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Biodiversity Mitigation and Enhancement Plan

Camp Field, Bartons Road, Havant

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Report Summary

1. The Ecology Co-op was commissioned by Wessex Environmental Planning to outline necessary mitigation and enhancements for land proposed for development at Camp Field in Havant, where it was determined that the site is located in close proximity to Ancient Woodland, supports a high diversity of foraging bats (including barbastelle and three *Myotis* sp. recorded on site through trapping) and six green listed breeding bird species.
2. Standard national guidance states that a buffer of at least 15m is created around Ancient Woodland, however in this instance an 18m buffer will be established along the northern and western boundary which meet the Ancient Woodland. This buffer will be planted to create high-value scrub habitat.
3. To prevent inadvertent damage to the western tree line during the construction phase, heras fencing, or similar, will be erected at the boundaries of the construction zone, outside of root protection areas. All machinery and materials must operate and be stored only within the fenced construction area.
4. During the construction phase, measures will be put in place to minimise potential harm to badgers. In addition, site staff must be briefed prior to the commencement of construction on the importance of contacting an ecologist in the unlikely event that any protected species are identified within the construction zone.
5. A sensitive lighting scheme, in line with the Bat Conservation Trusts Guidelines will be important and must include a 'no light zone' along the north or western boundary where a tree line is present that has been identified to support commuting and foraging bats.
6. Habitat enhancement measures are proposed for wider wildlife benefits including the creation of new high-value scrub habitat within the 18m buffer to the Ancient Woodland, an orchard and wildflower meadows, the native planting of SuDS, scattered tree planting and enhancement of the southern tree line. These new habitats will be beneficial for a variety of invertebrates and in turn provide value for foraging birds and bats.
7. The Biodiversity Metric Calculation in Section 5.2.8 has established that there will be an increase in the sites biodiversity value based on the proposed habitat creation detailed.
8. The installation of integral bat roosting features and bird nest boxes into buildings are also detailed to provide a net increase in bat and bird roosting habitat.
9. Post construction management is detailed in section 4.



Camp Field – Mitigation Statement

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We disclaim responsibility to the client and others in respect of any matters outside the scope of the above.

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1 INTRODUCTION

1.1 Background to the Scheme

Wessex Environmental Planning intend to submit a planning application for the residential development of an area of land at Camp Field in Havant, Hampshire. This proposal includes the development of the southern part of the site, which is likely to include approximately 72 properties with public open space and community orchard. An open green space will be created across the northern portion of the site. There is the potential for the northern portion of the site to be developed in the future should more housing be allocated by East Hants District Council and therefore consideration has been made to a wider development proposal at this site.

In November 2017, The Ecology Co-op undertook a Phase 1 Habitat survey and Preliminary Ecological Appraisal of the site. This was followed by Phase 2 protected species surveys completed across 2017 and 2018. The results of these surveys are presented in separate report¹ and ² submitted as part of the planning application.

In summary the surveys identified high bat diversity at the site with common pipistrelle, soprano pipistrelle, nathusius pipistrelle, common noctule, serotine, brown long-eared, barbastelle and the following *Myotis* sp. Natterer's bat, whiskered and Brandt's bat recorded on site and *Alcathoe* just off site through trapping. In addition, six green listed bird species were confirmed as breeding. Badger push throughs were identified along the northern boundary but no setts were identified upon or within close proximity to the site. The surveys have concluded the likely absence of great crested newts, reptiles and dormice.

Further to the findings of all ecological surveys at this site, Wessex Environmental Planning have commissioned the Ecology Co-op to develop ecological mitigation and habitat compensation measures for the proposed scheme.

1.2 The Site

The National Grid Reference for the centre of the site is approximately SU 7333 0811 and the closest postcode to the site is PO9 5NA. This site is approximately 6.2 Ha in area. It comprises an arable field with poor semi-improved grassland margins and a strip of improved grassland which supports scattered broadleaved trees in the centre of the field. On the western boundary of the site is a native species-rich hedgerow with trees which connects directly to Ancient Semi-natural Woodland located directly adjacent to part of the sites western and northern boundaries. The other half of the northern boundary is marked with wire mesh fencing and meets the grounds of the adjacent crematorium. Along the southern boundary is a mixture of species poor defunct hedgerow with trees and fencing beyond which is Bartons Road. Finally, on the eastern boundary is high wire mesh fencing beyond which is the access road to the crematorium. Dry ditches are also present along the western boundary and part of the northern boundary.

¹. The Ecology Co-op (2017) *Preliminary Ecological Appraisal, Phase 1 Habitat Assessment – Land North of Bartons Road, Havant.*

². The Ecology Co-op (2018) *Phase 2 Ecology Surveys – Camp Field, Bartons Road, Havant.*



Figure 1. An aerial image showing the location of the site. The approximate site boundary is outlined in red. Images produced courtesy of Google maps (Map data ©2018 Google).



Figure 2. Master plan for Camp Field produced by Stainsby Architect and provided by email on 31st October 2018.



1.3 Purpose of the Report

This document has been produced to demonstrate how a residential development upon land at Camp Field in Havant, Hampshire will minimise its impact upon protected species, wider biodiversity and provide targeted enhancement measures to create a net gain in biodiversity in line with the requirements of National Planning Policy Framework (NPPF) paragraphs 7 and 118. It outlines all mitigation and compensation measures that are designed to ensure that valuable habitats are either protected, replaced or enhanced at the above named site.

All of the prescribed mitigation measures described within this document will be issued to relevant works contractors to ensure that they are carried out in full. Implementation of this will be overseen by a suitable ecological consultancy, and the works contractor will be given contact details for an ecologist so that any issues can be resolved promptly.

1.4 Policy and Legislation

Legal protection applying to relevant bird, mammal, herpetofauna and other species and current nature conservation planning policy is outlined in Appendix 1 of the Phase 2 Ecology Surveys Report.

2 BIODIVERSITY OFFSETTING CALCULATION

Biodiversity metric calculations were made to determine the degree of biodiversity offsetting possible through this development proposal. This involved calculating the current site value and the future target site value in line with guidance produced by Natural England and Department for Environment Food and Rural Affairs ³.

3 PROTECTED HABITAT MITIGATION

Standard national guidance states that a buffer of at least 15m is created around Ancient Woodland. An 18m buffer will be established along the parts of the northern and western boundary which meet the Ancient Woodland. This buffer will be planted with species recommendations detailed within section 4.2.1.

To prevent inadvertent damage during the construction phase, heras fencing, or similar, must be erected at the boundaries of the construction zone, outside of root protection areas. All machinery and materials must operate and be stored only within the fenced construction area.

4 PROTECTED SPECIES MITIGATION AND ENHANCEMENTS

4.1 Badgers

4.1.1 Mitigation

The following mitigation measures must be put in place to minimise any potential harm to badgers.

³ Natural England and Department for Environment Food and Rural Affairs (Defra), (2012). *Biodiversity Offsetting Pilots. Technical Paper: the metric for the biodiversity offsetting pilot in England*



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- No food or waste will be left out overnight and tools will be locked away after each day.
- Any excavations more than 50cm deep will either be covered up overnight or have ladders put in place to provide an escape route.
- All chemicals and potentially hazardous substances must be stored securely in a structure such as a shipping container.

If any digging by large mammals is identified then an ecologist should be contacted for advice. If any active setts are established within the construction zone, specific mitigation measures are likely to be required that may include obtaining a licence from Natural England.

4.2 Bats

4.2.1 Mitigation

Bright external lighting can have a detrimental impact upon foraging and commuting bats, but importantly can also cause bats to be fooled into thinking that the light is from the sun, causing them to remain in their roosts for longer. A large proportion of bat activity was associated with the boundaries of the Ancient Woodland along part of the north and western boundaries and along the western tree line. There was relatively high species diversity and high levels of activity along these features with the following species recorded; common pipistrelle, soprano pipistrelle, *Myotis spp.*, long-eared bat, serotine, common noctule and barbastelle. Barbastelle bats and *Myotis* bats are particularly sensitive to artificial lighting.

As a result, the site boundaries must be protected from artificial lighting with no street lamps or outside lights to face towards these boundaries. In particular, a 'no light zone' must be established along the western boundary, whilst the development lies sufficiently far from the woodland to the north that light pollution is not considered to be a risk as long as bare bulb lighting is not used and the general lighting guidance below is incorporated.

Guidelines issued by the Bat Conservation Trust must be incorporated into the lighting scheme at Camp Field. These are outlined within Appendix 4. Overall the following measures must be implemented into the site design:

1. No 'upward pointing' or bare bulb lights will be installed anywhere on the development.
2. Column heights of external lights should be as low as reasonably possibly to limit light spill. Shields should be installed to focus light towards footpaths and roads only (See figure 3). No light will be allowed to emit light past horizontal (90 degrees from the ground).
3. A no-light zone to protect western boundaries from any artificial light. No lamp posts or other artificial lights should be positioned within 15 metres of these boundaries and no lights should be positioned to face towards these boundaries.
4. No external lights will be installed on new buildings above a height of 2 metres and all external lights will have shields to prevent light splash beyond horizontal.
5. A restriction on luminaires so that they lack UV elements or metal halide fluorescent sources, use of a warm white spectrum that is <2700 Kelvin and feature wavelengths higher than 550nm.



Figure 3. An example of suitable downward shielded street lighting

4.2.2 Enhancements

As a measure to enhance roosting opportunities for bats, 'built in' roosting features will be incorporated into the new buildings. It is recommended that 15 built in roosting features are installed. These must be located upon the buildings in close proximity to boundary tree lines or standing water. The boxes should be installed on the south or eastern elevations approximately 5 meters in height.

The following built in roosting features are recommended:

- Five 2FR Schwegler Bat Tubes (<https://www.nhbs.com/2fr-schwegler-bat-tube>). These can be incorporated into the fabric of the building. The bat tubes can be connected together in a module form
- Five Bat Access Tile sets (<https://www.nhbs.com/bat-access-tile-set>). Where access tiles are installed will not use a Tyvek type underlay, which has a tendency to fray and pose and entanglement risk to bats, but instead a must consist only of bitumen roofing felt or a similar material.
- Five 1FQ Schwegler Bat Roost (For External Walls) (<https://www.nhbs.com/1fq-schwegler-bat-roost-for-external-walls>). These can be attached directly to the external wall following construction.

Figure 4 shows proposed locations of these bat roosting features.



Bat Access Tile Set

2FR Schwegler Bat Tube

1FQ Schwegler Bat Roost

In addition, five Schwegler woodcrete bat boxes (two 2F, one 2FN, one 1FF and one 1FS Schwegler bat boxes) will be hung on suitable mature trees upon the western and northern site boundaries. The boxes would be hung by a suitably qualified ecologist to ensure that this positioning is most suitable, but generally locations above 3.5 metres in the most south easterly facing aspect of a tree is best. Proposed locations are indicated in Figure 4.



2F Schwegler Bat Box

2FN Schwegler bat box

1FF Schwegler Bat Box

1FS Schwegler Large Colony



Figure 4. Proposed locations of new bat roosting opportunities overlaid on the master plan produced by Stainsby Architect and provided by email on 25 September 2018. Bat boxes are indicated with yellow dots and 'built in' roosting features with orange dots.

4.3 Nesting Birds

4.3.1 Mitigation

Any scrub or trees to be cleared must be removed outside of the nesting bird season (1st March to 31st August) unless features are first hand-searched by a suitably qualified ecologist and declared clear of any active bird nests. In the event that any active nests are identified a buffer of at least 5 meters will need to be created and the nest must be left undisturbed until the young have fledged.

4.3.1 Enhancements

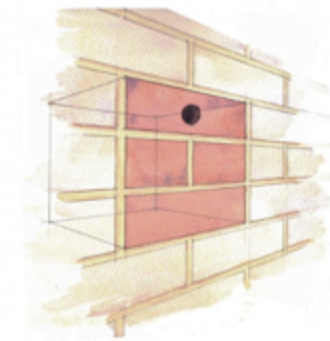
In order to enhance the site for nesting birds, ten nesting bird boxes (Five 1B, three 1N and two 3S Schwegler bird boxes) which can be purchased from <https://www.nhbs.com> will be put up across the site. Nest boxes should be installed high on trees along the western, northern and southern boundary. The 1B nest boxes should be installed at a height of 1.5metres whilst 1N and 3S boxes should be positioned at least 3m in height.

New nesting opportunities for house sparrows will be provided on four of the buildings. Two recommended boxes can be purchased from these links <https://www.nhbs.com/sparrow-box-smooth-brick> and <https://www.nhbs.com/1sp-schwegler-sparrow-terrace>. If individual sparrow boxes are used groups of 2 individual boxes would be recommended per building. If 1SP schwegler sparrow terrace are used 1 should be installed per building. Both examples can be incorporated into the fabric of the building. These boxes must be positioned at a minimum of 3 meters above the ground. Figure 5 indicates

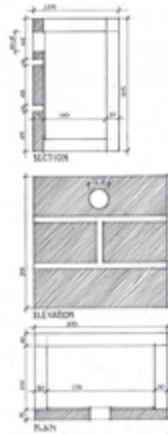


proposed locations.

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SPARROW NEST BOX
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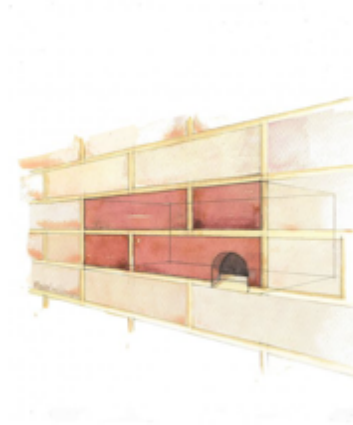


Sparrow Box – smooth brick

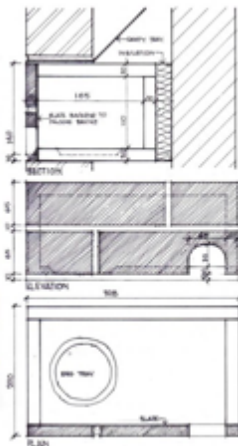


1SP Schwegler Sparrow Terrace

It is recommended that 8 new nesting opportunities are provided for swifts on 4 buildings. Two recommended boxes can be purchased from these links <https://www.nhbs.com/swift-box-smooth-brick> and <https://www.nhbs.com/schwegler-lightweight-swift-box-type-1a>. These boxes can be incorporated into the fabric of a building as it is built. They should be positioned at a minimum of 5 meters above the ground with clear unobstructed access to the entrance. They should be located within shaded areas out of direct sunlight or prevailing winds. Figure 5 indicates proposed locations.



Swift Box – Smooth Brick



Schwegler Lightweight Swift Box Type 1A



Figure 5. Proposed locations new bird nesting opportunities. House Sparrow boxes are indicated with red dots and swift boxes with purple dots. Bird boxes to be installed upon trees are shown with blue dots. These are subject to adjustment according to local circumstances to maximize their probability of uptake.

5 BIODIVERSITY CHANGE

5.1 Existing

The site presently supports low overall biodiversity value, with the arable habitat including a mixture of no more than 14 plant species (including the wheat crop), the majority of which are restricted only to the cultivated margins of the field where cultivation and herbicides will have had the least effect. It is therefore likely that at least 90% of the field by area supports less than 5 plant species. The total area of the arable field is 5.32Ha.

The poor semi-improved grassland margins that border the arable field includes 31 plant species and measure approximately 0.63Ha in area, representing a much greater biodiversity value and an improved grassland strip within the field that borders a row of mature trees includes 10 plant species and measures 0.16Ha in area.

Given the buffer areas that are proposed around the boundaries of the site and around the mature trees running through the middle of the site, the biodiversity change calculation for this site has focussed purely upon the change as a result of the development of the arable field and reversion of part of this field for wildlife benefit and proposed enhancements to the buffer strips.



5.2 Proposed Habitat Creation

5.2.1 Native Shrub Planting – Ancient Woodland buffer

The 18m buffer for the Ancient Woodland will be planted with shrubs and low trees. This will provide increased foraging habitat for bats plus nesting areas for birds once it becomes established and also to reduce public access to the Ancient Woodland and reduce the impact of degradation. Thorny species should be incorporated to reduce public access along with species identified within the woodland to retain consistency with the surrounding landscape. The recommended planting density is 1 tree per 1sqm. A minimum of 10 species should be chosen from the species recommended below:

- Hawthorn *Crataegus monogyna*
- Blackthorn *Prunus spinosa*
- Dog rose *Rosa canina*
- Sweet briar *Rosa rubiginosa*
- Butchers broom *Ruscus aculeatus*
- Wild cherry *Prunus avium*
- Hazel *Corylus avellana*
- Field maple *Acer campestre*
- Alder buckthorn *Rhamnus frangula*
- Dogwood *Cornus sanguinea*
- Rowan *Sorbus aucuparia*
- Elder *Sambucus nigra*
- Crab apple *Malus sylvestris*
- Wayfaring tree *Viburnum lantana*
- Guelder rose *Viburnum opulus*

5.2.2 Native Shrub Planting – Bund

Native shrubs and trees will be planted along the bund at the eastern boundaries of the site. This will create greater value habitat for a variety of birds and invertebrates and provide screening. Given the arrival of ash dieback, it is not recommended that any ash saplings are planted anywhere on the site. The recommended planting density is 1-2 tree per 1sqm. A minimum of 7 species should be chosen from the species recommended below:

- English Oak *Quercus robur*
- Field maple *Acer campestre*
- Hazel *Corylus avellana*
- Hawthorn *Crataegus monogyna*
- Wild Cherry *Prunus avium*
- Bird Cherry *Prunus padus*
- Rowan *Sorbus aucuparia*
- Elder *Sambucus nigra*
- Crab apple *Malus sylvestris*
- Dogwood *Cornus sanguinea*
- English Whitebeam *Sorbus aria*
- Wayfaring tree *Viburnum lantana*



It is best to plant while the trees are dormant between November and March in the absence of heavy frost. Guards to protect these hedge trees from rabbits and deer will be necessary for the first 3-5 years.

5.2.3 Wildflower Meadow Creation

A strip of wildflower habitat should be established on the inner face of the earth bund proposed at eastern corners of the site. The bund will be created with subsoil which will be a suitable growing base given its lower nutrient content. This will run the length of the bund, approximately 285m and be a minimum of 1.5m in width.

Wildflower habitat should also be established in other selective areas across the site such as around the sustainable drainage systems (SuDS) features. This will increase the value of this area as foraging habitat for bats and birds as well as pollinating insects.

To establish this as a wildflower area a process of light rotavating and seeding should be employed with good ground preparation essential to the success of the wildflower meadow. The sowing process is best undertaken between late August and the end of September during mild and wet weather best suited to seedling establishment or during mid-March to mid-May when the ground has sufficient moisture and there is very little risk of frosts. The rotavating process is to create an area of largely bare ground to allow the wildflower seed mix to establish. Sampling of soil nutrients should also be undertaken to establish the growing conditions present and ensure that nutrient levels are within the correct parameters for wildflower meadow propagation.

A suitable seed mixture containing not less than 25 wildflower and grass species should be sown across the ground at a density of four grams per square metre. The species included must all be of native British origin. A recommended seed mixture is EM5 – Meadow mixture for loamy soils, which is available from Emorsgate seeds (www.wildseed.co.uk). Table 1 details the composition of this mixture. Other commercial seed mixes are available.

As part of on-going management, the sward should be cut and gathered to a height of approximately 5cm at least three times in its first year of establishment to control the flush of annual weeds which will grow during the first growing season. Thereafter the sward should be cut (with all cuttings removed and composted) between mid-August and late September every year. Cutting in the spring (March/April) should be included if the sward grows too vigorously.

Table 1 – Composition of EM5 – Meadow mixture for loamy soils to be sown in areas across the site.

Wildflowers		
%	Latin name	Common name
0.5	<i>Achillea millefolium</i>	Yarrow
3	<i>Centaurea nigra</i>	Common Knapweed
1	<i>Daucus carota</i>	Wild Carrot
2.5	<i>Galium verum</i>	Lady's Bedstraw
0.3	<i>Geranium pratense</i>	Meadow Cranesbill
1.2	<i>Knautia arvensis</i>	Field Scabious
0.5	<i>Lathyrus pratensis</i>	Meadow Vetchling
0.4	<i>Leontodon hispidus</i>	Rough Hawkbit



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0.5	<i>Leucanthemum vulgare</i>	Oxeye Daisy
0.5	<i>Lotus corniculatus</i>	Birdsfoot Trefoil
1	<i>Malva moschata</i>	Musk Mallow
0.5	<i>Plantago lanceolata</i>	Ribwort Plantain
0.5	<i>Plantago media</i>	Hoary Plantain
1	<i>Primula veris</i>	Cowslip
1	<i>Prunella vulgaris</i>	Selfheal
2	<i>Ranunculus acris</i>	Meadow Buttercup
1	<i>Ranunculus bulbosus</i>	Bulbous Buttercup
1.5	<i>Rhinanthus minor</i>	Yellow Rattle
1	<i>Rumex acetosa</i>	Common Sorrel
0.1	<i>Trifolium pratense</i>	Wild Red Clover
Grasses		
8	<i>Agrostis capillaris</i>	Common Bent
3	<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass (w)
3	<i>Briza media</i>	Quaking Grass (w)
32	<i>Cynosurus cristatus</i>	Crested Dogtail
10	<i>Festuca ovina</i>	Sheep's Fescue
20	<i>Festuca rubra</i>	Slender-creeping Red-fescue
3	<i>Phleum bertolonii</i>	Smaller Cat's-tail
1	<i>Trisetum flavescens</i>	Yellow Oat-grass (w)

5.2.4 SuDS Planting

One SuDS pond will be created upon the site. This will measure approximately 590m². This feature will be designed to provide ecological benefits through shaping and planting with native species.

A small area in the centre should be designed to retain water throughout the year. Ideally it will retain at least 20cm of water throughout the year (thus ensuring successful breeding by a number of amphibian and invertebrate species), though some drying of the pond can potentially have benefits for biodiversity. This would be best achieved through incorporating bentonite clay in to the pond bed within the centre of the feature, or meeting the natural groundwater level by excavating to the right depth. This will allow a natural earth bottom to be present for planting and to increase its wildlife value.

Aquatic plants will be introduced and must include a combination of marginal aquatic plants and oxygenating plants. This should include the following:

- Hornwort *Ceratophyllum derersum*,
- Curled pondweed *Potamogeton crispus*
- Water crowfoot *Ranunculus aquatica*
- Water mint *Mentha aquatica*,
- Water forget-me-not *Myosotis palustris*
- Purple loosestrife *Lythrum salicaria*
- Brooklime *Veronica beccabunga*
- Amphibious bistort *Polygonum amphibium*
- Yellow iris *Lysimachia vulgaris*

The plants listed above are available in early autumn and spring, dependent upon species, and should



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be planted as soon as possible following the establishment of this pond and settling period (where the pond finds its natural water level).

The gently sloping banks of the SuDS features should be sown with pond edge seed mixture to maximise its ecological value. A suitable seed mixture containing not less than 20 wildflower and grass species should be sown in this area at a density of four grams per square metre. The species included must all be of native British origin. A recommended seed mixture is EP1 – Pond Edge Mixture, which is available from Emorsgate Seeds (www.wildseed.co.uk). Table 2 details the composition of this mixture.

This wildflower habitat establishment and management can be carried out under the same methodology as detailed in section 4.2.2.

Table 2 – Composition of EP1 – Pond Edge Mixture to be sown on the banks of the SuDS basin

Wildflowers		
%	Latin name	Common name
1	<i>Achillea ptarmica</i>	Sneezewort
2.3	<i>Angelica sylvestris</i>	Wild Angelica
0.1	<i>Caltha palustris</i>	Marsh Marigold
0.6	<i>Eupatorium cannabinum</i>	Hemp Agrimony
3	<i>Filipendula ulmaria</i>	Meadowsweet
1	<i>Geum rivale</i>	Water Avens
0.4	<i>Hypericum tetrapterum</i>	Square-stalked St John's Wort
4	<i>Iris pseudacorus</i>	Yellow Iris
1	<i>Lotus pedunculatus</i>	Greater Birdsfoot Trefoil
0.8	<i>Lycopus europaeus</i>	Gypsywort
0.6	<i>Lythrum salicaria</i>	Purple Loosestrife
0.1	<i>Mentha aquatica</i>	Water Mint
0.1	<i>Pulicaria dysenterica</i>	Common Fleabane
2.5	<i>Ranunculus acris</i>	Meadow Buttercup
0.1	<i>Scrophularia auriculata</i>	Water Figwort
1	<i>Silene flos-cuculi</i> - (<i>Lychnis flos-cuculi</i>)	Ragged Robin
1	<i>Succisa pratensis</i>	Devil's-bit Scabious
0.4	<i>Vicia cracca</i>	Tufted Vetch
Grasses		
10	<i>Agrostis capillaris</i>	Common Bent
2	<i>Alopecurus pratensis</i>	Meadow Foxtail (w)
2	<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass (w)
2	<i>Briza media</i>	Quaking Grass (w)
32	<i>Cynosurus cristatus</i>	Crested Dogstail
1	<i>Deschampsia cespitosa</i>	Tufted Hair-grass (w)
24	<i>Festuca rubra</i>	Slender-creeping Red-fescue
1	<i>Hordeum secalinum</i>	Meadow Barley (w)
6	<i>Schedonorus pratensis</i> - (<i>Festuca pratensis</i>)	Meadow Fescue (w)



5.2.5 Swale Planting

Swales will be located along much of the southern boundary of the site and along the access road. These will cover an area of approximately 660m². This feature will be designed to provide ecological benefits through shaping and planting with native species.

The gently sloping banks of the swales should be sown with wetland seed mixture to maximise the ecological value of these features. A suitable seed mixture containing not less than 20 wildflower and grass species should be sown in this area at a density of four grams per square metre. The species included must all be of native British origin. A recommended seed mixture is EM8 – Meadow mixture for wetlands, which is available from Emorsgate Seeds (www.wildseed.co.uk). Table 3 details the composition of this mixture.

This wildflower habitat establishment and management can be carried out under the same methodology as detailed in section 4.2.2.

Table 3 – Composition of EM8 – Meadow mixture for wetlands to be sown within the swales.

Wildflowers		
%	Latin name	Common name
0.5	<i>Achillea millefolium</i>	Yarrow
0.2	<i>Achillea ptarmica</i>	Sneezewort
1	<i>Betonica officinalis</i> - (<i>Stachys officinalis</i>)	Betony
2.5	<i>Centaurea nigra</i>	Common Knapweed
2	<i>Filipendula ulmaria</i>	Meadowsweet
1.5	<i>Galium verum</i>	Lady's Bedstraw
0.4	<i>Geum rivale</i>	Water Avens
0.6	<i>Leucanthemum vulgare</i>	Oxeye Daisy
0.8	<i>Lotus pedunculatus</i>	Greater Birdsfoot Trefoil
1	<i>Plantago lanceolata</i>	Ribwort Plantain
0.2	<i>Primula veris</i>	Cowslip
1.5	<i>Prunella vulgaris</i>	Selfheal
2.5	<i>Ranunculus acris</i>	Meadow Buttercup
1.5	<i>Rhinanthus minor</i>	Yellow Rattle
1.5	<i>Rumex acetosa</i>	Common Sorrel
1	<i>Sanguisorba officinalis</i>	Great Burnet
0.2	<i>Silene flos-cuculi</i> - (<i>Lychnis flos-cuculi</i>)	Ragged Robin
0.6	<i>Succisa pratensis</i>	Devil's-bit Scabious
0.5	<i>Vicia cracca</i>	Tufted Vetch
Grasses		
10	<i>Agrostis capillaris</i>	Common Bent
2	<i>Alopecurus pratensis</i>	Meadow Foxtail (w)
2	<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass (w)
1	<i>Briza media</i>	Quaking Grass (w)
32	<i>Cynosurus cristatus</i>	Crested Dogstail
1	<i>Deschampsia cespitosa</i>	Tufted Hair-grass (w)
24	<i>Festuca rubra</i>	Slender-creeping Red-fescue
1	<i>Hordeum secalinum</i>	Meadow Barley (w)



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7	<i>Schedonorus pratensis</i> - (<i>Festuca pratensis</i>)	Meadow Fescue (w)
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5.2.6 Orchard Planting

A community orchard is proposed at the north east corner of the site. Orchards are a Biodiversity Action Plan (BAP) habitat and are important for a range of species. This habitat will provide greater value for a variety of birds and invertebrates and in turn foraging bats. A mixture of different fruit species should be considered:

- Apple *Malus spp.*
- Pear *Pyrus spp.*
- Plum *Prunus spp.*
- Damson *Prunus spp.*
- Cherry *Prunus spp.*
- Quince *Cydonia spp.*

Trees should be spaced with a minimum of 7m between them to allow them to establish to their potential and reduce the susceptibility and spread of pests and disease.

Bare root trees should be planted between November and March. Potted trees can be planted out at any time of the year although if this is timed within the summer it must be kept well-watered. Planting should avoid times of drought, hard frost or waterlogged conditions.

Tree will require supports stakes which should be driven into the ground prior to planting to prevent damage to roots.

These orchard trees will need to be protected from rabbits and deer. This could be achieved through deer fencing the orchard or using guards on each individual tree which would likely be necessary for the first 3-5 years.

5.2.7 Enhancement of Southern Tree Line

The southern tree line is defunct and species poor and should be enhanced through the planting of native shrubs. Currently ash *Fraxinus excelsior* is dominant here with some sycamore *Acer pseudoplatanus*, hawthorn *Crataegus monogyna*, pedunculate oak *Quercus robur*, holly *Ilex aquifolium*, blackthorn *Prunus spinosa*, rose *Rosa spp.* and bramble *Rubus fruticosus* present.

A mixture of the following species should be planted at a density of no less than one tree per two linear metres to enhance this feature:

- Blackthorn *Prunus spinosa*
- Hawthorn *Crataegus monogyna*
- Spindle *Euonymus europaeus*
- Dogwood *Cornus sanguinea*
- Wayfaring-tree *Viburnum lantana*
- Field or dog rose *Rosa arvensis/ Rosa canina*
- Guelder rose *Viburnum opulus*
- Field maple *Acer campestre*
- Wild privet *Ligustrum vulgare*



- Hazel *Corylus avellana*

5.2.8 Biodiversity Metric Calculation

Table 3 and 4 below detail the biodiversity unit for each of the habitats based on the habitat distinctiveness and condition and the area of habitat present. These have been calculated for the current site and the future target. The conditions of the future proposed habitats have been assumed as good based on the proposed management detailed within this document. The exception is where the condition of the improved grassland has been assumed as moderate as this is expected to have high use by residents.

The current site biodiversity value is calculated as: 7.60. The future target value is calculated as: 11.06. Therefore, there will be a proposed increase in the site biodiversity value of 3.46.

There is a low establishment risk associated with creating the traditional orchard and pond (SuDS) and a low risk factor associated with restoration of the hedgerow³. The risk factor associated with creating species rich drains, ryhnes and ditches or neutral grassland (wildflower habitat) is unknown and not provided in the guidance used. Based on these there is a low risk associated with the creation of these habitats and the increase in biodiversity anticipated can be considered at face value as the multiplier associated stands at 1. Therefore, mitigation to manage risk involved are not deemed necessary.

There will be a mismatch between the timing of the impact and the offset. Therefore, it is recommended that the creation of the traditional orchard and enhancement of the hedgerow is completed ahead of the impact/development. All other habitats will be created during and post construction due to the practicality of this and the risk of construction activity impacting these habitats during their more sensitive establishment phase.

Table 4. Calculation table for total current site biodiversity value

Habitat	Distinctiveness	Condition	Biodiversity units per hectare	Area of habitat (ha)	Total biodiversity unit
Cereal crop	Low (2)	Poor (1)	2	2.65	5.30
Grassland probably improved	Low (2)	Moderate (2)	4	0.32	1.28
Improved grassland	Low (2)	Moderate (2)	4	0.06	0.24
Non-important hedgerow	High (6)	Poor (2)	6	0.13	0.78
Total current site biodiversity metric					7.60

Table 5. Calculation table for total future target site biodiversity value

Habitat	Distinctiveness	Condition	Biodiversity units per hectare	Area of habitat (ha)	Total biodiversity unit
Traditional orchard	High (6)	Good (3)	18	0.36	6.48



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Pond – BAP priority pond (SuDS)	High (6)	Good (3)	18	0.06	1.08
Species rich drains, rhynes and ditches (Swales)	High (6)	Good (3)	18	0.06	1.08
Other neutral grassland (wildflower meadow)	Medium (4)	Good (3)	12	0.08	0.96
Non-important hedgerow	High (6)	Good (3)	18	0.13	2.34
Improved grassland	Low (2)	Moderate (2)	4	0.17	0.68
Total future target site biodiversity metric					11.06

6 POST CONSTRUCTION MANAGEMENT

6.1 Management Plan Operations

6.1.1 Wildflower Habitat

The sward should be cut and gathered to a height of approximately 5cm at least three times in its first year of establishment to control the flush of annual weeds that will grow during the first growing season and suppress faster growing grass species. This will subsequently encourage the establishment of less competitive flowering species.

The cuttings must be gathered after each mowing to prevent soil from becoming nutrient-rich.

As part of on-going management, the wildflower meadow should be cut and gathered each year to a height of approximately 60mm after flowering in July and August. This process can be carried out through, strimming or tractor mowing. This is important to ensure that species diversity of the area is maintained, and grass species do not become dominant. Where necessary, a second cut could be taken in March each year if the sward is growing too coarsely. The grassland should not be cut between the mid-April and mid-August so that plants are given the opportunity to flower.

The cuttings must be gathered after each mowing to prevent soil from becoming too nutrient rich. These can be collected and composted or used to build hibernacula that will support hibernating amphibians on a patch of ground that will remain dry throughout the year and well away from the pond or watercourses.

6.1.2 Planted Trees and Shrubs

Weeds must be controlled at the base of the trees during the first three years.

Tree guards to protect the new saplings from rabbits and deer should be inspected yearly for first 3-5 years and then removed if well established.



Replacement planting will be required where trees fail to establish or where signs of disease are identified.

All planted trees and shrubs must only be cut outside the bird nesting season (1st March to 31st August) and where possible hedges shouldn't be cut until February, so that valuable winter food associated with fruiting hedge trees is retained for over-wintering birds.

6.1.3 Orchard Trees

A 1m diameter circle from the tree base should be kept free from vegetation for the first 3 years. This can be achieved through mulching.

Where tree guards are used these should be inspected yearly for first 3-5 years and then removed if planting well established.

Replacement planting will be required where trees fail to establish.

6.1.4 Bat and Bird Boxes

Bat and bird boxes on trees would be inspected to check they had not become detached or damaged each year.

Should you need any further advice on the information provided above, please do not hesitate to contact The Ecology Co-op.

7 APPENDIX 1 –Wildlife Legislation and National Planning Policy

Introduction

The following text is intended for general guidance only and does not constitute comprehensive professional legal advice. It provides a summary of the current legal protection afforded to wildlife in general and certain species. It includes current national planning policy relevant to nature conservation.

The ‘Birds Directive’, ‘Habitats Directive’ and ‘Natura 2000 Sites’.

The Council Directive 79/409/EEC on the Conservation of Wild Birds (“the Birds Directive”) sets a framework for the protection of wild birds. Under the directive, several provisions are made including the designation and protection of ‘Special Protection Areas’ (SPAs) – areas which support important bird populations, and the legal protection of rare or vulnerable species.

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the “Habitats Directive”) directs member states of the EU to take measures to maintain favourable conservation status of important habitats and species. This requires the designation of a series of sites which contain important populations of species listed on Annex II of the directive (for example Bechstein’s bat *Myotis bechsteinii*, Barbastelle bat *Barbastella barbastellus* and white-clawed crayfish *Austropotamobius pallipes*. Together with ‘Special Areas of Conservation’ (SPAs), designated under the Birds Directive, SACs form a network across Europe of protected areas known as the ‘Natura 2000 sites’.

Annex IV lists species in need of more strict protection, these are known as “European Protected Species (EPS)”. All bat species, common dormice *Muscardinus avellana*, otter *Lutra lutra* and great crested newts *Triturus cristatus* are examples of EPS that are regularly encountered during development projects.

The ‘Habitats Regulations’

The Conservation of Habitats and Species Regulations 2010 (the “Habitats Regulations”) is the principle means of transposing the Habitats Directive and the Birds Directive, and updates the Conservation (Natural Habitats, &c.) Regulations 1994 (“the 1994 regulations”) in England and Wales.

‘Natura 2000’ sites receive the highest level of protection under this regulation which requires that any activity within the zone of influence of these sites would be subject to a Habitats Regulations Assessment (HRA) by the competent authority (e.g. planning authority), leading to an Appropriate Assessment (AA) in cases where ‘likely significant effects on the integrity of the site are identified.

For European Protected Species, Regulation 41 makes it a criminal offence to;

- Deliberately capture, injure or kill any such animal;
- Deliberately disturb wild animals of such species;
- Deliberately take or destroy their eggs (where relevant);
- Damage or destroy a *breeding or resting place* of such an animal;
- Possess, control, sell or exchange any live or dead animal or plant, of such species;
- Deliberately pick, collect, cut, uproot or destroy a wild plant of such species.

The Habitats Directive and Habitats Regulations provide for the derogation from these prohibitions for



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specific reasons provided certain conditions are met. An EPS licensing regime allows operations that would otherwise be unlawful acts to be carried out lawfully. Natural England is the licensing Authority and, in order to grant a license, ensures that three statutory conditions (sometimes referred to as the 'three derogation tests') are met:

- A licence can be granted for the purposes of “preserving public health or safety or for other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment” (Regulation 53 (2) (e)).
- A licence can be granted if “there are no satisfactory alternatives” to the proposed action.
- A licence shall not be granted unless the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

Wildlife and Countryside Act (1981) as amended.

This remains one of the most important pieces of wildlife legislation in the UK. There are various schedules to the Act protecting birds (Schedule 1), other animals including insects (Schedule 5), plants (Schedule 8), and control of invasive non-native species (Schedule 9).

Under the Wildlife and Countryside Act (WCA) 1981, all wild birds (with the exception of those listed on Schedule 2), their eggs and nests are protected by law and it is an offence to:

- Take, damage or destroy the nest of any wild bird while it is in use or being built.
- Take or destroy the egg of any wild bird.
- Disturb any bird listed on Schedule 1, while it is nest building, or at a nest with eggs or young, or disturb the dependant young of any such bird.

Schedule 5 lists all non-avian animals receiving protection to a varied degree. At its strongest, the Act makes it an offence to intentionally kill, injure or take any wild animal listed on Schedule 5, and prohibits interference with places used for shelter or protection, or intentionally disturb animals while occupying such places. Examples of species with *full protection* include all EPS, common reptile species, water vole *Arvicola amphibius*, white-clawed crayfish *Austropotamobius pallipes* and Roman snail *Helix pomatia*. Other species are protected from sale, barter or exchange only, such as white letter hairstreak *Satyrrium w-album*.

The Act makes it an offence to intentionally pick, uproot or destroy any plant or seed, and sell or possess any plant listed on Schedule 8. It is also an offence to intentionally uproot any wild plant not listed on Schedule 8 unless authorised [by the land owner]. Species on Schedules 5 and 8 are reviewed every 5 years when species can be added or removed.

Measures for the prevention of spreading non-native species which may be detrimental to native wildlife is included in the Act, which prohibits the release of animals or planting of plants into the wild of species listed on Schedule 9 (for example Japanese knotweed *Fallopia japonica*, Himalayan balsam *Impatiens glandifera*, New Zealand Pygmyweed *Crassula helmsii*).

The Wildlife and Countryside Act 1981 (as amended) also prohibits certain inhumane methods of traps and devices for the capture or killing of wild animals and certain additional methods such as fixed trap, poisoning with gas or smoke, or spot-lighting with vehicles for killing species listed on Schedule 6 of the Act (this includes all bat species, badger, otter, polecat, dormice, hedgehog and red squirrel).

Natural Environment and Rural Communities (NERC) Act (2006)

The NERC Act (2006) created the statutory nature conservation body Natural England, and places a



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statutory duty on all public bodies, including planning authorities, under Section 40, to take, or promote the taking by others, steps to further the conservation of *habitats and species of principal importance for the conservation of biodiversity* in England (commonly referred to as the 'Biodiversity Duty'). This duty extends to all public bodies the biodiversity duty of Section 74 of the Countryside and Rights of Way (CROW) Act 2000, which placed a duty only on Government and Ministers. Section 41 of the NERC Act lists the habitats and species of principle importance. This includes a wide range of species from mosses, vascular plants, invertebrates through to mammals and birds. It originates from the priority species listed under the UK Biodiversity Action Plan (UK BAP) with some omissions and additions.

Protection of Badgers Act (1992)

The Badger *Meles meles* is afforded specific legal protection in Britain under the Protection of Badgers Act (1992), and Schedule 6 of the Wildlife and Countryside Act 1981 (as amended) (see above).

Under this legislation, it is a criminal offence to:

- intentionally kill, injure, take, possess, or cruelly ill-treat, a Badger, or to attempt to do so;
- interfere with a sett, by damaging or destroying it;
- to obstruct access to, or any entrance of, a Badger sett; or
- to disturb a Badger when it is occupying a sett.

A licence may be obtained from Natural England to permit certain prohibited actions for a number of defined reasons including interference of a sett for the purpose of development, provided that a certain number of conditions are met. Note that licenses are not normally granted for works affecting badgers between the end of November and the start of July.

National Planning Policy Framework

The National Planning Policy Framework (NPPF 2012) sets out the Government's view on how planners should balance nature conservation with development and helps ensure that Government meets its biodiversity commitments with regard to the operation of the planning system.

The NPPF states that the wider benefits of an ecosystem should be recognised, and the presence of a protected species is a material consideration for a development proposal (Circular 06/2005, 2005).

In accordance with the NPPF, it is important that developments should contribute to and enhance the natural and local environment by:

- Minimising impacts on existing biodiversity and habitats,
- Providing net gains in biodiversity and habitats, wherever possible,
- establishing coherent ecological networks that are more resilient to current and future pressures.

UK Post-2010 Biodiversity Framework

The UK Biodiversity Action Plan (UK BAP), first published in 1994, was the UK's response to the commitments of the Rio Convention on Biological Diversity (1992) until 2010, when the UK BAP was replaced by the UK Post-2010 Biodiversity Framework. This framework covers the period 2011 to 2020 and forms the UK government's response to the new strategic plan of the United Nations Convention on Biodiversity (CBD) published in 2010. This promotes a focus on individual countries delivering target for protection for biodiversity through their own strategies.



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The most recent biodiversity strategy for England, 'Biodiversity 2020: A strategy for England's wildlife and ecosystem services' was published by Defra (2011), and a progress update was provided in July 2013 (Defra 2013).

'Biodiversity 2020' builds on the Natural Environment White Paper for England – 'The Natural Choice', published on 7 June 2011, and sets out the strategic direction for biodiversity policy for the next decade. Biodiversity 2020 deliberately avoids setting specific targets and actions for local areas and species because the Government believes that local people and organisations are best placed to decide how to implement the strategy in the most appropriate way for their local area or situation.

In Havant, development must:

- Protect and where possible enhance the borough statutory and non-statutory designated landscapes, habitats and features of hydrological and geological interest. Which can be achieved by appropriate mitigation measures including creation of new habitats and water bodies/courses or planting of new trees and woodlands. Attention should be paid to: SPAs, SACs, SSSIs, NNRs, SINCs and LNRs.
- Support an ongoing programme of survey of habitats and species and designation of Sites of Importance for Nature Conservation.
- Ensure partnership working with landowners to ensure land management practices restore and enhance where possible new valued landscapes, habitats and their soil structure, particularly the ancient woodland remnants of the Forest of Bere.
- Protect wildlife corridors to prevent the fragmentation of existing habitats and to allow species like Brent Geese to respond to the local affects of climate change⁴

Birds of Conservation Concern (BoCC)

In 1996, the UK's leading non-governmental bird conservation organisations listed the conservation status of all bird species in the UK against a series of criteria relating to their population size, trends and relative importance to global conservation. The lists, known as the 'Red', 'Amber' and 'Green' lists (in order of decreasing concern) are used to inform key conservation policy and decisions. The lists are reviewed every 5 years and are a useful reference for determining the current importance of a particular site for birds. The most recent review was undertaken in 2015 (Eaton et al, 2015), which provides an up to date assessment of the conservation status of birds in the UK.

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⁴ Havant Borough Council – Havant Borough Council Core Strategy Local Development Framework (March 2011) [Currently forming a Local Plan stretching to 2036]



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8 APPENDIX 4 Reducing impacts of artificial light

Bright external lighting can have a detrimental impact upon foraging and commuting bat flight paths, but more importantly can also cause bats to remain in their roosts for longer. Artificial lighting can also cause significant impacts on other nocturnal species, most notably moths and other nocturnal insects. It can also result in disruption of the circadian rhythms of birds, reducing their fitness. Guidelines issued by the Bat Conservation Trust⁵ should be considered while designing the lighting scheme. This includes the following measures:

Do not:

- provide excessive lighting. Use only the minimum amount of light needed for the task.
- directly illuminate bat roosts or important areas for nesting birds

Avoid:

- installing lighting in ecologically sensitive areas such as: near ponds, lakes, rivers, areas of high conservation value; sites supporting particularly light-sensitive species of conservation significance (e.g. glow worms, rare moths, slow-flying bats) and habitat used by protected species.
- using reflective surfaces under lights.

Do:

- consider employing a competent lighting designer who will apply the principals of providing the right light, in the right place, at the right time and controlled by the right system.
- minimise the spread of light to at, or near horizontal and ensure that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required.
- consider the height of lighting columns. It should be noted that a lower mounting height is not always better. A lower mounting height can create more light-spill or require more columns. Column height should be carefully considered to balance task and mitigation measures.
- consider no lighting solutions where possible such as white lining, good signage, and LED cats eyes. For example, light only high-risk stretches of roads, such as crossings and junctions, allowing headlights to provide any necessary illumination at other times.
- use temporary close-boarded fencing until vegetation matures, to shield sensitive areas from lighting.
- limit the times that lights are on to provide some dark periods. The task being lit often varies, for example roads are less used after 23.00hrs and car parks are empty. A lighting designer can vary the lighting levels as the use of the area changes reducing lighting levels or perhaps even switching installations off after certain times. This use of adaptive lighting can tailor the installation to suit human health and safety as well as wildlife needs.

⁵ Bat Conservation Trust (2014) Artificial Lighting and Wildlife - Interim Guidance: Recommendations to help minimise the impact artificial lighting. Available at: http://www.bats.org.uk/pages/bats_and_lighting.html

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