Harbour SPA/Ramsar. These sites are designated for their nationally and internationally important waterfowl concentrations, and inter tidal habitats.

Non Statutory Sites

- 4.2.3 A total of 5 Sites of Importance for Nature Conservation (SINCs) are present within 1km of the site. These sites are a non-statutory local plan designation, initiated by Hampshire County Council. The location of these sites is shown on the HBIC plan in **Technical Appendix 5**. The Lumley Meadow SINC is within 100m of the site, and is designated for its wetland features alongside the River Ems, including populations of Water Vole. This is also known as Brook Meadow Local Nature Reserve.

4.3 Habitats and Vegetation

Introduction

- 4.3.1 The following description is based on a survey visit on 12 June 2008 with a re-survey of the site in August 2012 and August 2014. The site is a grazed paddock with scrub and ruderal vegetation encroaching the boundaries. The site is bounded to the north by the A27, which

sits on top of a tree lined embankment, and the south coast rail line which forms the southern boundary of the site. The site area is shown in **Figure 3**.

Historical Land Use

- 4.3.2 The 1870 First Edition six inch to the mile Ordnance Survey shows the site was part of a wide open field to the north of the railway, possibly part of the Mill land at Lumley. By 1932 the field had been split and the southern section formed a rectangle that encompasses the present site extent. The construction of the A27 trunk road is likely to have taken a small part of the rectangular field.

Grasslands

- 4.3.4 The grasslands on site appear to have historically had an element of agricultural improvement and contain abundant Perennial Rye Grass *Lolium perenne* and both Red and White Clovers *Trifolium pratense* and *T. repens*. In places the unimproved grassland indicator Meadow Barley *Hordeum secalinum* is locally frequent. Other grasses recorded include Fescues *Festuca rubra* & *F. pratensis*, Meadow Foxtail *Alopecurus pratensis*, Timothy *Phleum pratense*, Creeping Bent *Agrostis stolonifera*, Meadow Grasses *Poa* sp. Crested Dogtail *Cynosurus cristatus* and False Oat Grass *Arrhenatherum elatius*. The grassland also has a high herb content with abundant Common Knapweed *Centaurea nigra*, abundant Ribwort Plantain *Plantago lanceolata*, with some Birds Foot Trefoil *Lotus corniculatus*, Meadow and Bulbous Buttercup *Rununculus acris* and *R. bulbosa*. A species list is provided in **Technical Appendix 6** (See **Photo 1 and 2**).
- 4.3.5 A couple of unimproved grassland indicator species are present including Meadow Barley which is locally abundant across the site, Corky Fruited Water Dropwort *Oenanthe pimpinelloides* which is present in two discrete patches of the grassland, Stone Parsley *Sison amomum* and Hoary Ragwort *Senecio erucifolius* which are both occasional to rare along the grassland edges and are generally lower value as grassland indicators in Hampshire at least. A further notable species, Bee Orchid *Ophrys apifera* was found at the western end of the grassland, where five flowering spikes were noted in 2008. This part of the site contains more disturbed grassland. The commoner sedge species Spiked Sedge *Carex spicata*, Hairy Sedge *Carex hirta* and Grey Sedge *Carex divulsa* are occasional to local in the grasslands.
- 4.3.6 Where the grassland meets the edges of the scrub on site, and towards the western half of the site, there is evidence of more disturbance with Canadian Goldenrod and Fleabane becoming locally dominant and Rosebay Willowherb *Chamerion angustifolium* and Teasel *Dipsacus fullonum* present. Courser grasses also increase in frequency such as Cocks Foot *Dactylis glomerata*. The degree of ruderal and scrub dominance was greater in 2008 than 2012, a result of heavy grazing.
- 4.3.7 In 2008 the grasslands were mostly ungrazed, and appeared to have had only low to moderate grazing for at least a period preceding survey. By summer 2012 the grazing regime on the grasslands had altered to very intensive grazing by a number of gypsy ponies (upto 6 noted on site Aug 2012). The structure of the grasslands indicate that heavy grazing has occurred on and off for a number of seasons (perhaps every summer) since 2008 survey work. By 2014

the grazing intensity had reduced again, but two Horses were constantly present on site during 2014 survey work.



Photo 1: Grasslands on Site August 2012. Note grazing has created a structure with patchy bare ground and no grassland structure. Along the left of the photo is the secondary planting along the A27 embankment.



Photo 2: Lower grazing regime from 2008 with herb rich grassland area depicted, including a stand of Corky-fruited Water-dropwort

Woodland and Scrub

- 4.3.6 The site is bounded by young woodland planted as part of the A27 embankment construction to the north, with other embankments to the west and along the railway line along the south. The woody scrub generally lacks mature trees, being mostly made up of Hawthorn *Crataegus monogyna*, but with other species in the planting mix including Field Maple *Acer campestre*, Hazel *Corylus avellanus*; as well as Ash *Fraxinus excelsior* and Sycamore *Acer pseudoplatanus*, which could be self-sown. Along the southern boundary of the site are some mature Lime *Tilia x europaea*, Horse Chestnut *Aesculus hippocastanum* and Sycamore. The scrub on site merges into this woodland on the northern and southern boundaries (see **Photo 3 - 5**).
- 4.3.7 The ground flora in these areas is generally either bare or Ivy *Hedera helix* dominated. Where there is more open ground, nettle *Urtica dioica* beds have become established.
- 4.3.8 Off site to the east lie the River Ems and its millstream. At this point the Lumley Stream is partly tidal and follows a mostly natural course apart from where the railway was constructed in the 1847 and the River was diverted along a new channel to avoid excessive bridge construction.



Photo 3: Northern Boundary, Recent secondary woodland to north on the road embankment and Mature Scrub on site



Photo 4: Tree line on Southern Boundary with Largest Lime, with limited Ivy



Photo 5: Bramble and Hawthorn scrub with elements of ruderal vegetation such as Canadian Goldenrod shown at the left of the picture.

Evaluation

- 4.3.9 The grasslands on site are of interest on account of being herb rich, presumably reverting from some reseeded or agricultural improvement, and containing a couple of unimproved grassland indicators. The presence of Meadow Barley with locally abundant herbs such as Common Knapweed components over part of the meadow is of value.
- 4.3.10 The low number of unimproved grassland indicators, the abundance of Rye Grass and White Clover in the sward combined with ruderal species like Canadian Goldenrod around the edges is indicative of disturbance and some historic agricultural improvement, with the site possibly having being reseeded in the past. Any agricultural improvements that have occurred have not completely removed the diversity of herbs, and the meadow is reverting to a herb rich semi improved grassland, especially towards the eastern end. It is possible that historical 'improvements' may have reduced the number of unimproved grassland indicators.
- 4.3.11 Recent change in management of the grasslands has resulted in over grazing of the main grassland sward, which also reduces the amount of scrub encroachment. The scrub and ruderal vegetation is not of high value and is all considered to be relatively recent.
- 4.3.12 Overall the vegetation and flora of the site is considered to be of **high local value** to potentially **district value** if managed and when linked to Brook Meadows as a part of the local landscape.

4.4 Protected Species**Breeding Birds**

- 4.4.1 The rough grassland habitats present on site are favourable habitat for common bird species. No Biodiversity Action Plan species were noted during the site visit, although Song Thrush was recorded off site, and Bullfinch are likely to be in the local area and may make use of the boundary habitats on site.

Bats

- 4.4.2 There are no buildings present on site, and there are few mature trees. The trees present that are mature include Alder, Horse Chestnut and Lime (example shown at **Photo 4**). These are generally of good quality with little opportunity for bat roost potential, although Ivy covering the trunk of a number of these trees may disguise potential roosting opportunities. A single dead Lime tree is present on the southern boundary. Bats are likely to find the sheltered grassland habitats on site good quality foraging habitat, and common species in the local area are likely to make use of the site regularly.
- 4.4.3 During August 2012 a number of bat emergence and activity surveys were undertaken on site to determine the level of foraging and commuting activity across the site and any potential roosting opportunities. This included emergence survey work on the dead Lime tree on the southern boundary. The results of this survey are provided in **Table 1** and **Figure 4** below. A total of three species were recorded, Common & Soprano Pipistrelle *Pipistrellus pipistrellus*

& *P. pygmaeus* and Serotine Bat *Eptesicus serotinus*, but use of the site was considered relatively low, with bats only arriving on site upto 30mins after sunset in low numbers.

Table 1: Survey Results

Date	Survey	Results
08 August 2012	Bat Roost re-assessment	One Category potential dead Lime tree on southern boundary with other healthy Limes. Alder and Horse Chestnut with some Ivy growth providing low roost potential
15 Aug 2012	Emergence Survey, Transect of Activity Overcast dry, prev rain in day. 13c	First bat(PP) after sunset at foraging around Limes briefly. PS recorded along eastern boundary with individual PP on and off until survey end. 3min timed counts on transect: C1 = 0passes; C2 = 0passes
23 Aug 2012	Emergence Survey, Transect of Activity No cloud, temp reducing to 13c but SW wind	First bat(PP) after sunset at 20:34 foraging briefly in dark NW corner of site, then on and off occasional PP foraging with occasional PS for a further 30mins – in association with large garden to NW. 2 Passes of Noctule recorded high over site. PS & PP recorded along northern boundary and eastern boundary 3min timed counts on transect: C1 = 2passes PP; C2 = 0passes
03 Sept 2012	Emergence Survey Transect	First bat was very late at 20:39 a PP followed by irregular PP and PS foraging totalling c3-4 bats. These were most frequent along the eastern boundary, but with PP foraging around the larger southern boundaries trees as well. 3min timed counts on transect: C1 = 1passes; C2 = 1passes

Dormouse

- 4.4.4 The legally protected Dormouse *Muscardinus avellanarius* is not known from the immediate area and the desk top research has not revealed any local records within 1km. Further away, the species has been recorded at Holybank Woods to the north of Emsworth. The habitats on site are only marginally suitable for Dormice, although the woodland surrounding the site has limited potential. Given the lack of local records and fragmented nature of the site from likely potential source populations, Dormice are not considered likely to be present on site.

Badgers

- 4.4.5 Signs of Badgers *Meles meles* were searched for during the site visit. The grasslands on site is suitable foraging habitat for the species, and the embankments provide opportunity for sett creation. Despite this, no evidence that Badgers use the site or immediate surrounds was noted during the site visit. Access could not be gained to the railway embankment and the bank was assessed where viewable from the site. The boundary fence was, where possible,

walked to see if any sign of Badger access was present. Presence of Foxes *Vulpes vulpes* foraging was noted on site, although no earths/holes were recorded.

Amphibians

- 4.4.6 The potential for the legally protected and BAP species Great Crested Newt *Triturus cristatus* to be present on site was considered. No suitable breeding ponds were located within 500m of the site either during the site visit or from desk top information. No waterbodies exist on site, and although the terrestrial habitat is potentially suitable around the boundaries, this species is considered unlikely to be present. The reptile survey recorded small numbers of Common Toad *Bufo bufo*.

Reptiles

- 4.4.7 Three dedicated reptile surveys have been undertaken in all suitable areas of habitat across the site, the first during early summer 2008, and the second updated during late summer/autumn 2012 and a further update in late summer/autumn 2014. The methodology is provided in **Technical Appendix 7**. A total of c40 reptile refugia were placed on the site in suitable locations, mostly along the scrub and grassland edge.
- 4.4.8 The results of the 2008 survey showed the presence of three species of reptiles on the site. Each survey visit recorded numbers of Slow Worm *Anagallis fragilis*, with Common Lizard *Zootoca vivipara* also present on every visit. Grass Snake *Natrix natrix* were recorded on a couple of occasions. The results are provided in **Table 2** below.
- 4.4.9 The 2012 & 2014 surveys were undertaken by the same surveyors following a period of heavy grazing by gypsy ponies to 2012, then relaxation of some grazing in 2014. The amount of suitable edge habitat had diminished considerably since the 2008 survey work and the main grasslands had little suitable structure for maintaining reptile populations (see **Photo 1**). The survey results show a marked decrease in the number of reptiles recorded. It is considered that this cannot be attributed to an increase in grazing from just one season, as that is likely to have just concentrated reptiles in remaining small fragments of habitat. The lower records suggest that the site has been heavily grazed on a number of summers in between the first two reptile surveys. The consistent change in habitat may have forced the reptiles onto adjacent land such as the railway embankment and/or the Local Nature Reserve at Brook Meadows.

Table 2: Results of Reptile Survey

Date of Survey			Slow Worm			Common Lizard			Grass Snake		
2008	2012	2014	2008	2012	2014	2008	2012	2014	2008	2012	2014
10/06/08	14/08/12	18/04/14	1m 3f 6sub	1F	1F, 1sub	1ad	-	-	1sub	-	-
17/06/08	22/08/12	22/08/14	2m 2f 6sub	1F, 2sub	2sub	-	-	-	-	-	-
19/06/08	23/08/12	26/08/14	3m 9f 6sub	1F	2F, 1sub	-	-	-	-	-	-
23/06/08	24/08/12	06/09/14	3m 5f 4sub	2sub	1sub	2ad	-	-	-	-	-
27/06/08	29/08/12	12/09/14	1m 4f 6sub	1F	3F, 1sub	4ad	-	-	1sub	-	-
10/07/08	31/08/12	19/09/14	2m 7f 5sub	1F, 1sub	2F, 2Sub	1ad	-	-	-	-	-
11/07/08	03/09/12	16/10/14	4m 9f 7sub	2F	2sub, 1juv	2ad	-	-	-	1F	-

Key m = male f = female sub = sub-adult ad = adult

Other Protected Species

- 4.4.10 The legally protected and BAP species Stag Beetle *Lucanus cervus* is known from the local area although little mature dead wood, or dead wood habitat exists on site. The grasslands had a small number of Lepidoptera, including Meadow Brown, Large Skipper, Small Skipper, Essex Skipper, Gatekeeper and a few Marbled White butterflies during the 2008 survey work. Given the heavy grazing few were noted in 2012 and 2014.
- 4.4.11 Water Vole *Arvicola terrestris* are recorded along the River Ems to the east of the site (See **Technical Appendix 6**), but again no suitable habitat exists on site. Otter *Lutra lutra* have not been recorded, but the habitat in the Ems Valley is suitable. No other protected species are considered present within the zone of influence which would be impacted by the development proposals.

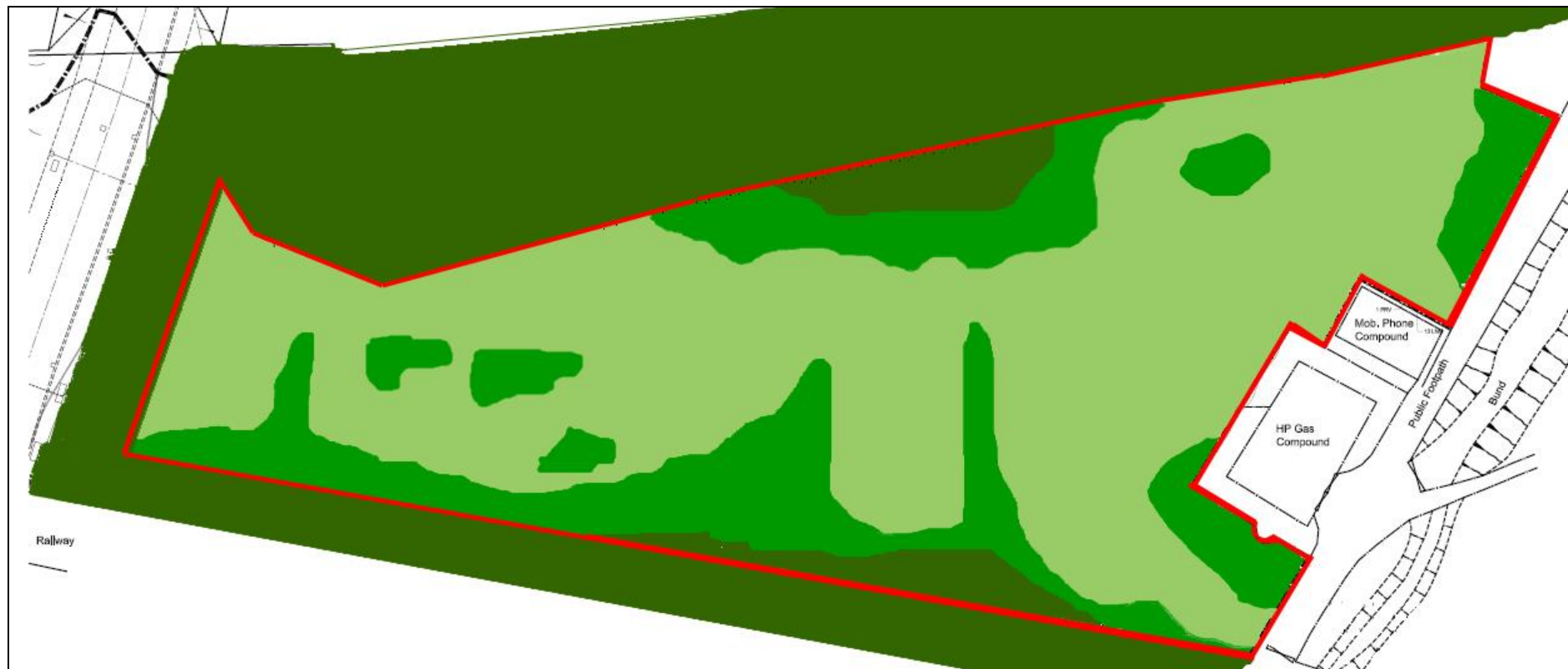
4.5 Evaluation of Species

- 4.5.1 A number of protected species are present on site, including breeding birds, foraging bats and reptiles. The site is considered to be of **value within the zone of influence** for birds, bats and invertebrates, on account of its small size and low diversity of habitats. No significant roosting potential is present for bats, but local populations utilise the habitats on site for foraging (**Figure 4**).
- 4.5.2 The reptile populations on site were, in 2008, distributed across the majority of the site and included populations of three species. By the 2012 survey reptile distribution is very patchy with the most activity on the eastern boundary. The low numbers continued during the 2014 survey, but with some distribution through the site. An estimate of the likely population of size can be made. This uses standard numbers from the Herptofauna Groups of the British Isles (HGBI, 1999) advisory notes for Amphibian and Reptile Groups (ARGs) and shown in **Table 3**.

Table 3: 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)

- 4.5.3 From the data gathered during the 2008 survey there was a medium population of Slow Worm and low to medium population of Common Lizard on the site. Given the Grass Snake records it is considered that there is likely to be a low to medium population of Grass Snake on site. During the survey in 2012 and 2014 the populations of reptiles are considered to be low for all species. On this basis the site is considered to be of **local value** for reptiles.



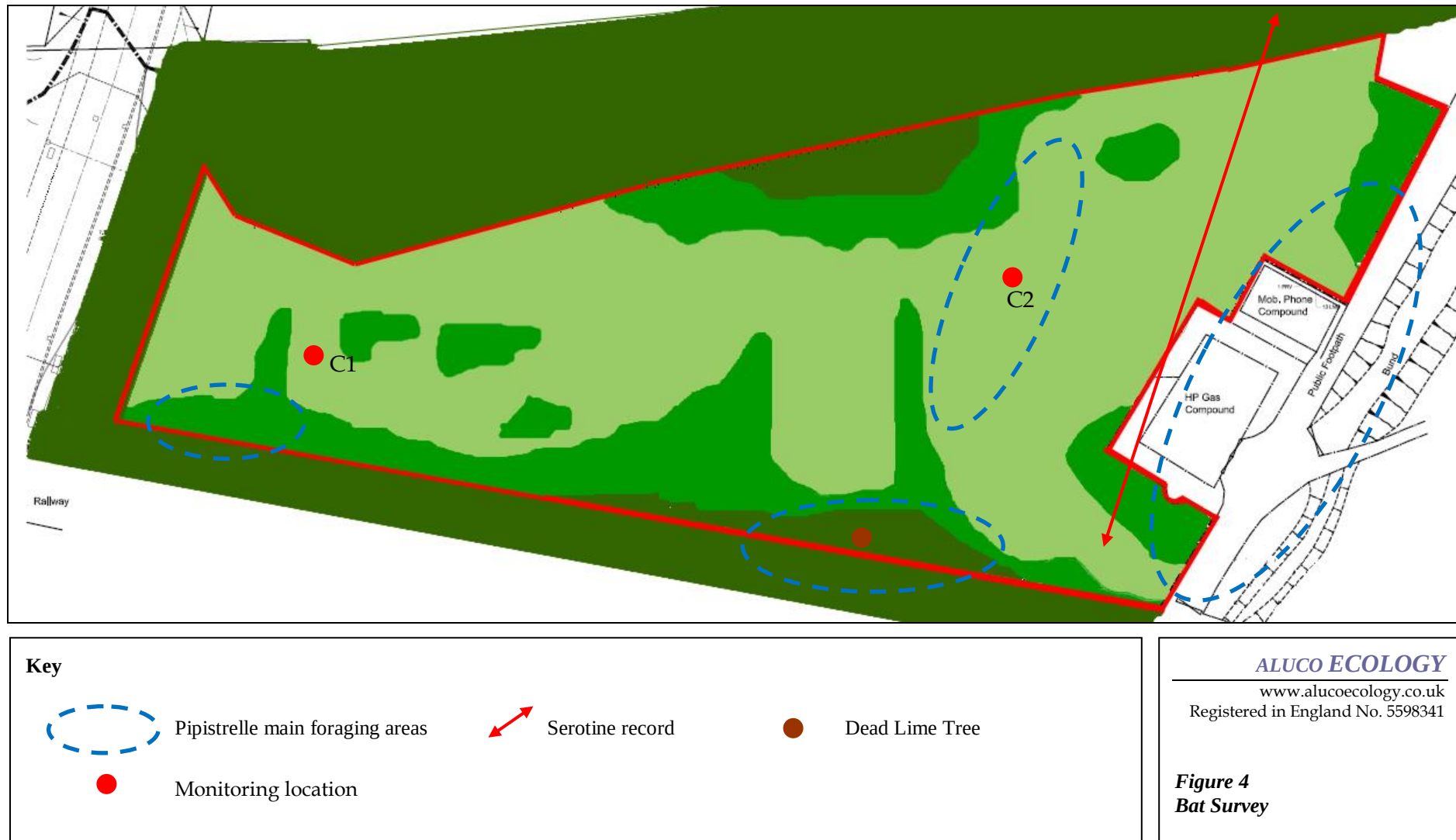
Key / Site boundary Grasslands Developing Scrub and Ruderal Vegetation

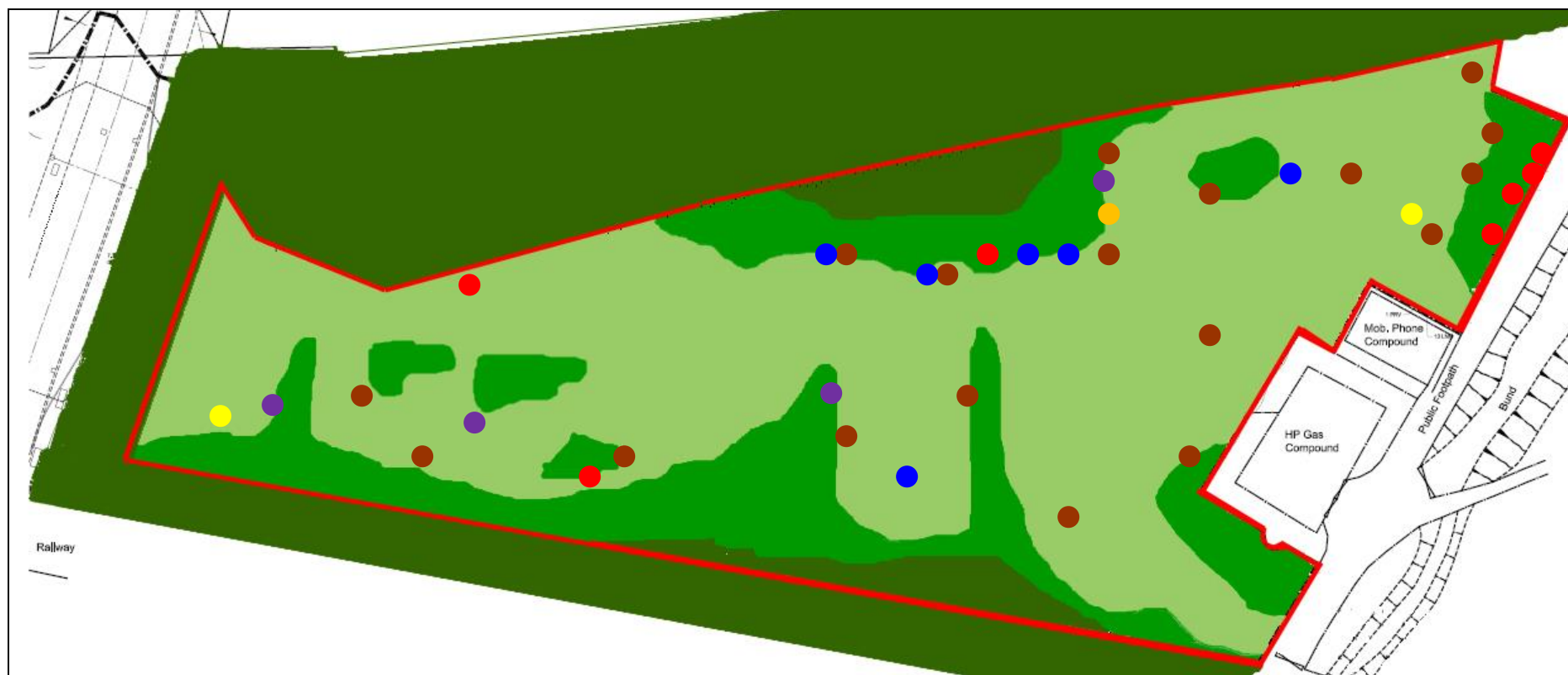
■ Mature Scrub & Secondary Woodland

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Figure 3
Vegetation & Habitats on Site





Key

2008:

- Slow Worm (1-2 records)
- Common Lizard (ind. Records)
- Grass Snake (ind. Records)

2012:

- Slow Worm (ind record)

- Grass Snake

2014:

- Slow Worm

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Figure 5
Reptile Survey 2008 & 2012

5.0 ASSESSMENT OF LIKELY IMPACTS WITHOUT MITIGATION

5.1 Introduction

- 5.1.1 In view of the predicted activities and the resultant biophysical changes associated with the proposal, as described in Section 3, this section identifies the main potential ecological impacts within the predicted zone of influence, those considered likely to arise in the absence of mitigation. This exercise provides focus for recommendations for mitigation.
- 5.1.2 The Interbridges scheme has planning permission. On this basis the assessment and mitigation proposals in the next section will focus on protected species mitigation, and potential enhancements for the scheme and zone of influence.

5.2 Protected Sites

Potential Impacts on the Chichester Harbour designated site, and Lumley Meadow SINC

- 5.2.1 Given the importance of the habitats off site, any potential dust or run off pollution, especially during construction could without mitigation provide an adverse effect on the features of international and national importance, and protected species/habitats associated with these sites (such as Water Vole). These sites are generally buffered by the railway and its embankment and adjoining garden areas to the east, which will buffer the potential for such pollution. The development access will be off the main road along the western boundary rather than the access of Seagull Lane.

5.3 Habitats & Species on Site

Potential Impacts on Habitats and Vegetation

- 5.3.1 The majority of the grassland and scrub will be re-profiled as a result of the development. This habitat is evaluated as being of a high local value, and its loss in vegetation terms is considered to be a local adverse impact. The mature trees on the southern boundary are mainly to be retained.

Potential Impacts on Birds

- 5.3.2 The loss of habitat will result in reduced habitat for birds in the local area. Given that the species present are widespread, this will be a localised impact and is not considered significant.

Potential Impacts on Bats

- 5.3.3 Potential roost structures are not considered likely to be present on site. The scheme will result in some changes to and the loss of some local foraging habitat, although other semi natural habitats exist along the Ems Valley and this loss is not considered significant.

Potential Impacts on Reptiles

- 5.3.5 The common reptiles on site are considered to be localised to around certain boundary features that have survived the periods of heavy site grazing by gypsy ponies over the last few years. Without mitigation the re-profiling works and creation of pitches may have a negative

impact on these reptile populations around the boundaries of the site and result in an adverse impact on this feature.

6.0 OPPORTUNITIES FOR DESIGN, ECOLOGICAL ENHANCEMENT AND MITIGATION

6.1 Introduction

- 6.1.1 The potential for impacts on an unmitigated scheme was considered in Section 5, and mitigation recommendations are provided to ensure that protected species are also considered in construction and operation of the site.

6.2 Mitigation for Designated Sites and Vegetation & Habitats

Potential for Effects on Adjacent Protected Habitats and Sites

- 6.2.1 The multiple designated sites are in part designated for their wetlands. The scheme will need to ensure that construction and operational impacts do not result in dust or run off pollution affect these adjacent habitats. This can be achieved through on site construction best practice operating procedure for pollution prevention control. A hydrological assessment is provided separately.

Habitats on Site

- 6.2.2 The scheme will see the loss of virtually all existing habitats on site, with only a few mature trees remaining (see **Figure 2**). There are no ways of preventing or reducing such an impact on the scheme design as the site is small and very little of it is not being used by the proposed development. The scheme already has planning permission so the loss of this feature has been weighed up by the planning system (with the site also having been surveyed by Hampshire County Council ecologists at HBIC).
- 6.2.3 Compensation is to be provided to offset such a loss, via a number of measures:

- Discussions have been had with the Brook Meadows Conservation Group (BMCG) over enhancement plans for wildflower grassland habitats in the adjacent reserve and a set of measures have been outlined with proposed funding options for certain measures relating to the grasslands. These measures are outlined in **Technical Appendix 9** and relate to their ongoing management plan (BMCG, 2013);
- As part of the reptile translocation strategy, discussions have been had with the Nore Barn Woods Conservation Group (NBWCG) and funding has been proposed to increase woody/grassland edge habitats proposed within the management plan for Nore Barn Woods. The funding of additional edge habitat creation will also enhance the vegetation and habitats value of the woodland here providing enhanced glades, rides and clearings within the wood. This is discussed further in relation to the reptile translocation in Section 6.4 below.

- 6.2.4 The development boundary abuts tree root protection areas of retained trees and hedges and these will be marked out to standard root protection methods.
- 6.2.5 The landscape strategy for the site should include native species woody planting in its mix. This is set out in the Landscape Plan for the site.

6.3 Mitigation for Birds

- 6.3.1 All bird species are protected at the nest. Any development that could affect nesting birds should take place outside the bird nesting season, usually considered March-August. Woody vegetation should only be removed within the nesting period after inspection by a suitably qualified ecologist that no active bird nests are present. Where woody vegetation is to be removed in reptile habitat on site, the vegetation contractors will be briefed by an ecologist prior to commencing works, with works areas defined, and reptile sensitive areas with no vehicle tracking set out. Vegetation will be removed to c100mm from the ground to avoid disturbing the ground (see also reptile methodology below).
- 6.3.2 As part of additional enhancements to the site a total of three bird boxes will be installed in suitable locations around the site boundaries. The location will be agreed with an ecologist on site.

6.4 Mitigation for Mammals

Bats

- 6.4.1 No roosts have been located on site. A single dead tree is present with limited potential, although assessment including detailed emergence survey work has not recorded any presence. Should this tree and mature Alder, Sycamore or Lime be removed as part of the scheme or for health & safety purposes a safe felling procedure (as outlined in **Technical Appendix 7**) should be followed. The mature trees along the southern boundary are mostly retained within the scheme (see **Figure 2**).
- 6.4.2 Habitat enhancements on the retained trees on the southern boundary will include the provision of six woodcrete bat boxes as per **Technical Appendix 10**. These should be located in suitable positions on site by an experienced ecologist.

Foxes

- 6.4.3 Survey work has not recorded Fox earths within the development footprint, but use of the site is recorded, and site clearance of vegetation will be combined with further checks for any use. If an earth has been constructed it will be closed down to best practice methodologies outside the period when dependant young are underground, considered to be Jan/Feb-May/June.

Water Vole

- 6.4.4 The provision of construction environmental management procedures to ensure that site run off does not affect the habitats of the Water Vole in the adjacent watercourses of Ems Brook will ensure that there are no significant impacts on this species. The hydrological assessment is provided separately.

6.5 Mitigation for Reptiles

Introduction

- 6.5.1 The reptiles present on site are legally protected from harm. A mitigation strategy has been developed to ensure that any re-profiling of the grasslands caters for these reptile populations.
- 6.5.2 Given the land take of the development there will be very little reptile habitat left on site following construction. Very small amounts of Ivy ground cover with some grassland may be present in retained tree lined edges on the southern and eastern boundaries.
- 6.5.3 The updated reptile survey has however only recorded a very small number of Slow Worm, and but suitable edge habitat on the site (although in recent history a total of three species has been recorded on site from less heavily grazed grasslands).
- 6.5.4 With the development of all suitable habitats on site, the reptile populations within the site will need to be translocated to a suitable local receptor site. A process of searching for suitable sites, and discussions with local conservation bodies has resulted in the consideration of two local sites for a reptile translocation. These are Brook Meadows LNR and Nore Barn Woods. The benefits of both these sites are they are within Emsworth and are therefore very local, and they contain existing suitable habitat and space to create additional habitat to support a translocated population of reptiles.
- 6.5.5 Discussions have been had with Conservation Groups for both sites and through these discussions it appears that the most suitable location for a translocation is at Nore Barn Woods, on the basis that there is more limited edge habitat creation options at Brook Meadows, and this site has been used as a receptor site for a translocation scheme recently.

Receptor Site Management

- 6.5.6 Ideally a receptor site should have no reptile population so that the translocation will result in establishing a new population in an area where they were absent. Sites such as these are extremely uncommon in southern England, especially where there is a long term commitment to conservation management. As the site has existing reptile populations, the strategy is based on the creation of new reptile habitat in the site.
- 6.5.7 The reptile mitigation strategy includes the creation and ten-year management of an area within Nore Barn Woods. The area calculation is made based on existing habitats to be lost at the development site, and populations of reptiles to be translocated. The populations at Interbridges are low, and it is likely that only low numbers of Slow Worm, and possibly Common Lizard would be translocated.
- 6.5.8 The main management principles are to create new reptile habitat as well as enhancing the management of other parts of the woodland, benefiting the entire woodland ecosystem. The management techniques and location of management areas have been carefully considered so as to provide complementary biodiversity benefits for the woodland, grassland glades and

rides, and provide additional compensation locally for the loss of the habitats within the development site (see section 6.2 above).

6.5.9 The area of reptile habitat management to be completed to facilitate the release of the reptiles from the development site has been calculated by considering the area of reptile habitat being removed. The initial habitat area of the site that is suitable for reptiles is given as about a third of the site based on habitats on site during survey work. This is roughly about 0.25ha.

6.5.10 The majority of management and reptile habitat creation will be through funding of management in the longer term in the open areas already created to maintain openness as per the management plan for the wood and edge habitat management strategy, and the creation of a series of scallops (semi-circular clearings) along the rides and glades within the wood. This upkeep of recently created habitat and creation of new scallops will total 0.25 hectare of habitat to be incorporated into the woodland management plan for the site providing contribution to the wider joint nature conservation initiative in the local area. These areas of habitat creation along the rides for the receptor site are illustrated in **Technical Appendix 11**.

6.5.11 The funded management includes the following steps:

- In areas identified for coppicing of understorey edge, undertaking of coppicing works in winter 1. Where considered necessary treatment of stumps to prevent regrowth. This may be the case with non-native species such as Laurel and Bay trees;
- Years 2-5 monitor regrowth. Potential for minor vegetation works eg brush cutting of woody re-growth and Nettles targeted in late autumn and early spring. Avoid banks/hibernacula areas that could be in use by hibernating reptiles. Remove spoil to suitable compost site;
- Years 6-10 , 2-3 year woody vegetation in rotation over the site, with areas worked on rotation annually. There should be a mosaic of edge habitat with developing natural scrub and rough grassland, with some areas of short grassland (see limits of acceptable change below);
- Designate compost area in discrete edge location and remove cuttings to compost or remove off site.
- The amount cut on each rotation will be dependent upon the vegetation growth and will be assessed annually by the Nore Barn Wood Conservation Group, based on criteria for maintenance of suitable reptile habitat;
- The arisings can be deposited to the edge of the scallops to provide additional reptile habitat.
- Log piles will be created in scallops where there is less likelihood of vandalism and arson, using initial clearance material, providing additional habitat structure;

- Management prescriptions are based on use of hand tools such as brushcutters, trimmers and chain-saws, or where possible small machinery such as a Forage Harvester.

Limits of Acceptable Habitat Change for Reptiles

The ideal limits of acceptable change for reptiles for the following micro habitats that comprise the glades and rides on site are considered to be:

- Semi-natural scrub redevelopment managed by occasional cutting/flail or preferably coppicing (every 10-20yrs): lower = 15%, upper = 35%
- Rough Grassland managed on a 3-5year cut by cutting or forage harvesting to prevent scrub forming: lower = 30%, upper = 75%
- Short annually or biannually managed grasslands; lower = 10%, upper = 35%
- Nettle and ruderals vegetation: lower = 5%; upper = 25%
- Bare ground or ruderal open ground: lower = 5%, upper = 15%

Translocation Procedures

6.5.12 The following strategy will be employed to translocate the reptiles to the receptor site (and based on best practice guidelines for reptile mitigation – see also **Technical Appendix 12**):

- Habitat manipulation of the core habitats on site to remove woody vegetation to 100mm by hand. Given timings of the works there is a need to remove woody vegetation within the winter period prior to translocation of reptiles. This will be to ensure nesting birds are not harmed. There is a need for the vegetation contractors to work sensitively around reptile habitat and be subject to initial discussions and supervision by an ecologist as to the methods of works;
- Removal of woody vegetation off site or chipping the material into a discrete area on site;
- The details of the reptile mitigation and translocation works are set out above, with funding for future management of habitats where the reptiles are present and drawn up with a local landowner having regard to best practice guidelines for reptile translocation;
- Translocation of the population on site. Refugia will be placed along the works area and a relocation of reptiles on the works side of the fencing will be made based on the strategy outlined in **Technical Appendix 12**. This will involve regular visits during suitable weather between March/April and Oct by experienced herpetologists to collect and translocate reptiles to habitat within the agreed main receptor site (away from the development site);
- If Grass Snake are caught within the development site, these will be released on the adjacent Brook Meadows/Seagull Lane patch on the basis that Grass Snake territories will encompass both sites and relocation within likely existing territory is considered a more suitable option to translocation to Nore Barn Woods;
- Following 3-5 negative visits in suitable conditions a destructive search will be undertaken of the works area by a suitably qualified ecologist;
- The site is not connected strongly to existing reptile habitat as it is surrounded by woodland on all sides, but reptile fencing of phases of the scheme may be necessary.

This will be installed to standard specifications to ensure reptiles are not harmed during the construction process.

- 6.2.14 With an agreed reptile strategy for a local site the development will ensure there is no harm to any populations of reptile on site.

6.6 Work Timetable for Mitigation

- 6.3.1 **Table 4** below shows the main periods where mitigation works will take place on site.

Table 4: Summary of Anticipated Protected Species Mitigation During Construction

2015 =	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M
Reptiles																	
Cut veg/install fencing where necessary																	
Monitor reptiles																	
Translocation																	
Destructive Search																	
Translocation Site initial habitat works																	
Foxes																	
Update Surveys on site																	
Earth Closures																	
Minimize secondary impacts/site induction																	
Nesting Birds																	
Principal Cutting of woody vegetation period																	
Vegetation																	
Plant Native tree/shrubs in retained areas																	
Protect retained vegetation with fencing																	
Bat & Bird Box Mitigation																	
Erect Bat & Bird Boxes																	

7.0 CONCLUSIONS

- 7.1 The proposed development will see land-take for the majority of the site and there is little opportunity for mitigation on site. Planning permission is granted for the scheme and this report outlines the ecology on site and protected species mitigation required prior to construction commencing.
- 7.2 Of the site features mitigation is outlined for the following:
- Funding of habitat management works on a local site to compensate for the loss of grasslands on site (to be joined with the reptile strategy as a joint initiative);
 - Translocation of the low Slow Worm and reptile populations to a local receptor site ;
 - Provision of native species in the landscaping proposals;
 - Provision of bird boxes on site;
 - Provision of bat boxes on site;
 - Mitigation to avoid harm to nesting birds, potential Foxes and other protected species.
- 7.2 With these measures in place the development will ensure that the ecology policies outlined in Section 3 are adhered to.

6.0 REFERENCES

BMCG (2013) Brook Meadows Management Plan 2005 – 2018 Supplement 1 October 2013

European Commission. 1992. Directive on the Conservation and Natural Habitats and Wild Fauna and Flora (Habitats Directive). Directive 92/43/EEC.

English Nature (1997) “Natural Area Profiles” Peterborough

FONBW (2013) Work Plan for Nore Barn Woods Emsworth Dec 2012

Havant Council (2011) Local Development Framework Core Strategy

Hampshire County Council (HCC) (1998) A Biodiversity Action Plan for Hampshire

HMSO. 1981. The Wildlife and Countryside Act 1981.

HMSO. 2000. The Countryside and Rights of Way Act 2000 (CRoW Act).

IEEM (2006). Guidelines for Ecological Impact Assessment in the United Kingdom, Institute of Ecology and Environmental Management, Winchester.

Pengelly (1999) Silvicultural Management Plan for Nore Barn Woods (North & South)

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Technical Appendix 1

Habitats Regulations and Schedule 2 Species

The Conservation (Natural Habitats & c.) Regulations SI 1994/2716 partially implement the Habitats Directive. This has recently been replaced by the Conservation of Habitats and Species Regulations 2010 (the Habitat Regulations). The Regulations contain provisions relating to the protection of European sites and European protected species. European Sites are defined within the Regulations as Special Areas of Conservation (SACs) or Special Protection Areas (SPAs) whether proposed, candidate or classified. European Protected Species are those species listed in Annex IV of the Directive that occur in the UK, and these have been listed in Schedule 2 of the Regulations.

Species listed under Schedule 2 of the Habitat Regulations were formally afforded protection by Regulation 39 (1994), this is now found under Regulation 41/42 (2010). European protected species include the great crested newt, dormice and all species of bats.

(1) The Habitats Regulations makes it an offence;

(a)deliberately to capture or kill a wild animal of a European protected species;

(b)deliberately to disturb any such animal;

(c)deliberately to take or destroy the eggs of such an animal; or

(d)to damage or destroy a breeding site or resting place of such an animal.

(2)It is an offence to keep, transport, sell or exchange, or offer for sale or exchange, any live or dead wild animal of a European protected species, or any part of, or anything derived from, such an animal.

(3)Paragraphs (1) and (2) apply to all stages of the life of the animals to which they apply.

(4)A person shall not be guilty of an offence under paragraph (2) if he shows-

(a)that the animal had not been taken or killed, or had been lawfully taken or killed, or

(b)that the animal or other thing in question had been lawfully sold (whether to him or any other person).

For this purpose "lawfully" means without any contravention of these Regulations or Part I of the Wildlife and Countryside Act 1981.

(5)In any proceedings for an offence under this regulation, the animal in question shall be presumed to have been a wild animal unless the contrary is shown.

(6)A person guilty of an offence under this regulation is liable on summary conviction to a fine not exceeding level 5 on the standard scale.

The Regulations go on to state exemptions and defences that apply to acts that may contravene the Regulation. Such exemptions include those listed in Regulation 40 (1994) now found at Regulation 42 of the 2010 Regulations

The granting of a licence under Regulation 44 (1994 Regulations) now Regulation 53-55 (of 2010 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 2010, 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.

For Full details of the 2010 Habitat Regulations see:

<http://www.legislation.gov.uk/ukxi/2010/490/regulation/42/made>

Technical Appendix 2

Wildlife & Countryside Act 1981 & Countryside & Rights of Way Act 2000 (CRoW)

Wildlife & Countryside Act

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 Article 1 (birds), Schedule 1 (specially protected birds), Schedule 5 (specially protected animals) or Schedule 8 (specially protected plants).

(ii) 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 policy (see PPS9)

(iii) Law Relating to Protected Species

The WCA provides protection to such species via Section 1 (birds) and Section 9 (animals). 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.

As with European Protected species, there are exemptions from this legislation, and licences for development can be obtained in certain circumstances. Protected species are also a material consideration in planning applications.

Countryside & Rights of Way Act 2000 (CRoW) and Wildlife and Countryside Act 1981

(i) Protected Species & SSSIs

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 an SSSI.

Havant Borough Council Ecology Policies

LOCAL DEVELOPMENT FRAMEWORK CORE STRATEGY ADOPTED IN MARCH 2011:

The Nature Conservation policies saved from the former Local Plan are now replaced by the Core Strategy. The following policies now apply:

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

Planning permission will be granted for development that:

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

DM8 Conservation, Protection and Enhancement of Existing Natural Features

Development will only be permitted where it protects and enhances local habitats and landscape distinctiveness and which addresses all of the relevant criteria as set out below:

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

DM9 Development in the Coastal Zone

Planning Permission will only be granted for development in the coastal zone which addresses all of the relevant criteria as set out below as shown on the Proposals Map:

1. Has no harmful effects on nature conservation within the Chichester and Langstone Harbour SSSIs and SPA, Solent Maritime SAC and Ramsar site, or any SINC and Local Nature Reserves.
2. Maintains and enhances the appearance and distinctiveness of existing settlements and landmarks along the coast.
3. Contributes positively to the landscape and has regard to best practice on the design of new buildings in coastal locations.
4. Upgrades existing footpaths and ensures that public access is retained and provided to connect existing paths along the waterfront where appropriate.
5. Would result in improvements to or redistribution of moorings, marine berths or launch on demand facilities (dry berths) in the harbours.
6. Would not be detrimental to infrastructure for, and quality of, water-based recreation, or be detrimental to the safety of navigation.
7. Provides recreational opportunities that do not adversely affect the character and appearance of the coast.

Ecological Appraisal and Assessment Method

Introduction

The methodology for this appraisal is based on the Guidelines for Ecological Impact Assessment (EcIA) in the United Kingdom published by the Institute of Ecology and Environmental Management (IEEM June 2006). 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 and Natural England's 'Nature on the Map' are interrogated for information regarding nationally or internationally designated sites within 1km or 5km of the site respectively. The National Biodiversity Network (NBN) data base is interrogated primarily for any relevant local protected species records within the area. The NBN provides access to a substantial volume of biodiversity data for the UK. Although rarely site specific, it does provide valuable information on the local occurrence of protected species.

Where appropriate, the local environmental Record Centre is approached to provide information regarding locally identified sites and records of protected and/or notable species within and around 1km of the site and European Protected species within 5km of the site.

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. Protected species law is a serious consideration for developers and land owners, as failure to confirm their presence during initial

project conception can later lead to serious programming delays and their associated costs and to prevent any infringement of the law.

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.

External inspections of the trees and buildings on site were undertaken. The survey looked 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 and an assessment of potential roost sites was therefore also undertaken:

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

The site and its boundaries were systematically searched for the presence of Badgers *Meles meles*, in particular badger setts, on or near (30-40m) of the site. The area was also assessed for the 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 presence of Dormouse on or near the site was considered during the survey, principally through habitat suitability, combined with data on occurrence within the area. Where suitable habitat occurs, further survey for feeding signs on hazel nuts and honeysuckle where it occurs along with searches for arboreal nests. If it a site is considered suitable, further survey may be recommended.

Other Mammals

Consideration is also given to the potential for habitats to support other legally protected mammals and those of nature conservation importance. Where any water bodies occur on or near to the site species including Water Vole *Arvicola terrestris* 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 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 more notable bird species.

Consideration is given to any features which could support nesting birds, (Buildings and other structures, and areas of vegetation) that will be cleared or disturbed as a result of the development.

Reptiles

Any areas of habitat considered suitable for supporting reptiles were noted (for example, areas of rough grassland and scrub, banks, burrows, and rubble piles, compost heaps).

Great Crested Newt

Due to declines in numbers predominantly due to habitat loss and restricted European range, Great Crested Newts *Triturus cristatus* are protected under Section 9 of the Wildlife and Countryside Act, 1981 (as amended) and Regulation 39 of the Conservation (Natural Habitats &c) Regulations 1994, which protects Great Crested Newts from harm, injury and deliberate capture, killing, disturbance, damage and destruction of eggs, breeding site or resting place. This includes deliberate or reckless damage or disturbance.

Survey was by habitat suitability (the occurrence of suitable ponds and terrestrial habitat) combined with knowledge on their distribution from biological records for the area. If a site is considered suitable, further survey is usually required if an impact 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, the survey concentrated 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

Walkover surveys are carried out during a brief window of time. And therefore, the survey will provide only 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. Where timing is likely to significantly affect the results of a survey, further survey work is recommended. Survey can also be restricted through land access, especially land adjacent to the site.

Assessment Guidelines

Introduction

The IEEM guidelines (2006) provide three principal reasons for an ecological feature being valued and therefore included within the EcIA: 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 IEEM'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

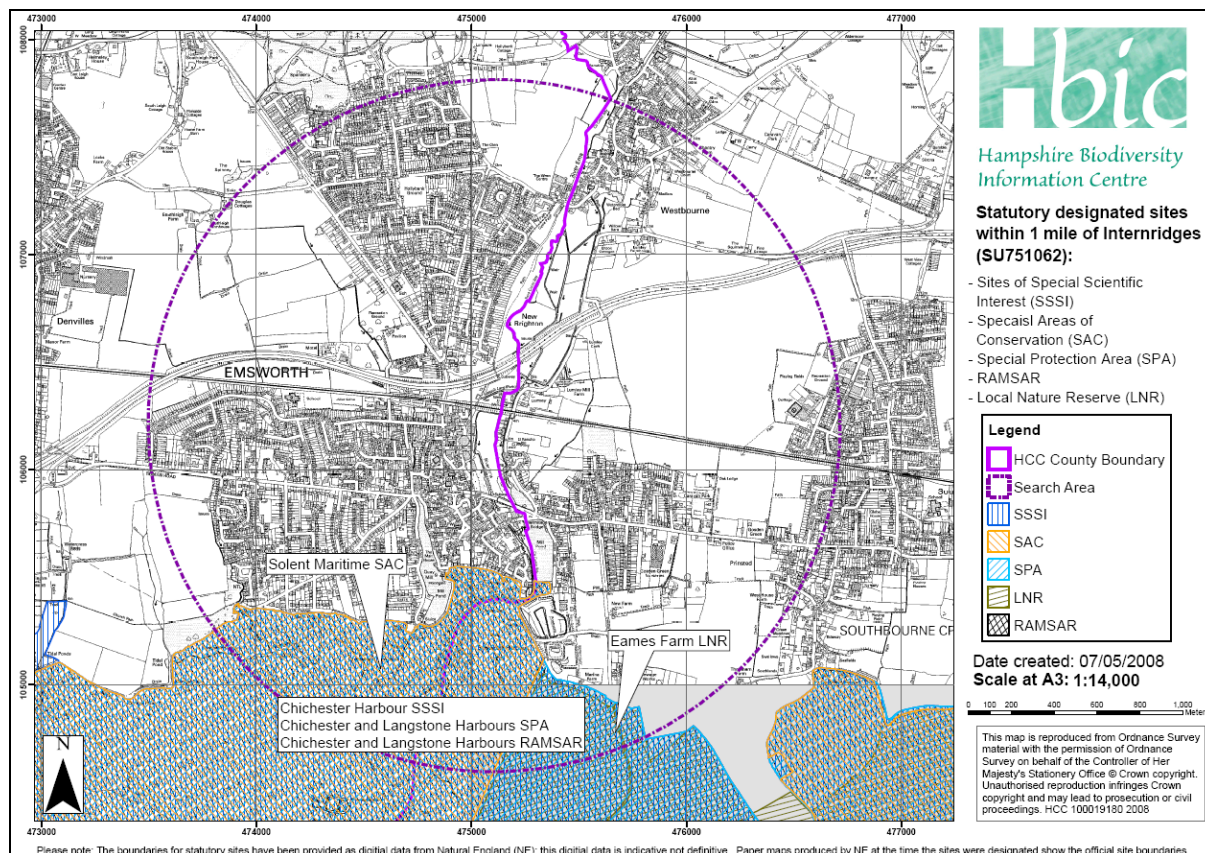
Drawing Assessment Together

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.

Designated Sites within 1km



Statutory Sites Within 1mile

Chichester Harbour SSSI

COUNTY: WEST SUSSEX/HAMPSHIRE
SITE NAME: CHICHESTER HARBOUR
DISTRICT: CHICHESTER/HAVANT

National Grid Ref: SU 760 000 Area: 2657 ha 6566.7 acres W Sussex 3695 ha 9130.3 acres
Date Notified (Under 1949 Act): 1970 Date of Last Revision: 1980
Date Notified (Under 1981 Act): 1984 (Hants) 1985 (W Sussex)

Other Information: This site lies within the South Coast Plain. It includes Nutbourne Marshes Local Nature Reserve. The site is listed in 'A Nature Conservation Review' and is a Geological Conservation Review site.

Reasons for Notification:

Chichester Harbour is a large estuarine basin in which at low water extensive mud and sandflats are exposed, drained by channels which unite to make a common exit to the sea. The site is of particular significance for wintering wildfowl and waders and also breeding birds both within the Harbour and in

the surrounding permanent pasture fields and woodlands. There is a wide range of habitats which have important plant communities. The intertidal area is fragmented in the upper reaches of the harbour by intruding tongues of land giving a very long and varied coastline. The harbour exhibits a wide range of intertidal and associated terrestrial habitats and with the neighbouring Langstone and Portsmouth Harbours is unusual in providing a large volume of sheltered saline water fed by a few streams of only low volume. The extensive intertidal mudflats are the feeding grounds, at the relevant times of year for internationally important numbers of ringed plover, grey plover, redshank, black-tailed godwit, dunlin, sanderling, curlew and greenshank (the latter two in autumn particularly). Bar-tailed godwit numbers are of European importance. Amongst the wildfowl, shelduck, teal and dark-bellied brent goose numbers are of international importance with 5% of the world population of the latter. The unimproved permanent pasture behind the sea wall provides alternative feeding sites for the geese and major high tide wader roosts. Some of this pasture is floristically rich being a red fescue *Festuca rubra* sward with scarce species such as green-winged orchid *Orchis morio* and adder's tongue fern *Ophioglossum vulgatum*. The lower saltmarsh habitat fringing the mud flats is dominated by cord grass *Spartina anglica* and in most places the upper saltmarsh is rather restricted by the sea wall but there are some pure stands of sea purslane *Halimione portulacoides* while in some areas there is also sea lavender *Limonium vulgare*, sea aster *Aster tripolium* and other saltmarsh species. Shingle occurs as spits and islands and most are rather unstable permitting little vegetation to become established. This habitat forms the main breeding grounds in the harbour for ringed plover, blackheaded gull and three species of terns. The extensive sand dunes at East Head are dominated by marram grass *Ammophila arenaria* although the degree of ground cover varies from 90% to 10% on the more recently established dunes. At the head of Fishbourne Channel saltmarsh grades through a reed *Phragmites australis* bed into fresh marsh influenced by a chalk spring. Most of the other fresh marshes behind the sea wall are small but at Thorney Deep's reclaimed saltmarsh has given way to extensive fresh water marsh vegetation influenced by salt water intrusion; here the reed is fringed by extensive areas of rushes *Juncus* species and invasive willow *Salix* scrub. A number of small ponds occur one of which contains the rare annual beard grass *Polypogon monspeliensis*. Significant blocks of scrub, mainly hawthorn *Crataegus monogyna* and blackthorn *Prunus spinosa* occur which are important for breeding and roosting birds. Hedgerows of oak *Quercus robur* are common and in some places the oak roots are strongly influenced by salt water. Semi-natural broadleaved woodland associated with the Harbour is important for breeding birds and supports two heronries. Oak is the major tree species usually with hazel *Corylus avellana* coppice, as at Old Park Wood, although Tournierbury Wood has well spaced oaks with the occasional beech *Fagus sylvatica*, holly *Ilex aquifolium* and yew *Taxus baccata* with a fairly dense ground flora of bramble *Rubus fruticosus* and bracken *Pteridium aquilinum*. Notable invertebrates include the long-winged conehead *Conocephalus discolor* and the moths, starwort hawk *Cucullia asteris*, the sand dart *Agrotis ripae*, shore wainscot *Mythimna litoralis* and lunar hornet *Sphecia bemeciformis*.

Geology and Physiography

East of Langstone, at SU 725053, a low cliff line at high water mark exhibits a complex of Brickearth and Coombe Rock deposits and at East Head, SZ 769991 there is a sizeable sand dune and shingle system both of which are of geomorphological importance.

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.

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)

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;

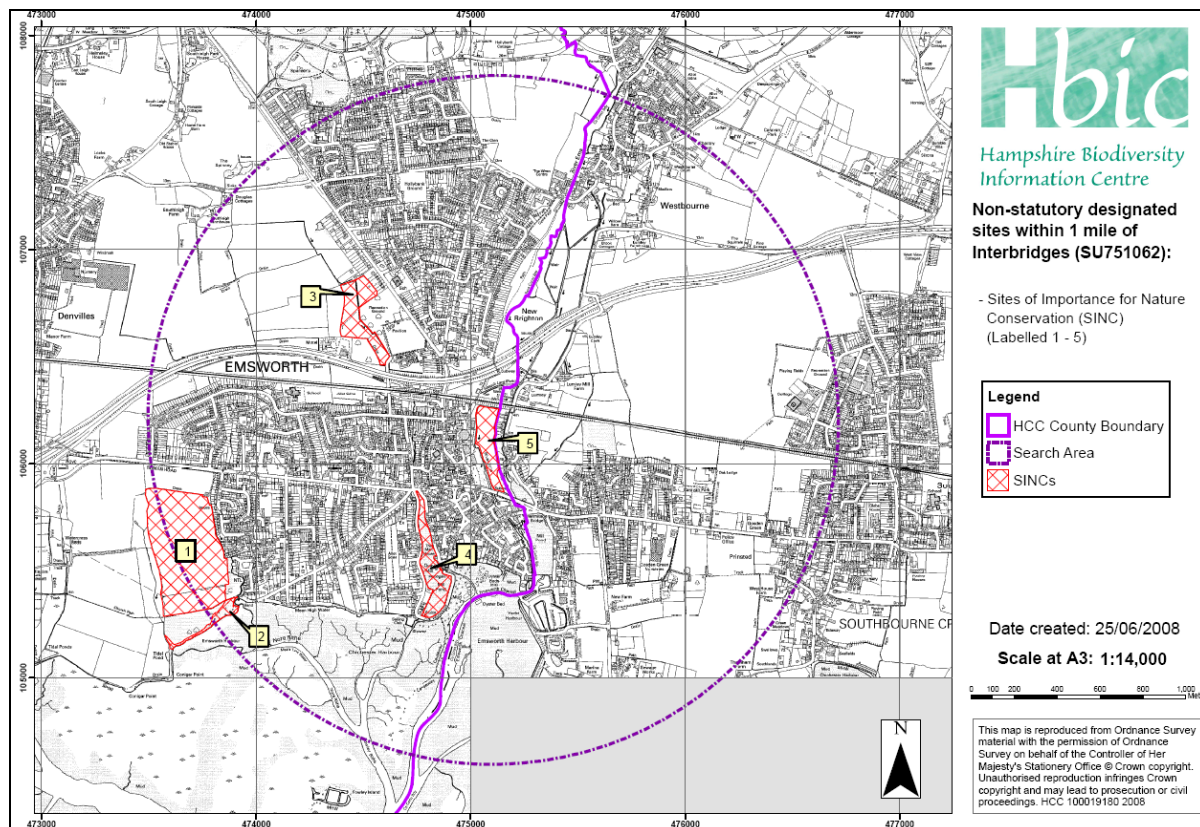
Little Tern *Sterna albifrons*, 100 pairs representing up to 4.2% of the breeding population in Great Britain (5 year mean, 1992-1996)

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)

Non Statutory Sites



Non Statutory sites Within 1Mile

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

Map	SINC Name	Criteria	Additional Species
1	Brook Farm B	6B	Brent Goose
2	Nore Grassland & Saltmarsh	4A	
3	Land West Of Emsworth Recreation Ground	2B/2D	
4	Emsworth Millpond	4A	
5	Lumley Meadow (Brook Meadow LNR)	2A/6A	Divided Sedge <i>Carex divisa</i> Distant Sedge <i>Carex distans</i>

Technical Appendix 6

Vegetation List

English	Latin	DAFOR
Ash	<i>Fraxinus excelsior</i>	R
Hawkbitt	<i>Leontodon sp.</i>	O
Bee Orchid	<i>Ophrys apifera</i>	R
Bittersweet	<i>Solanum dulcamara</i>	O
Black Medick	<i>Medicago lupulina</i>	F-A
Bramble	<i>Rubus fruticosus agg.</i>	F
Bristly Oxtongue	<i>Picris echioides</i>	R
Bulbous Buttercup	<i>Ranunculus bulbosus</i>	F
Canadian Goldenrod	<i>Solidago canadensis</i>	LD
Cat's-ear	<i>Hypochaeris radicata</i>	R
Cleavers	<i>Galium aparine</i>	O
Cock's-foot	<i>Dactylis glomerata</i>	LA
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	O
Common Fleabane	<i>Pulicaria dysenterica</i>	LF
Common Ivy	<i>Hedera helix</i>	LD
Common Knapweed	<i>Centaurea nigra</i>	LD
Common Lime	<i>Tilia x europea</i>	R
Common Mouse-ear	<i>Cerastium fontanum</i>	O
Common Nettle	<i>Urtica dioica</i>	LF
Common Ragwort	<i>Senecio jacobaea</i>	O
Common Sorrel	<i>Rumex acetosa</i>	O
Common Toadflax	<i>Linaria vulgaris</i>	R
Common Vetch	<i>Vicia sativa</i>	LF
Corky-fruited Water-dropwort	<i>Oenanthe pimpinelloides</i>	VLF
Cow Parsley	<i>Anthriscus sylvestris</i>	R
Creeping Cinquefoil	<i>Potentilla reptans</i>	O
Creeping Soft-grass	<i>Holcus mollis</i>	O
Creeping Thistle	<i>Cirsium arvense</i>	VLF
Crested Dog's-tail	<i>Cynosurus cristatus</i>	O
Curled Dock	<i>Rumex crispus</i>	R
Cut-leaved Crane's-bill	<i>Geranium dissectum</i>	O
Daisy	<i>Bellis perennis</i>	O
Dandelion	<i>Taraxacum officinale agg.</i>	O
Dog-rose	<i>Rosa canina</i>	O
Elder	<i>Sambucus nigra</i>	R
False Oat-grass	<i>Arrhenatherum elatius</i>	O
Field Bindweed	<i>Convolvulus arvensis</i>	O
Field Maple	<i>Acer campestre</i>	R
Greater Plantain	<i>Plantago major</i>	R

Grey Sedge	<i>Carex divulsa</i>	O
Groundsel	<i>Senecio vulgaris</i>	R
Hairy Sedge	<i>Carex hirta</i>	O
Hazel	<i>Corylus avellana</i>	R
Hedge Woundwort	<i>Stachys sylvatica</i>	R
Hemp-agrimony	<i>Eupatorium cannabinum</i>	O
Hoary Ragwort	<i>Senecio erucifolius</i>	O
Hoary Willowherb	<i>Epilobium parviflorum</i>	R
Hogweed	<i>Heracleum sphondylium</i>	O
Lords and Ladies	<i>Arum maculatum</i>	R
Male-fern	<i>Dryopteris filix-mas</i>	R
Meadow Barley	<i>Hordeum secalinum</i>	VLA
Meadow Buttercup	<i>Ranunculus acris</i>	O
Red Fescue	<i>Festuca rubra</i>	F
Meadow Foxtail	<i>Alopecurus pratensis</i>	LF
Milchaelmas Daisy	<i>Aster sp</i>	VLF
Mugwort	<i>Artemisia vulgaris</i>	R
Nippelwort	<i>Lapsana communis</i>	R
Perforate St John's Wort	<i>Hypericum perforatum</i>	O
Perennial Rye-grass	<i>Lolium perenne</i>	A-LD
Pine	<i>Prunus cf sylvestris</i>	R
Red Bartsia	<i>Odontites vernus</i>	F
Red Clover	<i>Trifolium pratense</i>	F
Ribwort Plantain	<i>Plantago lanceolata</i>	F
Rosebay Willowherb	<i>Chamerion angustifolium</i>	O
Round-leaved Crane's-bill	<i>Geranium rotundifolium</i>	O
Scented Mayweed	<i>Matricaria recutita</i>	VLF
Selfheal	<i>Prunella vulgaris</i>	F
Smooth Meadow-grass	<i>Poa pratensis</i>	O
Soft-brome	<i>Bromus hordeaceus</i>	O
Spear Thistle	<i>Cirsium vulgare</i>	R
Spiked Sedge	<i>Carex spicata</i>	O
Stone Parsley	<i>Sison amomum</i>	O
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	O
Sycamore	<i>Acer psuedoplatanus</i>	R
Timothy	<i>Phleum pratense</i>	R
White Clover	<i>Trifolium repens</i>	LA
Wild Privet	<i>Ligustrum vulgare (planted)</i>	R
Wild Teasel	<i>Dipsacus fullonum</i>	R
Yarrow	<i>Achillea millefolium</i>	F
Yorkshire-fog	<i>Holcus lanatus</i>	O

Key D = Dominant, A = Abundant, O = Occasional, F = Frequent, R = Rare, L = Locally V = Very

Bat Tree 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 Conservation (Natural Habitats &c.) Regulations 1994 (as amended).

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.

Tree Survey Evaluation

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

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

Tree category and description	Stage 1 Initial survey requirements	Stage 2 Further measures to inform proposed mitigation	Stage 3 Likely mitigation
Known or confirmed roost	Follow SNCO guidance and these guidelines wherever possible, to establish the extent to which bats use the site. This is particularly important for roosts of high risk species and/or roosts of district or higher importance and above		The tree can be felled only under EPS licence following the installation of equivalent habitats as a replacement.
Category 1* Trees with multiple, highly suitable features capable of supporting larger roosts	Tree identified on a map and on the ground. Further assessment to provide a best expert judgement on the likely use of the roost, numbers and species of bat, by analysis of droppings or other field evidence. <i>A consultant ecologist is required</i>	Avoid disturbance to trees, where possible. Further dusk and pre-dawn survey to establish more accurately the presence, species, numbers of bats present and the type of roost, and to inform the requirements for mitigation if felling is required.	Felling would be undertaken taking reasonable avoidance measures' such as 'soft felling' to minimise the risk of harm to individual bats.
Category 1 Trees with definite bat potential, supporting fewer suitable features than category 1* trees or with potential for use by single bats	Tree identified on a map and on the ground. Further assessed to provide a best expert judgement on the potential use of suitable cavities, based on the habitat preferences of bats. <i>A consultant ecologist required</i>	Avoid disturbance to trees, where possible. More detailed, off the ground visual assessment. Further dusk and pre-dawn survey to establish the presence of bats, and if present, the species and numbers of bats and type of roost, to inform the requirements for mitigation if felling is required.	Trees with confirmed roosts following further survey are upgraded to Category 1* and felled under licence as above. Trees with no confirmed roosts may be downgraded to Category 2 dependent on survey findings
Category 2 Trees with no obvious potential, although the tree is of a size and age that elevated surveys may result in cracks or crevices being found; or the tree supports some features which may have limited potential to support bats.	None. <i>A consultant ecologist is unlikely to be required</i>	Avoid disturbance to trees, where possible. No further surveys.	Trees may be felled taking reasonable avoidance measures. Stop works and seek advice in the event bats are found, in order to comply with relevant legislation.
Category 3 Trees with no potential to support bats	None. <i>A consultant ecologist is not required unless new evidence is found</i>	None.	No mitigation for bats required.

Adapted from a protocol by Corylus Ecology Ltd in BCT (2012)

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.

(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.

In addition the Anabat SD1Automated recorder was 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).

BEST PRACTICE METHODS FOR TREE WORK

Works to trees used by bats (even if the bats are not present at the time) may result in an offence being committed under this law. If bats or bat roosts are found to be present in a tree, a European Protected Species (EPS) license from Natural England is likely to be required to legally undertake works on that tree. Where a satisfactory survey has resulted in no evidence of bats being found, and bats are then incidentally discovered during work, it is a legal requirement that the activities are halted immediately and Natural England consulted.

To reduce the chance of disturbing a bat roost it is important to avoid the summer (breeding season) and winter (hibernation) months. Works to trees with potential for bats is best done in September when young bats are mobile and on the wing, female bats are unlikely to be pregnant and the hibernation season has not yet begun. March is also a suitable time, (although careful survey is required for nesting birds as these are legally protected during this period).

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, and as a result an assessment of the trees to identify those with potential to support a bat roost is usually undertaken with trees with bat potential categorised into three categories.

There are a number of procedures that can be used by tree surgeons to ensure that best practice is maintained when undertaking tree felling/pruning operations. These are detailed

below. The application of these principals apply to both Category 1 and Category 2 listed trees (see BCT, 2007). These methods should be used on these trees during the suitable tree felling periods (September and March).

- Keep tree work to a minimum retaining all potential roosts where possible.
- A precautionary inspection of the tree(s) by the tree surgeon looking for signs of bats should be carried out before starting work. This should include an inspection of all holes and niches using a torch and preferably an endoscope. If bats or signs of bats are found no work should start and Natural England should be contacted for further advice.
- Where possible avoid cross cutting in proximity to cavities or hollows.
- Limbs with internal fissures should be pruned carefully to maintain integrity of features as potential roost sites.
- Any sections felled containing cavities should be lowered carefully and left on the ground (preferably for 24 hours) with the openings clear, allowing anything inside an opportunity to escape.
- Split limbs that are under tension may need to be wedged open to prevent their closure when pressure is released, potentially trapping bats.
- Where ivy covers areas of a tree's trunk or branches, there may be hidden roosting potential behind it. Dealing with ivy covered trees depends on the amount of ivy. If there is a thick mass of ivy growth it may be practical to consider felling the tree on the basis that the thickness of the foliage will soften the fall and reduce the shock. This tree can then be inspected on the ground and if possible left for 24hours, before section cutting. If the tree is only partially covered, pruning or sectioning may be more appropriate. If the works are not urgent cutting the ivy at its base and completing the work when the ivy is dead, thus reducing the bat roosting potential should be considered. However where stems of ivy create a dense mass against the trunk there will always be roosting potential.

If bats or evidence of bats are found at anytime, all works must stop immediately and Natural England contacted for further advice.

Technical Appendix 8

Reptile Survey Methodology

For Common Reptile Species

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: 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

Herpetofauna 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.

Brook Meadow Management Options

Enhancement to Management Proposed in Man Plan

The management proposals are based on discussions with the BMCG during a site walkover in August 2014, and agreement of the methods outlined in this report. Any new actions can be written into the grassland prescription list in the Management Plan.

North Meadow

The North Meadow is subject to a mosaic management to provide rough grassland edges and compartments and to also provide hay meadow structure to central and southern parts of the grasslands. Some of this grassland is cut on rotation to provide a hay meadow core to the meadow, allowing rougher areas to develop. This has historically been done by machine (eg forage harvester) and power scythe (eg Brush cutter). Cuttings are removed.

The compartments NM1a & b are of lower diversity than NM2, which is cut more frequently as a result of the vegetation communities present. NM1 management has been reduced in recent years.

Options for increasing management could include:

- Additional cutting in NM1 areas to increase the areas under similar hay meadow management as NM2. The 2-3 year cutting cycle can be increased to annual cycle with additional funding;
- Cutting of the meadows should be considered in late summer/early autumn. If a damp hay meadow grassland is preferred then cutting can take place from July onwards in good weather. It should be noted that presence of orchids within the sward may influence management, with preferences for *Dactylorhiza* orchids being later cuts when the seed has been set.
- Additional areas on the periphery of NM2 could be considered to be brought into management;
- Plug planting of grassland species (eg BAP species of hay meadows in the local area), locally sourced, is being considered. Additional funds could be transferred to start this process if considered preferable.
- All cuttings should be removed to a suitable compost, or off site.

South Meadow

The south meadow is split into a number of compartments. These compartments allow the management of the meadow to provide different grassland management cycles to develop. At present the management of this area is allowing invasive species such as Field Bindweed to spread across the majority of compartments. In the southern section SM3, the management of

the sedge dominated grassland has become particularly rank and edge habitats are invading onto the meadow.

Options for increasing management could include:

- Additional focussed cutting of a proportion of the meadow (SM1 & SM2, SM3) during spring/autumn over a 5 year period. This would be to attempt to reduce the dominating rough grassland with invasive species such as Field Bindweed, Nettles and Brambles. Current management options are for a cut 1 in 3 years, rotating areas, this could be increased to annual cutting for the period.
- A rough grassland margin can be left with the edge habitats around the edge of the field and the marked scalloped margins (with consideration given to excessive succession in these areas);
- Management can be undertaken with forage harvester where available and access is possible, or through strimming/brushcutting.
- Arisings will need to be raked from the grasslands and removed or stored in an onsite compost area;
- Cutting should have regard to seasonal timing issues, such as nesting birds, waterlogging and site access.

The benefits of this additional management will be to help diversity the southern meadow into a more open grassland core area, with rough grassland edges and sections. This will then allow the BMCG to keep on top with their existing management regime of annual cutting.

Seagull Lane Patch

This area of ruderals and grassland vegetation has only recently been subject to management. At present it is mostly still dominated by tall herb vegetation, Hogweed, Nettles and at its northern end Brambles. Management of the vegetation community is undertaken on an ad hoc basis, but with a core grassland area cut.

- Additional management of this area could be increased cutting of the edges around the core grassland area to attempt to reduce Nettle and tall herb dominance if considered preferable. This would encourage a lower grassland core to the centre of the site;
- The mosaic of tall herb/Nettle and bramble could be altered, especially at the northern end, via cutting of Bramble dominance to provide more edge habitats to this future.

**Additional Habitat Enhancements
costing sheet**

		5 years
Details	Item/time	Full cost +VAT
Area X	BMCG	
Monitor growth in years 1 to 5		
Divide work into priority management units (as above) for an annual cut and collect programme. Annual programme	BMCG	
Brushcutting as required, 2 man days per annum.	Contractor	£700 x 5 = £4500
Or with Forage harvester on contract, 2 days of operator and machine on site.	contractor	£700 x 5 = £4500
	Totals	£3500.00 + VAT

The **Figure** below shows the management compartments

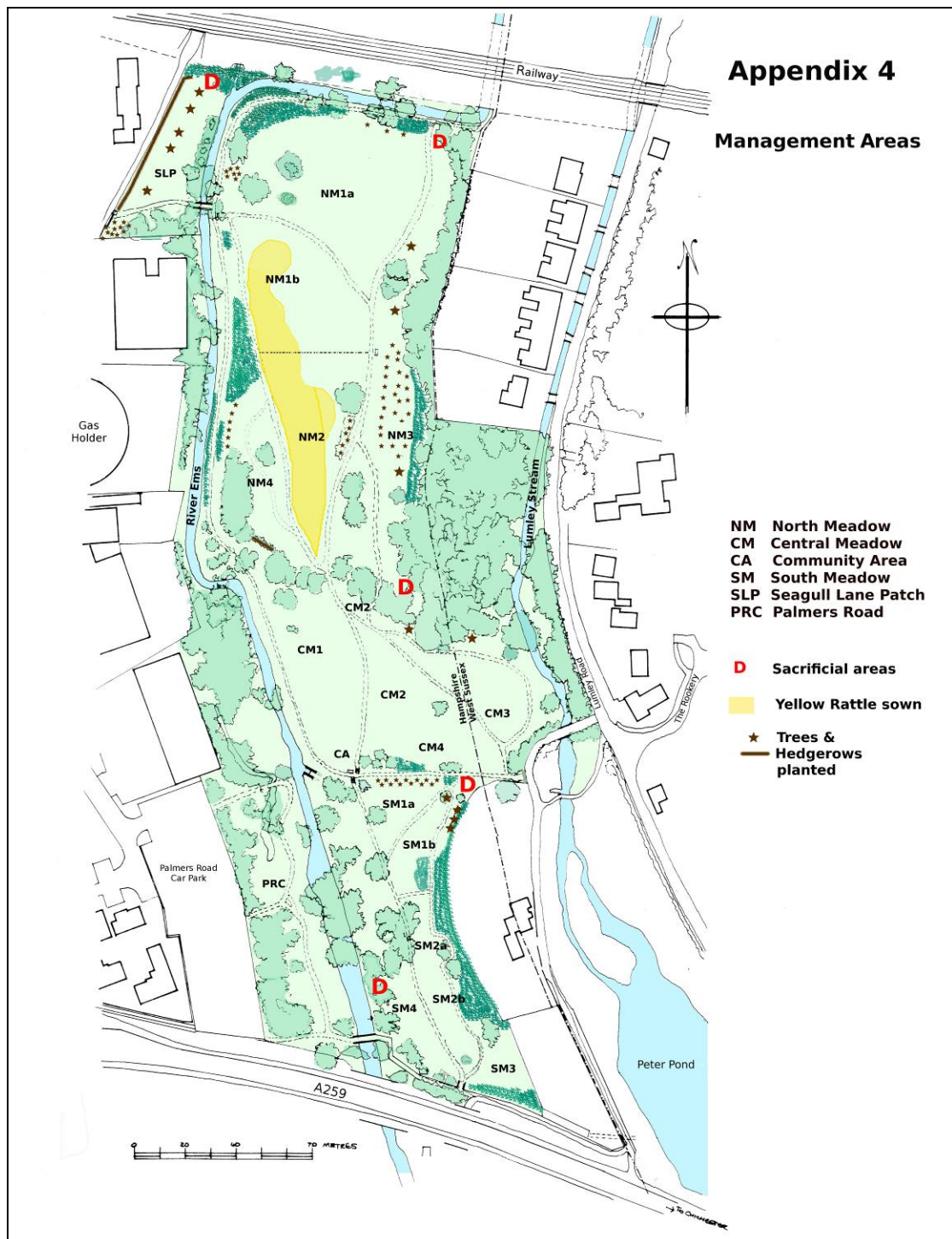


Figure Appendix 9.1: Brook Meadow Management Compartments (from BMCG, 2013)

Technical Appendix 10

Bat Mitigation Examples

Schwegler 2F Double Front Panel

Selected offering the appropriate conditions for smaller bats such as the pipistrelles.



Schwegler 2FN

This model has two entrances, one at the rear against the tree trunk and one at the front. Bats often creep into the rear entrance but leave by the front.



Nore Barn Woods Management Options

Additional Management Proposed in Man Plan for Reptiles

The management proposals below are based on discussions with the Friends Of Nore Barn Woods conservation group (FONBW) during a site walkover in August 2014, and agreement of the methods outlined in this report.

Additional management of woody habitat in line with the management plan (FONBW, 2013 and Pengelly, 1994), and will include the coppicing and where necessary treating of stumps followed by annual management to enhance edge habitat in adjacent areas and in newly created areas. The detail of management is set out in Section 6.5.11 above. The information below provides further details of areas, and costings.

Examples are shown in photographs below and can be written into the management plan or as advancement of existing aims of the management plan (Tables 1 and 2).



Photo A1: Extensive Bramble and ruderals scrub between two woodland blocks. Options here can be to reduce extensive nature of bramble scrub and create 'scallops' and bays within the existing bramble structure and then maintain over plan period.



Photo A2: Non-native Bay Tree and Mature Leggy Hawthorns. Here on southern path at SE corner of the wood. Creation of a scallop here would help forward aims within the management plan (eg Action 16)



Photo A3: Mature leggy Hawthorn. Increase rates of coppicing and managing of regrowth within central woodland glade and main ride for these management areas (this fits in with Actions A-D as shown on the Figure below, and Actions 9,10, and 17)



Photo A4: Main Ride. To increase areas of scallops and bays and linkage with the woodland glade. This ride is managed by HBC annually through cutting in autumn. The ride is open and includes a good grassland element at its eastern end, but encloses into the woodland, and toward the glade. Options to increase grassland areas on the eastern end and allow mosaic of rough grassland edge managed every three years outside of annual cut, and increase scalloped areas inside the wood and glade, and continue to contribute to existing Actions on Hawthorn glade and ride management.

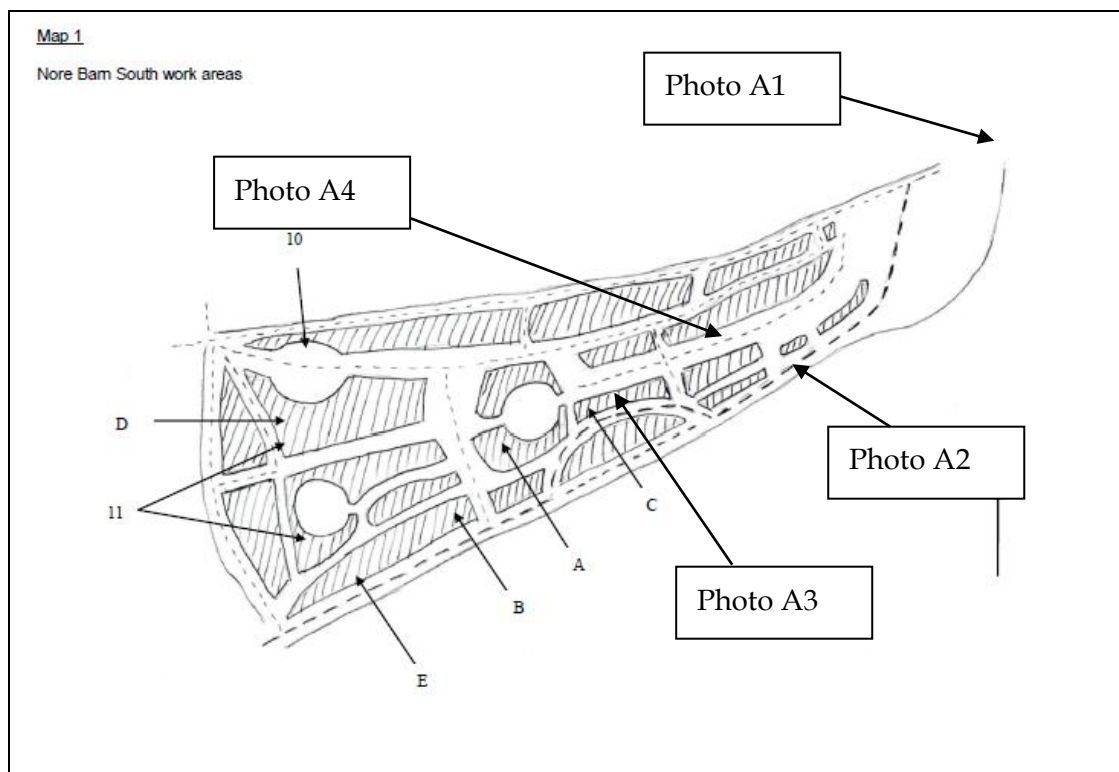


Figure Appendix 11.1: Nore Barn Woods Management Compartments

**Additional Habitat Enhancements
Reptile Translocation costing sheet**

		5 years
Details	Item/time	Full cost +VAT
Monitor growth in years 1 to 5. . 1 day	FONBW	-
Divide work into priority management units (as above) for an annual cut and collect programme.	FONBW	
Annual programme		-
Initial Chainsaw work on clearings areas (to add up to min 0.25ha)	3 days @£450 a day 2workers	£1350.00
Brush-cutting as required, upto 1 man days per annum.	@£250 a day	£2500.00
or with Forage harvester on contract, 1 days of operator and machine on site every other year.	@£250 a day	£2500.00
Monitoring of reptiles (5 visits x 2.5hrs) years 1, 3,7	£583 x 3	£1750.00
	Totals	£5600.00 + VAT

Reptile Translocation Methodology

Translocation of Reptiles

In summary, translocation is the movement of animals, usually deliberately, from one location to another (Gent *et al*, 1998). The receptor site is the site to which reptiles are moved, the donor site (or in this case development site) is where they are moved from.

The aim of the mitigation strategy is to ensure that an ‘equivalent population’ is maintained to that which existed before (Gent *et al*, 1998). Reptile mitigation strategies usually involve translocations and habitat management which is implemented between March and October once any reptiles on site have emerged from hibernation.

Receptor sites must be assessed prior to the translocation of any reptiles, against criteria provided as good practice guidance. This ascertains the existing population of reptiles on the receptor site and identifies any habitat management needs in order to provide the optimum habitat for translocated reptiles.

HGBI (1998) and Gent *et al* (1998) recommend that ‘reasonable effort’ should be undertaken to clear a site of reptiles prior to any works being carried out. Interpretation of what ‘reasonable effort’ translates as in minimum trapping days and capture methodologies is provided in **Table 1** below.

Table A1: Minimum Capture Effort for Common Reptiles

Species	Population size (adult density)	Tin density (tins/ha)	Minimum number of trapping days in good weather
Slow-worm	High (> 100 / ha)	100	All suitable days between March & September or a full year (min. 90 suitable days)
	Medium (> 50 / ha)	100	All suitable days between March & September or a full year (min. 70 suitable days)
	Low (< 50 / ha)	50	60 suitable days

Monitoring is necessary in the medium and long term in order to assess the success or otherwise of the translocation programme.

Capture Areas Assessment

The areas of the site to be developed have either very low or no reptile populations over most parts, and a translocation has already occurred over the main area of the site.

Receptor Area Assessment

A receptor site for reptiles needs to meet certain criteria to ensure that the conservation status of the populations of reptiles on the capture site and any on the receptor site are maintained.

In order that a receptor site is sustainable in the long term the following assessment criteria recommended by HGBI (1998) have been used to find a site:

- A receptor site should be local to the donor site, and as close as possible to it (at least within the same county or similar administrative area, with similar geology/habitat);
- Not currently supporting a viable breeding population of the species to be translocated, for known reasons, or be capable of supporting them given suitable habitat management and creation;
- Not be subject to planning or other threats in the foreseeable future;
- Subject to a written, agreed and funded pre- and post-translocation management agreement;
- Subject to a written, agreed and funded pre- and post-translocation monitoring programme.

There have been various translocation programmes which have assessed the populations and carrying capacities of a range of different reptile habitats particularly in relation to slow-worms. It is widely recognised that slow-worms can, in their ideal habitat, regularly occur at 1000+ per hectare but are usually present at lower densities. However it should always be carefully considered that few sites have large areas of continuous good slow-worm habitat capable of supporting such high populations although smaller, localised areas of a site may do so. When estimating the carrying capacity of a release site and considering the number of reptiles to be translocated, a precautionary approach will be used. The mitigation strategy will provide a larger area of suitable habitat at the receptor site than at the capture site.

The receptor site that is most fits the criteria above based on knowledge of populations on site, is the retained public open space woodland area on the site. The long term management of this area can be prescribed to cater for the small populations of reptiles, as well as other informal recreational activities and the other nature conservation interests.

Translocation Methodology

In order to fulfil a translocation of reptiles from the development site to the receptor sites, the animals must be caught, or in the case of a very low population discouraged from the areas of the site to be lost. The most effective method for capture involves the placing of cut up roofing felt or other materials such as corrugated iron sheeting, wood or plastic that snakes and lizards hide under. Refugia/Tins are best placed in locations which will be attractive to reptiles (e.g. 'sun-traps').

The most profitable time for capturing reptiles is generally between late April and late June, and again between late August and late September. The suggested number of days required to catch reptiles for a reasonable effort to remove the population is described in **Table A1** above.

Capture Site Preparation

The development site must be prepared in order to facilitate the successful removal of reptiles. Sheets of roofing felt and tin will be placed across the site to act as refugia for the reptiles. They will be placed at a high density in suitable habitat. Areas of suitable reptile habitat with

a high reptile density may have a tin density of up to 5 refugia per 10m², in line with the guidance in **Table A1**. The placement of a higher number of refugia on site will increase the efficiency of capture and can reduce the number of trapping days required to clear the site of reptiles.

Capture Effort

Table A1 above provides the suggested capture effort for Slow Worms, based on good practice guidance, whereby 60 trapping visits can be required to clear common reptiles from a site such as present, during periods of suitable weather conditions (HGBI, 1998). Reptile translocation can require at least one season (March to October), and sometimes longer, to ensure that all reptiles are removed from the development site.

The purpose of this type of translocation is to make reasonable effort to remove all reptiles from a site prior to a development. Where reptile populations are low or on small sites, Natural England often provide additional guidance that reasonable effort has been made and translocation to be considered complete in any area. The capture rate needs to have declined to zero over at least three consecutive trapping visits in suitable weather conditions.

Habitat Manipulation

The areas of habitat affected by the development will be modified to reduce their suitability for reptiles. This will encourage reptile movement within the site to increase capture in key areas around refugia and may also encourage some dispersal to suitable retained habitats. The grass height will be reduced by cutting to no less than 10cm on the first cut and will be phased in bands and habitat areas across the site. The location and timing of this process will be guided by capture rates in the different areas of the site.

Translocation programme

The development site will be inspected regularly and any reptiles will be captured and moved, using the methods described above to the receptor site. For the translocation to be considered complete in any area, the capture rate needs to have declined to zero over at least three consecutive trapping visits in suitable weather conditions.

The guidance on indicative trapping effort that may be required suggests this may take 60 trapping visits (HGBI, 1998). Close monitoring of the capture rate will allow a judgement to be made of the number of visits considered to be necessary. The site will be walked very slowly in order to search for basking reptiles and by carefully lifting each refugia, an attempt will be made to catch any reptiles basking beneath.

All reptiles will be transported to the receptor site in a secure ventilated container. At the end of each visit all reptiles caught will be released in suitable conditions at the receptor site. Details of all captures and releases will be recorded.

Exclusion Fencing

Reptile fencing will be used where required to prevent reptiles returning to cleared areas, and where populations are considered sufficient to warrant it.

Supervised site clearance

Following the completion of the translocation in any areas of the site, a supervised site clearance will be carried out. This will take place outside of the hibernation season usually between April- early October (November – February is the main hibernation period dependent on weather conditions). The technique is a last method used and requires very careful specialist supervision. Normal destructive search rates are between 0.1 and 1.0 ha per day depending on machine size and habitat type.

The search will begin by dismantling rubble piles and other debris by hand. Reptiles may be found sheltering in these structures. Following this, the vegetation will be stripped using an excavator and bucket. Firstly, the top few centimetres of the ground or first layer of rubble should be removed, to expose reptiles sheltering in crevices just below the surface. At least one experienced reptile handler should be positioned to catch any remaining reptiles as they are disturbed. Following this, larger and deeper excavations can be made, concentrating on areas which afford shelter to reptiles, such as tree stumps and buried rubble. Particular care should be taken when emptying the bucket in case any reptiles are dug up with the spoil. It is not anticipated that many reptiles (if any) are discovered as the reptile populations will have almost completely been moved by this stage.

Prior to starting works, the contractors will be alerted to the presence of protected species on the site and provided with the method statement and plans. The contractors will be shown reptiles, so that they are familiar with their identification, should they come across them during vegetation works.

Monitoring

Following completion of the work, monitoring of the reptile population at the receptor site will be completed by Aluco Ecology during the following two years, in order to determine the success of the translocation project.

Natural England (English Nature, 1998) suggests the following guidance which may determine the ‘success’ of a mitigation strategy:

- Removal of a ‘reasonable proportion’ of animals from a development site or no significant impact from development where in situ conservation is involved;
- Establishment and maintenance of a range of suitable habitats: with the presence of ‘good’ features and absence of ‘negative’ features;
- Breeding and successful recruitment;
- Re-establishment of animals in a range of habitat or spread of the animals throughout a site or to adjacent sites;
- Establishment of an appropriate age structure in the population;
- Survival of a large proportion of the animals that were moved;
- Establishment of:

- A viable population
 - An expanding population
 - An 'equivalent' population to that which previously occurred
 - A population that is fluctuating in size within acceptable limits;
- Persistence of individual animals over a number of years.

References

Herpetofauna 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.

