



ECOLOGICAL MITIGATION & ENHANCEMENT STATEMENT

Land at Coldharbour Farm Road, Emsworth

Prepared by	GS
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Date	8 th April 2020
Project Reference	LLD1726
Revision	00

Contents

	Page No.
1.0 Introduction	01
2.0 Baseline Ecological Conditions	01
3.0 Impact Assessment	05
4.0 Detailed Avoidance / Mitigation Measures	06
5.0 Ecological Enhancement	09
6.0 Ecology Enhancement Management Plan	12
7.0 Conclusion	16
8.0 References	17

FIGURES:

Figure No. 01 – Ecological Enhancement Plan



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1.0 INTRODUCTION

- 1.1 Lizard Landscape Design and Ecology has been commissioned to formulate an Ecological Mitigation Strategy for the proposed development at Coldharbour Farm Road, Emsworth (*Grid reference: SU 745 065; hereafter known as 'the site'*).
- 1.2 A summary of the results of the previous surveys, potential impacts of the proposals, and full details of avoidance, mitigation and compensation measures have been detailed within this report. This report has been prepared by Catherine O'Reilly (*MCIEEM, Senior Ecologist; Lizard Landscape Design and Ecology*) and reviewed by George Sayer (*BSc(Hons) PgDip, Project Ecologist, Lizard Landscape Design and Ecology*).
- 1.3 This report has been produced based on the following data and surveys undertaken by this company:
- Preliminary Ecological Appraisal (*June 2019*)
 - Detailed Reptile Survey (*June - July 2019*)

2.0 BASELINE ECOLOGICAL CONDITIONS

2.1 Designated Sites

- 2.1.1 Brook Stream adjacent to the eastern boundary comprises part of a Site of Importance for Nature Conservation (SINC), which lies to the north. This is notable for the presence of a scarce aquatic plant (narrow leaved water plantain) as well as being a habitat rich in other aquatic plant species. The section of stream which runs through the site was largely enveloped by bramble and hawthorn scrub with a small open section to the south supporting emergent vegetation such as hemlock water dropwort (*Oenanthe crocata*), watercress (*Nasturtium officinale*) and blue water speedwell (*Veronica anagallis-aquatica*). No narrow-leaved water plantain was recorded within the stream adjacent the site during the site visit in June 2019.

- 2.1.2 The site is also located 1.1km north of Chichester Harbour SPA, with Brook Stream discharging into this European protected site.

2.2 Habitats

- 2.2.1 The site is formed of 2no. small fields which were previously utilised for grazing enclosed by scrub and treelines. The site covers 1.9Ha to the south-west of Emsworth Recreation Ground and is bordered by the A27 to the south, Shell petrol station to the west, farmland to the north and housing and the recreation ground to the east.
- 2.2.2 The site is dominated by species-poor semi-improved grassland which had a sward height of c.70cm at the time of the site visit in June 2019. Bent (*Agrostis* agg.), meadow foxtail (*Alopecurus pratensis*), yorkshire fog (*Holcus lanatus*) and cocks-foot (*Dactylis glomerata*) grasses dominate the sward with areas of dominant creeping buttercup (*Ranunculus repens*), mayweed (*Tripleurospermum inodorum*), dock (*Rumex crispus*) and common fleabane (*Pulicaria dysenterica*). Areas of tall ruderal vegetation exist to the margins of the site and within the grassland.
- 2.2.3 Areas of dense bramble scrub and species-poor hedge delineate the northern and eastern boundaries of the site. The southern and western boundaries lie adjacent narrow strips of woodland including field maple (*Acer campestre*), ash (*Fraxinus excelsior*), oak (*Quercus robur*) and hazel (*Corylus avellana*).
- 2.2.4 A dry ditch runs north-south across the centre of the site. This ditch was heavily vegetated in places, showing that it rarely holds water for any significant period. A shallow, flowing ditch runs along the eastern boundary of the site. The ditch was c. 7cm deep at the time of the survey and heavily vegetated with bramble and hawthorn (*Crataegus monogyna*) scrub at its northern end with hemlock water dropwort (*Oenanthe crocata*), watercress (*Nasturtium officinale*) and blue water speedwell (*Veronica anagallis-aquatica*) filling the channel to the southern section. The eastern ditch forms part of Land West of Emsworth Recreation Ground SINC.

2.3 Reptiles

- 2.3.1 A total of 25no. artificial refugia were laid out around the site area on 13th June 2019 and allowed to bed-in for a period of 15 days before commencing the survey visits. 7no. survey visits were undertaken on site between 28th June and 31st July 2019.
- 2.3.2 No reptiles of any species were found on site during the detailed reptile survey. All survey visits were undertaken in suitable weather conditions at the appropriate time of the year, therefore surveys confirm the likely absence of reptiles on site.

2.4 Bats

- 2.4.1 The majority of trees on site are semi-mature and have no discernible potential roost features. A single Mature oak tree to the north-western corner of the site contained no obvious features but was of a size and age which could support a small number of bats; the tree was therefore assessed as offering 'low' bat roost suitability.
- 2.4.2 The tree belts to the south and west, and mature off-site scattered trees to the east are likely to offer foraging opportunity for light-tolerant species such as pipistrelle, while species such as noctule may forage high over the fields. Detailed bat activity surveys were not undertaken on this site as results of the survey would not have made any material difference to the assessment or mitigation measures proposed (*see section 4.0 below*). This approach is in accordance with CIEEM guidance (*Guidelines for Preliminary Ecological Appraisal, (Appendix 5), December 2017*).

2.5 Breeding Birds

- 2.5.1 The trees and dense scrub around the site are likely to offer nesting opportunities for small passerine species. The long sward (c. 70cm) within the main body of the site is too long to offered suitable nesting habitat for ground-nesters such as sky lark who require a sward 20-50cm in length. No evidence of ground nesting birds was recorded during any of the site visits.

2.6 Wintering Birds

- 2.6.1 The site is located within the 5.6km buffer zone of Chichester and Langstone Harbour SPA, within which any net gain in residential units is considered likely to cause increased recreation disturbance within the SPA.
- 2.6.2 The habitat within the site are considered to be unsuitable as a foraging resource for winter bird species such as Brent geese due to the length of the sward. In addition, neither the site nor any of the adjacent land has been identified by The Solent Wadars and Brent Goose Strategy as being of value to the local wintering bird population.

2.7 Other Species

- 2.7.1 No suitable habitat for any other species including dormouse, water vole, or badger was recorded anywhere within the site (*refer to LLD1726-ECO-REP-001-00-EcIA for details*).

3.0 IMPACT ASSESSMENT

3.1 Designated Sites

- 3.1.1 In the absence of mitigation, potential impacts upon surrounding designated sites could include increased recreational disturbance and release of nitrates into the watercourse. The adjacent SINC could be impacted through dust smothering, pollution events, run-off and changes to hydrology during the construction phase. The impacts would be of moderate impact magnitude and highly likely to occur.

3.2 Habitats

- 3.2.1 The development will cause the loss of areas of scrub, tall ruderal vegetation and semi-improved grassland. The habitats on site are of low ecological value, this loss of which is of low impact. In the absence of mitigation, the adjacent trees may be impacted through root compaction, dust smothering and mechanical damage. The impacts would be of moderate impact magnitude and certain to occur.

3.3 Reptiles

- 3.3.1 The site was found to be of negligible value to reptiles therefore no impacts are predicted.

3.4 Bats

- 3.4.1 In the absence of mitigation, impacts could include habitat fragmentation through hedge / tree removal, disruption of commuting routes through inappropriate lighting and potential disturbance of a bat roost if tree T01 were to be removed. The impacts would be of minor magnitude and likely to occur.

3.5 Breeding Birds

- 3.5.1 Impacts would include the damage or destruction of a bird nest if mitigation / avoidance measures weren't followed. The impacts would be of minor magnitude and highly likely to occur.

3.6 Wintering Birds

- 3.6.1 Unmitigated development of the site would result in increased recreational disturbance within Chichester Harbour SPA, in turn leading to disturbance of wintering birds. Given the fairly small size of the development, the impacts would be of relatively minor magnitude by certain to occur.

4.0 DETAILED AVOIDANCE, MITIGATION & COMPENSATION MEASURES

4.1 Designated Sites

Chichester Harbour SPA

- 4.1.1 Developer contributions to the Solent Recreation Mitigation Strategy (SRMS) would be provided in accordance with the local plan. The SRMS funds wardens, a programme of education, signage, bird refuges, strategic greenspaces and a monitoring programme to mitigate against adverse impacts from increased recreational disturbance.

Land West of Emsworth Recreation Ground SINC

Toolbox Talk

- 4.1.2 All contractors will be given a toolbox talk prior to starting work which will inform them of the location of the adjacent SINC, its designation and protection measures which will be implemented on site.

Pollution Control

- 4.1.3 Exclusion fencing formed of Heras or similar affixed with debris netting shall be installed along the banks of the stream to protect the area from accidental incursion by vehicles, materials or debris.

- 4.1.4 Storage of fuel or other hazardous materials will be a minimum of 15m from the watercourse. All fuel, oil or hazardous chemicals will be kept in appropriate containers with secondary containment measures in place and spill kits available.

Controlling Erosion and Run-off

- 4.1.5 Sediment barriers will be installed along the eastern edge of the development site to minimise the risk of sediment entering the adjacent stream. Wheel wash facilities will be located well away from the adjacent stream.
- 4.1.6 If dewatering is required, pumped groundwater should be disposed of appropriately according to EA Pollution Prevention Guidelines. At no time will silty water be discharged into the adjacent watercourse.
- 4.1.7 Where possible, stripping of vegetation on site will be timed to avoid times of year where erosion is most likely (e.g. avoiding wet, windy months). Areas of bare ground will be re-seeded as soon as reasonably practicable within the scheme, with seeding of the flood attenuation basin a priority.

Discharge of Surface Water

- 4.1.8 The scheme will include a large drainage basin and swales which will collect surface water, reducing run-off from the site during the operational phase. No wastewater will be discharged into or taken from the adjacent stream at any point during the construction or operational phases.

4.2 Habitats

Protection of Retained Habitats

- 4.2.1 All trees which are to be retained will be protected during construction in accordance with BS5837:2012. The details of protection measures including tree protective fencing and ground protection are shown in detail in *LLD1726-ARB-DWG-002 Tree Retention and protection Plan* and *LLD1726-ARB-REP-001 Arboricultural Impact Assessment and Method Statement*.

- 4.2.2 No access to machinery or storage of materials will be permitted within the RPA's as at time. All fuel and other hazardous materials will be stored away from the RPA's of retained trees and with suitable spill kits available.
- 4.2.3 Secure fencing in the form of closed board or acoustic fencing will enclose rear gardens and prevent encroachment or mismanagement of boundary vegetation.

Compensation Planting

- 4.2.4 Compensation for the loss of areas of grassland will be provided through creation of a wildflower meadow to the eastern section of the site. The area will be sown with EM8 Meadow Mix for Wetlands which provides 30no. species of wildflower and grasses suitable for seasonally wet soils.
- 4.2.5 Native trees, shrubs and species-rich hedge will form the western edge of the attenuation area, forming a linear corridor which runs north-south roughly along the route of the existing dense scrub and dry ditch.

4.3 Reptiles

- 4.3.1 No reptiles were found on site; no specific mitigation measures are required. Should any reptiles be found on site during clearance or construction works then all works will cease while a Suitably Qualified Ecologist is contacted for advice.

4.4 Bats

Retention of Potential Roosts

- 4.4.1 The mature oak tree to the north-eastern corner of the site (T01) will be retained and protected within the proposals.

Retention of Commuting Routes

- 4.4.2 Access to the site is proposed through an existing gap in the vegetation to the south-east and will therefore cause no fragmentation of retained vegetation. All existing boundary vegetation is to be retained and protected within the scheme, with built form set back from the boundary features. The south-western corner of the site will be re-enforced with native trees and mixed-species hedgerow planting to create continuous lines of vegetation around the site.

Lighting

- 4.4.3 Lighting is to be designed in accordance with ILP Guidance Note 08 (2018). All light spill onto boundary vegetation is to be avoided to ensure the continued ecological functionality of these features.

4.5 Breeding Birds

- 4.5.1 The removal of dense scrub and trees will be timed to avoid the nesting season (*e.g. avoiding March – August inclusive*). Should this not be possible all vegetation will be checked by a Suitably Qualified Ecologist no more than 48 hours before removal.

4.6 Wintering Birds

- 4.6.1 Developer contributions to the Solent Recreation Mitigation Strategy (SRMS) would be provided in accordance with the local plan. The SRMS funds wardens, a programme of education, signage, bird refuges, strategic greenspaces and a monitoring programme to mitigate against adverse impacts from increased recreational disturbance.

4.7 Mammals

- 4.7.1 Excavations deeper than 1.0m will be covered overnight or will have a ramp installed to prevent trapping of any animals. All trenches will be checked each morning prior to works beginning.
- 4.7.2 Closed board fencing and garden walls within the scheme will incorporate hedgehog friendly gravel boards or will have a gap of 13x13cm cut to the base to allow movement of hedgehogs between gardens. Access gaps will be suitably signed to prevent their closure by residents in the future.

5.0 ECOLOGICAL ENHANCEMENTS

- 5.1 Proposed enhancements include provision of bird and bat boxes, wildlife friendly ornamental planting, establishment of areas of wildflower, native tree, shrub and hedge planting and a SuDS scheme (*Refer to Figure No. 01 for location of enhancements*).

Wildlife Friendly Ornamental Planting

- 5.2 Herbaceous planting as listed within RHS 'Plants for Pollinators' will be utilised within the soft landscape scheme; with a particular focus on providing varying species which flower throughout the year. The species used will increase foraging habitat for wildlife both in terms of variety and seasonality.

Species-rich Hedgerow Planting

- 5.3 New hedgerow planting is proposed to the south-western and southern boundaries of the site and the western edge of the flood storage basin. The hedges will be planted as a double row in mixed-species bundles.

Proposed Native Hedging Species:

- Dogwood (*Cornus sanguinea*);
- Hawthorn (*Crataegus monogyna*);
- Hazel (*Corylus avellana*);
- Hornbeam (*Carpinus betula*);
- Dogg Rose (*Rosa canina*).

Wildflower Grassland

- 5.4 Wildflower planting suitable for seasonally wet soils will be utilised to the swales and flood storage basin . Proposed mix includes:
- EM8 Meadow Mixture for Wetlands;
 - EM5 Meadow Mix for Loam Soils.

Native Tree and Shrub Planting

- 5.5 Heavy Standard native trees are proposed to be planted to the margins of the site and within the flood storage basin. Species to include:
- Field Maple;
 - Silver Birch;
 - Bird Cherry;
 - Hornbeam;
 - Beech;
 - Lime;
 - Rowan.

- 5.6 Shrub planting is proposed to the understory of tree lines and margins of the flood basin. Native species proposed include

- Dogwood;
- Honeysuckle;
- Hazel;
- Hawthorn;
- Grey Willow;
- Guelder Rose.

Climbing Plants

- 5.7 Climbing planting are proposed to masonry walls to provide a nectar resource for invertebrates. Plants are to be supported by a wire framework with proposed species including *Clematis montana*, *Lonicera japonica* and *Lonicera periclymenum*.

Creation of Log Piles

- 5.8 The creation of log piles will provide a food source for invertebrates and resting and hibernation habitat for common amphibians and mammals. Log piles c. 75x75cm are to be created to the edges of the flood attenuation basin. Piles are to be both horizontal and vertical stacks secured in place with wire (*if deemed necessary*).

Bird, Bat and Invertebrate Boxes

- 5.9 A number of bird and bat boxes will be incorporated into the design (*refer to Figure 01 – Ecological Enhancement Plan for location details*). These will include:

Bird Boxes:

- Integrated House Sparrow terrace to the northern aspect of 3no. buildings on site.
- 2no. integrated Swift boxes to the northern aspect of building on site;
- 3no. general purpose predator-proof nest box with 32mm entrance hole to mature trees within the site boundaries;
- 2no. Open fronted nest boxes installed within dense vegetation to the boundaries of the site.

Bat Boxes:

- 4no. integrated bat boxes will be installed to the southern aspects of new dwellings on site;
- 2no. single crevice bat boxes as supplied by Greenwoods Eco-habitats to be installed to trees to the margins of the site;
- 2no. improved cavity bat boxes to be installed to trees to the margins of the site.

Invertebrate Boxes;

- 2no. boxes suitable for solitary bees to be installed to the south-eastern aspects of trees on site.

Hedgehog Access Holes

- 5.10 1no. 'Hedgehog friendly' gravel board is to be used between each garden to provide a commuting route for hedgehogs. Access gaps to be 13x13cm

6.0 ECOLOGY ENHANCEMENT MANAGEMENT PLAN

- 6.1 In order to ensure the long-term viability of the ecological enhancement measures outlined above, detailed prescriptions for maintenance requirements and long-term management are provided within this section.

6.2 Trees, Hedges and Shrubs*Proposal*

- 6.2.1 Boundaries of the site are to be re-enforced with native hedgerow species planted in mixed-species bundles. New hedgerow planting is proposed to the - south-eastern boundary and to the western margins of the flood storage basin. Native trees are to be planted to the boundaries and eastern section of the site, with native shrubs also proposed in this area.

Planting

- 6.2.2 Planting pits shall be excavated to a depth and size that contains the plant's root system and allows the collar of the plant (*the mark on the tree where it has been growing above ground*) to be level with the top of the soil. The soil shall be carefully backfilled in layers, ensuring the plant is held upright, and each layer should be carefully firmed down.

Watering – Years 1 - 3

- 6.2.3 The plants should be watered weekly from May to September for a minimum of three years to ensure they establish.

Pruning / Trimming - Ongoing

- 6.2.4 Pruning and trimming of trees, shrubs and hedgerows should be carried out outside of the bird breeding season (*March – August inclusive*). Trees and shrubs should be checked bi-annually for shape, form and size, and pruned accordingly whilst they are still in leaf. Hedges should be cut in sections and in alternate years to allow species such as guelder rose and hawthorn to flower and fruit on the previous year's growth. Pruning of hedgerows should be carried out in such a way to achieve a dense hedgerow.

Weeding - Ongoing

- 6.2.5 Areas around the new plants should be kept clear of weeds to allow the plants to establish by weeding twice a year in the Spring and Autumn.

6.3 Wildflower Grassland*Proposal*

- 6.3.1 Areas of wildflower grassland are proposed to the swales and flood storage basin.

Sowing

- 6.3.2 The seed should be sown on nutrient depleted soil; top soil should not be used within areas which are to be sown with wildflower seed. To prepare a seed bed first remove weeds and existing vegetation using repeated cultivation or a herbicide. Then plough or dig to bury the surface vegetation, harrow or rake to produce a medium tilth, and roll, or tread, to produce a firm surface. The seed bed should then be left for 2 weeks with any weed species which germinate removed before sowing.
- 6.3.3 Seeds require warmth and moisture in order to germinate and therefore August – September and March – April are generally the best times to sow. The seed shall be sown at a rate of 2 – 4 grams / m².

Cutting– Year 1

- 6.3.4 Sown meadow wildflower and grass species are perennial; they will be slow to germinate and grow and will not usually flower in their first growing season. There will often be a flush of annual weeds from the soil in the first growing season which may grow up and obscure the meadow seedlings beneath. This annual weed growth is easily controlled by topping or mowing.
- 6.3.5 Mow newly sown meadows regularly throughout the first year of establishment to a height of 40-60mm, removing cuttings if dense. This will control annual weeds and help maintain balance between faster growing grasses and slower developing wild flowers. Spot treat weeds such as dock with herbicide application.

Cutting – Year 2 Onwards

- 6.3.6 Wildflower grassland is not to be cut or grazed from spring through to late July/August to give the sown species an opportunity to flower. After flowering in July or August take a 'hay cut': cut back with a scythe, petrol strimmer or tractor mower to c 50mm. Leave the 'hay' to dry and shed seed for 1-7 days then remove from site.
- 6.3.7 Mow or graze the re-growth through to late autumn/winter to c 50mm and again in spring if needed.

Additional Yellow Rattle

- 6.3.8 Yellow rattle (*Rhinanthus minor*) is a root hemiparasite which parasitises the roots of meadows plants such as grasses and legumes, thereby impeding their growth. The additional sowing of yellow rattle can be used after the final cut to suppress any vigorous grass growth.

6.4 Bird and Bat Boxes*Proposal*

- 6.4.1 Bird and bat boxes shall be installed within the new buildings and to hedge / trees to provide additional nesting and roosting sites within the proposed scheme.

Maintenance – Long Term

- 6.4.2 The bat boxes specified above do not require any cleaning. A visual inspection should be carried out annually to ensure the boxes are secure.
- 6.4.3 If desired, bird boxes can be emptied each autumn and cleared of any parasites using boiling water. Boxes should be checked annually to ensure they remain secure.

6.5 Log Piles*Proposals*

- 6.5.1 The creation of log piles within areas of wildflower planting would provide a food source for invertebrates and resting and hibernation habitat for common amphibians and mammals.

Creation and Maintenance

- 6.5.2 The log piles are to be constructed from piling logs horizontally or vertically. Log piles can be created using any type of wood. The piles should be checked annually for their integrity and topped up with new wood as necessary.

7.0 CONCLUSION

- 7.1 The above mitigation, compensation and enhancement has been designed to ensure continued the favourable conservation status of protected species in the local area, and protection of the adjacent SINC. Mitigation as detailed will ensure that development proceeds in accordance with all relevant wildlife legislation including The Wildlife and Countryside Act 1981 (*as amended*), The Conservation of Habitats and Species Regulations 2017 (*as amended*) and The Protection of Badgers Act 1992.
- 7.2 The enhancement measures proposed will provide habitat for invertebrates, bats, birds, amphibians and reptiles within the scheme. Detailed management prescriptions as detailed above shall be followed to ensure appropriate management and the long-term success of the scheme.

8.0 REFERENCES

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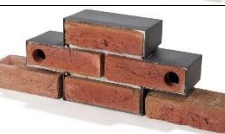
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Bird / Bat / Invertebrate Box Specifications:

Item	Installation / Specification	Example Image
Vivara Pro Barcelona Woodstone Open Nest Box (produced by CJ Wildlife)	2no. boxes to be installed to within dense vegetation at a minimum height of 1.5m.	
Vivara Pro Seville 32mm Woodstone Nest Box (produced by CJ Wildlife)	3no. boxes to be installed to the northern aspect of mature trees at a height of 2 – 3m.	
Single Crevice Bat Box (produced by Greenwoods Ecohabitats)	2no. boxes to be installed to the southern aspect of trees to the boundaries of the site at 3-6m height.	
Improved Cavity Bat Box (produced by The Nestbox Co.)	2no. boxes to be installed to the southern aspect of trees to the boundaries of the site at 3-6m height.	
Integrated Bat Box (produced by Bird Brick Houses)	4no. installed to the south facing walls to the new buildings. Box to be clad to match proposed.	
Integrated Swift Box (produced by Bird Brick Houses)	2no. installed to the northern wall of the new building with minimum of 5m clear drop beneath. Box to match proposed wall finish.	
Integrated Sparrow Terrace (produced by Bird Brick Houses)	3no. installed to north facing walls. Boxes to be clad to match proposed.	
Woodstone Insect box (produced by CJ Wildlife)	2no. insect boxes suitable for solitary bees to be installed to the south-eastern aspect of trees, adjacent suitable vegetation.	
Log Pile	75x75 cm log pileS created with minimum 100mm diameter logs. Piles to be formed either horizontally or vertically.	

Bird / Bat / Invertebrate Box Specifications:

Hedgehog Friendly Gravel Board	1no. gravel board to be installed between each garden to allow free movement of hedgehogs around the site.	
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Figure No. 01 – Ecological Enhancement Plan