

Ecological Design Strategy

Land at Dapper's Lane, Angmering

Report for GD Group

September 2019

Our Ref: WS166



Quality Assurance

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About Us

Bakerwell Limited has two offices, led by directors Fiona Baker and Donna Popplewell. The Directors have collectively 16 years' experience in the ecological consultancy industry, hold relevant degrees, are qualified botanists, and are trained in the use of biodiversity metrics to calculate no net loss/gain.

All staff are members, or training to be members, of the professional body for the environmental industry, the Chartered Institute of Ecology and Environmental Management (CIEEM) and hold Natural England European protected species licences for great crested newts, bats and dormice. Bakerwell Limited has SMAS Worksafe Health and Safety Accreditation; all staff hold relevant CSCS cards.

Bakerwell Limited is a consultancy specialising in ecological planning advice and surveys. Bakerwell also work in collaboration with trusted associates to provide Landscape Architecture, Arboriculture and Energy assessments.



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Figure 1: Mitigation and Enhancement Measures

Site: Dapper's Lane, Angmering
 Date: September 2019
 Job: WSBN18 166
 Author: MS
 Reviewer: FB

Key

 Red Line Boundary

Proposed Mitigation and Enhancement Measures

 Bat Box

 Bat Brick

 Schwegler 3SV Bird Box

 Log Pile

 Conservation/Wildflower Cut Areas

 Retained and Enhanced Wildlife Area

 Dark Corridor for Bats

0 10 20 30 m

Approximate Scale

bakerwell
 ecological expertise

Contains Google Satellite data © Crown
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1 Introduction

- 1.1 Bakerwell Limited were commissioned by GD Group to design an Ecological Design Strategy for the Proposed Development for Land at Dapper's Lane, Angmering, Littlehampton, West Sussex, BN16 4EN (hereafter referred to as the site).
- 1.2 Planning permission Ref: A/42/16/OUT was granted by Chichester District Council (CDC). This report has been provided to meet condition 14 which states:

"No development including site access, demolition or associate construction activities shall take place on the site unless and until full details of the mitigation and enhancement identified in Section 4 and 5 of Ecological Appraisal as well as timeline of implementation has been approved by the Local Planning Authority.

- 1.3 The site is located in Littlehampton central OS grid reference TQ 07332 05057. The site lies to the west of Dapper's Lanes and is approximately 1.15ha in area. The site is largely comprised of horse paddocks and residential garden space, bordered by scattered dense scrub and broadleaf treelines. The red line boundary of the site is bounded by a car garage and a cattery to the south, arable fields to the east and residential areas to the west and a plant nursery to the north. The A27 occurs approximately 500m to the north.
- 1.4 The proposed development comprises seventeen (new) residential dwellings with associated parking, landscaping and access from Dappers Lane. The site also includes the original house located in the southwest corner.
- 1.5 The EDS provides detailed mitigation and enhancement measures to be included in the proposed development, as well as details of the ongoing maintenance of the enhanced and retained habitats.

2 Ecological Background

2.1 A Preliminary Ecological Appraisal was undertaken by The Ecology Partnership in March 2016. This report was submitted to support the planning application and provided the following information which together with recent site visits (see Section 3) informs this EDS:

- Areas of ancient woodland occurred within 2km of the site.
- The most ecologically significant habitat on site was the mature trees, though the semi-mature trees, scrub and tussocky grassland were also notable.
- The site was found to have habitats present with the potential to support reptiles and breeding birds.
- A reptile presence survey was undertaken in the summer of 2016 and no reptiles were recorded.
- Of the trees on site, only one semi mature horse chestnut (T6) was found to have moderate potential to support roosting bats.
- The house, outbuildings and stables were considered to have low bat roosting potential. A bat survey of the house was undertaken. No evidence of bats was recorded in the buildings on site.
- The dusk emergence survey found bat activity levels were generally low. Common pipistrelles *Pipistrellus pipistrellus* and soprano pipistrelles *Pipistrellus pygmaeus* were recorded commuting and foraging along the treelines and occasionally in the southern garden. A serotine *Eptesicus serotinus* was recorded commuting over the site.
- No evidence of badgers *Meles meles* was found on site, however an active badger sett occurs 260m to the east.
- No evidence of dormice was found on site. Dormice *Muscardinus avellanarius* were recorded in 2015 in ancient woodland to the east of the site, but any possible connecting habitat is highly fragmented and of poor quality for dormice.
- No evidence of GCN *Triturus cristatus* or ponds occurred on or within 300m of the site.

3 Ecological Updates

- 3.1 The site was visited by Michael Smith BSc on 8th August 2019 to assess the habitats present, potential for protected species and current condition of these. The aim of this visit was to assess the likely ecological impacts of the development given the current potential.
- 3.2 It was concluded that the ecological condition of the site has not changed since the surveys in 2016 described in reports to support the planning application, please refer to the these for detailed descriptions. The site comprises horse paddocks and garden space with scattered trees and dense scattered scrub.
- 3.3 The horse chestnut with moderate bat roosting potential T6 will be retained. Lighting mitigation will be detailed within this EDS.
- 3.4 Previous surveys in 2016 did not record any bats emerging from the buildings on site, and the buildings currently have negligible potential to support bats.
- 3.5 The scrub, tussocky grassland areas and log pile on site provide suitable habitat for reptile foraging and basking. However, this condition has not changed since 2016 and reptiles were found to be absent during surveys. The site is not well connected to other suitable areas, therefore, the likelihood of reptiles being present has not increased.
- 3.6 The trees, shrubs and dense scrub present on site provide nesting and foraging opportunities for birds.
- 3.7 It is possible that other species such as hedgehogs, badgers and invertebrates such as stag beetles use the site with suitable foraging habitat currently present, and potential nesting areas in the form of a log pile and scrub present.
- 3.8 The mature scattered tree and treelines represent the habitats of highest ecological value, the majority of these will be retained as detailed in the Arboricultural Method Statement (AMS). To facilitate site access widening entry road is required, this requires the loss of a line of mature broadleaf trees occurring beside the existing access.

4 Ecological Constraints

- 4.1 Tree T6, horse chestnut located on the western site boundary within garden of the house to be retained. No bat surveys were carried out of this tree as it is due to be retained. Should any future works to the tree be required, such as trimming, crown lifting or felling for health and safety, bat surveys will be required. A check of features at height using an endoscope will inform the need for emergent and re-entry surveys. Should bat roost/s be found a Natural England (NE) protected species mitigation licence (EPSML) may be required if works would take place while bats are present, or if the roost will be lost.
- 4.2 The current condition of the buildings present is similar to those in 2016 with negligible roosting potential. As three species of bat were recorded using the site in 2016, there remains a low risk of bats being present during works. Therefore, guidance as per the recommendations from the CDC, and detailed within the Bat survey Report (Ecology Partnership, 2016) the buildings to be demolished will be soft stripped under ecological supervision as detailed in Section 8.
- 4.3 The proposed development is adjacent to a mature treeline, bats were recorded commuting and foraging within and adjacent to the red line boundary, therefore lighting for the proposal will follow guidance provided in Section 8
- 4.4 Nesting birds were noted on various survey visits, including a woodpigeon in the north western corner and a house martin in the westernmost stable. If any vegetation is to be removed, it should be done so outside of the bird nesting season, (September to February inclusive). If removal is required within nesting season (March to August inclusive), it must be supervised by an ecologist.
- 4.5 The site is suitable for hedgehog, badgers and invertebrates such as stag beetles, precautionary methodology and enhancement for these species is detailed in Section 8.
- 4.6 Loss of trees to facilitate access will affect sections of G1 (hornbeam) and G2 (Elm, cherry and bramble) reduce nesting and invertebrate habitat, this will be mitigated following the methodology given in Section 8.

5 Aims and Objectives

- 5.1 The aim of the EDS is to provide detailed specifications of the measures to be taken to avoid and mitigate harm to protected species from the proposed development. It also details measures to enhance the area for biodiversity.

Specifically, objectives are to:

- Confirm the measures to be taken to avoid and mitigate harm to protected species;
- Provide specifications for compensatory measures for protected species;
- Detail methodology for habitat removal;
- Comply with relevant wildlife legislation and the National Planning Policy Framework (NPPF) relating to the species potentially present;
- Maintain and enhance the retained ecological features of the site;
- Ensure the ongoing quality of all new biodiversity features;
- Confirm management methodology of ecology features;
- Provide proportional monitoring measures

6 Responsibilities

- 6.1 The responsibility for the completion of the mitigation and enhancement measures will fall to the applicant who will appoint the necessary contractors to complete the works.
- 6.2 Contact details will be confirmed to Chichester District Council prior to the implementation of development, once all personnel are confirmed.

Table 1: Showing Responsible Persons

Responsible Person	Company	Email	Phone
Applicant	GD Group		
Residential Site Manager	GD Group		
Client Ecologist	Bakerwell Limited		

7 Ecological Justification of Appropriate EDS

- 7.1 The site is located in the village of Angmering situated amongst residential and business areas to the north, east and south, and arable land to the east.
- 7.2 The site currently has limited potential to support a diverse range of wildlife, being comprised primarily of heavily grazed horse paddock and residential garden space. The ecological value of the site is predominantly derived from the mature trees and scrub, which provides some suitable habitat for several invertebrates, mammals, bats and birds.
- 7.3 The ecological condition of the site has not changed since the surveys undertaken in 2016. Therefore, the precautionary measures required by the planning conditions are still applicable.
- 7.4 The proposed development has the potential to improve the site for wildlife by mitigating against any damage to wildlife and enhancing the habitat through the improvement and creation of features of greater value to local species.
- 7.5 The mitigation hierarchy is a tool used to limit the negative impacts of development projects on biodiversity and should be considered during the design of any development. The hierarchy follows sequential steps, these are; to avoid adverse effects on biodiversity when and where possible, and where adverse effects cannot be avoided through design, mitigation measures will be implemented to minimise the negative impact. In exceptional cases, where avoidance and mitigation are not possible, compensation measures will be considered. Alongside the efforts to avoid, mitigate or compensate for the negative impacts of the development, opportunities to enhance the ecological value of the site will be considered.

Bats

- 7.6 There is potential for bats to be foraging and commuting across the site. Lighting considerations will be taken into account during the construction phase of development to ensure light spill over likely commuting and foraging areas is avoided or within limits acceptable to bat activity. The existing outbuildings and stables will be demolished following a precautionary soft strip methodology as described in Section 8 under ecological supervision.

Birds

- 7.7 The hedges, scrub and trees on site provide habitat potential for nesting birds. An appropriate, precautionary methodology is described below to ensure the possibility of harm to birds during construction activities is minimized.

Badgers and hedgehogs

- 7.8 There is potential for both badgers and hedgehogs to use the site. Data from bighedgehogmap.org, a website run by the People's Trust for Endangered Species and the British Hedgehog Preservation Society, shows a public sighting of a hedgehog within 200m of the proposed development from 2019.
- 7.9 Previous surveys showed a record of an active badger sett approximately 260m to the east. The National Biodiversity Network shows a record of a roadkill badger from 2016, approximately 2.6km to the west. An appropriate, precautionary methodology is described in Section 8 to ensure badgers and hedgehogs are not harmed during construction activities.

Stag beetles

- 7.10 There is potential for stag beetles and other invertebrates to forage and breed on site. The National Biodiversity Network has several recent records of stag beetle occurring within 1 kilometre of the site, with the closest approximately 50m to the west recorded in June 2018. An appropriate, precautionary methodology is described in section 8 to ensure stag beetles and their breeding places are not harmed during construction activities.

Habitats

- 7.11 The trees and hedges have intrinsic ecological value, the Arboriculture Impact Assessment (AIA) and AMS describes the works to be undertaken to protect the trees and hedges to be retained in detail.

SuDs Scheme

- 7.12 The proposal includes a Sustainable Urban Drainage Scheme. An ecological section has been provided for the SuDS Management Plan, this should be referred to for full details.

8 Mitigation and Enhancement Strategy

Multi-Species Enhancements

- 8.1 Enhancements for specific species are given below. Enhancements which are beneficial for a greater number of species are given here. Timing for the implementation of measures detailed below will be given section by section. However, this broadly falls into three timeframes:
- Pre-construction site preparation
 - Construction
 - Occupation

8.2 Where green space is available outside of residential gardens, within the wildlife corner and verges, wildflower and grassland meadow species will be planted to increase floral, and consequently faunal, diversity to the site. An area approximately 500-1000mm adjacent to roads and paths will be formed of amenity grassland to engender a sense of neatness and to avoid disruption to wildlife areas. As the site occurs near to the South Downs, chalky or limestone specialist species of local provenance will be used. The SuDs scheme will include suitable plants that can stand a period of inundation. This work will be undertaken during landscaping work as part of the construction phase. The following Emorsgate Seeds mixes are recommended:

- EM6 – Meadow Mixture for Chalk and Limestone Soils
- EN1F – Special Pollen and Nectar Meadow Mixture
- EP1F – Plants suitable for pond and stream banks

8.3 Three large log piles will be created in the wildlife corner shown in Figure 1. Exact locations will be south facing, unshaded, grassland areas to provide breeding, refuge and foraging habitats for a wide variety of species within the garden of the retained house. The logs will be of local provenance, ideally slow decaying hardwood species. Wood from site pruning works would be preferred. The log pile will be stacked and secured as shown in Appendix 2. This will be undertaken during the pre construction site preparation phase.

8.4 To mitigate for the loss of the trees and scrub, planting to the boundaries will have a number of standard trees and new garden boundaries to some gardens as shown in the landscape plan will be formed of hedge planting comprising native fruit or seed-bearing species hedge planting undertaken during landscape works during construction. These will provide feeding opportunities for wildlife, bird nesting and bat commuting flight lines. Examples of native and wildlife-beneficial shrub species suitable for the planting are shown in Table 2.

Table 2. Native tree species recommended for hedge planting

Common Name	Latin Name
Hawthorn	<i>Crataegus monogyna</i>
Blackthorn	<i>Prunus spinos</i>
Field Maple	<i>Acer campestre</i>
Wild Privet	<i>Ligustrum vulgare</i>
Wild Cherry	<i>Prunus avium</i>
Bird Cherry	<i>Prunus padus</i>
Alder	<i>Alnus glutinosa</i>
Guelder Rose	<i>Viburnum opulus</i>
Spindle	<i>Euonymus europaeus</i>
Juneberry	<i>Amelanchier lamarcki</i>

- 8.5 Trees will be planted between November and February for maximum chance of health and survival, any that fail to flourish during the first five years will be replaced. These will be surrounded by a deep mulch and watered as necessary.

Bats

- 8.6 Bats and their roosts are protected under the EU Habitats Directive (transposed into UK law as the Conservation of Species and Habitats Regulations 2010), and the Wildlife and Countryside Act 1981 (as amended). This protects bats from killing, injury, capture and disturbance of their roosts from damage, destruction and obstruction.
- 8.7 Bats are likely absent from the site; none were found during previous surveys, and the buildings offer negligible roosting potential. However, there has been a delay since surveys and low potential remains. Therefore, a soft strip demolition of the building will adopted as a precaution, as per the comments from the Chichester District Council.
- 8.8 The following features will be removed using hand tools following a check by and under the supervision of a suitably qualified and licenced ecologist (or accredited agent of such):
- Roof tiles/roof material, soffits, guttering and any window fixtures
 - Removal of existing brick and cement infill between timber beams
 - Removal of internal brickwork facing or wooden cladding in areas of bat roost potential
- 8.9 Roof tiles /roof material, soffits, guttering and any window will be carefully and slowly removed one by one. Each tile will be turned over to check for bats and the cavity below checked for bats, or evidence of bats such as droppings, before the removal of the next tile.
- 8.10 Removal of brick and cement will be completed slowly and carefully using hand tools. The removal will be completed by carefully removing a corner of the outer wall. A secondary check will then be completed of any cavity opened up by an ecologist with an endoscope. Where feasible and safe an opening will be made in the wall and then removal of the remaining wall will work in a direction towards the hole as a final in a precautionary manner, allowing an escape route for any bats not seen during endoscope checks. Once removal of brick and cement has been completed in the first wall, works will continue onto the next wall.
- 8.11 Removal of internal brick work facing or wooden cladding will be completed as above. A secondary check will be conducted by an ecologist following removal of a portion of the internal wall. The brickwork will then be removed in a directional manner towards a previously opened up hole, providing an escape route for bats.
- 8.12 Once the above features have been removed and the ecologist has confirmed there are no remaining features which require supervision, the remaining renovation works can be completed without an ecologist present. In the event the contractors believe that bats may have re-entered the building, or that bats are found, works will cease and advice sought from the named ecologist before works can recommence.

- 8.13 Due to the use of the site by foraging and commuting bats, the lighting scheme will ensure there is no excess light spillage; lighting should reach no more than 1-2m in height on to trees and other potential features (ILP & BCT, 2018). The lighting strategy will include use of baffles/downward facing lights, or low wattage lights with limited lighting within the UV spectrum to make this possible. A 0.4 lux (vertical plane) - 0.2 lux (horizontal) is recommended for dark buffer as it is within the range of light that light averse bat species hunt within. Security lights will be motion censored and timed to be on for as short a time as possible.
- 8.14 The Bat Conservation Trust (BCT) and Institution of Lighting Professionals (ILP) have produced guidance regarding lighting and bats, this can be accessed <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>.
- 8.15 Enhancement will consist of five bat bricks to be incorporated into the brickwork of the residential buildings or garages during construction, and three bat boxes on trees, see Figure 1 for indicative positioning. The bricks will be Ibstock Bat Access Bricks or similar. The boxes will be Bird Brick Houses Bat Box or similar. These will be installed at a height of at least 3m, with an unobstructed access point and on a southerly aspect where possible, facing away from the prevailing winds. Research into bat mitigation by The University of Exeter and the Chartered Institute of Ecology and Environmental Management (2018) has shown bats are unlikely to use bat boxes where less than five are installed as bats roost transiently, requiring several to be available at a time to facilitate roost selection based on weather conditions and the other factors.
- 8.16 Further enhancements benefiting bats are the additional hedge planting, log piles and wildflower planting given in Section 8.2, 8.3 and 8.5. These enhancements will provide improved roosting, foraging, commuting and feeding opportunities for bat species.

Breeding Birds

- 8.17 All active bird nests are protected under the WCA 1981 from damage and destruction. Furthermore, birds that are listed on Schedule 1 of the Act are protected from disturbance at all times.
- 8.18 The areas of dense scrub, the treelines and hedges present on site provide suitable nesting habitat. The majority of hedges and treelines will be retained, the dense areas of scrub are proposed for removal.
- 8.19 A number of trees, hedge and scrub areas have been identified within the application for removal and pruning works. Where possible these works will avoid the bird nesting season, March to August inclusive. Should it not be possible to avoid this period, works will be completed under the supervision of a suitably qualified ecologist during the pre construction site preparation phase.

- 8.20 The ecologist will carry out a check for bird's nests no less than 24 hours before works are due to start. Any active nests will be marked out with an exclusion zone appropriate to the species. No works will take place in this area until the ecologist has confirmed that the young have fledged.
- 8.21 Where trees or scrub are dense the ecologist will carry out a period of observation. Should birds be observed carrying out nesting behaviour, returning regularly to a specific location within the scrub, carrying nesting material or food, pair behaviour etc, the ecologist will mark out an exclusion zone as above. If no such behaviour is observed a precautionary methodology will be carried to remove scrub in small stages under ecological supervision, between localised searches for nests by the ecologist.
- 8.22 As per the Chichester District Councils six bird nesting boxes will be supplied to mitigate for the removal of dense scrub and will be erected during pre construction. Three schwegler 3SV bird nest boxes will be erected on mature trees around the development site. One schwegler 1SB and two schwegler 9A will be incorporated into the buildings.
- 8.23 The nest boxes will be placed at least 3m high, avoiding direct southern and northern aspects to minimise overheating/cooling. Care should also be taken to avoid artificial light spill on nest boxes, see Figure 1 for indicative positioning.
- 8.24 The site will be further enhanced for birds through the provision of log piles and wildflower planting given in Section 8.2 and 8.3. These enhancements will provide improved foraging and feeding opportunities for the species.

Hedgehog and badgers

- 8.25 Hedgehogs are partially protected under the Wildlife and Countryside Act 1981, whilst badgers and their setts are protected in the UK under the Protection of Badgers Act 1992. There are no badger setts on site, but there is potential for both badgers and hedgehogs to forage on site, as well as the potential for hedgehogs to nest in the scrub vegetation. Therefore, any areas where hedgehogs could be sheltering within the construction footprint will be dismantled by hand under a precautionary methodology during the pre construction site preparation phase. Any mammals or reptiles found at this point will be translocated to suitable habitat in the wildlife corner, see Figure 1. Excavations during the construction phase of the development will be covered overnight, or planks of wood will be placed so as to enable any animals which may fall to escape.
- 8.26 Fences (both new and retained) will have a 13x13cm gap cut at the base to allow hedgehogs to move across the site. Including any fences between residential gardens.
- 8.27 The site will be enhanced for hedgehogs and badgers through the provision of the wildflower planting and the log piles. These enhancements will provide improved foraging and feeding opportunities for both species.

Reptiles

- 8.28 All British reptiles are protected from intentional capture, killing, injury or sale under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).
- 8.29 Although no reptiles were found in the 2016 surveys, the site has some potential for reptiles to be present, and therefore the construction poses a possibility of killing, injury and disturbance to reptiles. For the development to proceed, reasonable effort must be made to avoid contravening the legal protection afforded to reptiles. A precautionary methodology will be followed for works to potential hibernation habitats, the log pile and dense scrub. The log pile will be dismantled by hand using hand tools only. This will be completed while reptiles are active (March to September inclusive, extended to October if weather conditions are suitable). Any mammals or reptiles found at this point will be translocated to suitable habitat provided in the wildlife corner, located in the western corner of the retained residential buildings garden, see Figure 1.
- 8.30 The existing logs will be repositioned in the wildlife corner, forming three log piles as detailed in Section 8.3. These enhancements will provide improved foraging and feeding opportunities for reptile species.

Stag Beetles

- 8.31 Stag beetles are partially protected under the Wildlife and Countryside Act 1981, listed on Schedule 5 as a "priority species". Several recent records of stag beetles occur within 500m of the area. The existing firewood log pile on site occurs on hardstanding so is currently suboptimal for use by breeding stag beetles. However, it does have the potential to be supporting other invertebrates, the log pile will be dismantled by hand to ensure to reduce the likelihood of injuring any species sheltering here. The logs will be transported to the wildlife corner and restacked.
- 8.32 The site will be enhanced for stag beetles by the creation of three proposed log piles, detailed in section 8.3. This will provide a good breeding and foraging habitat for the local stag beetle population and other invertebrates.

Trees

- 8.33 All trees will be retained as part of the landscaping scheme. Retained trees will be protected by Tree Protection Fencing (TPF) to standard BS5837, which will be erected prior to the start of construction. In summary, tree protection fencing will protect the root protection areas (RPA), any works within or adjacent to these areas, service trenches etc. will be supervised by an arboriculturalist. Should works be carried out adjacent to trees, the advice of an arboriculturalist will be followed to create root protection areas. TPFs will be erected prior to any site work and will remain in place until the completion of all construction and landscaping. Materials will not be stored within or against the TPF at any time. The retention and protection of retained trees will be secured through the development phases by measures carried out to meet Section 4 of the Decision Notice which states:

“A pre-commencement Site Meeting is to take place between the Arun DC Tree Officer and the Arboricultural Consultant representing the site owners - at this meeting all protective fencing will be inspected along with ground protection measures - they will be assessed to verify that they are 'Fit for Purpose' as required under British Standard 5837:2012 and have been erected and positioned exactly as shown on the Tree Protection Plan as required to be submitted and approved by the Local Planning Authority.

· A schedule of Site Monitoring/Supervision visits and Reporting Procedures prepared by an Arboricultural Expert will be required and their extent will be agreed on at the site meeting to the satisfaction of the Arun DC Tree Officer.

· If there is deemed to be a need for any Utility Service Route connections to bisect retained tree Root Protection Areas/Zones then prior to their installation a Method Statement prepared by an Arboricultural Expert must be submitted that stipulates how this can be achieved without adverse impact on tree roots. Written approval and confirmation of acceptance of this Methodology must be issued before any works are commenced out on site.

Reason: To comply with BS5837 and to ensure that retained trees are afforded due respect and appropriate levels of protection such that their ongoing health and vitality is not compromised and they can continue to enhance the landscape and amenity of the area. It is considered necessary for this to be a pre-commencement condition to ensure that the trees on site are not irreversibly harmed in accordance with the NPPF.”

9 Management Plan

- 9.1 Management of the retained and introduced biodiversity features will be carried out to ensure that these features remain a functioning benefit of the planning proposal. The management will be ongoing in perpetuity.

Amenity Grassland

- 9.2 Amenity grassland planting as per the Landscape plan will line the immediate area 500mm – 1000mm alongside roads, this will be managed using a bi-monthly cut to 50mm in height.

Wildflower Meadow Planting

- 9.3 The verges, non-residential garden space and the wildlife corner will be seeded with a wildflower grassland meadow mix as detailed in Section 8. To prepare these areas topsoil will need to be removed and the ground graded in preparation for receiving the seed mix. Follow Emorsgate guidance on planting times and ground preparation.
- 9.4 The seeded areas will require initial regular watering to ensure successful establishment. During the first growing season a quarterly cut should be carried out to manage dominant species such as nettle, dock and thistles.
- 9.5 Once established the wildflower meadow areas will be cut twice per year between October and February to avoid the plant flowering season to increase floral biodiversity and seedstock re-entering the soil. These areas should not be cut lower than 15cm to increase the suitability for a range of species including herpetofauna, invertebrates and small mammals.

SuDs

- 9.6 Emergent plants will need management periodically to ensure waterways do not become clogged. However, wildlife can be harmed if dredging is not carried out sensitively. Once planting has established an annual management programme will be carried out to dredge a quarter of the waterway each year. This will be carried out by hand or using a digger with a small bucket. Vegetation will be removed from the watercourse and set on the bank for at least 24 hours to allow wildlife a chance to re-enter the watercourse. The removed vegetation mater will be added to a compost pile on site or removed and disposed of appropriately.

Log Piles

- 9.7 An annual check of the status and condition of the log pile will be carried out with additional logs being added as required. Grass cutting will avoid the area within 1m of the log pile to provide continuous covers for wildlife.

Hedges and Treelines

- 9.8 Retained hedges and treelines will be only be pruned outside of the bird nesting season (March – August inclusive) to avoid damage and destruction of birds' nests.

- 9.9 Any new native hedge planting will follow an initial management plan to ensure healthy establishment. This will include weed control and firming of soil to encourage rapid establishment of newly planted hedges. Herbicides, pesticides and fertiliser use should be avoided where possible; an alternative is to carry out 'halo' cutting of weeds around each trees base. The use of Miccorhizal fungi placed beneath the trees when planted aids the natural establishment process, negating the need for fertilizers.
- 9.10 Following planting the top and sides of the hedgerow plants shall be pruned 'faced up' as required during the first two years to create a dense compact hedge. In year 3 once the hedge plants are established (dense enough to be suitable for nesting birds) cutting will take place outside of the bird nesting season March – August.
- 9.11 Where possible trimming of any new native hedge planting will be carried out on a three-year rotation following DEFRA guidelines (DEFRA, unpublished). A different 1/3 of the hedge area will be cut each year. This will allow 2/3 to flower and fruit each year providing foraging opportunities for mammals and birds. A more regular cut may be required in areas adjacent to footpaths/roads to allow these to remain open.
- 9.12 Laying of hedgerows should be considered where the growth is consistently of the correct age, which for newly planted hedgerow will be approximately after ten to fifteen years of growth. Mulch around trunk and weed for the first year to allow trees to establish.

10 Health and Safety

- 10.1 Working on the site carries a number of risks. The landowner will be responsible for drawing up a health and safety risk assessment which will be updated every year. The site will be managed to comply with all Health and Safety Executive approved codes of practice and health and safety legislation. The managing agent will be responsible for ensuring that the annual risk assessment takes into account the effectiveness of all control measures.
- 10.2 The landowner will be responsible for ensuring that accidents and incidents which occur on the site are reported to the relevant enforcing authority as required by the Reporting of Injuries, Disease and Dangerous Occurrences Regulations 1995.

11 Monitoring

- 11.1 The responsibility for monitoring the ecological features as described in Section 8 will fall to the applicant who will monitor these features for 5 years from the completion of the proposal. This will include monitoring the condition of the enhancements, such as log piles, bat boxes and bird boxes to ensure that they continue to function. Any damaged features must be replaced as necessary. Where bat boxes require removal/repair or replacement a bat licenced ecologist should first check to ensure no roost is present. As bat roost are protected in legislation.
- 11.2 The log piles will be monitored to ensure they remain stable and in a sunny position. Shading vegetation will be cut back, and the pile supplemented with new, native species logs if necessary. Old logs will not be removed, these will instead be left to decompose naturally to encourage the local stag beetles to breed here.
- 11.3 The applicant should revisit the EDS annually to ensure that the management is following the methodology laid out in Section 9 Where there are concerns that the management is incorrect or not meeting the aims and objectives set out in the EDS, an ecologist should be consulted and review of the management carried out to inform any changes.
- 11.4 Any changes to the management regime should be recorded and full justification given in a revised EDS to be provided to the LPA for their approval.

12 Conclusion

- 12.1 This Ecological Design Strategy details the measures to be taken to safeguard protected species at Dapper's Lane, Angmering. Providing the mitigation detailed in Section 8 is implemented the approved development will remain compliant with relevant biodiversity legislation. In the context of Chapter 15 of the NPPF the enhancements and management in Section 8 and 9 of this report will ensure the approved development will remain compliant with this policy, ensuring the longevity and potential increase in the biodiversity present.

13 References

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14 Appendices

Appendix 1: Emorsgate Wildflower Mixes

Appendix 2: Log Pile Diagram

Appendix 3: Mitigation and Management Schedule

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Appendix 1. Emorsgate Wildflower Mixes

Mixture EM6 and EN1F contains wild flowers suitable for chalky soils and specifically beneficial to pollinators respectively.

EM6 – Wildflower Mixture for Chalk and Limestone Soils

Latin Name	Common Name
<i>Achillea millefolium</i>	Yarrow
<i>Anthyllis vulneraria</i>	Kidney Vetch
<i>Centaurea nigra</i>	Common Knapweed
<i>Centaurea scabiosa</i>	Greater Knapweed
<i>Clinopodium vulgare</i>	Wild Basil
<i>Daucus carota</i>	Wild Carrot
<i>Galium verum</i>	Lady's Bedstraw
<i>Knautia arvensis</i>	Field Scabious
<i>Leontodon hispidus</i>	Rough Hawkbit
<i>Leucanthemum vulgare</i>	Oxeye Daisy
<i>Lotus corniculatus</i>	Birdsfoot Trefoil
<i>Onobrychis viciifolia</i>	Sainfoin
<i>Origanum vulgare</i>	Wild Marjoram
<i>Plantago media</i>	Hoary Plantain
<i>Poterium sanguisorba</i> - (<i>Sanguisorba minor</i>)	Salad Burnet
<i>Primula veris</i>	Cowslip
<i>Prunella vulgaris</i>	Selfheal
<i>Ranunculus acris</i>	Meadow Buttercup
<i>Ranunculus bulbosus</i>	Bulbous Buttercup
<i>Scabiosa columbaria</i>	Small Scabious
<u><i>Briza media</i></u>	<u>Quaking Grass (w)</u>
<u><i>Carex flacca</i></u>	<u>Glaucous Sedge</u>
<u><i>Cynosurus cristatus</i></u>	<u>Crested Dogstail</u>
<u><i>Festuca ovina</i></u>	<u>Sheep's Fescue</u>
<u><i>Festuca rubra</i></u>	<u>Slender-creeping Red-fescue</u>
<u><i>Koeleria macrantha</i></u>	<u>Crested Hair-grass (w)</u>
<u><i>Phleum bertolonii</i></u>	<u>Smaller Cat's-tail (w)</u>
<u><i>Trisetum flavescens</i></u>	<u>Yellow Oat-grass (w)</u>

EN1F – Special Pollen and Nectar Meadow Mixture

Latin Name	Common Name
<i>Achillea millefolium</i>	Yarrow
<i>Centaurea nigra</i>	Common Knapweed
<i>Centaurea scabiosa</i>	Greater Knapweed
<i>Daucus carota</i>	Wild Carrot
<i>Echium vulgare</i>	Viper's Bugloss
<i>Eupatorium cannabinum</i>	Hemp Agrimony
<i>Galium verum</i>	Lady's Bedstraw

<i>Knautia arvensis</i>	Field Scabious
<i>Leontodon hispidus</i>	Rough Hawkbit
<i>Leucanthemum vulgare</i>	Oxeye Daisy
<i>Lotus corniculatus</i>	Birdsfoot Trefoil
<i>Malva moschata</i>	Musk Mallow
<i>Onobrychis viciifolia</i>	Sainfoin
<i>Origanum vulgare</i>	Wild Marjoram
<i>Primula veris</i>	Cowslip
<i>Prunella vulgaris</i>	Selfheal
<i>Pulicaria dysenterica</i>	Common Fleabane
<i>Ranunculus acris</i>	Meadow Buttercup
<i>Rhinanthus minor</i>	Yellow Rattle
<i>Silene dioica</i>	Red Campion
<i>Taraxacum officinale</i>	Dandelion
<i>Trifolium pratense</i>	Wild Red Clover
Latin name	Common name
<i>Achillea ptarmica</i>	Sneezewort
<i>Angelica sylvestris</i>	Wild Angelica
<i>Caltha palustris</i>	Marsh Marigold
<i>Eupatorium cannabinum</i>	Hemp Agrimony
<i>Filipendula ulmaria</i>	Meadowsweet
<i>Geum rivale</i>	Water Avens
<i>Hypericum tetrapterum</i>	Square-stalked St John's Wort
<i>Iris pseudacorus</i>	Yellow Iris
<i>Lotus pedunculatus</i>	Greater Birdsfoot Trefoil
<i>Lycopus europaeus</i>	Gypsywort
<i>Lythrum salicaria</i>	Purple Loosestrife
<i>Mentha aquatica</i>	Water Mint
<i>Pulicaria dysenterica</i>	Common Fleabane
<i>Ranunculus acris</i>	Meadow Buttercup
<i>Scrophularia auriculata</i>	Water Figwort
<i>Scutellaria galericulata</i>	Skullcap
<i>Silene flos-cuculi</i> - (<i>Lychnis flos-cuculi</i>)	Ragged Robin
<i>Succisa pratensis</i>	Devil's-bit Scabious
<i>Vicia cracca</i>	Tufted Vetch
Latin name	Common name
<i>Achillea ptarmica</i>	Sneezewort
<i>Angelica sylvestris</i>	Wild Angelica
<i>Caltha palustris</i>	Marsh Marigold
<i>Eupatorium cannabinum</i>	Hemp Agrimony
<i>Filipendula ulmaria</i>	Meadowsweet
<i>Geum rivale</i>	Water Avens
<i>Hypericum tetrapterum</i>	Square-stalked St John's Wort
<i>Iris pseudacorus</i>	Yellow Iris
<i>Lotus pedunculatus</i>	Greater Birdsfoot Trefoil
<i>Lycopus europaeus</i>	Gypsywort

Lythrum salicaria	Purple Loosestrife
Mentha aquatica	Water Mint
Pulicaria dysenterica	Common Fleabane
Ranunculus acris	Meadow Buttercup
Scrophularia auriculata	Water Figwort
Scutellaria galericulata	Skullcap
Silene flos-cuculi - (Lychnis flos-cuculi)	Ragged Robin
Succisa pratensis	Devil's-bit Scabious
Vicia cracca	Tufted Vetch
Latin name	Common name
Achillea ptarmica	Sneezewort
Angelica sylvestris	Wild Angelica
Caltha palustris	Marsh Marigold
Eupatorium cannabinum	Hemp Agrimony
Filipendula ulmaria	Meadowsweet
Geum rivale	Water Avens
Hypericum tetrapterum	Square-stalked St John's Wort
Iris pseudacorus	Yellow Iris
Lotus pedunculatus	Greater Birdsfoot Trefoil
Lycopus europaeus	Gypsywort
Lythrum salicaria	Purple Loosestrife
Mentha aquatica	Water Mint
Pulicaria dysenterica	Common Fleabane
Ranunculus acris	Meadow Buttercup
Scrophularia auriculata	Water Figwort
Scutellaria galericulata	Skullcap
Silene flos-cuculi - (Lychnis flos-cuculi)	Ragged Robin
Succisa pratensis	Devil's-bit Scabious
Vicia cracca	Tufted Vetch

EP1F – Wildflowers for Pond Edges**Latin name**

Achillea ptarmica
 Angelica sylvestris
 Caltha palustris
 Eupatorium cannabinum
 Filipendula ulmaria
 Geum rivale
 Hypericum tetrapterum
 Iris pseudacorus
 Lotus pedunculatus
 Lycopus europaeus
 Lythrum salicaria
 Mentha aquatica
 Pulicaria dysenterica
 Ranunculus acris

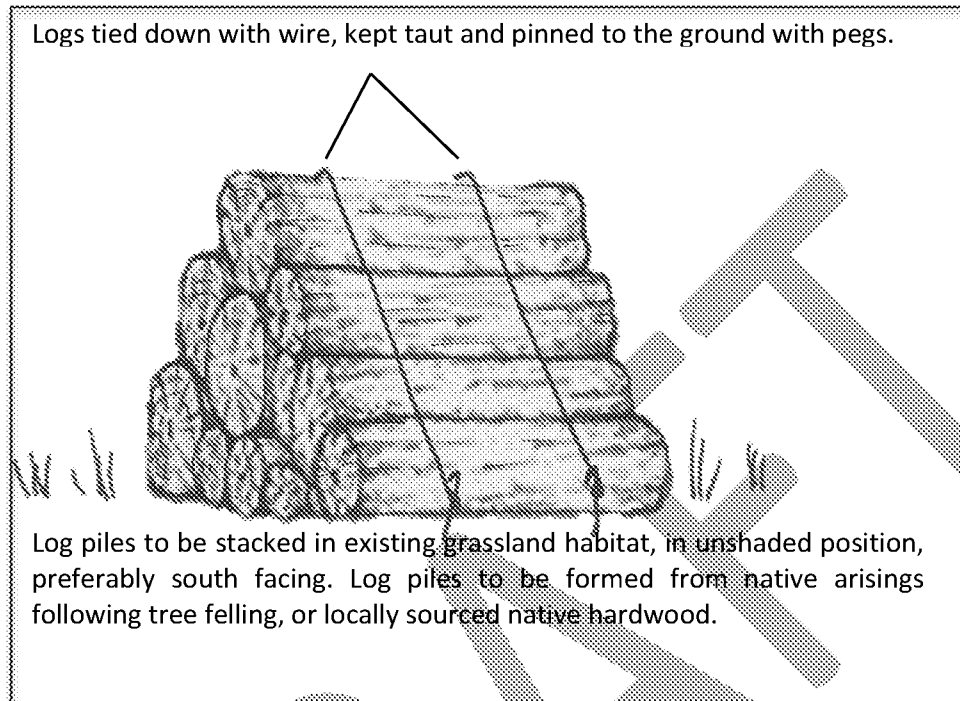
Common name

Sneezewort
 Wild Angelica
 Marsh Marigold
 Hemp Agrimony
 Meadowsweet
 Water Avens
 Square-stalked St John's Wort
 Yellow Iris
 Greater Birdsfoot Trefoil
 Gypsywort
 Purple Loosestrife
 Water Mint
 Common Fleabane
 Meadow Buttercup

Scrophularia auriculata
Scutellaria galericulata
Silene flos-cuculi - (Lychnis flos-cuculi)
Succisa pratensis
Vicia cracca
Latin name
Achillea ptarmica
Angelica sylvestris
Caltha palustris
Eupatorium cannabinum
Filipendula ulmaria
Geum rivale
Hypericum tetrapterum
Iris pseudacorus
Lotus pedunculatus
Lycopus europaeus
Lythrum salicaria
Mentha aquatica
Pulicaria dysenterica
Ranunculus acris
Scrophularia auriculata
Scutellaria galericulata
Silene flos-cuculi - (Lychnis flos-cuculi)
Succisa pratensis
Vicia cracca

Water Figwort
Skullcap
Ragged Robin
Devil's-bit Scabious
Tufted Vetch
Common name
Sneezewort
Wild Angelica
Marsh Marigold
Hemp Agrimony
Meadowsweet
Water Avens
Square-stalked St John's Wort
Yellow Iris
Greater Birdsfoot Trefoil
Gypsywort
Purple Loosestrife
Water Mint
Common Fleabane
Meadow Buttercup
Water Figwort
Skullcap
Ragged Robin
Devil's-bit Scabious
Tufted Vetch

Appendix 2. Log Pile Diagram



Appendix 3: Mitigation and Management Schedule

Habitat/Species	Timeframe	Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Trees/Hedge/Shrub	Pre-construction	Clearance												
Building	Pre-construction	Demolition												
Log Piles	Pre-construction	Building												
Meadow	Construction	Planting												
SuDs	Construction	Planting												
Trees/hedges/scrub	Construction	Planting												
Badger/hedgehog	Construction	Gaps to fencing												
Amenity Grass	Post-construction	Cutting												
Meadow cutting	Post-construction	Cutting												
SuDs	Post-construction	Dredging												
Log Piles	Post-construction	Check and rebuild												
Hedge/Tree	Post-construction	Cutting												
All areas	Post-construction	Annual Monitoring												

Key



Optimal Time

Requires Ecological Supervision