ALUCO ECOLOGY

ECOLOGICAL ASSESSMENT

LAND AT MANOR FARM
& COPSEYS NURSERY,
DENVILLES,
HAMPSHIRE

JUNE 2013

HAVANT BOROUGH COUNCIL
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ECOLOGICAL ASSESSMENT, LAND AT MANOR FARM & COPSEYS NUSREY, DENVILLES, HAMPSHIRE

1.0 INTRODUCTION

1.1 Background

1.1.1 Aluco Ecology Ltd was commissioned to carry out detailed ecological survey work of land at Manor Farm and Copseys Nursery, Denvilles by Barratt David Wilson Homes (Southampton) Ltd and the Generator Group. The survey work was originally reported and submitted as part of a combined Application for Manor Farm and Copsies Nurseries in April 2013. This report has now been updated where necessary to include information on the Reserved Matters Application for the Copsies Nursery Phase of the scheme. The report should also be read in conjunction with the Biodiversity Implementation report (Aluco Ecology, May 2013).

1.1.2 The aim of the Ecological Assessment is to survey and document baseline ecology data on the site, and then to evaluate and assess the impacts of the proposals for Outline Planning Permission against this baseline. The assessment therefore:

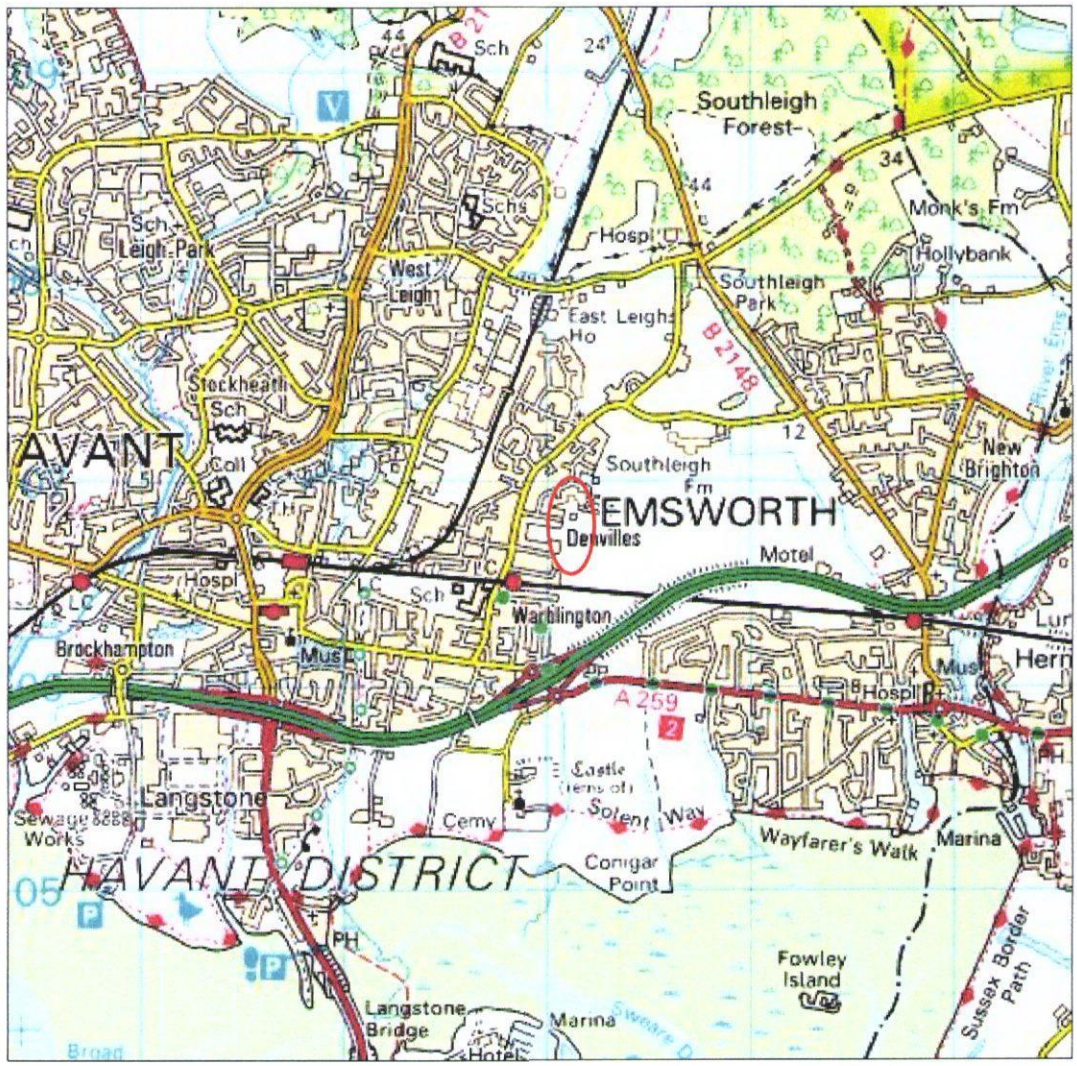
- highlights any features of particular ecological value;
- identify potential impacts to ecology as a result of the proposed works;
- identify any ecological issues that may have legal or planning implications such as the presence of protected species; and
- recommends potential for mitigation and/or compensation that can be undertaken to avoid, reduce or offset the potential for impacts.

1.1.3 The results of the assessment are provided below to inform the Planning Application for development on the site

1.2 Outline of the Scheme and Site Location

1.2.1 The complete scheme consists of land consists of a farm with farm house, yards, arable land, horticultural glasshouses and a modern detached house to the east of the village of Denvilles, Hampshire. Its location is shown at **Figure 1** below, with the original site layout provided at **Figure 2**.

1.2.2 The reserved matters scheme for the northern part of the site is based on the original scheme and is provided as **Figure 2(a)**.



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Figure 1: Location of the Site

1.2.3 The overall Scheme is for the development of 191 dwellings. A proposed Masterplan is shown at **Figure 2** below. **Figure 2a** provides reserved matters information on the masterplan for the northern section of the site at Copsey's Nursery.

1.3 Relevant Legislation and Policy

UK Legislation

1.3.1 The Wildlife & Countryside Act 1981 is the principal mechanism for the legislative protection of wildlife in Great Britain. This legislation deals with both protected species and the designation and protection of Sites of Special Scientific Interest (SSSI). The parts of this Act most relevant to the proposed development are outlined in **Technical Appendix 1**.

1.3.2 Environmental Impact Assessment (EIA) is governed by the Environmental Impact Assessment Regulations 'The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (as amended)'. These Regulations implement the European Council Directive 85 / 337 on the assessment of the effects of certain

public and private projects on the environment in so far as it applies to town and country planning. Even though this development is not considered as falling within the Regulations, regard has been had to these Regulations in the ecological assessment undertaken.

European Legislation

1.3.3 The Conservation (Natural Habitats &c) Regulations 1994 now replaced by the Conservation of Habitats & Species Regulations 2010 (known as the Habitats Regulations) makes it an offence to deliberately kill, capture, or disturb a European Protected Species (EPS), or to damage or destroy the breeding site or resting place of such an animal. European Protected. The Habitats Regulations are also concerned with the protection of Special Areas of Conservation (SAC) and Special Protection Areas (SPA), which are designations applied to sites of European Importance for wildlife. See **Technical Appendix 2** for more details.

National Planning Policy

1.3.4 The Government sets out its objectives for conserving and enhancing biodiversity in the new National Planning Policy Framework that also makes reference to the existing ODPM Circular 06/2005. 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.'

1.3.5 The Framework goes on to state that at the heart of the planning system is a presumption in favour of sustainable development.

Local Planning Policy

1.3.6 The Havant Borough Council Local Plan has of March 2011 been replaced by Local Development Framework Core Strategy. These policies are set out in **Technical Appendix 3.**

Biodiversity Action Plans

1.3.7 The UK Biodiversity Action Plan is the Government's response to the 1992 Convention on Biodiversity (The Rio Convention), with the aim of halting loss of biodiversity in the UK. Biodiversity strategy is implemented at a local level through county and district level Biodiversity Action Plan (BAPs). The site falls within the geographic area covered by the National BAP and the Hampshire County Council BAP.

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). This sets out survey, evaluation and assessment guidelines.

2.2 Site Survey Methodology

2.2.1 The first stage of the assessment 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. This is then backed up with detailed ecological surveys where necessary. The details of these survey methodologies are described in relevant baseline chapters and Technical Appendices.

2.2.2 Following the evaluation of the baseline an impact assessment is made. Further details of the assessment methodology used can be found in **Technical Appendix 4.**

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 proposed development scheme is shown at **Figure 2** below.

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

3.2.1 It is proposed that change of use of the site 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 immediately adjacent to the site. Consequently, survey has been carried out within this zone.

3.3 Site Preparation / Construction Activities and Biophysical Changes

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

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

3.4 Predicted Operational Activities during Use Phase and Biophysical Changes

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



Figure 2: Proposed Site Layout



Figure 2(a) Reserved Matters Information for Copsies Nurseries Phase, June2013

4.0 DESIGNATED SITES, HABITATS & VEGETATION

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 the proposed development.

4.2 Designated Sites

Statutory Designated Sites

4.2.1 Three Sites of Special Scientific Interest (SSSI) designated of regional to national importance are present within 2km of the site; four European and Internationally important sites (Special Areas of Conservation (SAC), Special Protection Areas (SPA), and Ramsar Sites) are present within 5km of the site. The citation for the SSSIs within 2km and European and International Sites within 5km is provided at **Technical Appendix 5**. The sites are summarised in **Table 1** below.

Table 1: Statutory Designated Sites

Site	Status	Distance from Site	Summary
Warblington Meadows	SSSI	700m	Unimproved Grazing Marsh
Chichester Harbour	SSSI	1.4km	Estuarine habitats and species
Langstone Harbour	SSSI	1.4km	Estuarine habitats and species
Solent Maritime	SAC	1.4m	Estuarine habitats and species
Solent & IoW Lagoons	SAC	1.4m	Estuarine habitats and species
Chichester &Langstone Harbour	SPA	1.4km	Estuarine habitats and species
Chichester & Langstone Harbour	Ramsar	1.4km	Estuarine habitats and species

Non Statutory Sites

4.2.3 There are three Sites of Importance for Nature Conservation (SINC) present within 1km of the site. These are mostly designated for grazing marsh habitats, especially those supporting feeding areas for Dark Bellied Brent Goose *Branta bernicula bernicula*. All SINCs are south of the railway line. Further details of the SINCs are provided in **Technical Appendix 5**.

4.3 Habitats and Vegetation

Introduction

4.3.1 The following description is based on a number of site visits between December 2010 and September 2011. The site is made up of a much larger agricultural field with mixed vegetable cultivation bordered by a farm with a single detached dwelling, gardens and farmyard with associated outbuildings and storage areas. To the north are the partially defunct glasshouses and grounds of Manor Farm (Copseys) Nurseries and a dwelling house and private garden. To the north, south and west of the site is housing, and to the east is a large area of agricultural land under arable production with maintained thorn hedges.

4.3.2 The broad habitats on site are shown in **Figure 3** and described below. The vegetation description includes land beyond the proposed development area (see **Figure 2**).

Site History

4.3.3 Historical Ordnance Survey (OS) mapping has been consulted to understand the development of the habitats on the site over the last c180 years. The earliest studied maps being the first edition one inch to mile and six inch to mile OS from around the 1830's and 1870's. The first edition one inch map shows that the general landscape was open ground probably farmland both on site and all around. The more detailed map from the 1880's shows the extent of former field outlines present at the time and the presence of the Southern Railway.

4.3.4 By 1909 the north south road forms the start of the development of the settlement that is Denvilles. On site the first and largest of the barns present are shown. There is a nursery to the north west of the main road and site and the barns may be associated with Manor farm. The large field that forms the eastern part of the site and stretches east beyond the site is present, and a small clay pit is present over the site of the current pond location. The northern part of the farmyard at the end of Fifth avenue is also marked as an old clay pit by 1909, although little evidence of this is present today.

4.3.5 By 1938 the Manor Farm dwelling house is present with gardens suggesting two semi-detached dwellings. The farmyard is mostly marked out with some of the associated outbuildings shown. The land to the east is shown as a large single field with the boundaries as present today. The housing to the west is also present to its current extent, with the exception of the north west which is Nursery land. The Manor Farm nurseries were moved onto farmland to the east with the further spread of housing west of the site. To the south the housing here does not appear on mapping until the late 1960's early 1970's.

Arable Land

4.3.6 The arable land is under intensive cultivation, but as a small holding this appears to be relatively varied, with also some small scale animal husbandry (chickens & formally possibly pigs). The arable flora is typical of intensive arable production. The data search has shown that two red data declining species Corn Spurrey *Spergula arvensis* and Weasel's Snout *Misopates orontium* are present in the wider landscape, as well as the uncommon Blue Pimpernel *Anagallis arvensis ssp. foemina.* Survey work during summer months found a small amount of Corn Spurrey in a spoil heap around the Nursery area to the north of the site, with a single plant of a coastal species, Musk Storksbill *Erodium moschatum.*

4.3.7 The Arable weed flora is typical of agriculturally improved farmland and includes Redshank *Persicaria maculosa*, Red Deadnettle *Lamium purpureum*, Broad Leaved Dock *Rumex obtusifolius*, Common Ragwort *Senecio jacobaea,* Annual Meadow Grass *Poaa annua*, Common Chickweed *Stellaria media*, Scarlet Pimpernel *Anagallis arvensis,* Shepherd's Purse *Capsella bursa-pastoris*, Common Fumitory *Fumaria officinalis*, Fat Hen *Chenopodium album*, Sentless Mayweed *Tripleurospermum inodorum* and rarely Henbit Deadnettle *Lamium amplexicaule.*

4.3.7 The eastern boundary of the arable land is marked by a managed species poor planted Hawthorn *Crataegus monogyna* dominated hedge on a bank with a ditch to the east, and a strip of improved grassland to the west. A pond has been dug at the southern edge of this hedgerow and has species poor aquatic vegetation. This natural clay lined pond is dominated by Reedmace *Typha latifolia,* Reed Sweet Grass *Glyceria maxima,* and Reed Canary Grass *Phalaris arundinacea.* It was created by the current owners a number of years ago for water storage and irrigation, but is likely to have developed from a former clay pit that is shown on turn of the century mapping. The pond is shown on **Photo 9** below. The railway boundary is dominated by Brambles *Rubus fruticosus agg.* over a fence line and occasional Hawthorn. A typical view of the arable ground with an Onion crop is shown at **Photo 1** below.



Photo 1: Arable Farmland on Site, looking west

Farmyard

4.3.8 At the south west corner of the site is a working farmhouse, outbuildings, farmyard and gardens to the farmhouse. The trees on site are mix of planted native and non-native species, and probably some self-sown species, the latter including a patch of maturing Willow *Salix sp.* with Oak *Quercus robur* on a ditch at the north eastern end of the farmyard. This 'ditch' does not lead anywhere and may be a relic of the clay pit constructed in the early 1900's. Other species in the farmyard include Sycamore *Acer pseudoplatanus*, Elder *Sambucus nigra*, Hazel *Corylus avellana*, as well as, Poplar *Populous sp*, Birch *Betula sp*, Pine *Prunus sp*, Laurel *Laurus sp*, Holly *Ilex aquifolium,* Buddleia *Buddleja davidii*, Apple *Malus domesticus* and Walnut *Juglans sp*. The garden in particular has become overgrown with young understorey woody vegetation and Bramble over an Ivy *Hedera helix agg.* dominated ground flora.

4.3.9 The remainder of the farmyard consists of a mosaic of bare to ruderal vegetation such as Willowherb and Mugwort, with areas of Nettle *Urtica dioica* and Bramble scrub that is kept in check by mowing/flailing, and some rank grassland mostly dominated by Cocks Foot *Dactylis glomerata.* The farmyard habitats are shown on **Photos 2-7** below



Photo 2: Ruderal, Tipped Material, Bramble and Nettles within Farmyard



Photo 3: Invading low Bramble in Farmyard with Willows along 'ditch' in background. The ditch dried out early Spring 2011.



Photo 4: Boundary between Manor Farmyard and the Nursery with Brambles and scattered thorn bushes with mature trees including Oak. There is also a bank and ditch, which acts to drain rainfall from Nursery to the north. This drain retained water into spring but was dry by summer 2011.



Photo 5: Southern Boundary with housing - Fenced



Photo 6: Garden of Manor Farmhouse



Photo 7: Outgrown woody nature of Farmhouse Garden

Northern Dwelling & Garden

4.3.10 At the north end of the site is a large detached house with garage and outbuilding set in a large mature private garden. The garden is well planted with formal flower and shrub borders and a regularly maintained lawn. The lawn is species poor and dominated by grasses such as Yorkshire Fog *Holcus lanatus*, Rye Grass *Lolium perenne*, Meadow Grasses *Poa sp.* and Creeping Bent *Agrostis stolonifera*. A few herbs are present including abundant White Clover and patches of Sweet Violet *Viola odorata* and Self Heal *Prunella vulgaris*. The boundary of the garden is mature shrubs and young trees with some native species including Oak, Hawthorn *Crataegus monogyna* and Elder. A ditch, which is dry during summer months, runs along the eastern boundary of the garden. The Dwelling house Gardens are shown at **Photo 8** below.



Photo 8: Northern Dwelling House Garden

Manor Farm Nursery

4.3.11 The Nursery buildings take up the majority of the northern central part of the site (see **Photos 9-10**). They mostly comprise glass growing houses, only semi-operational. There are yard areas within the centre of the site that are in low use and common ruderal species and non-native species such as Fleabanes *Conyza sumatrensis & C. canadensis* are taking advantage of the low use.

4.3.12 Around the boundaries of the Nursery is an area of rank grassland and ruderal vegetation and on the outside edge of the land an engineered ditch network to drain the glass houses; as well as species poor, semi-maintained thorn hedges dominated by Hawthorn and Blackthorn *Prunus spinosa*, including developing scrub and Roses *Rosa canina.*

4.3.13 The grassland in these small edge strips is species poor, unmanaged and becoming rank and tussocky. It is generally dominated by False Oat Grass *Arrhenatherum elatius*, with Cocks Foot *Dactylis glomerata* and some Creeping Bent and Timothy *Phleum pratense.* Herb diversity is low with Nettle *Urtica dioica,* Creeping Buttercup *Ranunculus repens*, Creeping Thistle *Cirsium arvense*, Common Fleabane *Pulicaria dysenterica*, Docks *Rumex sp*, Ragwort *Senecio jacobaea*, Hoary Ragwort *Senecio erucifolius* and Stone Parsley *Sison amomun* all locally distributed. A small amount of Common Centaury *Centaurium erythraea* is present along the eastern boundary.

4.3.14 The ditches which are winter wet and dry during the summer are also fairly species poor but with some aquatic vegetation including Reedmace, Common Reed, Grey Willow, Willowherbs, Nettle, and Fleabane. Bramble is also locally dominant. Along the southern and northern edge of the Nursery area the ditch has a couple of mature Oaks.

Flora

4.3.15 Corn Spurrey has been recently Red Data listed as a locally scarce declining plant species of arable land. It is widespread in southern Hampshire but declining as a result of changing agricultural practices and intensification. The population on site was noted only within a small spoil pile to the north of the Nursery rather than within the arable flora. Two species sometimes considered indicative of unimproved grasslands, Stone Parsley and Hoary Ragwort are present in the species poor grassland around the Nursery edges, but their presence is not considered of significant conservation value here.

Evaluation of Vegetation and Habitats

4.3.16 The habitats on site are generally either improved, disturbed or outgrown formal garden plantings. The habitats are considered to be of **Value within the Zone of Influence** on account of the fact they provide some semi natural vegetation, but the intrinsic value of these habitats is considered low. The highlighting of the garden of Manor Farmhouse as a BAP Priority habitat of Mixed Woodland is likely to have been undertaken from inspecting aerial photographs, and the categorisation is considered not suitable for the outgrown garden habitats present on site.



Photo 9: Open areas of the Nursery are in low use and Ruderal vegetation is developing opportunistically



Photo 10 Rough Grassland around Nursery boundaries

5.0 PROTECTED SPECIES & SPECIES OF CONSERVATION CONCERN

5.1 Birds

Breeding Bird Survey

5.1.1 Data on nesting birds was collected during survey work in Spring and Summer 2011. The site within the proposed development area contains a number of habitats from mature and overgrown gardens to developing scrub and arable farmland. A number of species of conservation concern and locally notable species were recorded on site. The results of the bird survey work are provided in **Table 2** below.

Table 2: Species of Conservation Concern & Other Species with Notes

Species	Status	Comments
Common Kestrel Falco tinnunculus	Amber (SPEC)	Hunting on site on a couple of visits over the arable, but not regular.
Mediterranean Gull Larus melanocephalus	Sch1 (BR)	35 birds were counted on two consecutive dates in April 2011, attracted to the site by spring ploughing
Herring Gull Larus argentatus	Red (BDP, WDP, BDMP, WI)	Birds regularly overfly the site but no birds using the site.
Black-headed Gull Larus ridibundus	Amber (WDMP)	As per Mediterranean Gull
Common Swift Apus apus	Amber (BDMP)	Recorded during summer survey work foraging over site
Green Woodpecker Picus viridis	(SPEC)	1 pair noted usually around the northern end of the site, breeding considered likely off site to the north.
Sky Lark Alauda arvensis	BAP, Red (BDP, SPEC, BDMP)	1 territory in arable east of the site
Barn Swallow Hirundo rustica	Amber (SPEC)	Regularly recorded during survey work foraging over site and inspecting farm buildings in Manor Farmyard.
House Martin Delichon urbicum	Amber (SPEC, BDMP)	Regularly recorded during survey work foraging over site
Hedge Accentor Prunella modularis	Amber (BDMP)	3-4 territories on site
Song Thrush Turdus philomelos	BAP, Red (BDP)	two territories on/near site at northern and southern edges
Common Starling Sturnus vulgaris	Red (BDP, SPEC)	Not breeding on site, but present off site
House Sparrow Passer domesticus	Red (BDP, SPEC)	Not breeding on site, but present off site
Common Linnet Carduelis cannabina	Red (BDP, SPEC, BDMP)	Two to three birds noted in farmland to the east of the site likely to be breeding locally, birds generally mobile and often feeding in the open areas on site
Common Bullfinch Pyrrhula pyrrhula	Amber (BDMP)	A pair was present on a number of visits to the east of the Manor Farm Nursery buildings. Breeding not confirmed.

Key
Sch1 = Listed under Schedule 1 of the Wildlife & Countryside Act 1981 (as amended)
Annex 1 = Listed under Annex 1 of the Wild Birds Directive 79/409/EEC
BAP = Listed as a local or national Biodiversity Action Plan species
Red = Red Listed bird of Conservation Concern
Amber = Amber listed bird of Conservation Concern
(nb details of these category listings is provided in **Technical Appendix 7**)

5.1.2 The site provides foraging opportunities for a number of species of conservation concern, most being widespread and common species. There are few species actually recorded nesting

on site, but most are likely to nest within the wider zone of influence. The Red listed (for declining populations - see Eaton *et al* 2009) and BAP species Skylark, Song Thrush, and Linnet were noted foraging within the arable landscape during survey work, and 1 Skylark territory was present at the eastern end of the wider site. Low numbers of Starling and House Sparrow were also noted. The early spring ploughing of part of the arable field network provided opportunistic foraging for a day or two for nesting Gulls in the harbours south of the site, with the Schedule 1 species Mediterranean Gull recorded in good numbers (a result of a successful breeding populations south of the site).

5.1.3 As well as the species of conservation concern an active Sparrowhawk *Accipiter nisus* nest was recorded within the farmyard of Manor Farm in the largest Oak, covered by Ivy (marked as a Category 2b tree on **Figure 4**). This species also strongly associated with Oak trees on the northern boundary of Manor Farm. This was successful in 2011 with at least two fledged young noted during August survey work.

5.1.4 The potential for the Schedule 1 species Barn Owl *Tyto alba* was also considered. The habitats on the parts of the site proposed to be developed are only marginally suitable for this species, but there is foraging habitat in the wider arable landscape. No evidence of Barn Owl use was noted.

Winter Bird Survey

5.1.5 In the recent revised Brent Goose Strategy for the Solent (HWT, 2010) assessment is made of all grasslands and open space, including farmland and inland areas up to 2km from the coast (based on location or habitat). As a part of the general assessment, the large arable field that forms a small part of the proposed Manor Farm development site and continues further east of this proposed site was included. Access to this land was not undertaken during the survey, and a desktop assessment concluded that the land is of 'uncertain potential for waders'. This appears to have been a blanket designation of all the arable farmland to the east of the site.

5.1.6 Whilst the majority of the proposed development site at Manor Farm and Copsey's Nurseries contains no habitats suitable for regular use by waterfowl (wildfowl and waders), the wider arable field is a large and open arable landscape, currently intensively farmed, but as a market garden with a diverse mix of crops. The use of the land as arable mostly provides limited opportunity for waterfowl. This combined with the distance from the coast provides a low potential for use of the site by waterfowl. A small agricultural pond is present on the eastern boundary of the main survey area. However given the size of this pond it is considered to be of negligible value to wintering waterfowl.

5.1.7 A number of winter visits were made to the site to determine whether any waterfowl use was made of the wider farmland and to record general bird use. The dates and results of these visits is provided in **Table 3** below. No waterfowl were recorded during the visits.

Table 3: Species of Conservation Concern Recorded during Survey

Species (BoCC*)	**05/11/11 H****	**08/11/11 H**	**18/11/11 L**	**30/11/11 H**	**12/12/11 H**	**21/12/11 L**	**30/12/11 H**	**Comments**
Black-headed Gull (amber)					1		1	Occasionally feeding on bare soil areas.
Buzzard						1	2	One hunting on 21/12, one perched in trees at eastern end on 30/12 (and another nearby in adjacent woodland)
Chaffinch	1	6	8	28	12	24		Often present in maize crops.
Chiffchaff							2	Feeding in hedgerow, N side of railway.
Dunnock (amber)		2			2	1	3	In hedges, but often feeding in low bramble and other vegetation in middle of site.
Goldfinch			2		1		2	Most records of flyovers.
House Sparrow (red)					8			Near houses in south-west corner of site, and using bushes along railway corridor.
Kestrel (amber)		1		1	1		1	Female regularly hunting, usually at eastern end of site, but close to farm on 30 December.
Linnet (red)	20	26	16	22		35	48	Regularly feeding on an area of fairly bare soil with scattered weeds.
Meadow Pipit (amber)	3	8	6		1	21	15	Using whole of site except Brassicas
Pied Wagtail	3		7	5		6	9	Usually feeding on same area as Linnets.
Reed Bunting (amber)					1		1	Flushed from maize
Skylark (red)	4	1	6	5	5	25	27	Using whole of site except Brassicas
Song Thrush (red)		1			2			Occasionally feeding within crops and other vegetation.
Stock Dove (amber)		2			15	19	25	Flock briefly feeding on site, but mainly present on adjacent land to north-east.

* Birds of Conservation Concern (Eaton *et al.* 2009), amber and red listed species.

** Tide state during survey H=High L=Low

Evaluation

5.1.8 The western part of the site is considered to be of **value within the Zone of Influence** for local bird populations. The arable field to the east of the site is part of a wider network of local farmland, which contains a population of declining farmland birds (mostly declining as a result of changing agricultural practices). These species are still however widespread, and not at high density within the wider landscape during the breeding survey work. During the winter the field contains reasonable flocks of farmland birds and is considered to be of **local value**.

5.2 Bats

Introduction

5.2.1 A number of buildings are present on site and these have been assessed for their potential to contain a bat roost by internal and external examination, and emergence survey work. This has been undertaken to the methodology outlined in **Technical Appendix 6**. Annotated **Photos 11-21** illustrate the internal and external features of the building in relation to the bat survey.

Manor Farm House & Farmyard Buildings

5.2.2 The main dwelling house is a typical semi-detached brick house with tiled roof and loft. The internal loft structure was examined in January 2011 and no evidence of bats was noted. There is some limited potential for the hanging tiles and soffits around the house to provide a roosting niche for a bat. The the house is shown at **Photo 11-17** below.



Photo 11 Manor Farm House is 2 semi-detached houses



Photo 12 All external surfaces of the structure were assessed for evidence of bats such as bat droppings. No evidence of use was noted.



Photo 13 All upper roof surfaces were inspected for signs of bats such as dropping and staining. Particular attention was paid to roof junctions and tile gaps. No evidence of use was noted externally.



Photo14: Internal Chimney Structure

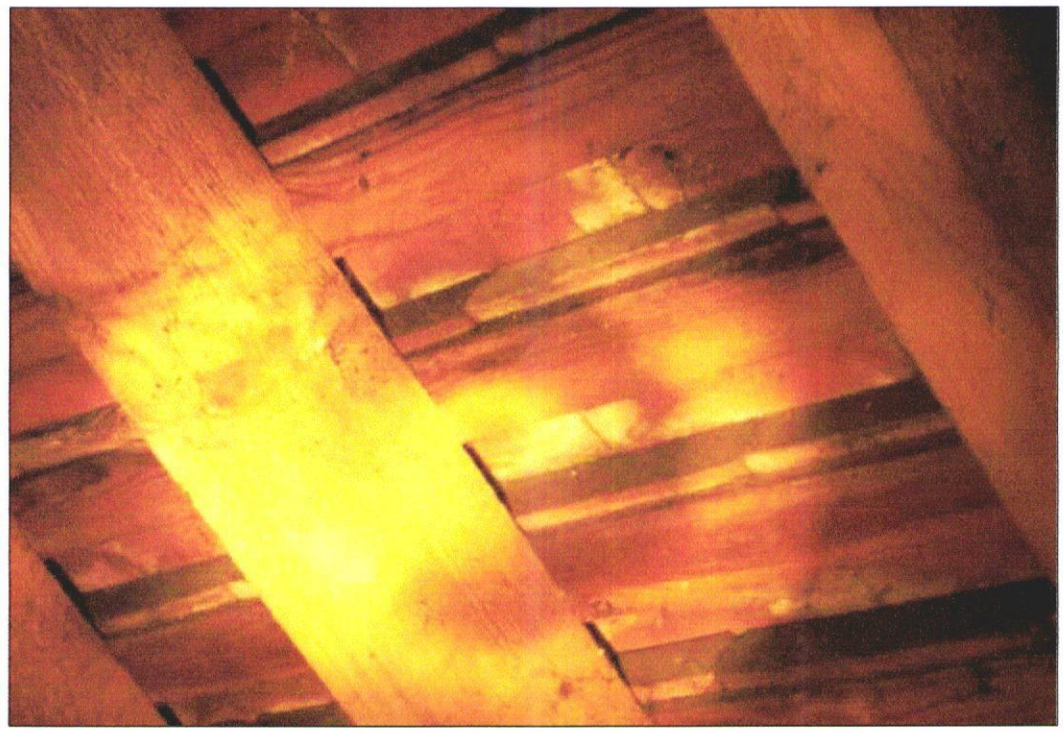


Photo15 The internal roof structure was fully accessible with the roof void. The roof tiles are hung direct onto the timber structure with no felt or roofing membrane resulting in a cold and drafty loft space.



Photo 16 All surfaces of the structure were examined for evidence of bats such as bat droppings.



Photo 17 The upper roof had an accumulation of cobwebs again indicating lack of recent bat use.

5.2.3 The outbuildings assessed were considered to be of low potential for roosting bats, being either open sided, single frame wooden clad buildings, with metal roofs without loft structures, or wooden frame corrugated iron buildings (see **Photo 18** below) and having few niches in beams/wood work to provide some limited potential for bats. The south facing wooden cladding on the main 'L' shaped barn may provide limited potential.

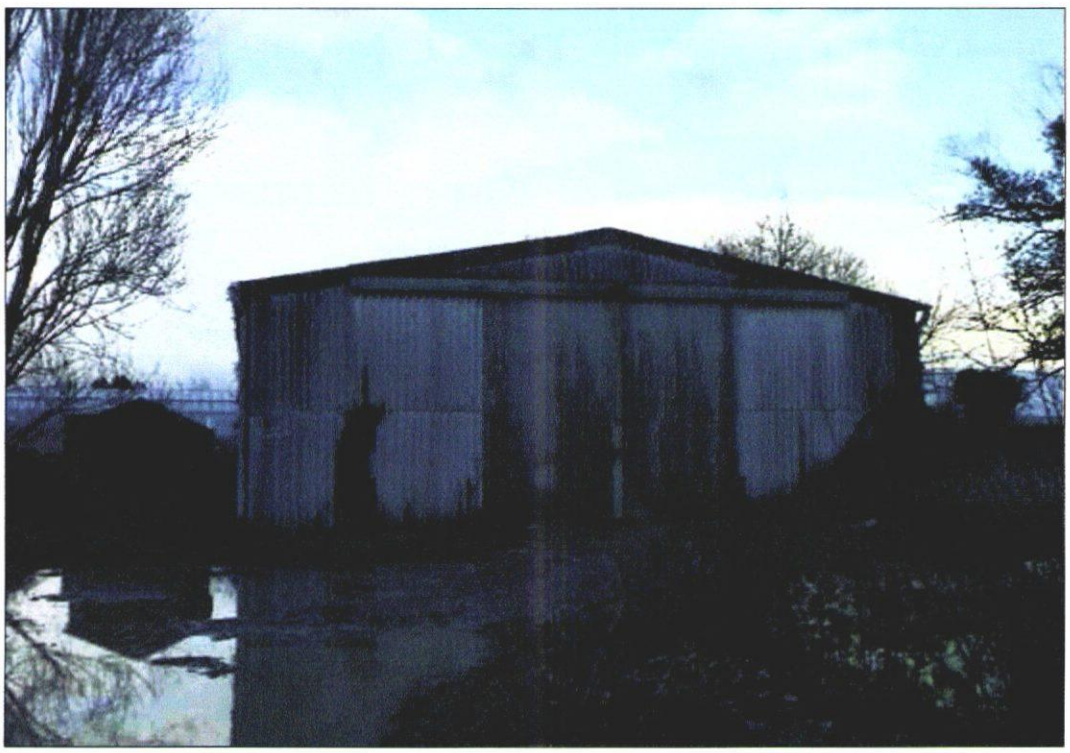


Photo 18 The outbuildings are predominantly of corrugated iron construction on a timber frame with limited roosting opportunity.

Manor Farm Nursery Buildings

5.2.4 The buildings around Manor Farm Nursery are all Glass Greenhouses or single storey sheds with limited bat roost potential. **Photo 16** shows a typical view of the buildings in this part of the site.



Photo 19: Manor Farm Nursery

Northern Dwelling and associated Buildings

5.2.5 The Northern dwelling as a modern construction 1960's plus style brick house with concrete interlocking tile roof. The building was assessed for bat potential by internal and external examination. There are two areas of tight tongue and groove timber cladding with no suitable access opportunities, and the soffits are also tight fitting and well-sealed. All external surfaces were inspected for droppings and other evidence of use with no evidence recorded. The roof is mostly converted to dwelling accommodation; access was possible throughout the remaining 'bunker' roof spaces within the eaves. All surfaces were carefully inspected for the presence of bat droppings with no evidence noted. Overall there are very few access opportunities due to the construction method and it being a modern and maintained house (see **Photos 20-21**).



Photo 20: Northern Dwelling House

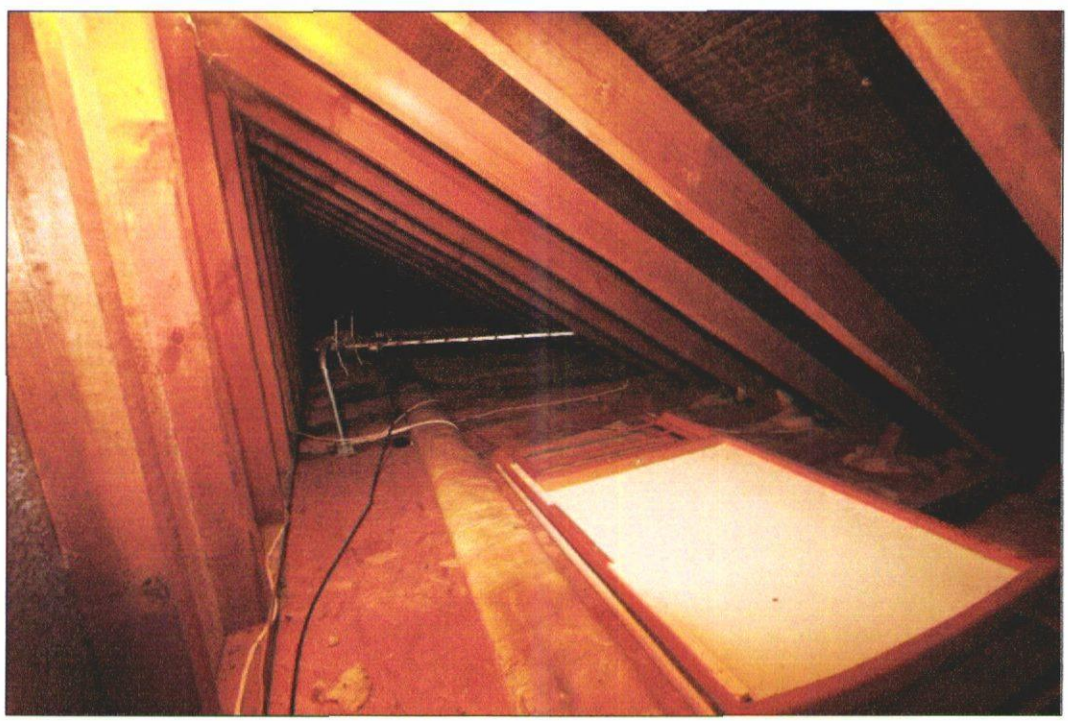


Photo 21: Internal Roof Voids in the converted roof space of the dwelling, used as storage with lighting and some boarding. No evidence of Bat use, extensive mouse droppings and two Wasps nests noted.

Trees

5.2.6 A number of trees are present on site and adjacent to the boundary of the site. These are generally considered to be still relatively young and free from damage and the associated

potential access for bat roosts. A number of the larger Oak trees have extensive Ivy covering the trunks making thorough examination for holes difficult but significant roosting features appear absent. These trees have been marked as lower potential category trees (Category 2b, see **Technical Appendix 6** for definitions) and are marked on **Figure 5** below.

Emergence Survey and Transect Survey

5.2.7 The habitats on site provide potential foraging and commuting opportunities for local populations of bats, with maturing hedges and semi-natural habitat within the field. The general landscape also provides reasonable quality bat foraging habitat across the network of field edges. The desk top data survey indicates that two species of bat Common Pipistrelle *Pipistrellus pipistrellus* and Brown Long Eared Bat *Plecotus auritus* have been recorded from within 1km of the site. With 5km of the site recent records of the Nationally Rare Bechstein's Bat *Myotis bechsteinii* have been made north of Emsworth. This species is an ancient woodland specialist that is likely to be present in remaining wooded patches of the former Forest of Bere, and is unlikely to occur on the current site given its open nature and history.

5.2.8 The site, including the two dwellings, outbuildings and the semi-natural features on site were surveyed during Spring and Summer 2011. A total of six visits were made to the site, three to the southern area of Manor Farm House and three two the northern area of Manor Farm Nurseries and the northern dwelling with two to three survey positions covered per survey. The results of these surveys are provided in **Table 4** below and at **Figure 4**.

Table 4: Survey Results

Date	*Survey*	*Results*
13/04/11	*Emergence Survey, Manor Farm Dwelling & Outbuildings, Transect of Activity*	*2-3 x PP foraging around Manor Farm and outbuildings 30mins after sunset. PP foraging around Pond and eastern edge of Arable. No other species recorded.*
26/04/11	*Emergence Survey Manor Farm dwelling house and outbuildings*	*Similar results to the earlier survey with PP activity around the farmyard and buildings and around the pond in low numbers after dusk with no emergence*
19/05/11	*Emergence Survey Manor Farm Dwelling & Outbuildings, Transect of Activity*	*NN at 21:10 first bat. PP from west at 21:14 over outbuildings then round main Dwelling. PP foraging inside open fronted barn 21:21 on and off until 21:40. PS at northern boundary of farmyard with Nursery first bat in this area 21:35. ES foraging around outbuildings 21:38-21:45. Occasional PP & PS after this.*
03/08/11	*Emergence Survey Northern buildings around Manor Farm Nurseries Transect*	*PP 21:15 around Northern dwelling house from north no emergence from dwelling. PS 21:17 around Nursery and dwelling. NN 21:17 over Nursery. Occasional PP & PS foraging until 22:30 PE foraging along lane at 21:19*
28/08/11	*Emergence Survey Northern buildings around Manor Farm Nurseries Transect*	*First bat PP at 20:31 relatively early but not emerged. Foraging in northern dwelling garden. By 21:00 4 PP in northern Nursery and garden area with social calling. PS within Nursery area 20:45. ES brief pass Nursery eastern end at 21:12*

29/09/11	*Emergence Survey Northern buildings around Manor Farm Nurseries Transect*	*First bat PP at 19:03, 10mins after sunset arrived from the northern boundary and foraged around the house along NE boundary. This bat foraged in northern garden, occasionally with second for 25mins. At 19:18 NN passed NE to SW. Transect work showed PP and PS in low numbers around Manor Farm Nursery northern and eastern boundaries. 3x PS inc. social calling on northern boundary*

Key: PP= Common Pipistrelle, PS=Soprano Pipistrelle, My = Myotis sp, ES = Serotine, PA = (Brown) Long Eared Bat

5.2.9 A total of five species of bat have been recorded on site during the survey including Common and Soprano Pipistrelle *Pipistrellus pygmaeus*, Long Eared Bat, Noctule *Nyctalus noctula* and Serotine *Eptesicus serotinus*. All these species are widespread in southern England, although Serotine is confined to southern England. The bat use of the site is dominated by Common Pipistrelle, but with regular Soprano Pipistrelle and occasional use by the other species. Use of the site by Long-eared Bats may be under represented on account of their difficulty to detect.

Evaluation

5.2.10 The site is considered to be of local value to populations of bats. There are no recorded roosts on site, but the habitats within the farmyard, Nursery and gardens provide semi natural foraging habitat for local bat populations which use the site at moderate levels.

5.3 Badgers

5.3.1 The site was searched for signs of the potential presence of Badgers *Meles meles* using the methods outlined in **Technical Appendix 4**. No signs of Badgers were noted during the survey effort on site. A number of mammal tracks were noted along the northern boundary of the site and just off site, but no signs of Badgers were noted from them, most being dominated by signs of Roe Deer. A series of mammal holes are present in the artificial bank on the boundary of the farmyard and Manor Farm Nurseries. These were examined for signs of use by Badger during winter 2011, and again in summer 2011. Two of the holes are of sufficient size for Badger activity, but no evidence of Badgers was noted. Fox *Vulpes vulpes* hair indicated that at least one hole was used by Foxes in early 2011, and Rabbit evidence was noted. Badgers are in the local area and a record was provided in the data search within 250m of the site, just south of the railway crossing.

5.4 Other Protected Mammals

5.4.1 The potential for the European protected species Dormouse *Muscardinus avellanarius* to be present was also considered (See **Technical Appendix 1 & 2** for legal status). The data search shows no records within 1km the site, and the nearest known records are from along the A3(M) north west of Havant.

5.4.2 The woody habitats on site are considered of only marginal suitability for Dormice, and because of its very small size and recent development, only if there was significant adjacent woody habitat of potential value. However the adjacent farmland and even the railway banks are relatively open with well managed species poor hedges with gaps. This combined with the lack of local records means that Dormice are unlikely to be present on site.

5.4.3 Given the habitats present no other protected mammal species are considered likely on site. The potential for the protected species Water Vole *Arvicola terrestris* in the ditches along the hedges on the northern boundary and east of the site was considered. The ditches are only of marginal suitability for Water Vole, and would only be used as habitat should a good population exist elsewhere in the local area. The data search has not recorded any local populations of this species, no evidence was noted on the site visit, and it is unlikely they are present.

5.4.4 The site (and particularly the boundary features adjacent to the site) is likely to be of **Value within the Zone of Influence** to mammal populations, as part of the wider countryside.

5.5 Reptiles

Methodology

5.5.1 The initial ecological appraisal considered that potential reptile habitat is present on site, mostly along the edges of the Farmyard and arable, and around the Nursery. The desktop survey has shown that both Grass Snake *Natrix natrix* and Adder *Viper berus* have been recorded to the north of the site at Havant Thicket.

5.5.2 On this basis a total of c70 refugia were placed in the potentially suitable reptile habitat on site around all boundaries, with a handful in more open field locations, and then subsequently surveyed during suitable weather conditions according to the methodology outlined in **Technical Appendix 7**. The initial survey in spring 2011 only surveyed the Manor Farmyard area and not the wider countryside. A further survey in Summer 2011 surveyed the rough grassland around Manor Farm Nurseries, the northern dwelling house garden and also the hedgerow around the pond, east of the arable field.

Results

5.5.3 The results can be seen in **Table 5** below and at **Figure 5**. The only reptiles recorded during the survey were a low number of Slow Worm *Anguis fragilis,* widely scattered around the site, and a single record of Grass Snake around the pond in the arable farmland.

Table 5: Survey Results

Date	Time	Numbers
Spring Survey		
13-04-11	pm	Set up
05-05-11	am	AF = 1M; NN = 1sub
11-05-11	am	AF = 1M 1F 1sub
16-05-11	am	AF 2F 1sub

19-05-11	pm	AF = 1M 1F
24-05-11	am	AF = 1M 1F
26-05-11	pm	AF = 2F 2sub
28-05-11	am	AF = 1 sub
Summer Survey		
20-07-11	pm	Set up
06-08-11	Am	AF = 1 sub
12-08-11	A	0
28-08-11	Pm	AF = 1 F
08-09-11	Am	0
10-09-11	Pm	AF = 1 sub
13-09-11	Am	AF = 1 sub
29-09-11	pm	0

AF = Slow Worm; NN = Grass Snake; Ad=Adult, m=male, f=female, sub= subadult

Evaluation

5.5.4 Despite suitable habitat along most of the site boundaries very low numbers of reptiles were recorded, perhaps an indication that the site was formally more intensively managed. The site is considered to be of **value within the zone of influence to local value** for reptiles.

5.6 Amphibians

Methods

5.6.1 No waterbodies suitable for amphibians exist on the proposed development area. The ditch network are considered to only be marginally suitable as breeding habitat for amphibians as they all are likely to dry out in late spring annually. The nearest pond is noted as just over 180m from the proposed development area to the east within the wider farmland. This pond was constructed by the current residents of Manor Farm for water storage and irrigation, and is an open farm pond dominated by Reedmace, Reed Canary Grass with some introduced Water Lilly. The pond holds water year round and is fed by the ditches along the northern hedgerow boundary and the eastern hedgerow boundary off site. A pump is located in the pond resulting in draw down during dry periods when used for irrigation. The pond is roughly 25mx30m and c1m+ deep and is shown on **Photo 22** below.

5.6.2 The legally protected Great Crested Newt *Triturus cristatus* is not known from the local area, but the data search has provided records from about 2km north the site, and about 5km from the site to the east.



Photo 22: Pond Eastern end of Arable Field

5.6.3 A survey of the pond was undertaken to the methodology outlined in **Technical Appendix 8** during spring 2011

Results

5.6.4 The results of the survey work over four dates is provided in **Table 6** below. The survey was undertaken over five dates using various methods. No Great Crested Newts were recorded. The pond held moderate numbers of Smooth Newt *Triturus vulgaris* (see **Photo 23**). No amphibians were noted in ditches on site.

Table 6: Great Crested Newt Survey Spring 2011

Date:	**13/04/2011**	**26-27/4/2011**	**28-29/4/2011**
Approx. Air Temperature	13-11c	14-12c	14-12c
Methods: *Te=Terrestrial, B=Bottle Trap, O=Observations, T=Torching, E=Egg Searching, ES=Egg Strip N=Netting*	O,T,E	E,B,N	E,B,T
Smooth Newt:			
Male	*1*	*6*	*2*
Female	*1*	*4*	*1*
Imm			



Photo 24: Smooth Newts from Pond

Evaluation

5.6.5 The habitats on site are considered to be of **Value within the Zone of Influence** for amphibians.

5.7 Invertebrates

4.4.15 A number of commoner invertebrate species are likely to use the site. The legally protected Stag Beetle *Lucanus cervus* is has been recorded within 1km of the site, but there is only limited dead wood habitat on site.

5.8 Other Protected Species

4.4.16 No other protected species are considered present within the zone of influence which would be impacted by the development proposals. On the basis of the data and site visit information provided above the site is likely to be of **Value Within the Zone of Influence** to **Local Value** for protected species.



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Figure 3: Habitats on Site



Figure 4: Bat Survey



Key:

- **Grass Snake**
- **Slow Worm**

Records provided relate to all individuals recorded on site

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Figure 5: Reptile Survey

6.0 BRIEF ASSESSMENT OF LIKELY IMPACTS WITHOUT MITIGATION

6.1 Introduction

6.1.1 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 further scheme design and mitigation.

6.2 Habitats & Species on Site

Potential Impacts on Designated Sites

6.2.1 The development is within proximity to the coastline which contains sites designated for wetland migratory and non-breeding bird species. Survey work in the adjacent arable farmland has not recorded use of the area by waterfowl. The proposed development contains a large area of open space for formal and informal recreation as a part of the scheme proposals for new and existing local residents. This is subject to a landscape and open space strategy with ecological mitigation.

Potential Impacts on Habitats and Vegetation

6.2.2 The majority of habitats on site within the proposed development area will be developed and therefore lost as a part of the scheme. The habitats are of low intrinsic value and no significant impacts are predicted. The potential loss of a small amount of the declining arable plant Corn Spurrey is not considered significant.

Potential Impacts on Birds

6.2.3 A number of garden trees, farmyard trees and scrub would be removed by the scheme. If this is removed during the breeding season there is potential to destroy bird nests, which would be contrary to Section 1 of the Wildlife and Countryside Act 1981 (as amended), see **Technical Appendix 2**. The land take of a small amount of the main arable field for the scheme and associated open space area will reduce the potential habitat for the nesting BAP species Skylark. This is considered to be a minor adverse impact, although there will still be habitat retained in the remainder of the field and adjacent fields.

6.2.4 The development will also see the loss of an active Sparrowhawk nest. This is not a species of conservation concern and has increased in the UK over the last 30 years. A likely second nest site for this pair will be retained in the Oaks on the northern boundary, north of the Nursery buildings.

6.2.5 The majority of the farmland to the east of the site will be retained in situ without public access. The value of this farmland for wintering birds should therefore not be affected by the scheme.

Potential Impacts on Bats

6.2.6 No roosts were noted during survey work. The creation of boundary features along the eastern edge of the development will ensure that commuting routes and foraging areas around these routes are retained (these being as new garden and open space areas).

6.2.7 There is potential for street lighting to affect foraging and commuting along the boundary features. Without mitigation this is considered to be a minor adverse impact.

Potential Impacts on Reptiles & Amphibians

6.2.8 There is limited habitat within the farmyard and Nursery and gardens on site for populations of reptiles to be present. Two species of reptile have been recorded on site, with one species within the proposed development zone at a low density. All reptiles are protected from harm by the Wildlife & Countryside Act 1981 (as amended). Development without mitigation will therefore be likely to cause an adverse impact on local reptile populations. The pond and its environs will be retained in situ.

7.0 OPPORTUNITIES ECOLOGICAL ENHANCEMENT AND MITIGATION

7.1 Introduction

7.1.1 The potential for impacts on an unmitigated scheme was considered in Section 6, and further survey and mitigation recommendations are provided to ensure that protected species are also considered in construction and operation of the site.

7.1.2 The location of the site and the scheme design provides for potential to provide enhancements to the local ecology. Suggestions and recommendations are outlined below, including broad scheme design recommendations. Mitigation and enhancements are further detailed in the Biodiversity Mitigation and Management Report (Aluco Ecology, 2013).

7.2 Mitigation for Protected Habitats, Species and Species of Concern

Vegetation

7.2.1 Any retained hedges and trees should be protected during construction to current industry standards to ensure that construction material isn't stored around the root systems and they are not compacted by machinery. If the population of Corn Spurrey flowers again before or during construction period and it is to be lost as a result of the scheme, seed the seed bank can be collected for translocation to the arable farmland retained as part of the scheme.

Birds

7.2.2 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 to be from March to August.

Bats

7.2.3 The survey work did not find any evidence of roosting bats in the buildings on site. There will be a loss of low potential buildings and a single Category 2b tree will be removed (the Oak in the Farmyard). A safe felling procedure is provided in **Technical Appendix 6** for the removal of this Oak to best practice guidelines.

7.2.4 It is recommended that a minimum of six bat features should be incorporated into dwellings along the eastern edge of the proposed development (examples are provided in **Technical Appendix 9**). In addition to this a further six Schwegler type bat boxes should be installed on retained mature trees around the wider site.

7.2.5 The scheme should avoid allowing any scheme lighting to spill onto the hedges and boundary features of the site as these are likely to function as local mammal corridors.

7.2.6 The landscaping of the open space areas within the scheme should have regard to the features set out in section 7.3 below.

Badgers

7.2.7 A Badger survey should be repeated prior to any commencement of construction on the site. There are records of Badgers locally and there is sufficient potential on site in bund between the farmyard and the Nursery, on hedge banks and off site (eg along the railway) for Badgers to occupy the site/local area in the future.

Reptiles

7.2.8 Reptile habitat exists within the proposed development area, principally around the edges of the gardens of Manor Farm house and the northern dwelling, in the farmyard and along the edges of the Nursery buildings. Only very low numbers of reptiles have been recorded using this habitat. Survey indicates that habitat retained in the wider site is also used at a very low density.

7.2.9 There is therefore potential to translocate the population of reptiles from the proposed development area to the retained areas prior to construction to ensure that no reptiles are harmed. The length of the eastern boundary provides sufficient habitat of moderate quality including banks, hedges, rough grassland and developing scrub in a 5m strip along the eastern boundary from the pond to the northern end of the nursery building (see **Figure 6** below).

7.2.10 The methodology for translocation of reptiles on site is described in **Technical Appendix 10**. The methodology will be undertaken to best practice guidelines outlined in this Appendix. This will involve the following:

- placement of artificial refugia within the capture area at high density;
- manipulation of habitat to increase capture rates;
- translocation to suitable habitat within the wider retained site, with fencing;
- commitment to management of retained habitat for reptiles;
- capture of reptiles until a total of at least 3-5 blank visits are made;

- destructive search of the capture area to the guidelines.

Fox

7.2.11 Foxs are present on site, and there are old earths in the northern corner of the Farmyard. Any active Fox earth is likely to be affected by the development will be closed down prior to works commencing, and the outside the season when there are dependant young (Feb-June).

General

7.2.12 Personnel are to be briefed when working on site as to the potential presence of wildlife and the need for special care when undertaking vegetation removal and the protection of features such as hedges / trees. Ensure site personnel are aware of a procedure to follow in the event of discovery of a protected species such as reptiles or bats.

7.3 Potential for Ecological Enhancement

7.3.1 Provision of native locally sourced species within the landscaping of the scheme and particularly within the open space area to the eastern end of the scheme will provide new habitats for wildlife on the edge of the site. The natural habitats should extend to the offsite boundaries to provide suitable corridors for wildlife. Scheme lighting should be directed away from this area.

7.3.2 Two new ponds will be created on site as part of the surface water strategy. These ponds will be designed to have shallow edge profiles and will have surrounding area planted with native species vegetation mixes.

7.3.3 There is potential to provide benefits to the local bat and bird communities by providing new roosting and nesting opportunities, through the provision of bat and bird boxes that can be located in the mature Oak trees just off site or in the building to be constructed.

7.3.4 The eastern boundary hedge, the ditch line and the 5m strip that is to be managed as retained reptile habitat should be left uncut, with only annual or every two years cutting of the encroaching brambles and scrub to no lower than 10-15cm. Some scrub development is recommended, with an aim of a mosaic of 70% rough grassland and 30% developing scrub. The hedge along this area should be reduced to being cut every three years in an 'A' shape to provide additional habitat at the base of the hedgerow and bank.

7.3.5 **Figure 6** below shows enhancement potential. See also Aluco Ecology (2013). This will be developed in a management plan for the retained and created open areas, which will include ecology prescriptions and management options.



Grassland areas within the former arable or under nursery glasshouses will be sown with an appropriate wildflower meadow mix.

Grassland management within the open space should include areas along the edges of the grasslands where no grassland cutting takes place in order to create an edge habitat with woody vegetation that will enhance the wildlife value of the informal open space.

Pond creation will involve shallow graded levels seeded with a native wetland species mix.

Reptile translocation area (if necessary can be extended to second area) to be maintained as rough grassland along the eastern boundary hedge and bank. A minimum 5m strip of rough grassland should be retained.

Retention of existing large Oak trees and other boundary woody vegetation.
This vegetation can be enhanced through native planting with woody species such as Hazel, Hawthorn, Field Maple, Grey and Common Willows, Elder and Oak.
Formal and informal pathways are to be created through the site.

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Figure 5: Mitigation and Enhancement

8.0 CONCLUSIONS

8.1 Compliance with legislation

8.1.1 The initial survey work has shown that the habitats on site are of low intrinsic value, and that there are low populations of protected species including, nesting birds, Slow Worm and foraging and commuting bats. Mitigation is proposed in order to reduce and offset the potential for impacts on these species groups.

8.2 Opportunities for Ecological Gain

8.2.1 A number of options are put forward for providing ecological gain to the development proposals. The implementation of these or other ecological gains as part of the development will ensure that the provisions of Government policy and the saved policies in the Havant Borough Local Plan (See **Technical Appendix 3**) are complied with.

9.0 REFERENCES

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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 procession 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.

The CRoW Act also provides a basis for Local Authorities to consider Biodiversity within their functions and decision making.

Technical Appendix 2

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 Widlife 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/uksi/2010/490/regulation/42/made

Technical Appendix 3

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 SINCs 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.**

Technical Appendix 4

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 there distribution from biological records for the area. If it 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 (PPS 9).

Technical Appendix 5

SSSI Citation
SAC & SPA Citation
SINC and Ancient Woodland Details
Data from Hampshire Biodiversity Information Centre (HBIC)
Notable Species within 1km of the Site (HBIC)
European Protected Species within 5km (HBIC)
HBIC data obtained Oct 2010

County: Hampshire **Site Name: Warblington Meadow SSSI**

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981

Local Planning Authority: Hampshire County Council, Havant Borough Council

National Grid Reference: SU 730052

Ordnance Survey Sheet 1:50,000: 197 **1:10,000**: SU 70 NW

Area: 4.26 (ha) 10.52 (ac)

Date Notified (Under 1949 Act): – **Date of Last Revision**: –

Date Notified (Under 1981 Act): 16.12.1986 **Date of Last Revision**: –

Other Information:

Reasons for Notification:
Warblington Meadow Site of Special Scientific Interest is an unimproved grazing marsh adjoining Chichester Harbour and is of special interest for its gradation from freshwater, base-rich marsh to old reclaimed saltmarsh, and for its rich associated flora, with a total of 158 species of flowering plants having been recorded up to the time of notification.

The freshwater marsh consists of a sedge-rush community with *Carex acutiformis*, *C. otrubae*, *C. flacca*, *C. panicea*, *C. nigra*, *C. disticha* and *C. ovalis* growing together with *Juncus effusus*, *J. inflexus*, *J. acutiflorus* and *J. articulatus*. The grass component is also high with much Yorkshire fog *Holcus lanatus*, crested dog's tail *Cynosurus cristatus*, quaking grass *Briza media* and several fescues *Festuca* species including *F. rubra*, *F. pratensis* and *F. arundinacea*. The sward contains a number of locally distributed herbs, such as marsh arrow-grass *Triglochin palustris*, southern marsh orchid *Dactylorhiza praetermissa*, ragged robin *Lychnis flos-cuculi*, bog pimpernel *Anagallis tenella*, creeping jenny *Lysimachia nummularia* and corky-fruited water-dropwort *Oenanthe pimpinelloides*.

The freshwater marsh grades seawards into reclaimed saltmarsh, dominated by saltmarsh rush *Juncus gerardi*, and retaining several elements of the old saltmarsh flora. Species include sea arrow-grass *Triglochin maritima*, sea plantain *Plantago maritima*, sea milkwort *Glaux maritima*, both common and reflexed saltmarsh grasses *Puccinellia maritima* and *P. distans* and glasswort *Salicornia* species in the wetter areas and red fescue *Festuca rubra*, sea rush *Juncus maritimus*, buck's-horn plantain *Plantago coronopus*, hard grass *Parapholis strigosa*, strawberry clover *Trifolium fragiferum* and both distant and divided sedges *Carex distans* and *C. divisa* on the drier ground.

A small bed of reed *Phragmites australis* and a clear, unpolluted stream lined with oaks *Quercus robur*, alders *Alnus glutinosa* and willows *Salix* species add habitat diversity to the site.

COUNTY: WEST SUSSEX/HAMPSHIRE SITE NAME: CHICHESTER HARBOUR

DISTRICT: CHICHESTER/HAVANT

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981.

Local Planning Authority: CHICHESTER DISTRICT COUNCIL; HAVANT BOROUGH COUNCIL

National Grid Ref: SU 760 000 Area: 2657 ha 6566.7 acres W Sussex
3695 ha 9130.3 acres Total

Ordnance Survey Sheet 1:50,000:197 1:10,000: SU 70 NW,NE,SW,SE, SU 80 NW, SW,SE, SZ 79 NW,NE, SZ 89 NW

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 Deeps 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 Tournerbury 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 shark *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.

County: Hampshire **Site Name: Langstone Harbour SSSI**

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

National Grid Reference: SU 700030

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

Area: 2,069.4 (ha) 5,113.4 (ac)

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

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

Other Information:

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

Reasons for Notification:

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

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

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

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

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%)

Location of Solent Maritime SAC/SCI/cSAC

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).

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:

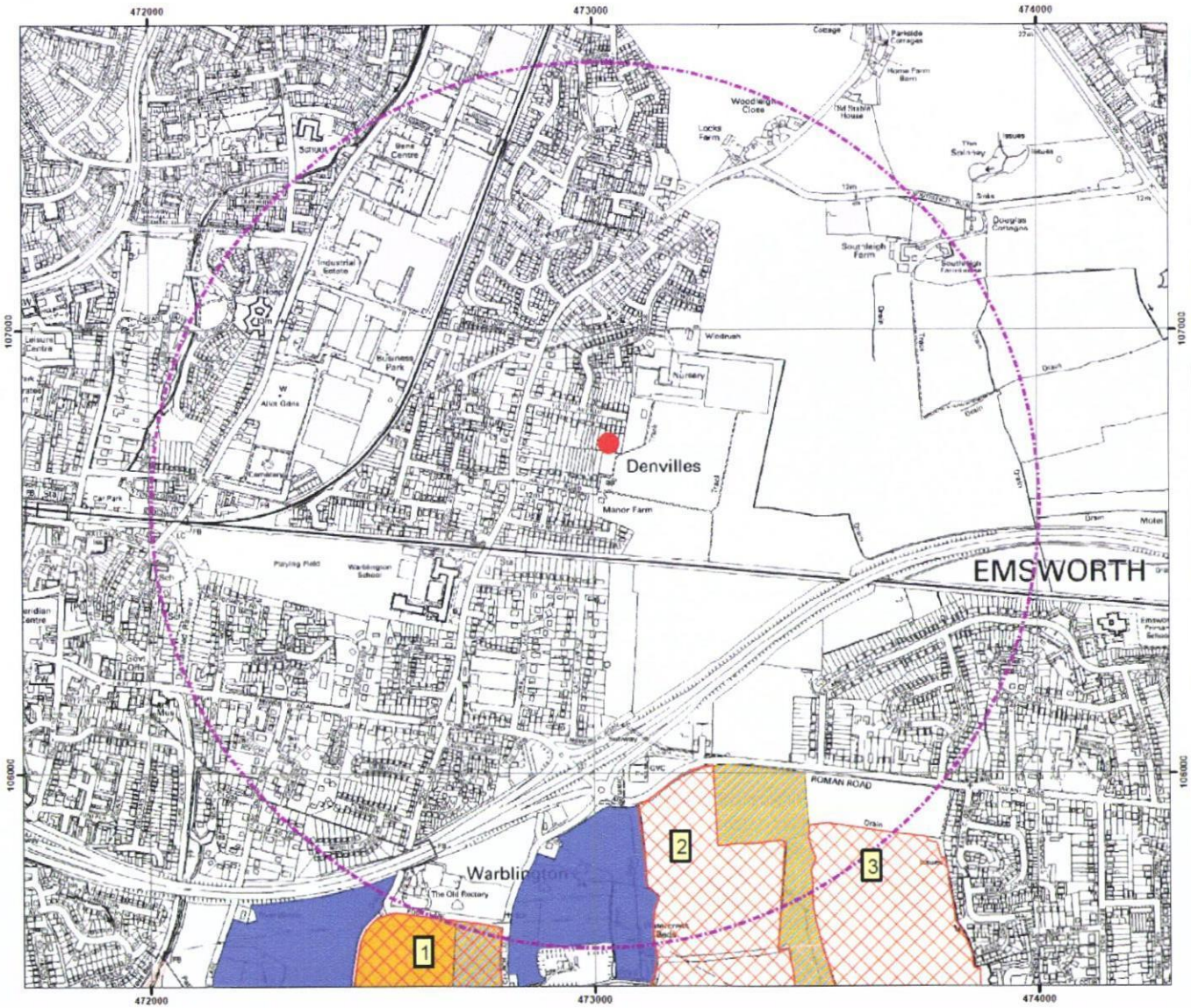
During the breeding season;

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)



Hampshire Biodiversity Information Centre

Non-statutory designated sites within 1km of Manor Farm (SU 730 066)

Legend

- 1km Search Area
- SINCs (Labelled 1-3)
- Surrounding SINCs

Waders & Brent Geese (2010)

- Brent records
- Wader records
- Wader & brent Records

N

Created: 24/12/2010
Scale @A3: 1:8,000

0 60 120 240 360 480 Meters

This map is reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office © Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. HCC 100019180 2010

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

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

Map Label	SINC Ref	SINC Name	Central Grid Ref.	SINC Criteria	Species supported that meet Section 6 of SINC Selection Criteria	Area (ha)
1	HV0094	Warblington Castle Farm West	SU72670544	6B	Branta bernicla bernicla (Dark-Bellied Brent Goose) [UKBAP]	14.60
2	HV0106	Warblington Castle Farm East D	SU73300560	6B	Branta bernicla bernicla (Dark-Bellied Brent Goose) [UKBAP]	18.58
3	HV0114	Brook Farm B	SU73700560	6A/6B	Branta bernicla bernicla (Dark-Bellied Brent Goose) [UKBAP] Misopates orontium (Weasel's Snout) [NR] Spergula arvensis (Corn Spurrey) [NR]	14.41

Key:

Woodland

1A Ancient[1] semi-natural[2] woodlands.

1B Other woodland where there is a significant element of ancient semi-natural woodland surviving.

1C Other semi-natural woodland if;

(ii) they comprise important community types of restricted distribution in the County, such as yew woods and alder swamp woods

1D Pasture woodland and wooded commons, not included in any of the above, which are of considerable biological and historical interest.

Ancient - refers to woodlands which have developed particular ecological characteristics as a result of their long continuity. Those identified to date which are over 2ha are included on the Hampshire Inventory of Ancient Woodlands (Provisional).

Semi-natural - modified types of vegetation in which the dominant and constant species are accepted natives to Britain and that locality, and the structure of the community conforms to the range of natural vegetation types.

Neutral/acid/calcareous grassland

2A Agriculturally unimproved grasslands[3]

Coastal habitats

4A Semi-natural coastal and estuarine habitats, including saltmarsh, intertidal mudflats, sand dunes, shingle, brackish ponds, grazing marsh and maritime grasslands.

Wetlands

5B Fens, flushes, seepages, springs, inundation grasslands etc. that support a flora and fauna characteristic of unimproved and waterlogged (seasonal or permanent) conditions.

Species

6A Sites which support one or more notable species4.

Notable species include Red Data Book species, Nationally Scarce species, species covered under Schedules 1,5 and 8 of the Wildlife & Countryside Act 1981, Annex 1 of the EC Bird Directive 79/409 and Annex II & IV of the EC Directive 92/43/EEC 'The Habitats Directive', and those covered by the Bern, Bonn and Ramsar Conventions. Notable species will also include species which are considered 'County Rare' or 'County Scarce'. County Rare = those species recorded in 1% or less tetrads in Hampshire or either of the two vice-counties (11 & 12) separately. County Scarce = 4% or less tetrads.

Technical Appendix 6

Bat Survey Methodology

(1) Bat Tree Survey & Emergence/Transect Surveying

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 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 the potential to support bats.

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 was noted.

The potential for trees to support roosting or breeding bats is evaluated under the following categories:

Tree category and description	Stage 1 Survey requirements prior to determination	Stage 2 Further measures to inform mitigation	Stage 3 Likely mitigation
Category 1 Confirmed bat roost tree with field evidence of the presence of bats, e.g. droppings, scratch marks, grease marks or urine staining.	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. **Ecologist involvement will be required.**	Avoid disturbance to trees where possible[1]. Further dusk and dawn surveys to establish more accurately the presence, species, numbers and type of roost present, and to inform the requirements for mitigation if felling is required.	Felled under Habitats Regulations licence[2] following the installation of equivalent habitats as a replacement. Felling would be undertaken taking reasonable avoidance measures[3] such as 'soft felling' to minimise the risk of harm to individual bats.
Category 2a Trees that have a high potential to support bat roosts	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. **Ecologist involvement may be required.**	Avoid disturbance to trees where possible[1]. More detailed, off-the-ground visual assessment Further dusk and dawn surveys to establish the presence of bats and, if present, the species, numbers and type of roost to inform the requirements for mitigation if felling is required.	Trees with confirmed roosts following further survey would be upgraded to Category 1 and felled under licence as above. Trees with no confirmed roosts would be downgraded to Category 2b and felled taking reasonable avoidance measures[3].
Category 2b Trees with a moderate/low potential to support bat roosts	None. **Ecologist involvement is unlikely to be required.**	Avoid disturbance to trees where possible[1]. No further surveys.	Trees would be felled taking reasonable avoidance measures[3].
Category 3 Trees with negligible potential to support bat roosts	None. **Ecologist involvement will not be required unless new evidence is found.**	None.	No mitigation for bats required.

Notes

1 A general principle for those involved in advising on and undertaking tree works should be, wherever possible, to avoid disturbance and retain all features which offer some value to bats. For safety-related tree work, a balance should be sought between tree safety standards and the impact on wildlife.

2 When a Habitats Regulations licence to undertake work on a tree roost is required, the licence will need to demonstrate that alternative approaches have been previously considered to try to avoid works to the tree. These may be options such as diverting paths away from hazardous trees and removing unsafe limbs, instead of felling an entire tree.

3 Reasonable avoidance measures are considered to be good practice. 'Soft felling' is a generic term used to describe more cautious felling approaches, using lowering and cushioning techniques to reduce the impact of felling limbs which may still have bats within cavities. Where proportionate to the impact, best practice approaches to felling may include methods such as additional dusk emergence or dawn re-entry surveys immediately prior to felling (during the active bat season) or the use of non-return valves to ensure that bats can leave but not return to a roost cavity before works begin.

Detailed 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.

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.

(2) Bat Activity Survey

Introduction

The value of a site to bats can 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

During the survey a site is walked slowly, mainly following woodland edges, tree lines, hedgerows, paths or rides through woodland, and incorporating all features of the landscape that may be of value to bats. A transect is often followed, worked out prior to the survey commences.

Bat detectors (Bat box III , Petterson D240x &Anabat SD1) are used as an aid to detecting bats on the site, and also in determining the species which were present. Each survey visit generally continued for 2 hours or more, after sunset.

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, and for minimal extra survey effort. They can allow longer periods of time coverage than could be practically and economically covered, 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 events.

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).

References

Bat Conservation Trust (2007). "Bat Surveys Good Practice Guidelines."Bat Conservation Trust, London. ISBN 978-1-872745-99-2

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

(3) Bats in Buildings Survey Method

Introduction

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

Methods

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

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

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

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

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

Survey Constraints and Limitations

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

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

Reference

Bat Surveys Good Practice Guidelines. Bat Conservation Trust (2007). Bat Conservation Trust, London. ISBN 978-1-872745-99-2

Technical Appendix 7

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.

References

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

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

Technical Appendix 8

Great Crested Newt Survey Methodology

Introduction

Natural England guidance recommends, that in order to confirm the presence/absence of Great-crested Newt *Triturus cristatus* (GCN) on a site it is necessary to perform three different survey methods over a minimum of four visits in suitable weather conditions.

Ideal survey time is between mid-March to mid-June, with two visits during mid-April to mid-May. These timing restrictions are in order to monitor the newts during the peak breeding season, when most of the population is within the water body.

Torchlight searching

The water's edge of a pond is scanned systematically at night using a powerful halogen lamp with 500,000 candlelight power. All water was searched systematically and repeatedly. It is possible through torch surveys to distinguish newt species and sex from external patterning. Torch survey is undertaken during night time where weather conditions are good for amphibian activity: night-time air temperature > 5 °C, no/little rain.

Egg searching

Examination of submerged vegetation for eggs is an effective method for detected the presence of GCN. GCN eggs are characteristic in size and colour, laid singly and folded within pliable material such as that of aquatic plants and plastic debris.

Netting

Netting is carried out using a sturdy net, with a 4 mm mesh. A slow sweeping action is used to explore areas of aquatic vegetation and leaf litter. Netting can be standardised so that it is consistent with guidelines on SSSI selection to produce relative abundance scores. These method uses fifteen minutes of netting per 50m. This survey technique causes vegetation disturbance, and other methods are a preferable technique to determine relative abundance especially in smaller ponds or ponds within gardens.

Bottle Trapping

Both adult and larval newts can be trapped by the use of bottle traps. Newts find their way into the bottles but usually cannot leave because of how the bottles are positioned. Bottle traps are an effective way of detecting a population but need to be used with care. Bottle traps are set in the evening, followed by an early morning visit to check them. The traps are checked within two hours of dawn where they are set within direct sunlight.

Observation

Vigilant and prolonged daytime observation, for example, watching for GCNs to surface for air and for GCN movement within the water body can be a very effective in locating GCN in water bodies.

Terrestrial search

Suitable terrestrial habitat such as logs, rubble, discarded carpet and wood are carefully inspected underneath and then replaced.

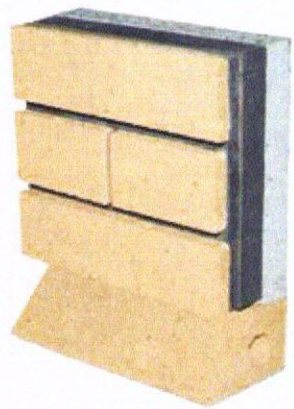
References

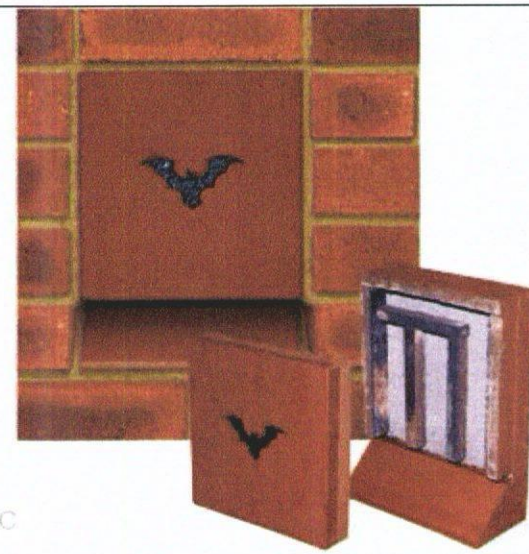
Frog Life (Langton, T., Beckett, C. & Foster, J.) (2001) Great Crested Newt Conservation Handbook. Halesworth

English Nature (2001). Great Crested Newt Mitigation Guidelines. English Nature, Peterborough

Ibstock B Roost Unit

This roost unit has been designed to meets the characteristic habitat requirements of the types of bats that inhabit buildings. The roost unit can be installed within any external brick walls and can be matched with the brick type or supplied with decorative motif.





Enclosed Bat Box B

Designed specifically for the pipistrelle bat

Available in all brick types Several roosting zones are created inside the box

Bats are contained within the bat box itself

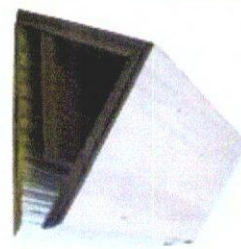
Maintenance free with entrance at the base

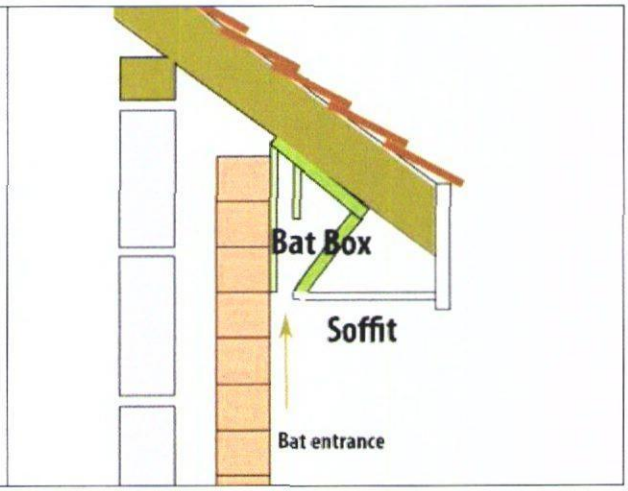
Cut to show function of the roost unit

Size 215x 290

Soffit Box

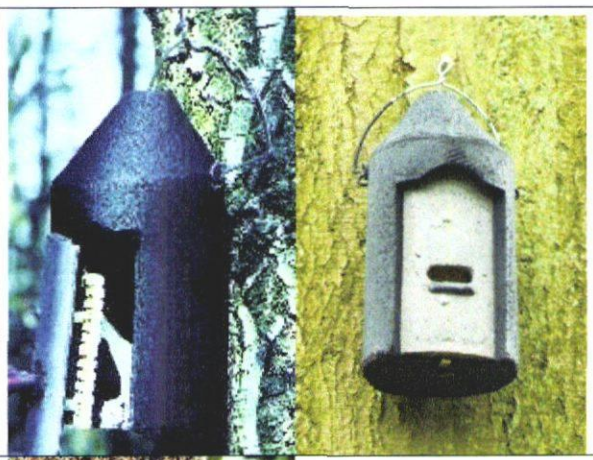
The soffit bat box utilises the wasted space above the soffit on a standard roof structure. The entrance is formed by cutting away a 20mm slot in the back of the soffit board against the external wall, and a specially designed plate is then screwed through into the bat box to secure it and to make it a tidy finish. Virtually invisible, and self-emptying.





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.



Technical Appendix 10

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 $10m^2$, 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

Herptofauna Groups of the British Isles (HGBI) Guidelines (1998) "Evaluating Local Mitigation/Translocation Programes: 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.


A number of cut logs provided by the tree surgeons are for reptile area.
Retained vegetation along this boundary requires protection fencing.
Ensure tree protection is up in former garden area.
Ensure close-board or Tree protection fencing is up along this boundary to retain vegetation
The vegetation within the red boundary requires protective fencing installed along boundary. It has some reptile habitat still in place that will need to be destructively searched May 2014.
Over winter some vegetation cutting is required with ecology supervision. It is recommended this is undertaken prior to the new year.
Internal brick bat boxes to be purchased to brick colour and installed high under eves of marked dwellings. To be installed on the north/east side facing ditch and trees.
TREE PROTECTION FOR
THIS PHASE IS SHOWN
ACD PLANS FOR MANO
FARM: REF: BSH17581
The vegetation within the red boundary requires protective fencing installed along boundary. It has some reptile habitat still in place that will need to be destructively searched May 2014.
Over winter some vegetation cutting is required with ecology supervision. It is recommended this is undertaken prior to the new year.
Reptile fencing needs to remain in place for duration of construction (it runs behind red line). The pond location here needs moving devt side of existing ditch line to not interfere with reptile protection area.
WHY TREE PROTECTION IS NEEDED
ACD
Ecology
Arboriculture
Landscape Architecture
scheme: Nursery Fields, Denvilles Havant, Hampshire
client: Barratt David Wilson
drawing: Tree Protection Plan
date: July 2013
scale: 1:500@A1
dwg no: BSH18623-03
drawn: MW checked: TRG