

ECOLOGICAL APPRAISAL

**LAND AT OLDLANDS FARM,
PHASE 2
BOGNOR REGIS**

MAY 2015

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ECOLOGICAL APPRAISAL, LAND AT OLDLANDS FARM, PHASE 2, BOGNOR REGIS

1.0 INTRODUCTION

1.1 Background

1.1.1 Aluco Ecology Ltd was commissioned to carry out an ecological appraisal and assessment of Phase 2 land at Oldlands Farm, Bognor Regis, West Sussex. An 'Ecological Appraisal' is a general investigation of the likely ecological and nature conservation issues associated with the site and its potential development.

1.1.2 The aim of an Ecological Appraisal is to:

- highlight 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
- recommend any further work (such as targeted protected species surveys) required in order to fully assess the value of the site, and therefore the potential ecological impacts of the proposals that may arise.

1.1.3 The Government sets out its objectives for conserving and enhancing biodiversity in the National Planning Policy Framework. 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.'

1.1.4 The Framework goes on to state that at the heart of the planning system is a presumption in favour of sustainable development. Planning Practice Guidance on the Natural Environment provides information on taking biodiversity into account in planning (see Para. 007- onwards)

1.2 Outline of the Scheme and Site Location

1.2.1 The land consists of arable farmland, hedges and ditches south of the partially constructed Bognor Northern Relief Road (BNRR) (A29-Flansham section). The location of the site is shown at **Figure 1** below. A proposed Flood Compensation Area is located north of the BNRR.



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Figure 1: Location of the Site

- 1.2.2 The land subject to the Appraisal is proposed to be developed for commercial purposes. The Illustrative Masterplan for the site is shown at **Figure 2**.

1.3 Relevant Legislation and Policy

- 1.3.1 The outcomes of this Ecological Appraisal will be tested against relevant legislation and policy; namely the Conservation of Habitats & Species Regulations 2010 in relation to the protection of European sites (Special Protection Areas SPA, and Special Areas of Conservation SAC) and European protected species (eg bats, dormouse, great crested newts) (**Technical Appendix 1**) and the Wildlife & Countryside Act 1981 (as amended) and Countryside & Rights of Way Act (CROW) 2000 for protected species and the designation and protection of SSSIs (**Technical Appendix 2**). The Protection of Badgers Act 1992 gives protection to Badgers *Meles meles*.
- 1.3.2 In addition to the National Planning Policy Framework and the legislation outlined above, the strategic and local planning policies are the principal policies against which the outcomes of this ecological appraisal will be tested; the Arun District Council Local Development

Framework contains policies in the pre-submission Core Strategy consultation Draft relating to ecology, these are outlined at **Technical Appendix 3**.

- 1.3.3 Under the Governments duty to conserve Biodiversity, a number of Biodiversity Action Plans have been prepared for habitats and species of conservation concern, including national BAPs and a Biodiversity Action Plan for Sussex, and this is considered in general ecological site appraisal.

2.0 ASSESSMENT METHODOLOGY

2.1 Introduction

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

2.2 Site Survey Methodology

- 2.2.1 The first stage is a desk study of the site and associated Zone of Influence. This provides background information on the site and local environment in order to effectively target field survey and further desk research. The aims of the field survey are to record land-use and broad vegetation types present on the site and in the surrounding areas, and to evaluate the habitats and vegetation communities' potential ecological value along with their potential to support protected species, species of principal importance, and any other notable species. Further details of the methodology used can be found in **Technical Appendix 4**.

3.0 BIOPHYSICAL CHANGES AND THE ZONE OF INFLUENCE

3.1 Introduction

- 3.1.1 In order to be able to target relevant ecological survey and assess the impacts of a proposed development, it is necessary to identify the activities that may result in biophysical changes from the development and the area these cover (i.e. the zone of influence). There are three stages of this development scheme that include activities that may have an impact on features of ecological value; namely site preparation, construction and operation / use.
- 3.1.2 **Figure 2a** below shows the extent of the site and flood compensation area north of the Bognor Northern Relief Road (BNRR), **Figure 2b & 2c** below shows the illustrative Masterplan depicting the extent of the main development site and proposed development area.

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

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

3.3 Site Preparation / Construction Activities and Biophysical Changes

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

3.4 Predicted Operational Activities during Use Phase and Biophysical Changes

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

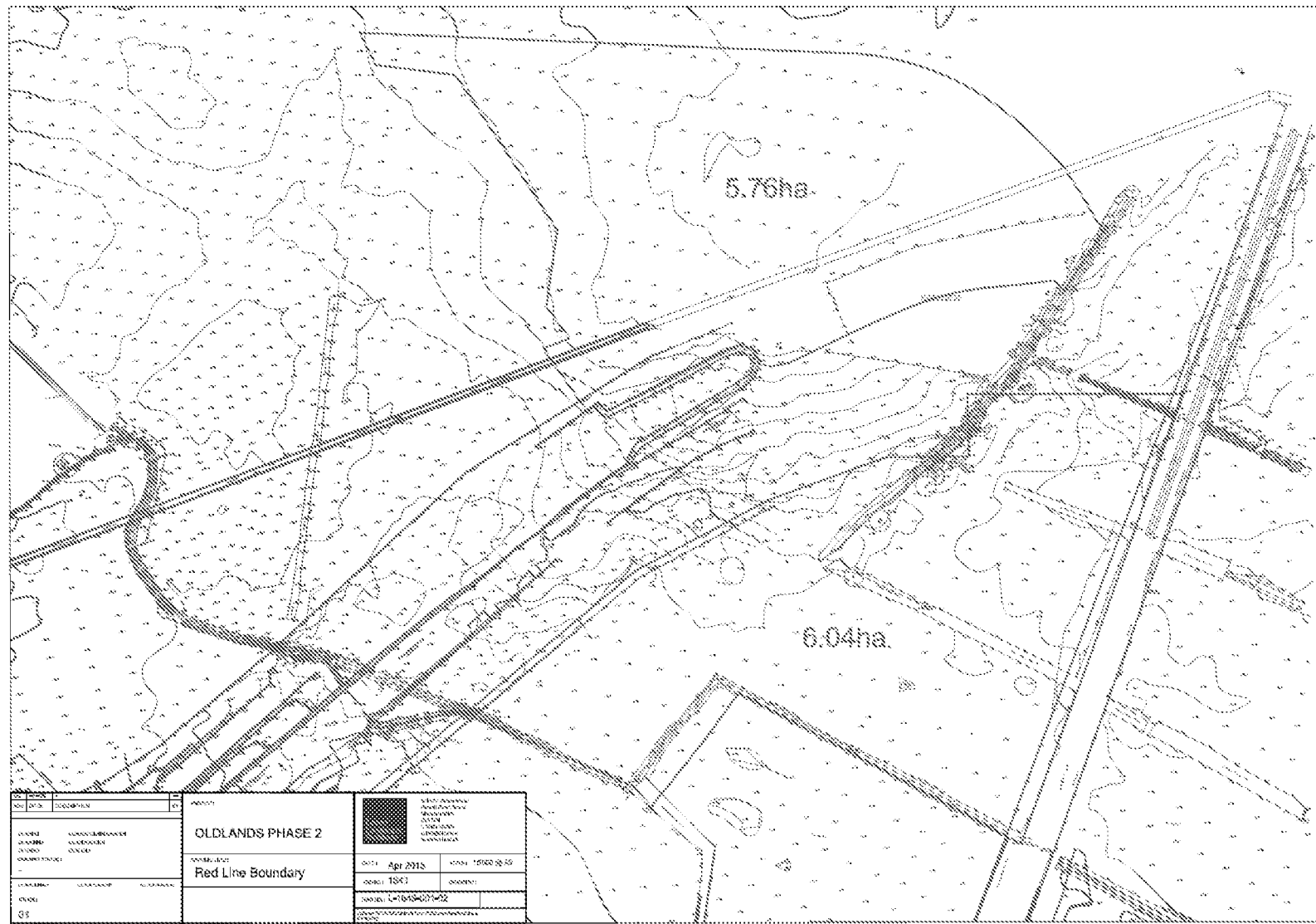


Figure 2a: Oldlands Farm Phase 2 Site Areas (Davis Landscape Architects, 2015)

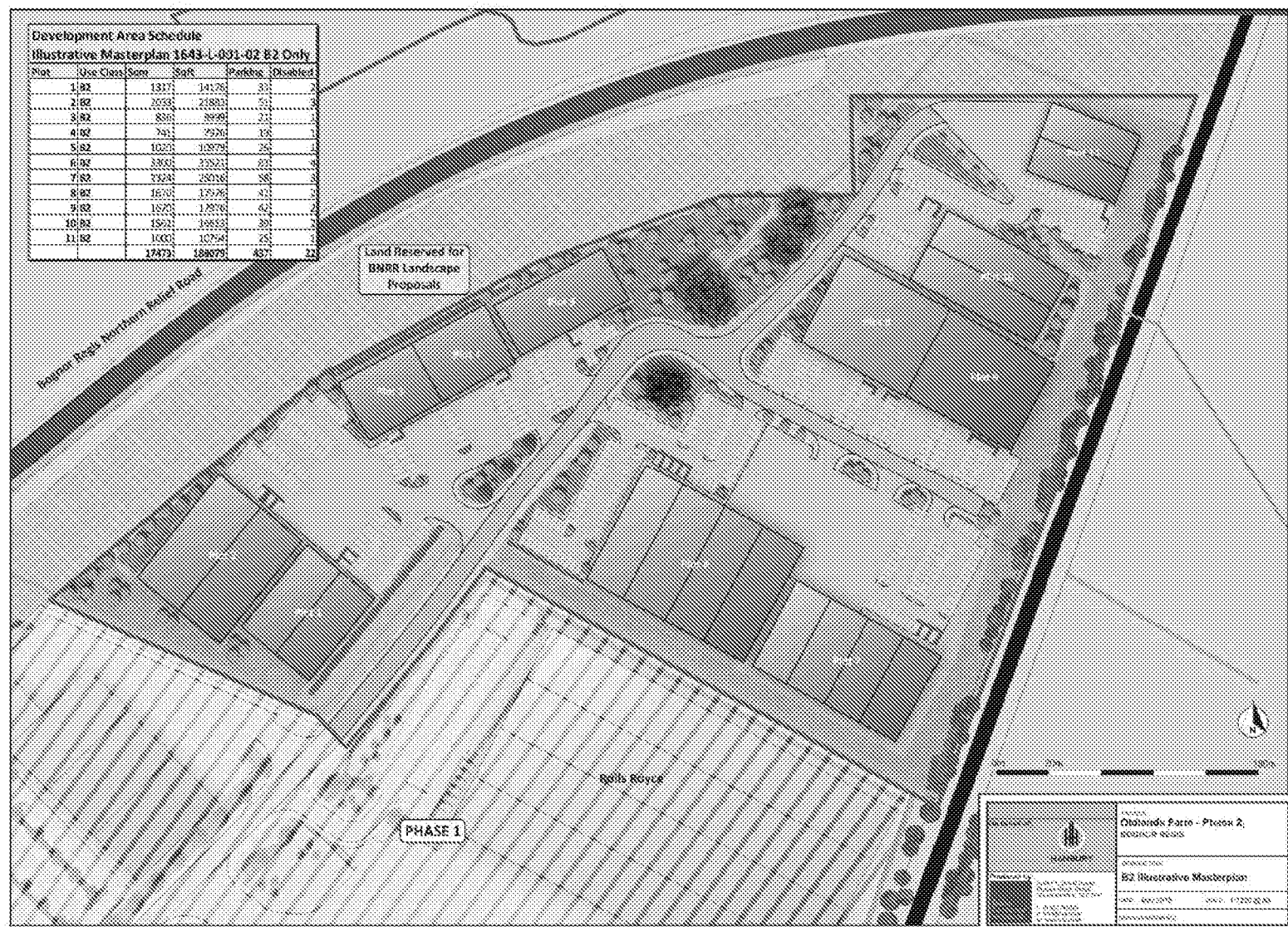


Figure 2b: Oldlands Farm Phase 2 Illustrative Masterplan B2 Use (Davis Landscape Architects, 2015)

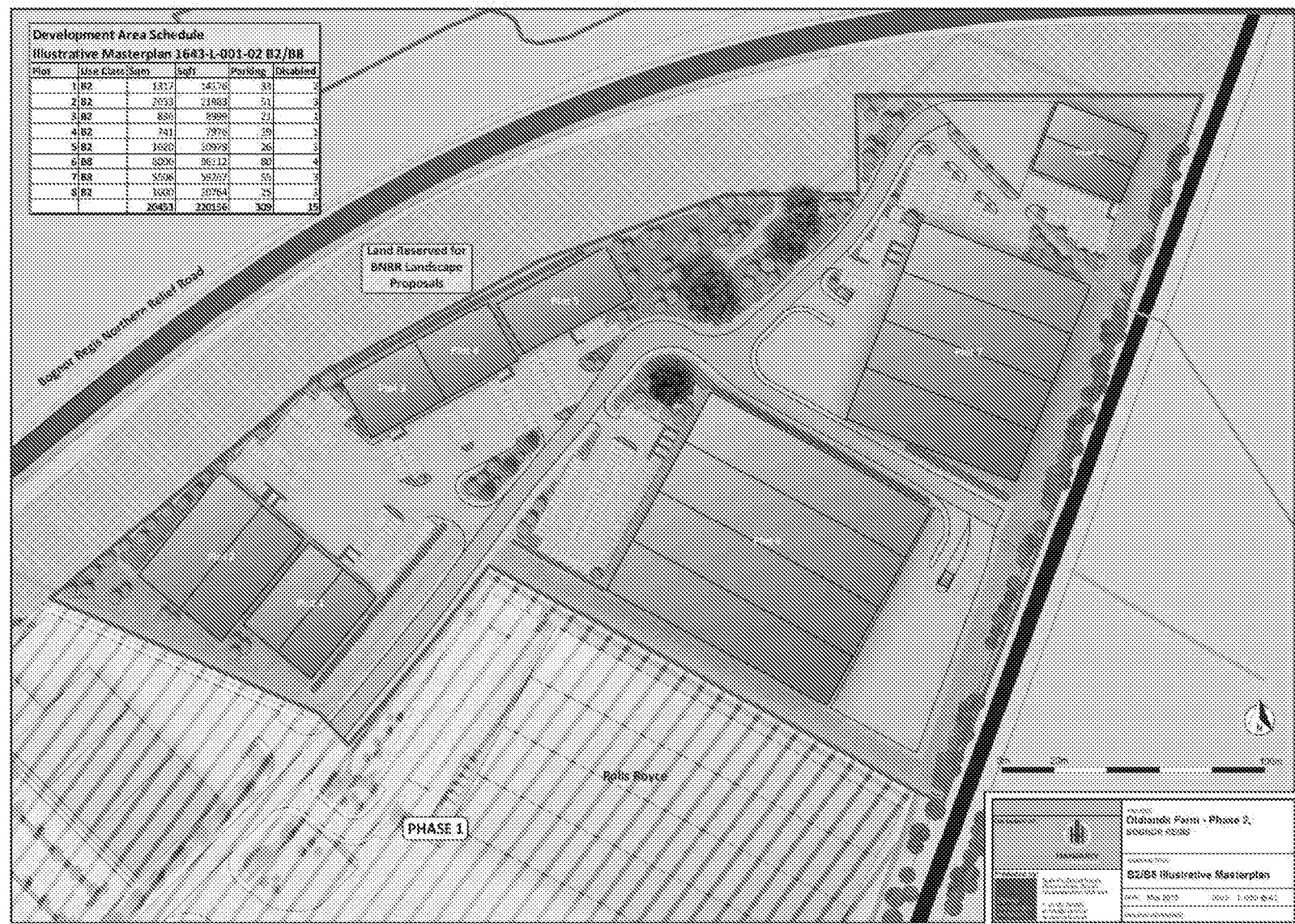


Figure 2c: Oldlands Farm Phase 2 Illustrative Masterplan B2& B8 Use (Davis Landscape Architects, 2015)

4.0 BASELINE CONDITIONS WITHIN THE ZONE OF INFLUENCE

4.1 Introduction

- 4.1.1 The ecological baseline describes the site in the context of the characteristic habitats of the area, and includes descriptions of designated sites and ecological features present within the potential zone of influence of the proposed development. The site was surveyed on two dates 05 & 18 March 2015. The proposed Flood Compensation Area was visited on the 28 April 2015.

4.2 Designated Sites

Statutory Designated Sites

- 4.2.1 There are no Sites of Special Scientific Interest within 2km of the site.
- 4.2.2 There is a single European and Internationally designated site just over 6km from the site. This is Pagham Harbour Special Protection Area (SPA); designated under the Wild Birds Directive 79/409/EEC and under the Ramsar Convention 1971. The site is south west of Oldlands Farm and is designated for its migratory, breeding and non-breeding wetland bird species. The SPA citation for this site is reproduced in **Technical Appendix 5**.

Local Nature Reserves

- 4.2.3 A single Local Nature Reserve (LNR) is present within 1km, this is Berstead Brooks LNR. It is located to the west of the site on the far side of the A29. This is designated for its grazing marsh and wetland habitats alongside the Aldingbourne Rife. The location of this site is shown at **Technical Appendix 5**.

4.3 Habitats and Vegetation

Introduction

- 4.3.1 The site is made up of an area dominated by a large arable field, a smaller arable field and a small permanent pasture field with field boundaries comprising ditches and hedges. **Figure 3** below shows the main habitats present on site.

Arable

- 4.3.2 The majority of the proposed development site is made up of arable farmland that is intensively farmed with virtually no field margins, comprising two arable fields south of the BNRR. The arable flora was examined during the site visit, but visits were early in the season for a full assessment. It is likely that the arable flora is similar to the adjacent phase 1 Oldlands Farm. A number of common arable plants were recorded including Scentless Mayweed *Tripleurospermum inodorum*, Common Poppy *Papaver rhoeas*, Cut-leaved Cranesbill *Geranium dissectum*, Thistles *Cirsium arvense* & *C. vulgare*, Groundsel *Senecio vulgaris*, Broad-leaved Dock *Rumex obtusifolia*, and Red Deadnettle *Lamium purpureum*. The main arable areas are shown at **Photos 1 & 2**. The current crop is a winter Oilseed Rape

Brassica napus in both arable fields. The very western most section of this field is being used as a storage area for Phase 1 of the development at Oldlands Farm.



Photo1: Intensive Arable Units on site. The largest 'L' shaped arable field



Photo 2: The smaller arable unit, also with a winter Oil Seed Rape Crop

- 4.3.3 The proposed flood compensation area is entirely situated within a large arable field north of the BNRR, adjacent to the phase 1 flood compensation area. The field has been sown with a spring Bean crop and a winter wheat crop in 2015 (see **Photo 3** below).



Photo 3: Arable Field in Flood Compensation Area

Permanent Pasture

- 4.3.4 The north/north east field of the proposed development site is a species poor permanent pasture that is likely to have been agriculturally improved, with limited herbs noted in the sward. Grass species recorded were typical of coarse nutrient rich lowland grasslands on the flood plain including Yorkshire Fog *Holcus lanatus*, Meadow Foxtail *Alopecurus pratensis*, Cocks Foot *Dactylis glomerata* and Common Couch *Elymus repens*. Herbs included Spear and Creeping Thistle and Broad-leaved Dock. Associated with the railway boundary were a couple of plants of Hard Rush *Juncus inflexus*, Great Willowherb *Epilobium hirsutum* and Pond Sedge *Carex sp.* The very northernmost section of this field is part of the BNRR construction site and is fenced off from the remainder of the site. This part of the site (and the arable field to the south) is mapped as Coastal Floodplain & Grazing Marsh habitat within the Lidsey Rife valley (see **Technical Appendix 5**). A drain shown on mapping at the northern end of this field is part of the field within the BNRR construction zone and not well defined (B9 on **Figure 3**). This area is shown at **Photo 4** below. A public right of way runs through this field from the south east corner to the north west.



Photo 4: Permanent Pasture in North-eastern field showing boundary fencing for construction area of the BNRR

Field Boundaries

- 4.3.5 The field boundaries are numbered on **Figure 3** below. The north-western boundary of the proposed development site B1, is made up of the southern land take for the Bognor Northern Relief Road (BNRR) and at present is a mesh and metal post fence line. This recently created boundary comprises a short species poor False Oat Grass *Arrhenatherum elatius* bank on its southern edge with Nettles *Urtica dioica*, and isolated Bramble *Rubus fruticosus* (see **Photo 5**).
- 4.3.6 The south-western boundary, B2, is a minor watercourse between phase 1 and 2 and was around 10-20cm in depth during the survey and c2m wide and c1.5m lower than the farmed land. The watercourse is dominated by Common Reed *Phragmites australis* and Fools Water Cress *Apium nodiflorum*. This ditch was historically regularly maintained on at least one side each winter by the farming enterprise. The southern edge of the watercourse is within Phase 1 and is part bare ground as a result of land raising, and part Bramble and Common Reed within the construction zone of this site, with an access to the BNRR to the north for construction purposes at the western end of its length. On the site the boundary the northern edge is a 5-7m wide section of Brambles and Common Reed. A short section of Hawthorn *Crataegus monogyna* hedge is present towards the western end (See **Photo 6**).
- 4.3.7 The south-eastern boundary, B3-B5, is a fence line along the railway line, which is in part a large Hawthorn dominated hedge (B3 & B4) with some gaps, and part Bramble scrub (B5). This is mostly on railway land, but with some woody vegetation on the site, particularly Bramble. The boundary contains some Blackthorn *Prunus spinosa*, for example as very young scrub entering the northernmost pasture. The understorey is species poor and ruderals in nature, dominated by Nettles *Urtica dioica*, with occasional but limited marginal aquatic

vegetation such as Common Reed, Hard Rush, Pond Sedge and Great Willowherb (see **Photo 7**).



Photo 5: North-western boundary (B1) with the BNRR construction site



Photo 6: South-western Boundary (B2) showing Reed banks with Bramble Scrub. Other sections are dominated by Bramble. The building construction off site is part of the new Rolls Royce Factory



Photo 7: South Eastern Boundary to the site (B3) showing tall Hawthorn bushes along the Railway boundary with gaps and Bramble within the site boundary.

- 4.3.8 The largest internal boundary, B6, is a south east facing bank with dry ditch during the survey. The bank is approximately 10m wide by 130m long. It is dominated by an outgrown woody hedge strip with mature and maturing Crack Willow *Salix fragilis*, Elder *Sambucus nigra*, with occasional Hawthorn and Grey Willow *Salix cf. cinerea*. The ditch contained a stagnant ponding of water along its southern c20m. No aquatic vegetation is present. The understorey of the bank is dominated by bare ground, Ivy *Hedra helix* and Nettles, with occasional Harts Tongue Fern *Asplenium scolopendrium* and one plant of Soft Shield Fern *Polystichum setiferum*. A single plant of Figwort *Scrophularia cf. nodosa* is also present. To the south east of the bank is an area of the two internal field units that is not farmed. This area has three mature Oak *Quercus robur* trees (one double stemmed), with a ruderal understorey dominated by Nettles and Docks, with some Bramble scrub. As well as the mature Oaks, two of the Crack Willows are large mature trees, with a number of smaller medium sized specimens along the ditch/bank (see **Photos 8-9**).



Photo 8: Internal boundary (b6) with Mature Trees



Photo 9: Internal Boundary (B6) from South-eastern side showing Mature Oaks set into the field, and mature Crack Willow in the ditch line.

- 4.3.9 The southern internal north-west to south-east boundary (B7) is a species poor Hawthorn hedge on its southern edge (c130m) with a small bank and ditch that contained c20cm depth of standing water during the survey. Three sections of c10m gaps were present with bramble scrub and occasional patches of Common Reed in these gaps. No other aquatic vegetation was noted, apart from a couple of individual tussocks of Pond Sedge. On the north side of the

ditch the bank is a continuous length of Bramble scrub c2m wide by c2m high. Ground flora is generally bare or with Nettles and some Wild Arum *Arum maculatum*. A mature Oak is present at the north western end. This boundary is shown at **Photo 10**.

- 4.3.10 The northern internal north-west to south-east boundary (B8) is another species poor Hawthorn hedge for c90m and then open grassy ditch in the north west section for c25m. Again it has a small bank and ditch with c20cm standing water during the survey. Small sections of the hedge have Bramble scrub and occasional Common Reed in gaps. The northern bank is also Bramble dominated. This boundary is shown at **Photos 11-12**. On the northern boundary of the proposed site a damp depression in the field has some brambles and nettles (B9). This is within the construction zone of the BNRR.



Photo 10: Internal Boundary (B7) is a Hawthorn dominated hedge with occasional 10m gaps with Bramble and Common Reed in these gaps as shown above.



Photo 11: Internal Boundary (B8).



Photo 12: North West end of Internal Boundary (B8) showing shallow damp grassy ditch

- 4.3.11 The flood compensation area north of the BNRR has one field boundary, and a boundary with the new BNRR, which is a recently placed boundary fence line. The field boundary, Boundary B10, is on its eastern edge and comprises a Willow *Salix cf cinerea*, Elder and Blackthorn thicket over a dry ditch and bank (a continuation of B6), which appears to be mostly dry even in winter, with no flow noted during monitoring for the BNRR (Aluco

Ecology, 2008-2012). The ground flora comprises nutrient rich vegetation with Nettles dominating. A few plants of Soft Shield Fern are also present. This boundary is shown at **Photo 13** below.



Photo 13: Boundary B10 in the Flood Compensation Area north of the BNRR

Flora

- 4.3.12 No rare or scarce species were recorded on site. The Oaks and large Crack Willows have value as older vegetation features within the landscape, with associated value to wildlife features described below.

Evaluation of Vegetation and Habitats

- 4.3.13 The arable and permanent pasture habitats over the site are considered to be of **value within the zone of influence** for the vegetation and habitats, being either intensive arable production with limited ruderal field edges, or a species poor pasture with limited diversity of herbs. The wet watercourse along the south-western boundary (B2) is of **local value** for vegetation and habitats as it provides natural features within the landscape, although are generally of lower habitat diversity. The boundaries along the railway (B3-B5) are of **value in the zone of influence to local value** on account of semi-natural but again lower diversity of habitats, with woody vegetation mostly on the railway land. The largest internal boundary (B6) is considered to be of **higher local value** on account of mature Oak trees, as well as Crack Willows with semi-natural woody vegetation on a bank with a dry ditch, in a generally open landscape. The internal boundaries B7 & B8, and the boundary north of the BNRR (B10) are considered to be of **local value** as part of the ditch/hedgerow network in the wider valley. The mature Oak in B7 is of **higher local value**. They contain low species diversity habitats dominated by Thorn hedges and Bramble, but are semi natural features with some standing water in the ditches and small banks.

4.4 Protected Species & Species of Conservation Concern

Birds

- 4.4.1 Two site visits were undertaken during the late winter. During these visits BAP and Red and Amber listed species of conservation concern were recorded on site (see Eaton *et al*, 2009). These included small numbers of Skylark *Alauda arvensis* (2-3 birds per visit), Linnet *Carduelis cannabina* (small flock 3-4 overflying site), Yellowhammer *Emberiza citronella* (singing bird first visit), Reed Bunting *Emberiza schoeniclus* (singing bird first visit), and a pair of Grey Partridge *Perdix perdix* (on northern boundary, both visits). On the Flood Compensation Area a flock of c80 Stock Dove *Columba oenas* were recorded during the survey foraging on the Bean crop, and a single Skylark territory. The Schedule 1 species Cetti's Warbler *Cettia cetti* was also recorded on one of the visits along boundary B2. Barn Owl *Tyto alba* has potential to use the boundary habitats on site for foraging.
- 4.4.2 The southern boundary contains a wet Reed filled ditch that provides suitable habitat for the wetland species Reed Warbler *Acrocephalus scirpaceus*. In spring 2013 up to 3-4 territories were present along this ditch line between the BNRR and the railway (Aluco Ecology 2013). During site visits in 2013 a single Cetti's Warbler *Cettia cetti* was also noted on territory along the railway line off the site (Aluco Ecology, 2013).
- 4.4.3 A breeding bird survey of Oldlands Farm in 2014 included the Phase 2 site. This recorded the following bird species of conservation concern holding territory or recorded during the 2014 survey period (see Tim Moya Associates, 2014a):
- Schedule 1 WCA: Cetti's Warbler – probable breeder recorded singing on three surveys adjacent to railway, east side, north-east boundary of proposed Phase 1/2 development area;
 - Red Listed Birds of Conservation Concern: Cuckoo – recorded on two visits, possible breeder; Grey Partridge – two recorded on a single winter visit west edge of Phase 1 and listed as a possible breeder; Herring Gull – recorded in local area; House Sparrow – breeding on Farm; Linnet – recorded on three visits possible breeder adjacent to the site; Skylark – territories across the farm with a single territory mapped for Phase 2 area; Song Thrush – recorded southern edge of Phase 1 on one visit; Starling – recorded by Phase 1 one two visits; Yellowhammer – Recorded across the farm on three visits, probable breeder, with one location the southern boundary of Phase 2;
 - Amber listed Birds of Conservation Concern: Dunnock, Green Woodpecker, Stock Dove, Swallow, Swift, Whitethroat – territories in Phase 2 area, Reed Bunting – a probable breeder on the southern edge of Phase 2 area, Mallard
 - Other notable species: Reed Warbler, Sedge Warbler noted on southern boundary of Phase 2.
- 4.4.4 The site and immediate boundaries are considered to be of **local value** for bird populations on account of the fact that there are populations of BAP and red/amber listed birds that utilise the habitats on and adjacent to the site, these habitats are part of the farmland network in the wider landscape. The habitats present include mature field boundaries and minor watercourse and ditches that provide edge habitat for species associated with arable habitats in the Lidsey

Rife valley. In 2014 the breeding bird survey by Tim Moya Associates (Tim Moya Associates, 2014a) noted Skylark, Yellowhammer, Reed Bunting and all were considered probable breeders in Phase 2 area (with mapping estimating one territory each); with Linnet, Cuckoo and Grey Partridge recorded on the farm and likely to breed in the wider local landscape using the Phase 2 area; in addition, Whitethroat, Reed & Sedge Warbler were also recorded from the Phase 2 area. Cetti's Warbler was also considered a probable breeder off site adjacent to the railway line.

Bats

- 4.4.5 The site contains no buildings, but at least seven mature trees associated with B6 and a single mature tree in B7 are present and provide features such as splits, cracks and holes that provide potential for roosting bats. Boundaries B2-B8 and B10 provide commuting and foraging potential for local populations of bats. **Photos 14-17** show mature Crack Willow and Oak with potential.
- 4.4.6 The data search returned records for five species of Bat; Pipistrelles *Pipistrellus pipistrellus* & *P. pygmaeus*, Brown Long-eared Bat *Plecotus auritus*, Noctule *Nyctalus noctula* and Serotine *Eptesicus serotinus* within 1km of the site. Survey work for the Phase 1 section of the site recorded six species of bat with Common & Soprano Pipistrelle and Noctule recorded in low but regular numbers foraging on the Phase 1 site area (with low numbers of passes recorded on the site boundaries), and three further species Serotine, Natterer's Bat *Myotis nattereri* and Nathusius's Pipistrelle *P. nathusii* recorded on one occasion (see Aluco Ecology, 2013a).
- 4.4.7 The boundaries with potential roosting features in mature and semi-mature Crack Willows and mature Oaks, as well as foraging and commuting potential along boundaries suggest the site is considered likely to be of value for bat populations.



Photo 14: Mature Crack Willow Boundary B6 within dry ditch



Photo 15: Mature Oak adjacent to Boundary B6 (southern most Oak on B6)



Photo 16: Mature Oak adjacent to Boundary B6 with bough split (double stemmed Oak)



Photo 17: Mature Oaks adjacent to Boundary B6 with bough snag and split (double stemmed Oak and northern Oak on B6 behind)

Badgers

- 4.4.8 The site was searched for evidence of Badger *Meles meles* presence. Badgers are known from the wider area, being recorded to the west of the railway land around the proposed BNRR route north of boundary B6 (Aluco Ecology, 2008, 2011, 2012). Active holes of an outlying Sett were closed under licence in relation to the relief road construction north of the site on the southern edge of B10. The opportunity for sett creation on the development site is mostly within boundary B6. There is also potential on boundary B10. The site was examined for evidence of Badger presence. A number (6+) of currently dis-used holes are present along the length of the bank on B6, including some that are of a size and shape that could have potential historic Badger activity. These were examined for any current/recent use, but none was noted during the site visits, with most holes with leaf litter and no fresh earth works. It is estimated that there has been no use of the holes for a couple of years (pre 2013). A small amount of disturbance on a couple of holes was considered likely to have been created by Rabbit *Oryctolagus cuniculus*, with associated droppings and hairs recorded. Stretches of the other boundaries around the site could not be fully examined due to the extensive nature of the Bramble scrub in places, but no evidence or significant trails were recorded. No evidence of active Badger Setts was recorded on boundary B10 where the historical outlying sett was closed under licence on the BNRR boundary as part of the BNRR work. Here Rabbit and Brown Rat *Rattus norvegicus* holes were present in the ditch and bankside.

- 4.4.9 An ecological survey update for Phase 1 of Oldlands Farm in 2014 recorded a Badger footprint of Badger at the northern end of the Phase 1 site, as well as footprints and a latrine north of the BNRR site in the flood compensation land for Phase 1, showing occasional use within Oldlands Farm (Tim Moya Associates, 2014b).
- 4.4.10 The habitats on site are generally intensive arable and of lower foraging value to the social group of Badgers that are known to be present in the wider Rife valley. The permanent pasture provides some potential foraging habitat, and the boundary features also provide some value for foraging and commuting through the landscape. The site is therefore considered to be of **value in the zone of influence to local value** as foraging habitat for the local Badger population, but with no current evidence of Sett activity on site from the site visits.

Water Vole & Otter

- 4.4.11 Water Vole *Arvicola terrestris* has been recorded on the Aldingbourne Rife at Berstead Brooks LNR (in 2009 - SussexBRC) and along the Lidsey Rife as part of monitoring and mitigation for the BNRR (Aluco Ecology 2008, 2011, 2012 and see **Technical Appendix 5**). They have also been recently recorded from the minor watercourse on the south-western boundary (B2) of the site (Tim Moya Associates, 2014c; Ecology Solutions, 2014). The latest survey evaluated the use of the minor watercourse and Phase 1 site generally as ‘a very low density of water voles that appear to use the network of ditches to access favoured conditions’ (Ecology Solutions, 2014 at 6.3).
- 4.4.12 Ditches are present within the internal boundaries (B6-B9) of the site. The ditch at B6 (and B10 north of the BNRR) is mostly dry with some dampness towards the northern end of B6, and a ponding of stagnant water with high leaf litter at the south west end. The habitat is lacking aquatic vegetation and is of low value for Water Vole at present.
- 4.4.13 The ditches of boundaries B7 & B8 are mostly enclosed by woody vegetation, dense Hawthorn and Bramble, which limits aquatic marginal vegetation to a few small patches of Common Reed growing through Bramble where the Hawthorn hedge is absent, and occasional plants of Pond Sedge. The ditches contained c20cm of standing water along their length with shallow banks within the hedgerow during the late winter site visits (see **Photo 18**), so are likely to dry out in most years. This may provide some habitat for Water Vole given the species is present in the local area; but this would be likely to be seasonal habitat such as habitat when regular sites are inundated, or commuting habitat through the landscape; and is of lower quality than open watercourses such as those at boundary B2, and may dry out during the summer months. A 25m section of B8 is open with damp grassy vegetation (see **Photo 12**). The boundary at B9 has a damp depression at the north end of the permanent pasture, this is within the BNRR construction zone.
- 4.4.14 Survey work for Otter *Lutra lutra* in the local area has not recorded the presence of this species to date, although they are expected to use watercourses in the area periodically, and are increasing in Sussex. The ditch line is also currently of low value for this species. The wet watercourse contains suitable habitat for movement through the local landscape as a wildlife corridor.



Photo 18: Example of ditch in B8 showing a more open section with a single clump of Pond Sedge & Reed but lacking in aquatic vegetation and potentially likely to be seasonally dry.

Other Protected Mammals

- 4.4.15 No other legally protected mammal species are likely to occur on site. There is suitable habitat for the BAP species Brown Hare *Lepus europaeus*, but it was not noted during survey work on site or for Phase 1 (Aluco Ecology, 2013). There is one record from the data search from 2010 about 700m to the north east and east of the Lidsey Rife. There is considered to be limited suitable habitat on site for the legally protected Dormouse *Muscardinus avellanarius*, with some lower diversity generally species poor woody scrub that is generally not well connected to the wider landscape. The wider landscape is very open and no records of Dormouse are present in the wider local area. Dormice are therefore considered not likely to be present on site. Roe Deer *Capreolus capreolus* were recorded on survey visits.

Reptiles

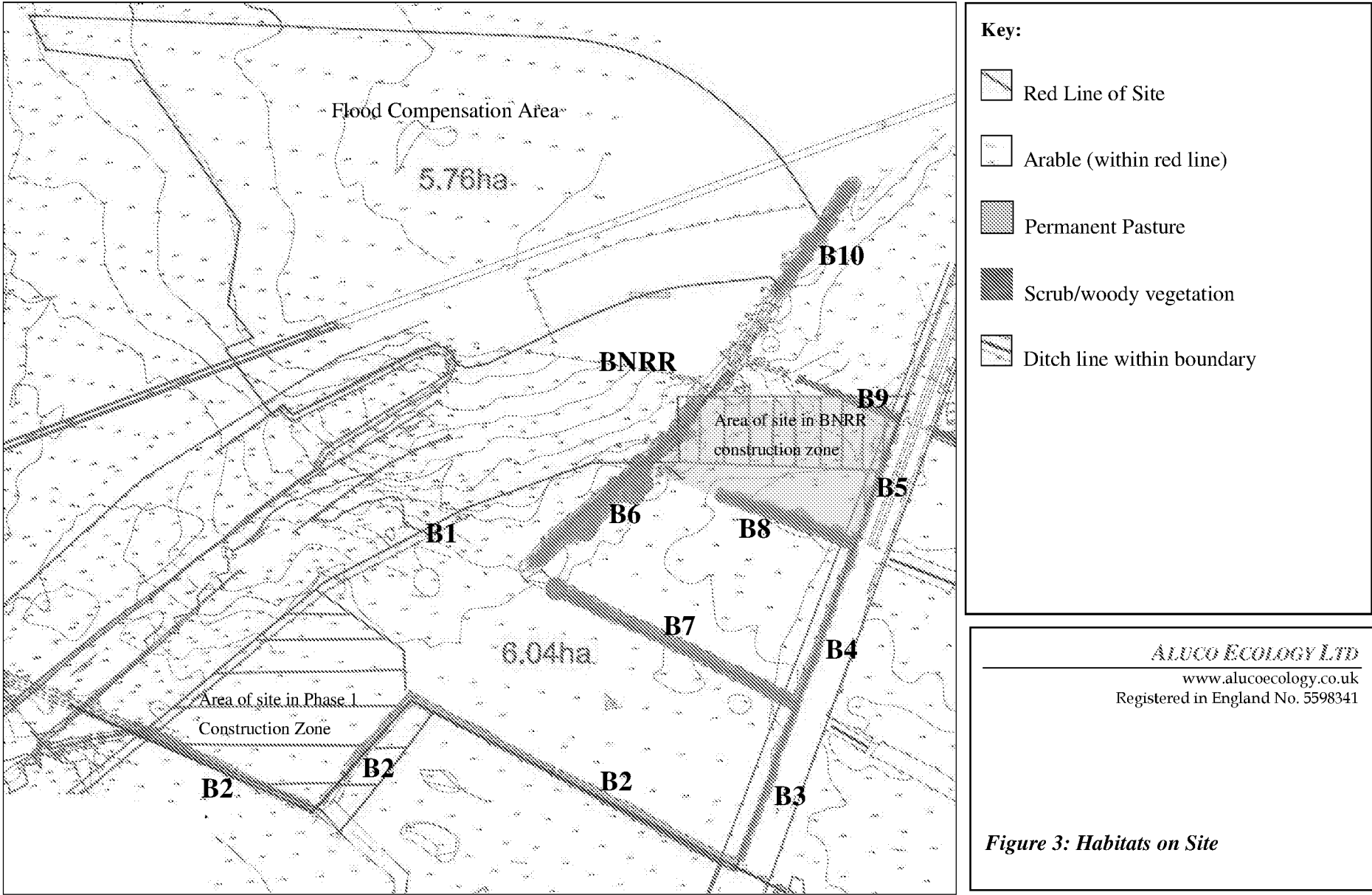
- 4.4.16 The habitats on site are mostly arable with a ruderal edge that has been affected by the intensive arable use of the land. There is little grassland habitat, the permanent pasture does not provide suitable coarse tussocks except for edge habitat around the field boundaries. Slow Worm *Anguis fragilis* has been recorded north of the BNRR from the Phase 1 survey work (Aluco Ecology, 2013a) to the west of the site in low numbers and may also be present on the site around the field boundaries. Grass Snake *Natrix natrix* has been recorded along the BNRR construction route so is also known from the local area (Aluco Ecology, 2008, 2011, 2012).
- 4.4.17 The site is generally considered to be of **value in the zone of influence** for reptiles, with the field boundary edges being the highest potential suitable habitat on site.

Amphibians

- 4.4.18 There are no known records of Great Crested Newt *Triturus cristatus* for the site or nearby 1km area. There are no 'offline' waterbodies suitable for Great Crested Newt *Triturus cristatus* exist on site and no waterbodies are present within 500m with potential for the legally protected Great Crested Newt *Triturus cristatus* to be present.

Invertebrates

- 4.4.19 The habitats on site are considered of **value within the zone of influence** for invertebrate species of conservation concern on account of their intensive arable nature, with the field boundaries providing the most suitable habitat. These boundaries are generally species poor with low species diversity in the hedgerow. Some dead wood habitat is present along boundary B6.



5.0 BRIEF ASSESSMENT OF LIKELY IMPACTS WITHOUT MITIGATION

5.1 Introduction

- 5.1.1 In view of the predicted activities and the resultant biophysical changes associated with the proposal, as described in Section 3, this section identifies the main potential ecological impacts within the predicted zone of influence, those considered potentially likely to arise in the absence of mitigation. This exercise provides focus for recommendations for further scheme design and mitigation.

5.2 Protected Sites

Potential Impacts on Designated Sites

- 5.2.1 The nature, scale and location of the development are likely to be such that legally designated sites are considered to be of sufficient distance for the proposed development not to have significant adverse impacts on their features.

Potential Impacts on Berstead Brooks Local Nature Reserve

- 5.2.2 The nature, scale and location of the development are likely to be such that non statutory designated sites are considered to be of sufficient distance for the proposed development not to have significant adverse impacts on their features.

5.3 Habitats & Species on Site

Potential Impacts on Habitats and Vegetation

- 5.3.1 The arable habitats on site are considered to be of low nature conservation value. The general impact of loss of these habitats is therefore not significant. The loss of species poor permanent pasture that is classified as lowland floodplain grazing will result in an overall loss of a small part of the resource in the valley. The pasture is however species poor and with low herb diversity and abundance. In vegetation and habitat terms this loss is a minor adverse impact. The lowering of levels north of the BNRR will only create a short term impact on the arable farmland here and is not considered significant.
- 5.3.2 The boundary habitats of B6 and mature trees associated with it are to mostly be retained in situ, and only the extreme southern part impacted by an internal access road. There is potential for indirect impacts and their setting will change. There is space on the illustrative Masterplan for the majority of the hedge bank and ditch, as well as the southern mature Oak tree to be retained. Where these features are retained in situ the impacts are not considered significant. Lost woody and boundary features would result in an adverse impact on a feature of higher local importance.
- 5.3.3 The boundary habitats of B7-B9 are within the proposed development area and there will be a direct impact on c160m of ditch line and hedgerow on B7 and c90m of hedgerow and c115m of ditch in B8. The mature Oak on B7 will be retained. This will result in the loss of a semi-natural feature of a local value, which whilst species poor, contains some diversity of habitat,

with woody vegetation, ditch and shallow bank. The loss of these features is an adverse impact on a feature of local importance.

- 5.3.4 The boundary at B2 will be directly affected for an access route onto the site from Phase 1. The loss of a small section that is affected is not considered significant in vegetation and habitat terms. The remainder of the boundary will have a buffer to the proposed buildings. Where the ditch side vegetation is retained in situ the impacts are not considered significant.

Potential for Impacts on Protected Species and Species of Conservation Concern

- 5.3.5 The potential for nesting bird species to be affected by development is present within the boundary habitat, and any area of crop planted. If these areas were to be removed or cut during the nesting season there is the potential for the development to affect the nests of birds, which would be contrary to Section 1 of the Wildlife & Countryside Act 1981 (as amended).
- 5.3.6 The development will see the loss of arable farmland used by farmland birds with Skylark, Linnet, Yellowhammer, Reed Bunting, Grey Partridge and Cetti's Warbler recorded using the site or adjacent farmland on the late winter site visit on or around the site in 2015, and these species also recorded in 2014 (Tim Moya Associates, 2014a). The loss of this farmland is likely to have an adverse effect in the local area of a feature likely to be of local importance, however the wider landscape is retained as open farmed countryside. The wider landscape is also proposed in the draft Arun District Council Local Plan 2013-2028 as 'Green Infrastructure'.
- 5.3.7 Potential bat roosting features are present in a number of the mature trees on site. These are mostly within boundary B6 (& B7 Oak). B6 is to be mostly retained on the illustrative Masterplan at **Figure 2b/c**, including all three Oak trees in B6, and the large Oak in B7. A small amount of the boundary at B6 with Crack Willows will also be lost for the internal access road, and these may contain potential bat roosting features. The setting of these trees will be altered and potential foraging and commuting routes around internal boundaries may be lost or significantly affected. There is therefore the potential for a significant adverse impact without mitigation.
- 5.3.8 Badgers are known in the wider environment, and there is habitat and potential for Sett creation on site, with old holes noted in boundary B6, and a former outlier Sett closed down as part of the BNRR work in 2012 just south of the Flood Compensation Area site at B10. At present no recent signs of current Badger use were noted during the survey work to date on site, but with occasional use of the site likely for foraging.
- 5.3.9 If the site is to be lit for security, or through the road network, this could without mitigation adversely affect the use of the wider area by wildlife such as Bats and Badgers.
- 5.3.10 The loss of the ditches the internal boundaries will result in the loss of potential Water Vole habitat, which although potentially of lower quality on account of low water levels and a lack of aquatic vegetation over much of their lengths, the ditches are linked to the wider network through culverts under the railway line and may provide habitat for Water Vole during inundation or as dispersal/commuting habitat.

- 5.3.11 The minor watercourse at boundary B2 will have a direct impact on a c30m stretch to create a link road to the site from Phase 1. This without mitigation may have an adverse impact on Water Vole habitat. The remainder of the watercourse will be buffered from development. Where this buffer retains the existing 5m from the water edge of habitat with no loss of vegetation or earth raising there will not be an impact. The Masterplan retains a c8m buffer from the far side of the ditch to the nearest built part of the site.
- 5.3.12 Without mitigation for potential pollution from construction there is potential for run off to have adverse effects on watercourses on the site and to the south east towards the Lidsey Rife in the short term.

6.0 ECOLOGICAL MITIGATION & ECOLOGICAL ENHANCEMENT

6.1 Introduction

- 6.1.1 The potential for impacts without mitigation was considered in Section 5, and mitigation recommendations are provided for consideration for a future development proposal. Recommendations are also made for further survey work on site and in the Zone of Influence. Phase 2 survey work for protected species is ongoing.

6.2 Mitigation and Opportunities for Ecological Gain for Protected Habitats, Species and Species of Concern

Habitats

- 6.2.1 The lost boundary features in the internal boundaries should be mitigated for 1:1 or greater through creation of new semi-natural native hedgerow or woody features, and new wetland features. There is potential for habitat creation within the buffers along the south-western and south-eastern/railway boundary, and landscaping around the scheme. This should be set out in a detailed mitigation strategy and management plan for retained and created habitats. Mature Oak trees are to be retained within B6/B7, and most of the boundary at B6, with just a small loss of the southern end. The impact of this loss should be reduced, and as much of the boundary hedgerows/features should be retained in situ in the schemes landscaping, with appropriate root protection to the relevant British Standard.
- 6.2.2 Where new swales or ditches are proposed as part of the drainage solution and flood compensation this should incorporate locally sourced native wetland species planting and wildlife features and connect to the existing ditch network. This can help to mitigate for loss of species poor coastal floodplain grazing habitat. The boundaries of the scheme for part of their length abut the new flood compensation areas of the BNRR. Landscaping along these boundaries and buffers along the south-western and railway boundaries should be of native hedgerow and wildflower grassland species similar to the mix used in the BNRR proposals (See **Technical Appendix 6**).

- 6.2.3 The construction of the site should be subject to a Construction Environmental Management Plan to ensure that the retained habitats and habitats off site (such as the Lidsey Rife) are not adversely affected by construction activities, including surface water run off into the ditch network.

Birds

- 6.2.4 The breeding bird survey from 2014 (Tim Moya Associates, 2014a) and late winter visits for this Appraisal have recorded a number of declining farmland birds, in lower numbers, using the site. The development would see loss of farmland habitat, with some potential for edge habitat and wetland habitat mitigation around buffer zones. There may also be potential for enhancing areas north of the BNRR for farmland birds in line with the Council's Green Infrastructure draft policy. Mitigation for loss of bird habitats should be set out in a detailed mitigation strategy. Provision of bird nest boxes should also be considered in retained habitat as part of the strategy. An detailed mitigation strategy is should be informed with bird survey data.
- 6.2.5 During construction any woody/reedy habitat that could contain a bird's nest should be removed outside of the nesting bird season, which is usually from end February to end August. It may be possible to check certain vegetation does not contain a bird nest during the nesting period, but this should only be done by a suitably qualified ecologist. The development construction can avoid impacts on ground nesting Skylark by ensuring that the season prior to construction crops aren't planted and the ground is left ploughed bare. Weed growth should be restricted.

Bats

- 6.2.6 Survey work for Phase 1 of the scheme has showed that the wider landscape is open and with only limited bat foraging activity, with three regular species recorded, and a further three species recorded once. There are some potential bat roosting features in Phase 2. It is recommended that a bat survey is undertaken of potential roost features in the boundary trees in B6, particularly any potential roost features likely to be impacted directly, and the mature Oak in B7. Survey work should also include foraging and commuting and transect work to understand the bat use of the site.
- 6.2.7 The Masterplan shows that internal boundaries except B6 and the mature Oak in B7 will be lost as a result of the scheme. B6 will be part impacted by an internal access road at its very southern end. The loss of commuting and foraging habitat, should be mitigated as minimum for 1:1 through replacement of new semi-natural woody habitat linked to the retained boundary habitats, for example in open space buffers and around SUDs features, such as the c8m buffer along the south-western boundary or the 15m buffer along the railway boundary. A detailed mitigation strategy for the scheme should consider:
- Retention of existing boundary hedges as far as possible with root protection to current British Standards, particularly in open space and buffer areas of the site. This should include retaining as much of the existing features in B6/B7, including the mature Oak and areas of hedgerow within the open space, with root protection to current British Standards, and reducing the impact of the internal access road;

- Updated tree bat survey immediately prior to any tree removal (at the appropriate time of year);
- Creation of new native hedges & woody vegetation in landscaping and buffer zones, especially where it links with existing retained boundary features and provides links through the site. This should consider landscape connectivity to retain commuting corridors for bats;
- Sensitive provision of lighting (see below);
- Provision of Bat boxes;
- Detailing of mitigation and long term management of retained/created habitats in a detailed ecological mitigation report.

Badgers

6.2.8 As Badgers are known from the wider local area, prior to any construction further Badger monitoring should be undertaken to ensure that Badgers are not harmed by the proposals.

6.2.9 It is possible that badgers will travel through the site during construction and therefore the following measures should be implemented to reduce the risk of secondary impacts to badgers:

- Trenches in excess of one metre in depth should be covered or secured and a means of escape provided for any animal that does fall in (a suitable escape can be provided by wooden planks placed at a 45 degree angle);
- Any temporarily exposed open pipe system should be capped in such a way as to prevent badgers gaining access;
- Chemicals and fuels should be stored carefully and as far away from setts and badger paths as possible, and in accordance with the Code of Construction Practice; and
- Any security lighting (if required) should be directed away from the sites boundaries.

6.2.10 To facilitate these measures, contractors and subcontractors should be made aware of the location of any setts and protection zones (should they be present on or adjacent to the site) as part of environmental site induction courses. They should also be informed of the protection afforded to badgers under the *Protection of Badgers Act 1992* and the need for confidentiality of the sett locations.

Lighting

6.2.11 Any scheme lighting and security lighting should aim to ensure that the retained woody boundaries and watercourses are not within the lit curtilage and remain a dark zone, through the use of downward facing directional lighting. Where possible the developing landscape planting on the other boundaries should avoid being lit. This will allow natural corridors to develop through the site. This is particularly important along the south-western and south-eastern boundaries, and boundary B6 where potential bat roost features are present in the retained tree line.

Water Vole

- 6.2.12 Ongoing Water Vole survey is recommended on the ditches and watercourses within the site, particularly the internal boundary ditches. Local Water Vole survey (Aluco Ecology 2008, 2011, 2012, 2013) and Survey work for the minor watercourse on B2 has shown presence of what was considered to be a low density of Water Voles along this watercourse (Tim Moya Associates, 2014c, Ecology Solutions, 2014). Where ditches/watercourses over 50m-100m or more are to be directly affected and Water Vole has been recorded, works to disturb these habitats can only be undertaken under a licence from Natural England. This would involve translocation of Water Voles into a suitable created habitat where the scheme has been demonstrated to be of overall net conservation benefit to Water Vole.
- 6.2.13 Stretches affected under 50m and possibly up to 100m may be suitable for displacement mitigation techniques, for example, on the access road from Phase 1. The methodology for removal/disturbance of the habitat should be provided in a detailed method statement, agreed with the local authority and the Environment Agency and should include update survey, mitigation methodologies and timing according to the Water Vole Conservation Handbook Third Edition (Strachan, 2012) until this guidance has been superseded.
- 6.2.14 Loss of ditch and watercourse habitat should be mitigated for with 1:1 or greater, through creation of enhanced wetland watercourse habitats linked to the existing network, and designed with benefits to Water Vole populations. There is potential for some habitat creation in the 15m buffer along the railway boundary. This will need to be set out in a detailed mitigation strategy.
- 6.2.15 Old farm access points, or phase 1 temporary construction access over the watercourse in boundary B2 should be removed and reinstated as open watercourse and set out as part of a detailed mitigation strategy.

Reptiles

- 6.2.16 Given the detailed surveys for the BNRR and for Phase 1 of Oldlands Farm it is anticipated that low numbers of common reptiles may be present in suitable boundary and edge habitats. It is recommended that a reptile survey is undertaken on site. There is potential suitable edge habitat around the boundary features. Some of these habitats are likely to be retained in situ and survey work should inform a detailed mitigation strategy to avoid harm to reptiles during construction. A suitable mitigation strategy is likely to involve the following:
- Retention and protection of boundary edge habitat in buffer zones and retained boundaries on site, consideration should be given to extending tree protection areas where necessary to include retained reptile habitat;
 - Relocation of small populations of reptiles from construction areas to retained areas following best practice methodologies for reptile translocation;
 - Habitat manipulation and sensitive vegetation cutting (to 10-15cm) in reptile areas to enable capture and reduce habitat suitability;
 - Destructive searches following 3-5 black survey visits with no reptiles in areas defined as reptile habitat;

- Detailing of mitigation and long term management of retained/created habitats in a detailed ecological mitigation report.

Invertebrates

- 6.2.17 The design of new and managed retained habitats on site should have regard to features of importance to invertebrates such as dead wood habitat, sunny banks and wetland features with a diversity of locally native plant species.

Biodiversity Gain

- 6.2.18 Where new landscaping is proposed this should include native locally sourced species. The Masterplan (see **Figure 2b/c**) provides a c8m buffer along the boundary B2 and 15m along the railway boundary, as well as new SUDs features. Native boundary vegetation within the buffers should be retained in situ. The open spaces should include area of native species seeding and planting.
- 6.2.19 Created and retained boundary areas should be managed in part as informal green space along the linear features, this should be through reduced management of grassland and native hedgerow planting. Berry and nut bearing shrubs and bushes would provide new habitats for the local population of Badgers and other wildlife.
- 6.2.20 The landscaping and boundary planting scheme and the flood compensation and drainage solutions should be influenced by an ecologist during detailed drawing of the scheme. This will ensure that the open space and landscaping can serve a dual purpose of landscaping and wildlife enhancement, including new habitat for loss of habitats and any short term impacts on the minor watercourses on the boundaries of the site. **Technical Appendix 6** provides suitable suggested planting mixes for native species within the swales and landscaping areas of the site. The buffer zones along the boundaries should contain appropriate native species planting and seeding.
- 6.2.21 The management of these open space buffers and drainage mitigation/flood compensation areas should be on a low management regime to provide suitable habitats for wildlife and not harm any protected species or species of conservation concern that may colonise the site following creation. Management Strategies and Plans for open space management should therefore be agreed with a suitably qualified ecologist prior to agreement with the Council.

7.0 CONCLUSIONS

- 7.1.1 An ecological appraisal of the site was undertaken in order to provide an indication of the potential for habitats and species of conservation concern to be present on site. The site is part of a wider farm where detailed ecological survey and assessment has taken place for projects including the Bognor Northern Relief Road (BNRR), and Oldlands Farm Phase 1 development. This background, provides additional information on the local ecological features, including some survey work on the Phase 2 site area under consideration.

- 7.1.2 The survey summarises existing baseline data for the Phase 2 site and provides a number of options for mitigation and biodiversity gain for a proposed development scheme, including further survey work for certain protected species groups, which is ongoing.

8.0 REFERENCES

Aluco Ecology (2013) Ecological Appraisal Land at Oldlands Farm, Bognor Regis

Aluco Ecology (2013a) Additional Protected Species Surveys, Land at Oldlands Farm, Bognor Regis.

Aluco Ecology (2012) BNRR Update Ecology Mitigation for Bognor Northern Relief Road, Lidsey Rife Temporary Crossing Works & Adjacent Watercourses

Aluco Ecology (2011) BNRR Update Ecology Strategy Bognor Northern Relief Road, A29 – Stanover Lane Section.

Aluco Ecology (2008) Felpham Site 6 and Bognor Northern Relief Road, Ecological Mitigation Strategy;

Eaton MA, Brown AF, Noble DG, Musgrove AJ, Hearn R, Aebischer NJ, Gibbons DW, Evans A and Gregory RD (2009) Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man. *British Birds* 102, pp296–341

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Strachan R, ed (2012) The Watervole Conservation Handbook, third Edition Wildcru

Tim Moya Associates (2014a) Ecological Report, Breeding Bird Report, June 2014

Tim Moya Associates (2014b) Ecological Report, Extended Phase 1 Habitat Assessment, June 2014

Tim Moya Associates (2014c) Ecological Report, Water Vole Presence/Absence Survey Report.

Technical Appendix 1

Habitats Regulations and Schedule 2 Species

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

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

(1) The Habitats Regulations makes it an offence;

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

(b)deliberately to disturb any such animal;

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

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

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

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

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

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

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

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

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

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

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

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

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

However, in accordance with the requirements of the Habitats Regulations 2010, a licence can only be issued after the following conditions have been satisfied:

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

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

For Full details of the 2010 Habitat Regulations see:

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

Technical Appendix 2

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

Wildlife & Countryside Act

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

(ii) Protection Afforded to SSSIs

The presence of an SSSI on or near to a development is a material consideration, and this is discussed further in policy (see PPS9)

(iii) Law Relating to Protected Species

The WCA provides protection to such species via Section 1 (birds) and Section 9 (animals). These sections provide protection from intentionally:

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

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

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

(i) Protected Species & SSSIs

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

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

This addition means that any person who deliberately takes an unacceptable risk or fails to notice an obvious risk is falls under the Section irrespective of intention.

The CRoW Act also provides greater protection to SSSIs from operations (and non operations) of owners, occupiers and third party users of an SSSI.

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

2013-2028 Draft Local Plan Policies

Policy DM 26

Development and Biodiversity

Development schemes shall, in the first instance, protect existing habitats on site. They shall also however incorporate elements of biodiversity including green walls, roofs, bat and bird boxes as well as landscape features minimising adverse impacts on existing habitats (whether designated or not). Development schemes shall also be appropriately designed to facilitate the emergence of new habitats through the creation of links between habitat areas and open spaces. Together, these provide a network of green spaces which serve to reconnect isolated sites and facilitate species movement.

Where there is evidence of a protected species on a proposed development site, planning applications shall include a detailed survey of the subject species, with details of measures to be incorporated into the development scheme to avoid loss of the species. This involves consideration of any impacts that will affect the species directly or indirectly, whether within the application site or in an area outside of the site, which may be indirectly affected by the proposals. All surveys shall be carried out at an appropriate time of year and shall be undertaken by a qualified and, where appropriate, suitably licensed person.

All developments shall have regard to Natural England's standing advice for protected species.

Developments shall also be consistent with all other local plan policies.

Policy SP 23

Natural Environment

Arun District Council will encourage and promote the conservation and enhancement of biodiversity and the natural environment through policies for the protection of both designated and non-designated sites. Where possible it shall also promote the creation of new areas for habitats and species. In relation to designated sites, development will be permitted where it protects sites listed in Tables 19.1-19.6 that are recognised for the species and habitats contained within them.

Name	New Site Code ⁽³⁾
Pagham Harbour	UK 11052

Table 19.1 Ramsar Sites

Name	Site Code
Pagham Harbour	UK 9012041
Arun Valley	UK 9020281

Table 19.2 Special Protection Areas

Name	Site Code
Pagham Harbour	1000243
Bognor Reef	1000219
Felpham	1000357
Climping Beach	1000225

Table 19.3 Sites of Special Scientific Interest

Name	Site Code
Pagham Harbour	1009061
West Beach	1009233

Table 19.4 Local Nature Reserves

Name	Site Code
Ferring Rife & Meadows	Ar12
Littlehampton Golf Course and Atherington Beach, Littlehampton	Ar06
Elmer Rocks	Ar18
Fontwell Park Race Course	Ar01

Table 19.5 Sites of Nature Conservation Importance

Name	Site Code
Felpham Foreshore, Bognor Regis	1475602
Climping Sand Dune System	1475611
Bognor Foreshore	1475600
Pagham Harbour	1475608

Table 19.6 Local Geological Site

Policy DM 34

Designated Nature Sites

It is the policy of the Council to maintain, protect and where possible enhance the conservation value of International, European, National and Local designated sites as listed in Tables 19.1 - 19.6. Development not directly connected with or necessary to the management of the designated site(s) and which is likely to have an adverse effect on the site(s), will generally not be permitted however such development may be permitted where any of the following can be demonstrated:

1. there is no alternative solution (which shall be adequately demonstrated by the developer) or
2. there are reasons of public health or public safety or
3. there are benefits of primary importance to the environment or
4. there are imperative reasons of overriding public interest

Notwithstanding the above however, the presumption in favour of sustainable development does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined.

Where development is permitted, the use of conditions or planning obligations will be used in order to avoid and minimise harm to the site(s). In any event, any adverse impacts shall be minimised and mitigated or compensated in full as agreed with the planning authority.

Developments shall also be consistent with all other local plan policies.

Policy DM 35

Pagham Harbour

1. Within Zone A (<400m) as identified on the Proposals Map, development will only be permitted in exceptional circumstances which shall be demonstrated by the developer. These circumstances shall relate to the impact, type and the effects of any proposed development on Pagham Harbour, including on non-native species.

2. Within Zone B (400m – 5km) all new residential development will be required to:

(a) contribute financially towards improved access management at Pagham Harbour. Access management measures shall be undertaken and shall include wardening, access management and site protection, habitat improvements, provision for interpretation, education and signage and monitoring of wildlife and visitor numbers

and

(b) create easily accessible new green spaces for recreation within or adjacent to the development site, or to make developer contributions towards the provision of such green spaces to serve the area. New spaces shall be capable of accommodating the predicted increases in demand for local walking and dog walking. Good pedestrian links shall be provided between housing areas and new and existing green space in order to discourage car use.

3. Large scale developments taking place outside Zone B and close to its boundary will be considered on a case by case basis for potential effects on Pagham Harbour, and the need for avoidance or mitigation measures.

A tariff will be set to ensure sufficient funds are available to secure the required access management measures and the provision of alternative green space of a suitable size, design and location, where necessary, in advance of the occupation of new development and to ensure it is appropriately managed in perpetuity.

Developments shall also be consistent with all other local plan policies.

Policy DM 36

Appropriate Assessment

An Appropriate Assessment shall be carried out in respect of any plan or project likely to have a significant effect on Pagham Harbour or any other Natura 2000 sites outside the district (where appropriate), either individually or in combination with other plans or projects. If after completing an Appropriate Assessment of a plan or project the Planning Authority is unable to conclude that there will be no adverse effect on the integrity of these sites, the project will not be approved, unless otherwise in compliance with the Habitats Directive.

Projects which may give rise to significant cumulative, direct, indirect or secondary impacts on these sites will only be permitted (either individually or in combination with other plans or projects) for reasons of overriding public interest.

Developments shall also be consistent with all other local plan policies.

Policy DM 37

Non Designated Sites

Within Biodiversity Opportunity Areas (BOA's) and the Marine Conservation Zone (MCZ) (see Proposals Map), development shall

- (i) retain and sympathetically incorporate locally valued and important habitats, including wildlife corridors and stepping stones
- (ii) be designed in order to minimise disturbance to habitats

Where development proposals are likely to have an impact on species or habitats within either the BOA's or recommended MCZ, any application for planning permission shall include a properly conducted survey of the presence of that species and habitat and any impact that development may have on either. Development proposals that do not reasonably address opportunities for enhancing BOA's and the recommended MCZ through their design, layout and landscaping shall not be permitted. Where a development scheme would result in a habitat loss, mitigation measures shall be proposed as part of the proposed scheme and such measures agreed with the planning authority prior to the determination of any planning application.

Developments shall also be consistent with all other Local Plan policies.

Policy DM 38

Protection of Trees

Development will only be permitted where it will not damage or destroy tree(s) protected by a tree preservation order(s), (TPO) identified as ancient woodland, in a conservation area or contributing to local amenity, unless to do so:

- (i) would result in the removal of one or more trees in the interests of good arboricultural practice. This shall be demonstrated by the developer following the advice of a suitably qualified person which shall be guided by BS 5837. Details of any advice received having regard to BS 5837 shall be submitted, in writing, as part of a planning application or
- (ii) would enhance the survival and growth prospects of other protected trees
- (iii) the benefits of the proposed development in a particular location outweigh the loss of trees or woodland, especially ancient woodland

Where planning permission is granted in any of the above instances, conditions shall be used to ensure that, for any trees which are removed as part of a development, at least an equivalent number of a similar species and age (where practical) are planted on the proposed development site. Sufficient space for replacement trees to mature shall be provided. The planting of new trees shall form an integral part of the design of any development scheme.

Proper provision must be made for the protection and management of trees or areas of woodland on-site when undertaking development. A management plan shall be provided as part of a planning application in accordance with BS 5837 in order to ensure that trees are adequately protected during development. Conditions for the continued protection of trees on sites shall be included in any planning consent given.

Where there are existing trees on or adjacent to a development site, developers shall be required to provide:

- (i) land and tree surveys
- (ii) a tree constraints plan
- (iii) an arboricultural implications assessment to include a tree protection plan and arboricultural method statement

These will ensure that development is planned to take a comprehensive view of tree issues at an early stage in the design process and that development works do not have a negative impact on existing trees.

Developments shall also be consistent with all other Local Plan policies.

ARUN LOCAL PLAN POLICIES

Policies Relevant to Ecology saved from the Local Plan 2011 (Adopted 2003)

POLICY GEN3 Protection of the Countryside

Outside the Built-Up Area, as defined on the Proposals Map, the countryside will be safeguarded for its own sake. Development will not be permitted unless:

- (i) it meets the operational needs of agriculture, forestry, the extraction of minerals or the deposit of waste; or
- (ii) for quiet, informal recreation; or
- (iii) for the diversification of the rural economy; or
- (iv) for essential road schemes; or
- (v) it is in accordance with a policy in Sections 2 and 3 of the plan referring to a specific use or type of development.

Permission will not be given for the extension of isolated groups of buildings or the consolidation of linear or sporadic development unless the proposal accords with criteria (i) to (iii) or (v).

POLICY GEN23 The Water Environment

Development will not be permitted if it would have a direct or indirect unacceptable adverse impact on the water environment, notably in relation to rivers, ponds, wetlands, public access in river corridors and water related recreation.

Where appropriate, the Council will support initiatives which seek to restore or enhance the water environment.

POLICY GEN25 Water Resources

Development will only be permitted where the Local Planning Authority is satisfied that adequate water resources are available or will be provided in time to serve the development, and that provision is not considered detrimental to existing abstractions, river flows, water quality, fisheries, amenity or nature conservation.

POLICY GEN26 Water Quality

Development will only be permitted where the Local Planning Authority is satisfied that it would not lead to a deterioration in the quality or potential yield of surface and ground water resources.

POLICY GEN28 Trees and Woodlands

Development will not be permitted if it would damage or destroy one or more trees protected by a tree preservation order, identified as ancient woodland or in a conservation area unless:

- the removal of one or more trees would be in the interests of good arboricultural practice; or
- the benefits of the proposed development outweigh the amenity value of the protected trees.

Conditions may be used to ensure that, for any trees which are removed as part of a development, an equivalent number are planted on the site.

POLICY GEN29 Nature Conservation Across the District

Development will only be permitted on sites which contain semi-natural habitats, features of nature conservation interest, or within wildlife corridors, where these can be largely retained and sympathetically incorporated into the scheme. Legal agreements may be used to offset the loss of, or impact on, any nature conservation resource present on the site prior to development.

POLICY AREA13 Sites of International Importance for Nature Conservation

Proposals for development in, or likely to affect (directly or indirectly) a site of international importance for nature conservation will be subject to the most rigorous examination. Development not directly connected with or necessary to the management of the site which is likely to have an adverse effect on the site, will not be permitted unless: there is no alternative solution, there are reasons of public health or public safety, or there are benefits of primary importance to the environment.

Where such sites do not host a priority habitat or species, development will not be permitted unless there are imperative reasons of overriding public interest.

Where development is permitted, the use of conditions or planning obligations will be considered in order to avoid and minimise harm to the site, to enhance the site's nature conservation interest, and to secure any compensatory or mitigation measures and appropriate management that may be required.

POLICY AREA14 Sites of National Importance for Nature Conservation

Proposals for development in, or likely to affect (directly or indirectly) Sites of Special Scientific Interest will be subject to special scrutiny. Where such development is likely to have an adverse effect, it will not be permitted unless the reasons for the development clearly outweigh the nature conservation value of the site itself and the national policy to safeguard the national network of such sites.

Where the site concerned is a National Nature Reserve, a site identified by the Nature Conservation Review or Geological Conservation Review, particular regard will be paid to the national importance of that site.

Where development is permitted, harm to the nature conservation interest must be minimised. The use of conditions or planning agreements will be considered to ensure the protection and enhancement of the nature conservation interest, and to provide appropriate compensatory or mitigation measures and site management.

POLICY AREA15 Sites of Local Importance for Nature Conservation

Proposals for development in, or likely to have an adverse effect (directly or indirectly) on a Local Nature Reserve, Site of Nature Conservation Importance (including ancient woodlands or wildlife corridors) or Regionally Important Geological/Geomorphological Site will not be permitted unless it can be demonstrated that reasons for the proposal outweigh the need to safeguard the nature conservation value of the site/feature. Where development is permitted which would damage the nature conservation value of the site/feature, such damage should be kept to a minimum.

Conditions or planning obligations will be used to secure necessary compensatory or mitigation measures, enhancement and site management.

Where appropriate, the Authority will consider the use of legal agreements to provide appropriate compensatory measures, enhancement and site management.

Retained Ecology Policies of the West Sussex Structure Plan 2001-2016

Nature conservation

Policy ERA2

(a) Development should not be permitted unless the wide range of habitats, species and geological features of the County will be protected, conserved and, where possible, enhanced particularly through long-term management mechanisms and habitat creation schemes. A particularly high level of protection should be afforded to sites and features of national and international importance. Proposals for the extension or creation of new habitats should be permitted provided that they are consistent with wider environmental objectives.

(b) Local plans will include policies to:

(1) ensure that site evaluation is undertaken to establish the nature conservation importance of proposed development sites;

(2) protect sites or features of nature conservation importance, including those protected under legislation and prevent development unless there are no alternative solutions and there are overriding reasons which outweigh the need to safeguard the value of sites or features;

(3) ensure that where development would result in the loss of an important nature conservation resource, a new resource is provided which is of at least equivalent value, where possible;

(4) where appropriate, secure the restoration, creation and management of habitats through development proposals; and

(5) where necessary, ensure the investigation and recording of sites and features of nature conservation importance, and, where appropriate, the preservation of any finds.

Ecological Appraisal Method

Introduction

The methodology for this appraisal is based on the Guidelines for Ecological Impact Assessment (EcIA) in the United Kingdom published by the 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. This is having regard to best practice such as Natural England Standing Advice, and individual survey/assessment best practice guidelines for protected species groups:

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 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, both are legally protected species under the Wildlife & Countryside Act 1981 (as amended) with their habitats also

being protected. Otter are also afforded protection under the Habitats Directive 92/43/EC. Depending upon the geographic location consideration is also given to species such as Red Squirrel.

Breeding Birds

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

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

Reptiles

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

Great Crested Newt

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

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

Invertebrates

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

Survey Constraints and Limitations

Walkover surveys are carried out during a brief window of time. And therefore, the survey will provide only a snapshot of the range of plants and animals that might be present. However, professional judgement is used to interpret the habitat features recorded, and their likely value for supporting protected and notable species, including species of principal importance. Where timing is likely to significantly affect the results of a survey, further survey work is often 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).

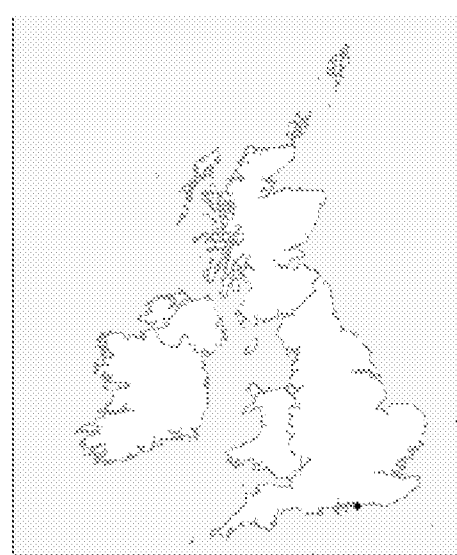
SPA description

(information as published 2001)

Pagham Harbour

Country	England
Unitary Authority	West Sussex
SPA status	Classified 30/03/1986
Latitude	50 45 48 N
Longitude	00 45 38 W
SPA EU code	UK9012041
Area (ha)	636.68
Component SSSI/ASSIs	Pagham Harbour

Pagham Harbour is located on the south coast of England in West Sussex. It is an estuarine basin that comprises an extensive central area of saltmarsh and intertidal mud-flats, surrounded by lagoons, shingle, open water, reed swamp and wet permanent grassland. The mud-flats are rich in invertebrates and algae, and provide important feeding areas for birds. The lower saltmarsh is dominated by Common Cord-grass *Spartina anglica*, with patches of Glasswort *Salicornia* spp. The area supports breeding Little Tern *Sterna albibifrons* in summer, as well as wintering concentrations of Ruff *Philomachus pugnax* and Pintail *Anas acuta*.



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 albibifrons*, 12 pairs representing 0.5% of the breeding population in Great Britain (Count as at 1995)

Over winter;

Ruff *Philomachus pugnax*, 160 individuals representing at least 22.9% of the wintering population in Great Britain

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

Over winter;

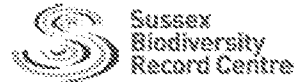
Pintail *Anas acuta*, 628 individuals representing at least 1.0% of the wintering Northwestern Europe population (5 year peak mean 1991/2 - 1995/6)

Note:

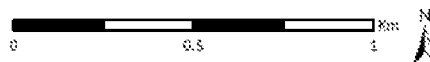
Many designated sites are on private land: the listing of a site in these pages does not imply any right of public access.

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

Designated Site Map (ESD/15/157)
Land at Oldlands Farm, South Bersted + 1km radius
 Prepared for Gareth Knass (Aluco Ecology) - 19/03/2015



Woods Mill, Hovefield,
 West Sussex BN1 9DQ
 01273 497 158
 www.sussex.org.uk



- Key to Map:**
- Enquiry area
 - Species search area
 - LNR

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RAMSAR, Special Areas of Conservation (SAC), Special Protection Area (SPA), National Park, Area of Outstanding Natural Beauty (AONB), National Nature Reserve (NNR), Site of Special Scientific Interest (SSSI), Local Nature Reserve (LNR) and County Park data reproduced with permission of Natural England. Site of Nature Conservation Importance (SNCI) data provided by East and West Sussex County Councils, and Brighton & Hove City Council. Metres Road verge data supplied by East and West Sussex County Councils. Local Geological Site (LGS) data created by iLRG in partnership with Sussex Biodiversity Group. © Crown Copyright. All rights reserved 2015.

Berstead Brooks LNR (Map: Sussex Biodiversity Records Centre)

Habitat & Natural Features Map (ESD/15/157)
Land at Oldlands Farm, South Bersted + 1km radius
 Prepared for Gareth Knoss (Alcon Ecology) - 18/03/2015



Woods Hill, Hove, East Sussex BN1 9SD
 info@sussexbiodiversity.org.uk
 01273 497 552
 www.sussexbiodiversity.org.uk



Key to Map:

- Enquiry area
- Species search area
- Ancient/veteran tree
- Chalk stream
- Open Water
- Coastal & floodplain grazing marsh

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Ancient woodland, traditional orchards, woodpasture and parkland, vegetated shingle and other special sites reproduced with permission of Natural England. Revised created and floodplain grazing marsh data remains provisional and is also reproduced with permission of Natural England. Chalk ground data supplied by Natural England and South Downs Conservation Board. Black Poplar data supplied by Sussex Wildlife Landscapes Project. Shrub woodland data supplied by Dr. Stuart Bloor. Reefs data funded by Environment Agency and West Sussex County Council is provided by Sussex Biodiversity Record Centre and maintained by RSPB. Heathland data funded by West Sussex County Council, RSPB and Herts Wood AGNS Unit. Ancient/veteran tree data derived from results of the Ancient Tree Hunt Project and the Tree Register of the British Isles (TR058). South East Coastal Habitat Mapping data reproduced with permission of Environment Agency. © Crown Copyright. All rights reserved 2015.

Statistical data held by Sussex Biodiversity Record Centre (SBRC) are included in-house or obtained from a variety of dataset providers. SBRC continuously strive to further improve and update these data wherever possible. However, this map should be treated as indicative rather than definitive. Data may be generated from a range of field survey and/or predictive methods, each of which may have its own inherent limitations. In some situations a recent ground survey may be required to establish definitively the current status of a particular habitat at a specific location.

Sussex Biodiversity Records Centre Protected Species Data:

Arvicola amphibius

European Water Vole

Terrestrial mammal

The fastest declining native British mammal, the water vole was 'Batty' in Wind in the Willows. Water voles prefer slow flowing streams, rivers and dykes with steep earth banks and luxuriant emergent vegetation. They have been in decline for over a century mainly due to loss of habitat while the presence of American mink has greatly hastened this decline. In many areas of mainland Britain water voles are already extinct but there are still some strong populations in Sussex. A legally protected species, listed on the Sussex Rare Species Inventory and the subject of a Sussex Species Action Programme.

Designations

Natural Environment and Rural Communities Act 2006 - Species of Principal Importance in England (sec; Sussex Biodiversity Action Plan; Sussex Protected Species Register; Sussex Rare Species Inventory; UK Biodiversity Action Plan priority species; Wildlife and Countryside Act 1981 Schedule 5 Sections (9.1 killing/injuring; 9.1 taking; 9.2; 9.4; subdivision a; 9.4b; 9.5a; 9.5b; Schedule 5)

Grid Reference	Recorder	Date	Locality
SU9318601493	Rowenna Baker	2012	Aldringham Rife, Bersted Brooks LNR
SU932014	Ruth Street,Sarah Hughes	24/06/2013	Bersted Brooks, Bognor Regis, Bersted Brooks LNR
SU936012	Ruth Street,Sarah Hughes	24/06/2013	Bersted Brooks, Bognor Regis, Bersted Brooks LNR
SU937013	anon @ The Ecology Co-operation	July 2014	Bognor Regis, A29
SU942015	anon @ The Ecology Co-operation	July 2014	Bognor Regis, A29
SU94860160	Andrew Smithem,Jane Reeve	22/05/2014	Bognor Golf Course
SU94860161	Andrew Smithem,Jane Reeve	14/05/2014	Bognor Golf Course
SU949016	Andrew Smithem	28/07/2013	Lidsey Rife at Golf Course
SU949017	Anon	1997	Ryebank Rife, West Sussex (VC13)
SU955024	Jamie Ambrose	28/07/2014	Flansham
SU95600248	Jane Reeve	30/07/2014	Lidsey Rife
SU956025	Jamie Ambrose	09/08/2014	Flansham
SU95620249	Jane Reeve	27/07/2014	Junction of Ryebank and Lidsey Rife
SU95630250	Andrew Smithem,Jane Reeve	01/06/2014	Lidsey Rife
SU95640251	Andrew Smithem,Jane Reeve	30/05/2014	Lidsey Rife
SU957025	Andrew Smithem,Jane Reeve	28/05/2014	Lidsey Rife near The Footbridge
SU95710257	Andrew Smithem,Jane Reeve	28/05/2014	Lidsey Rife
SU95750260	Jane Reeve	14/09/2014	Lidsey Rife
SU958027	Andrew Smithem,Jane Reeve	30/04/2014	Lidsey Rife
SU95840269	Andrew Smithem,Jane Reeve	01/04/2014	Lidsey Rife
SU95860272	Andrew Smithem,Jane Reeve	30/04/2014	Lidsey Rife

Anguis fragilis

Slow-worm

Reptile

A legally protected legless lizard resembling a small snake. Slow-worms are widespread in southern England and found in open habitats such as rough grassland, heath and on road and railway embankments. They are often common in urban and suburban areas. Like most reptiles and amphibians they have declined considerably and need protection wherever they occur.

Designations

Natural Environment and Rural Communities Act 2006 - Species of Principal Importance in England (sec; Sussex Biodiversity Action Plan; Sussex Protected Species Register; UK Biodiversity Action Plan priority species; Wildlife and Countryside Act 1981 Schedule 5 Sections (9.1 killing/injuring; 9.5a; 9.5b)

Grid Reference	Recorder	Date	Locality
SU942015	anon @ The Ecology Co-operation	07/08/2014 - 15/08/2014	Bognor Regis, A29

SUSSEX BAT INVENTORY REPORT SUMMARY

Please note that all species of bat and their roosts are protected by UK and European law, under the Wildlife and Countryside Act 1981 (WCA) in the UK and the Habitats Directive in the EU. Bats and their roosts may also be protected by site designations, for example if their roost site or feeding grounds are notified as Special Area of Conservation (SAC) or a Site of Special Scientific Interest (SSSI).

You could be committing a criminal offence if you :

1. Deliberately capture, injure or kill a bat. 2. Intentionally or recklessly disturb a bat in the roost or deliberately disturb a group of bats. 3. Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time). 4. Intentionally or recklessly obstruct access to a bat roost. 5. Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat.

Key to Indicators

M/S	Mating/Swarming
H	Hibernaculum
FR	Feeding Roost
MR	Maternity Roost
UR	Unspecified Roost
D	Droppings

Land at Oldlands Farm, South Bersted + 1km radius

18 March 2015

ESD/15/157

Search Area: SU9301 to SU9502; SU9400

Gareth Knass (Aluco Ecology)

Common Name	Latin Name	No of Records	M/S	H	FR	MR	UR	D
Brown Long-eared Bat	<i>Plecotus auritus</i>	3	☐	☐	☐	☐	☒	☒
Common Pipistrelle (45 kHz)	<i>Pipistrellus pipistrellus</i>	4	☐	☐	☐	☐	☒	☒
Long-eared sp.	<i>Plecotus</i>	1	☐	☐	☐	☐	☒	☒
Noctule Bat	<i>Nyctalus noctula</i>	1	☐	☐	☐	☐	☐	☐
Pipistrelle sp.	<i>Pipistrellus</i>	3	☐	☐	☐	☐	☒	☒
Serotine	<i>Eptesicus serotinus</i>	1	☐	☐	☐	☐	☐	☐
Soprano Pipistrelle (55 kHz)	<i>Pipistrellus pygmaeus</i>	1	☐	☐	☐	☐	☐	☐

SUSSEX BAT INVENTORY REPORT

Please note that all species of bat and their roosts are protected by the Wildlife and Countryside Act 1981 and/or by the 1982 and the Habitats Directive in the EU. Bats and their roosts may also be protected by site designations, for example if their roost site or feeding grounds are held as a Special Area of Conservation (SAC) or a Site of Special Scientific Interest (SSSI).

You could be committing a criminal offence if you:

1. Deliberately capture, injure or kill a bat;
2. Intentionally or recklessly obstruct a bat in the roost or deliberately disturb a group of bats;
3. Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time);
4. Intentionally or recklessly obstruct access to a bat roost;
5. Presence of advertisements on a roost or any part of a bat.

Key to Indicators

MS	Mating/Swarming
H	Hibernaculum
FR	Feeding Roost
MR	Maternity Roost
UR	Unspecified Roost
D	Droppings

Land at Oldlands Farm, South Bersted + 1km radius

10 March 2015 ESD115157 Search Area: SU9301 to SU9502, SU9400

Gareth Knox (Abcon Ecology)

Eptesicus serotinus

Serotine

A large bat that frequents pasture, parklands and gardens as well as the wider countryside. It forms summer roosts in buildings where it also probably hibernates. A widespread southern species in the UK, though often only present in small numbers. Its British stronghold is in the south east (widespread in Sussex) and parts of the West Country.

Date	Location	Grid Reference	Recorder	Sampling Method	MS	H	FR	MR	UR	D	Abundance	Notes
23/06/2014	Bognor Regis, A29	SU942015	anon @ The Ecology Co-operation	Unknown	☐	☐	☐	☐	☐	☐	Present Taxon	

Nyctalus noctula

Noctule Bat

BAF

A large bat of woodlands and wetland that sometimes occurs in towns. Summer roosts are usually in trees, where it can also hibernates. Other hibernation sites can be in rock fissures, bat boxes and sometimes buildings. Widespread, but declining in Sussex and in both England and Wales generally.

Date	Location	Grid Reference	Recorder	Sampling Method	MS	H	FR	MR	UR	D	Abundance	Notes
23/06/2014	Bognor Regis, A29	SU942015	anon @ The Ecology Co-operation	Unknown	☐	☐	☐	☐	☐	☐	Present Taxon	

Pipistrellus

Pipistrelle sp.

There are three species of Pipistrelle bat found in the UK: common (*Pipistrellus communis*), soprano (*P. pygmaeus*) and Nathusius (*P. Nathusii*). Common and soprano pipistrelles were previously recorded as one species, but they are now recognised as separate species, with a peak frequency echolocation at 45 kHz and 25 kHz respectively. The following records refer to an aggregation of the two species, where the audio frequency of specific species is unidentified. Little is known about the Nathusius pipistrelle, but the other two species are found in all types of countryside (except very exposed areas) as well as in towns and suburbs. Summer roosts are usually in buildings, though tree trunks and bat boxes are also used. Hibernation sites are in buildings and tree holes. Both common and soprano pipistrelles are widespread in Sussex, while Nathusius is much rarer.

Date	Location	Grid Reference	Recorder	Sampling Method	MS	H	FR	MR	UR	D	Abundance	Notes
14/07/2009	Private property, Steyney	SU938021	NE Bat Worker	Building Inspection	☐	☐	☐	☒	☒	☒		
14/07/2009	Walnut Tree Cottage, Steyney Lane, Steyney, PO22 6XR, West Sussex (VC13)	SU937022	NE Bat Worker	Building Inspection	☐	☐	☐	☒	☐	☐	1 seen Present	House - west half 1890's; east half 1930's. 12 bats entered house since July 2009, released outside. Description and location likely Pipistrelle roost in end wall.
08/07/2004	Walnut Tree Cottage, Steyney Lane, Bognor Regis, West Sussex (VC13)	SU938021	NE Bat Worker	Building Inspection	☐	☐	☐	☒	☐	☐	2 Present	

*Pipistrellus pipistrellus***Common Pipistrelle (45 kHz)**

The common pipistrelle (*Pipistrellus pipistrellus*) and soprano pipistrelle (*P. pygmaeus*) were previously recorded as one species. They are now recognised as separate species, with a peak frequency echolocation of 45 kHz and 55 kHz respectively. Pipistrelles are the most common bat in the British Isles and are found in all types of countryside (except very exposed areas) as well as in towns and suburbs. Summer roosts are usually in buildings, though tree holes and bat boxes are also used. Winter roosts are in buildings and tree holes.

Date	Location	Grid Reference	Recorder	Sampling Method	M	S	H	FR	MR	UR	D	Abundance	Notes
23/06/2014	Bognor Regis, A29	SU942015	anon @ The Ecology Co-operation	Unknown	☐	☐	☐	☐	☐	☐	☐	Present Taxon	
25/06/2014	Bognor Regis, A29	SU937013	anon @ The Ecology Co-operation	Unknown	☐	☐	☐	☐	☐	☐	☐	Present Taxon	
27/07/2012	Private property, Shipney	SU928022	NE Bat Worker	Building Inspection	☐	☐	☐	☐	☒	☒	☐		
29/06/2011	Private property, Shipney	SU958022	NE Bat Worker	Building Inspection	☐	☐	☐	☐	☒	☐	☐	M Bats!	

*Pipistrellus pygmaeus***Soprano Pipistrelle (55 kHz)**

SAP

For a while considered as a variant of the common pipistrelle, the soprano pipistrelle is now recognised as a separate species. Pipistrelles are the most common bat in the British Isles and are found in all types of countryside (except very exposed areas) as well as in towns and suburbs. This species has a stronger association with water than common pipistrelle. Summer roosts are usually in buildings, though tree holes and bat boxes are also used. Winter roosts are in buildings and tree holes.

Date	Location	Grid Reference	Recorder	Sampling Method	M	S	H	FR	MR	UR	D	Abundance	Notes
23/06/2014	Bognor Regis, A29	SU937013	anon @ The Ecology Co-operation	Unknown	☐	☐	☐	☐	☐	☐	☐	Present Taxon	

*Plecotus***Long-eared sp.**

It is difficult to distinguish the rare grey long-eared bat from the much more common brown long-eared bat without studying in the hand. This also applies to identifying the species from their droppings.

Date	Location	Grid Reference	Recorder	Sampling Method	M	S	H	FR	MR	UR	D	Abundance	Notes
14/07/2009	Private property, Shipney	SU956021	NE Bat Worker	Building Inspection	☐	☐	☐	☐	☐	☒	☒		

*Plecotus auritus***Brown Long-eared Bat**

SAI

One of the more common British bat species, but difficult to distinguish from the much rarer grey long-eared bat (*Plecotus austriacus*), unless in the hand. It frequents woodland and orchards and has summer roosts in older buildings and trees. It often hibernates in caves, tunnels and mines. The brown long-eared has declined in the British Isles though it remains widespread.

Date	Location	Grid Reference	Recorder	Sampling Method	M	S	H	FR	MR	UR	D	Abundance	Notes
23/06/2014	Bognor Regis, A29	SU942015	anon @ The Ecology Co-operation	Unknown	☐	☐	☐	☐	☐	☐	☐	Present Taxon	
14/07/2009	Worsted Tree Cottage, Shipney Lane, Shipney, PO22 2NR, West Sussex (VC13)	SU937022	NE Bat Worker	Building Inspection	☐	☐	☐	☐	☒	☒	☐	taxon Present	House - west half 1600's; east half 1630's. 10+ droppings in east loft. 150+ in pile in west loft.
09/07/2004	Oak Tree Cottage, Shipney Lane, Shipney, West Sussex (VC13)	SU956021	Marin Love	Building Inspection	☐	☐	☐	☐	☒	☐	☐		

*Lepus europaeus***Brown Hare**

N

Terrestrial mammal

Widely distributed throughout England and Wales and probably an ancient introduction. Hares occur on a wide range of mainly open farmland and nationally the species is thought to be undergoing a steady decline. Much less common in Sussex than it used to be, but widely recorded.

Designations

Natural Environment and Rural Communities Act 2006 - Species of Principal importance in England (sec. Sussex Biodiversity Action Plan, UK Biodiversity Action Plan priority species)

Grid Reference	Recorder	Date	Locality
SU953824	Laure Jackson	12/05/2010	Flansham, West Sussex (VC13)

Suggested Native Species Mixes

The lists below provide suitable native species mixes that contain species that are found locally within the Lidsey Rife floodplain and are suitable for enhancing buffer zones and wetland compensation/drainage solutions within the development. They are proposed also to have ancillary benefit to species of conservation concern recorded within the development zone of influence. The mixes are not set and detailed mixes should be provided along with management of created semi natural features

Hedge and Woody Scrub Mix

The tables below relate to mixes discussed with the Landscape Architects as suitable native species for the site.

Proposed Native Hedgerow and Scrub Species Mix

Species	Latin Name	% of Mix
Hawthorn	<i>Crataegus monogyna</i>	
Hazel	<i>Corylus avellana</i>	
Holly	<i>Ilex aquifolium</i>	
Blackthorn	<i>Prunus spinosa</i>	
Dog Rose	<i>Rosa canina</i>	
Grey Willow	<i>Salix cinerea</i>	
Standard trees within hedgerow		
Pendunculate Oak	<i>Quercus robur</i>	
Ash	<i>Fraxinus excelsior</i>	
Field Maple	<i>Acer campestre</i>	

Proposed Native Tree Belt Species Mix

Species	Latin Name	% of Mix
Field Maple	<i>Acer campestre</i>	
Hawthorn	<i>Crataegus monogyna</i>	
Hazel	<i>Corylus avellana</i>	
Hornbeam	<i>Carpinus betulus</i>	
Pendunculate Oak	<i>Quercus robur</i>	
Ash	<i>Fraxinus excelsior</i>	
Elder	<i>Sambucus nigra</i>	
Crack Willow	<i>Salix fragilis</i>	

Dry Grassland Mix

For Example a mix suitable on lowland arable farmland: EM1 – Basic General Purpose Meadow Mixture from Emorsgate Seeds

Composition

This is a simple low cost meadow mixture suitable for a wide range of soil types. The wild flowers are robust and showy, and the grasses are fine and slow growing.

Wild Flowers

%	Latin name	Common name
0.5	<u><i>Achillea millefolium</i></u>	<u>Yarrow</u>
0.5	<u><i>Centaurea nigra</i></u>	<u>Common Knapweed</u>
1	<u><i>Daucus carota</i></u>	<u>Wild Carrot</u>
2	<u><i>Galium verum</i></u>	<u>Lady's Bedstraw</u>
2	<u><i>Leucanthemum vulgare</i></u>	<u>Oxeye Daisy</u>
3	<u><i>Sanguisorba minor</i></u>	<u>Salad Burnet</u>
2.5	<u><i>Prunella vulgaris</i></u>	<u>Selfheal</u>
3.5	<u><i>Ranunculus acris</i></u>	<u>Meadow Buttercup</u>
0.5	<u><i>Rumex acetosa</i></u>	<u>Common Sorrel</u>
2.5	<u><i>Silene dioica</i></u>	<u>Red Campion</u>
2	<u><i>Silene vulgaris</i></u>	<u>Bladder Campion</u>
20		

Grasses

%	Latin name	Common name
8	<u><i>Agrostis capillaris</i></u>	<u>Common Bent</u>
40	<u><i>Cynosurus cristatus</i></u>	<u>Crested Dogtail</u>
28	<u><i>Festuca rubra</i></u>	<u>Slender-creeping Red-fescue</u>
4	<u><i>Phleum bertolonii</i></u>	<u>Smaller Cat's-tail</u>
80		

Sowing Rates

kg/ha kg/acre g/m²

40 16 4

Swale/Wet Grassland Mix

For Example a wet meadow mix for swales that only contain water for storm events but remain damp through the year:

EM8 – Meadow mixture for wetlands Emorsgate Seeds

Composition

EM8 contains species suitable for seasonally wet soils and is based on the vegetation of traditional water meadows. Soils in wet meadows may flood for short periods in winter, but are usually well drained in summer.

Wild Flowers

%	Latin name	Common name
0.5	<u>Achillea millefolium</u>	<u>Yarrow</u>
0.5	<u>Betonica officinalis</u> - (<u>Stachys officinalis</u>)	<u>Betony</u>
1	<u>Centaurea nigra</u>	<u>Common Knapweed</u>
1	<u>Filipendula ulmaria</u>	<u>Meadowsweet</u>
1.6	<u>Galium verum</u>	<u>Lady's Bedstraw</u>
1.5	<u>Leucanthemum vulgare</u>	<u>Oxeye Daisy</u>
0.3	<u>Lotus pedunculatus</u>	<u>Greater Birdsfoot Trefoil</u>
1	<u>Plantago lanceolata</u>	<u>Ribwort Plantain</u>
1	<u>Primula veris</u>	<u>Cowslip</u>
2	<u>Prunella vulgaris</u>	<u>Selfheal</u>
3	<u>Ranunculus acris</u>	<u>Meadow Buttercup</u>
1.6	<u>Rhinanthus minor</u>	<u>Yellow Rattle</u>
1.2	<u>Rumex acetosa</u>	<u>Common Sorrel</u>
1.5	<u>Silene alba</u>	<u>Pepper Saxifrage</u>
0.3	<u>Silene flos-cuculi</u> - (<u>Lychnis flos-cuculi</u>)	<u>Ragged Robin</u>
0.2	<u>Succisa pratensis</u>	<u>Devil's-bit Scabious</u>
1.8	<u>Vicia cracca</u>	<u>Tufted Vetch</u>

20

Grasses

%	Latin name	Common name
12	<u>Agrostis capillaris</u>	<u>Common Bent</u>
5	<u>Alopecurus pratensis</u>	<u>Meadow Foxtail (w)</u>
1	<u>Anthoxanthum odoratum</u>	<u>Sweet Vernal-grass (w)</u>
36	<u>Cynosurus cristatus</u>	<u>Crested Dogstail</u>
1	<u>Deschampsia cespitosa</u>	<u>Tufted Hair-grass (w)</u>
25	<u>Festuca rubra</u>	<u>Slender-creeping Red-fescue</u>

80

Sowing Rates

kg/ha kg/acre g/m² Order Mixture

40 16 4

Wet Watercourse Mix

Based on the surrounding watercourses the following species could comprise any watercourse creation, where the watercourse is wet:

Common Reed	<i>Phragmites australis</i>	5%
Common Bent	<i>Agrostis capriallis</i>	20%
Meadow Foxtail	<i>Alopecurus pratensis</i>	20%
Crested Dogtail	<i>Cynosurus cristatus</i>	20%
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>	5%
Meadowsweet	<i>Filipendula ulmaria</i>	8%
Yellow Flag Iris	<i>Iris pseudocorus</i>	10%
Reedmace	<i>Typha latifolia</i>	2%
Hemp Agrimony	<i>Eupatorium cannabinum</i>	2%
Fools Water-cress	<i>Apium nodiflorum</i>	2%
Greater Birds Foot Trefoil	<i>Lotus Pedunculatus</i>	2%
Meadow Buttercup	<i>Ranunculus acris</i>	2%
Tufted Vetch	<i>Vicia cracca</i>	2%