



Dapper's Lane, Angmering

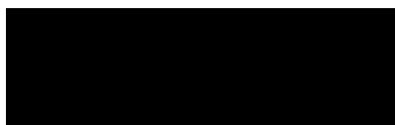


Biodiversity Enhancement Plan

Persimmon Homes Thames Valley

August 2020

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2	18/08/2020	Vivienne Greenough	Vivienne Greenough	Slight amendments to wording and detail added on hedgehog enhancements and pond.

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Executive Summary

Contents	Summary
Site Location	The site is located to the east of Dapper's Lane, north of Angmering in west Sussex at Ordnance Survey grid reference TQ 07130 05169.
Proposals	The development proposals include a residential redevelopment comprising 84 new dwellings with associated landscaping, access and public amenity space.
Existing Site Information	The site has been subject to several ecological surveys, including ecological appraisals (WYG, 2016 and WYG, 2018a), bat surveys (WYG, 2018b), great crested newt (WYG 2017) and dormouse surveys (WYG, 2019). The site is known to support breeding birds, several bat species and dormouse. A dormouse mitigation report has also been produced for the site.
Enhancements	Enhancements to be included within the site: ✧ Planting of wildflower meadow; ✧ Infilling of line of trees and hedgerows; ✧ Pond creation (attenuation basin); ✧ Ten bird boxes and ten bat boxes; ✧ Five hedgehog boxes and small mammal holes within boundary fencing; and ✧ Two refugia piles and two log piles.

Glossary

BEP	Biodiversity Enhancement Plan
CEcol	Chartered Ecologist
CIEEM	Chartered Institute of Ecology & Environmental Management
CRoW Act	Countryside and Rights of Way Act 2000
EPDM	Ethylene Propylene Diene Monomer
EPSL	European Protected Species Licence
Habitat Regulations	Conservation of Habitats and Species Regulations 2017 (as amended)
HPI	Habitat of Principle Importance
JNCC	Joint Nature Conservation Committee
LBAP	Local Biodiversity Action Plan
LPA	Local Planning Authority
MCIEEM	Member of Chartered Institute of Ecology & Environmental Management
NERC Act	Natural Environment and Rural Communities Act 2006
NPPF	National Planning Policy Framework
SPI	Species of Principal Importance
SuDs	Sustainable Urban Drainage System
W&CA	Wildlife & Countryside Act 1981 (as amended)

1.0 Introduction

1.1 Background

WYG was commissioned by Persimmon Homes Thames Valley on 14th July 2020 to prepare a Biodiversity Enhancement Plan (BEP) of the site known as Dapper's Lane, Angmering.

This report has been prepared by WYG Assistant Ecologist Jo Sykes and the conditions pertinent to it are provided in Appendix A.

1.2 Site Location

The site is located to the east of Dapper's Lane, north of Angmering in west Sussex at Ordnance Survey grid reference TQ 07130 05169 (Figure 1). The majority of the site comprises intensively horse grazed semi-improved grassland. The north east of the site is bounded by farms and the east by Dapper's Lane. To the south of the site is a residential development and to the west hedgerows with St Margaret's C of E Primary School playing fields beyond. To the north west the site is bounded by further grazed fields. In the wider area to the north is Poling Furzefields which is immediately bounded by the A27.

1.3 Ecological Baseline

Previous ecology surveys have been carried out at the site by WYG. Those of relevance to this BEP are discussed in Table 1.

Table 1: Survey Results Summary

Survey Type	Survey Date	Report Date	Summary of Results
Preliminary Ecological Appraisal (WYG, 2016)	September 2016	December 2016	The most ecologically valuable habitats are the boundaries, including field margins and hedgerows, which provide opportunities for roosting bats, foraging / commuting bats, reptiles, badgers <i>Meles meles</i> , dormouse <i>Muscardinus avellanarius</i> , nesting birds and invertebrates. The semi-improved grassland has habitat suitable for great crested newt <i>Triturus cristatus</i> .
Great Crested Newt eDNA survey (WYG, 2017)	April 2017	June 2017	No great crested newt were present but some waterbodies not accessible. Precautionary methods of habitat clearance recommended.
Update Ecology Walkover Survey (WYG, 2018a)	July 2018	July 2018	Habitats had remained the same as during the previous survey. Surveys for dormouse and foraging and commuting bats were recommended.
Bat Activity Survey	August to October 2018	December 2018	Eight species of bat were recorded using the site. These included common pipistrelle <i>Pipistrellus pipistrellus</i> , Nathusius' <i>Pipistrellus</i>

Survey Type	Survey Date	Report Date	Summary of Results
(WYG, 2018b)			<i>nathusii</i> and soprano pipistrelle <i>Pipistrellus pygmaeus</i> , noctule <i>Nyctalus noctula</i> , serotine <i>Eptesicus serotinus</i> , brown long-eared bat <i>Plecotus auritus</i> , a myotis species <i>Myotis</i> sp. and barbastelle <i>Barbastella barbastellus</i> . The species-poor hedgerow and woodland bounding the site to the north and west were the most frequently used by foraging and commuting bats.
Dormouse Survey (WYG, 2019)	August 2018 to May 2019	February 2019	Dormouse (adults and juveniles) were recorded in the northern and western site boundaries. No dormouse were recorded within the eastern or southern boundaries.

1.4 Development Proposals and Recommendations from Arun District Council

The development proposals include a residential redevelopment comprising 84 new dwellings with associated landscaping, access and public amenity space. The main access route will come from Dapper's Lane along the eastern site boundary. This will sever the existing hedgerow with some habitat clearance required for the associated visibility splay (approx. 46 m² of vegetation removal). In addition, two pedestrian access points to the existing footpath along the western boundary of the site will be created from the site and this will require removal of the existing hedgerow (approx. 25 m² of vegetation removal).

Planning conditions have yet to be finalised, but comments from the Arun District Council Environment Officer (dated 27th May 2020) include the following:

"In line with Policy ENV DM5 of the Arun District Local Plan information on Biodiversity Net Gain needs to be provided as part of the planning application prior to determination. Though some biodiversity enhancements have been recommended within the Preliminary Ecological Appraisal (Dec 2019), further information is required demonstrating what will be included within the scheme. Examples of what we would be expecting to see include;

- ✧ *Any trees removed should be replace at a ratio of 2:1*
- ✧ *Wildflower meadows*
- ✧ *Wildlife area onsite*
- ✧ *Filling any gaps in tree lines or hedgerows with native species*
- ✧ *Bat bricks / tiles are integrated into the buildings onsite facing south/south westerly positioned 3 - 5m above ground.*
- ✧ *Bird box to be installed on the buildings / and or tree within the garden of the properties.*
- ✧ *Grassland areas managed to benefit reptiles.*
- ✧ *Log piles onsite*
- ✧ *We require that gaps are included at the bottom of the fences to allow movement of small mammals across the site*
- ✧ *hedgehog nesting boxes included on the site"*

These comments have been taken in to consideration when preparing this BEP.

1.5 Habitats and Protected / Notable Species

The habitats included in this BEP include:

- ✧ Proposed Wildflower Meadow;
- ✧ Existing Hedgerow and New shrub planting; and
- ✧ Proposed pond (SuDs pond).

Legally / notable protected species considered within this BEP include:

- ✧ Breeding birds;
- ✧ Bats;
- ✧ Amphibians and reptiles (including great crested newt *Triturus cristatus*);
- ✧ Hedgehog *Erinaceus europaeus*.

Note that enhancements for dormouse are detailed within the Dormouse Mitigation Strategy (WYG, 2020).

Legally protected species considered within this BEP include breeding birds, bats, great crested newt, hedgehog and reptiles. The legislation afforded to these species is included in Appendix B.

2.0 Habitats and Ecological Features to be Created

2.1 Habitats

A comprehensive Landscape Plan has been compiled by WYG (drawing reference: A109012 LA100-106[A]). Dormouse mitigation planting comprising native UK shrub species is also included, the details for this are provided in the Dormouse Mitigation Strategy (WYG, 2020). The Landscape Masterplan shown in Appendix C shows the locations of the habitats that will be created on site.

Private gardens have been excluded from the report as management of these habitats will be dependent upon the owner / occupier.

Comprehensive species lists have also been provided. All seed mixes and plants mentioned in this section are available from www.naturescape.co.uk.

2.1.1 Wildflower Meadows

In line with the Landscape Plan, the wildflower meadow areas (labelled as grass areas planting with flowering annuals on landscape plan) will be sown using a 50:50 mix of NSG Select Grasses Mixture and N4F Summer Flowering Butterfly and Bee Mix Flowers Only. The species composition for the seed mixes are provided in Table 2 and Table 3.

Table 2: Species and percentages of distribution of NSG

Species	Scientific Name	Percentage Composition of Seed Mix
Common Bent	<i>Agrostis capillaris</i>	3%
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>	3%
Quaking Grass	<i>Briza media</i>	2%
Crested Dogstail	<i>Cynosurus cristatus</i>	22%
Hard Fescue	<i>Festuca trachyphylla</i>	22%
Chewing's Fescue	<i>Festuca rubra ssp. commutata</i>	22%
Slender Creeping Red Fescue	<i>Festuca rubra ssp. litoralis</i>	13%
Meadow Barley	<i>Hordeum secalinum</i>	1%
Smooth Stalked Meadow Grass	<i>Poa pratensis</i>	10%
Yellow Oatgrass	<i>Trisetum flavescens</i>	2%

Table 3: Species and percentages of distribution of N4F

Species	Scientific Name	Composition of Seed Mix
Yarrow	<i>Achillea millefolium</i>	3%
Kidney Vetch	<i>Anthyllis vulneraria</i>	3%
Clustered Bellflower	<i>Campanula glomerata</i>	1%
Nettle Leaved Bellflower	<i>Campanula trachelium</i>	1%

Species	Scientific Name	Composition of Seed Mix
Common Knapweed	<i>Centaurea nigra</i>	8%
Greater Knapweed	<i>Centaurea scabiosa</i>	5%
Wild Carrot	<i>Daucus carota</i>	4%
Viper's Bugloss	<i>Echium vulgare</i>	4%
Lady's Bedstraw	<i>Galium verum</i>	8%
Meadow Cranesbill	<i>Geranium pratense</i>	2%
Common St. John's Wort	<i>Hypericum perforatum</i>	3%
Field Scabious	<i>Knautia arvensis</i>	5%
Meadow Vetchling	<i>Lathyrus pratensis</i>	3%
Common Toadflax	<i>Linaria vulgaris</i>	1%
Birdsfoot Trefoil	<i>Lotus corniculatus</i>	7%
Purple Loosestrife	<i>Lythrum salicaria</i>	2%
Wild Marjoram	<i>Origanum vulgare</i>	2%
Self Heal	<i>Prunella vulgaris</i>	10%
Yellow Rattle	<i>Rhinanthus minor</i>	7%
Small Scabious	<i>Scabiosa columbaria</i>	4%
Betony	<i>Stachys officinalis</i>	4%
Hedge Woundwort	<i>Stachys sylvatica</i>	3%
Devilsbit Scabious	<i>Succisa pratensis</i>	2%
Wild Red Clover	<i>Trifolium pratense</i>	3%
Dark Mullein	<i>Verbascum nigrum</i>	2%
Tufted Vetch	<i>Vicia cracca</i>	3%

2.1.2 Trees, Shrubs and Hedgerows

There will be minimal tree removal to facilitate the proposals and the proposed tree planting for the site provides more than a like for like replacement. The agreed landscaping plans include tree planting throughout the site, particularly along the southern boundaries, but also interspersed within the residential areas. These will consist of both native and non-native species. Some hedge planting is also scattered across the site, primarily within residential areas. The species for trees, shrubs and hedgerows are listed within the Landscaping Plan produced by WYG (Appendix B) and also below in Table 4. There is also UK shrub species planting included along the northern and western site boundary (see landscape plan), this forms the dormouse mitigation buffer, the details for this are provided in the Dormouse Mitigation Strategy (WYG, 2020).

Table 4: Tree, shrub and hedgerow species

Enhancement	Species
Tree planting	Field Maple <i>Acer campestre</i> Red Maple <i>Acer rubrum</i> West Himalayan Birch <i>Betula utilis jacquemontii</i> Beech <i>Fagus sylvatica</i> Sweet Cherry <i>Prunus avium</i> Callery Pear <i>Pyrus calleryana</i> 'Chanticleer' Whitebeam <i>Sorbus aria</i>
UK Native shrub	No.3CLEVI No.15CORSA No.19Cav No.11EUON No.6Ia No.4LIGVU No.3RIBRU No.6Rca No.4SAMNI No.8VIBLA
Hedgerows	Japanese Holly <i>Ilex crenata</i> Garden Privet <i>Ligustrum ovalifolium</i>

2.1.3 Pond

One pond (a SuDs pond) will be created to the south of the site in an area subject to a reasonable level of sun exposure. The pond will be up to 1.2m deep and hold 653m³ of water (see RGP Design Flood Risk Assessment, 2020). The pond will provide dual purpose, both an attenuation basin and an ecological enhancement feature.

The pond will be excavated during the winter months and lined with Ethylene Propylene Diene Monomer (EPDM) rubber pond liner. When excavating the pond, the top soil and subsoil layers will be divided into two separate piles. The topsoil will be piled up along the margins of the ponds to create an earth bank (on the side of the prevailing wind). This will provide additional shelter for the pond and also provide additional foraging and sheltering opportunities for the local ecology. The liner will be covered with the excavated subsoil (not top soil which can cause algal blooms) which will allow aquatic plants to establish.

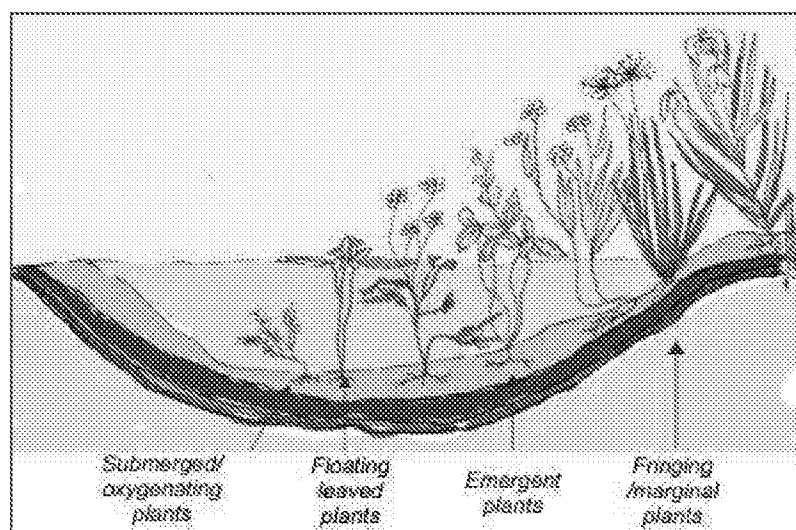
The pond will support terraces at a range of depths including shallow areas towards the pond edges and a deeper area. The banks of the ponds will be shallow (1:3 sloping sides), allowing easy access for the local ecology.

Where possible, native plant species of local provenance only will be used. Table 5 details the plant species considered suitable for ponds, along with the recommended species distribution. Planting will be completed during the spring / early summer period with at least 30 cm between each specimen.

Table 5: Pond plant species and percentages of distribution

Species	Scientific Name	Planting Location in Accordance with Diagram 1	Approx. Composition
Brooklime	<i>Veronica beccabunga</i>	Emergent plants	5%
Water Forget-me-not	<i>Myosotis scorpioides</i>	Emergent plants	10%
Water Soldier	<i>Stratiotes aloides</i>	Emergent plants	5%
Watercress	<i>Nasturtium officinale</i>	Emergent plants	10%
Spiked Water-milfoil	<i>Myriophyllum spicatum</i>	Oxygenating plants	20%
Hornwort	<i>Ceratophyllum demersum</i>	Oxygenating plants	20%
Amphibious Bistort	<i>Persicaria amphibia</i>	Floating leaved plants	10%
Frogbit	<i>Hydrocharis morsus-ranae</i>	Floating leaved plants	10%
Common Water Crowfoot	<i>Ranunculus aquatilis</i>	Floating leaved plants	10%

Alongside this, a seed mix will be planted on and near the pond margins to increase floral diversity. A recommended mix to be used is N8F Water's Edge Flowers Only Mix. The composition of the seed mix is given in Table 6. This seed mix will account for the fringing and marginal plants. Species will be planted in accordance with Diagram 1.

Diagram 1: Suggested layout of pond plants (after Pond Conservation, 2012)**Table 6: Species composition for flowering mix**

Species	Scientific Name	Composition of Seed Mix
Sneezewort	<i>Achillea ptarmica</i>	3%
Wild Angelica	<i>Angelica sylvestris</i>	4%

Species	Scientific Name	Composition of Seed Mix
Marsh Marigold	<i>Caltha palustris</i>	2%
Pendulous Sedge	<i>Carex pendula</i>	2%
Common Knapweed	<i>Centaurea nigra</i>	4%
Hemp Agrimony	<i>Eupatorium cannabinum</i>	2%
Meadowsweet	<i>Filipendula ulmaria</i>	11%
Water Avens	<i>Geum rivale</i>	4%
Squared Stemmed St John's Wort	<i>Hypericum tetrapterum</i>	1%
Yellow Flag Iris	<i>Iris pseudacorus</i>	21%
Soft Rush	<i>Juncus effusus</i>	1%
Hard Rush	<i>Juncus inflexus</i>	4%
Meadow Vetchling	<i>Lathyrus pratensis</i>	2%
Greater Birdsfoot Rrefoil	<i>Lotus pedunculatus</i>	5%
Ragged Robin	<i>Lychnis flos-cuculi</i>	4%
Gypsywort	<i>Lycopus europaeus</i>	3%
Purple Loosestrife	<i>Lythrum salicaria</i>	7%
Common Fleabane	<i>Pulicaria dysenterica</i>	1%
Meadow Buttercup	<i>Ranunculus acris</i>	7%
Great Burnet	<i>Sanguisorba officinalis</i>	1%
Water Figwort	<i>Scrophularia auriculata</i>	2%
Marsh Woundwort	<i>Stachys palustris</i>	1%
Devilsbit Scabious	<i>Succisa pratensis</i>	4%
Tufted Vetch	<i>Vicia cracca</i>	4%

2.2 Ecological Features

To enhance the biodiversity within the site, a number of ecological features are to be included within the landscape scheme for the site. These include:

- ✧ Bird bricks / boxes;
- ✧ Bat boxes;
- ✧ Hedgehog boxes;
- ✧ Small mammal holes (to accommodate hedgehog) in fencing; and
- ✧ Log piles.

Please note that example biodiversity enhancement feature photos have been taken from the Natural History Book Store website (<http://www.nhbs.com>) and are shown in Appendix D.

2.2.1 Bird Boxes

Bird boxes are an established technique for increasing the value of landscapes to hole-nesting bird species and may help contribute to LBAP targets, such as house sparrow. The size of the entrance hole influences the species of bird that will occupy it and so a variety of sizes will be used to encourage a range of species to nest.

To enhance the site's value to nesting birds, bird boxes of varying sizes (to attract different species) will be placed on the retained trees and within the new buildings. Figure 2a shows indicative locations and Table 7 gives more detail on the orientation of boxes.

The recommended bird box types are listed in Table 7 below and shown in Appendix D.

Table 7: Bird Boxes

Species	No.	Box Types	Locations
Swift <i>Apus apus</i>	3	WoodStone Build-in Swift Nest Boxes. These will be placed near each other to create a colony.	To be built into new dwellings, least 5 m high, with a clear flight path and avoid south facing sites.
House sparrow <i>Passer domesticus</i>	3	1SP Schwegler Sparrow Terrace or Sparrow Terrace Nest Box, these will be placed near each other to create a colony.	To be installed at a minimum of 2 m above ground, under soffits / eaves preferably avoiding areas that are exposed to strong sunlight or prevailing winds.
Garden species, including robins <i>Erithacus rubecula</i> and spotted flycatchers <i>Muscicapa striata</i>	2	2HW Schwegler Nest Box	To be installed within dense vegetation at a minimum of 3 m above ground to avoid predation.
Tit species	2	Vivara Pro Seville WoodStone Nest Box, one 32 mm and one 28 mm, as this will provide nesting options for different sized birds (e.g. blue tit <i>Cyanistes caeruleus</i> and great tit <i>Parus major</i>).	To be installed on new dwellings with a clear flight path. They need to be placed at a minimum of 2m above ground to avoid predation.

2.2.2 Bat Boxes

To increase the value of the site for bats, 10 bat boxes will be installed. These will be installed on retained mature trees and / new buildings.

Bat boxes will be sited 3-4 m high to avoid predation by cats and disturbance from people. The boxes will also be positioned as to be high enough to avoid direct illumination, placed out of the way of strong wind and positioned where they can get sun for part of the day. Bats can use boxes as hibernation roosts in winter and as maternity roosts in the summer. Therefore, to create a range of temperature variations the boxes will be installed facing different directions avoiding north, as this is unsuitable for bats.

Boxes such as the Low Profile WoodStone Bat Box, Ibstock Enclosed Bat Box and Vincent Pro Bat Box will be installed on site, seven boxes will be installed on / integrated into the new buildings and three will be attached to retained trees. Figure 2a shows indicative locations for bat boxes.

As bats are legally protected, **bat boxes cannot be disturbed by anyone without a licence after they have been installed.**

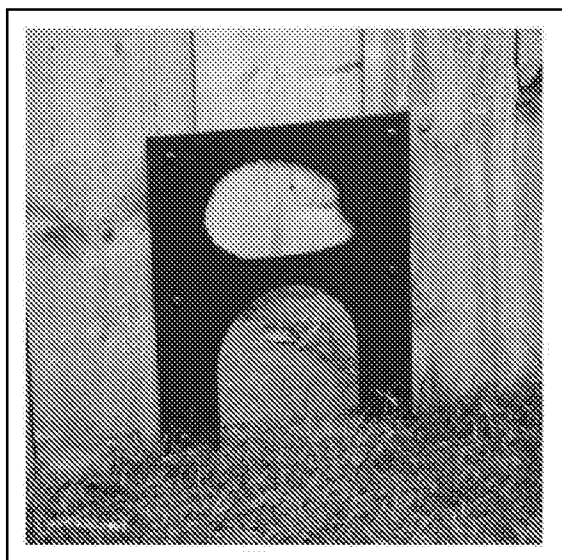
2.2.3 Hedgehog Boxes and Small Mammal Fencing

The site can be enhanced for small mammals, with the inclusion of hedgehog boxes and small mammal holes within boundary fencing, to allow hedgehogs to pass through private gardens whilst foraging.

The site will create avenues of gardens that have the potential to be valuable to hedgehogs *Erinaceus europaeus*. However, fences can inhibit the ability of the species to move around sites between gardens. To address this, gaps will be left at the intersections in fences to allow hedgehogs to travel throughout the site (see Figure 2b for approximate locations). The size of the gaps will be 13cm by 13cm and each gap will be fitted with a plate (like the example below) to show new homeowners / tenants the reason for the gap in the fence. An example is provided in Photograph 1.

The holes will be installed in such a way that hedgehogs will be able to move from one end of a run of gardens to another and therefore will include a mix of gaps between gardens that are parallel to one-another, and back on to one another. See Figure 2b for approximate locations of the hedgehog 'highways'.

Photograph 1: Example of a plate for hedgehog gaps (<https://www.nhbs.com/eco-hedgehog-hole-fence-plate>)



Five hedgehog boxes will be installed within the wildlife area to the south of the site, the public open space to the north of the site and within the dormouse mitigation buffer. Boxes will be placed in dense vegetation and out of sight, to minimise likelihood of them being tampered by the public. The nest boxes will have nesting materials, such as leaves and dry grass, placed inside the box. Figure 2b

shows indicative locations. Boxes such as the Hedgehog Nest Box or the Hedgehog House will be used.

2.2.4 Log Piles

Habitats on site could be enhanced for invertebrates and hedgehogs. To achieve this two log piles will be created. Figure 2b shows indicative locations.

The log piles will be made of stacked logs of varying sizes and overlain with smaller branches. This work can be done using materials found on site where possible, although more substantial logs may need to be sourced, these logs will be hard woods as they last longer and do not contain resins that may stop their use. Each log pile will be at least 1 m x 1 m. Protection will be put around the log piles to stop them being tampered with by members of the public.

3.0 Management and Timescales

Details of the management required as well as timings for management activities are provided below for each habitat / ecological feature.

3.1 Habitats

3.1.1 Wildflower Meadows

The created wildflower meadow will be cut at the end of the first year of the sowing (assuming the grassland is sown in April / May). Prior to completing the cut, the grassland establishment will be assessed to determine whether it would be suitable to cut the grass. The first cut will be completed in August / September and the cut will be to a height of 300 mm only if required.

The establishment of the meadow will be monitored for competitive weeds, which will be spot sprayed where necessary or hand pulled. This will be undertaken every two months during the main growing period April to September for two years post sowing. The monitoring will also be for birds, where needed deterrent methods will be used to discourage feeding on the grass seed, in the worst case a covering with mesh will be considered.

Once the meadow is established it will be cut three times per year; once in spring (no later than April) to 80 mm; once in mid-summer, to between 40 to 80 mm; and once in autumn, again to between 40 to 80 mm, these cuts will be undertaken using a hand strimmer. When the cut is done it will be left for 3-5 days, this is to allow the seeds to drop, before being collected, keeping the soil poor. The meadow will require no watering or fertilising and any weeds which begin to appear will be handpicked. If the grasses begin to takeover then a combination of seeding more yellow rattle *Rhinanthus minor* and raking areas to form bare patches will rectify this.

Meadow boundaries will be left uncut, to encourage use by reptiles.

All cuts will be done using direction clearance, to allow any reptiles or amphibians to escape the area.

Table 8: Management and Timings for Wildflower Meadow

Item	Timing
Soil strip	During construction
Sowing of grass seed	In spring once nightly temperatures exceed 5°C
First year management	August / September and the cut will be to a height of 300 mm only if required.
Yearly management	Three cuts: ♦ before the end of April 50-80mm, ♦ between June and August 40mm, and ♦ between August and November 40mm

3.1.2 Trees, Shrubs and Hedgerows

Any major pruning work that is required to maintain the trees and hedgerows on site will be undertaken during January and February. This timing will avoid the bird breeding season (which begins in March) and also any fruiting plants will be left to support over wintering birds.

Trees, shrubs and hedgerows will be fitted with some form of protection and support, i.e. tubes / stakes, if necessary when planted. Protection of new planting is essential to promote growth and improve survival rates. Trees will not be planted in water logged or frozen soil and will receive regular water when the earth is dry. Mulch will be spread around the base of newly planted trees, shrubs and hedgerows to protect the roots, reduce evaporation (water loss) and suppress weeds. Alongside this, corrective pruning maybe required and any weeds will be removed to prevent competition. Any planting that fails will be replaced during the next suitable planting period for that species.

Table 9: Management and Timings for Trees and Hedgerows

Item	Timing
Initial planting	Autumn and Winter (October to April)
Tree guards / stalks installed	On same day as planting
Replacement of failed plants	Annually in September for the first 5 years
Pruning once established	Annually, during winter (January and February)

3.1.3 Pond

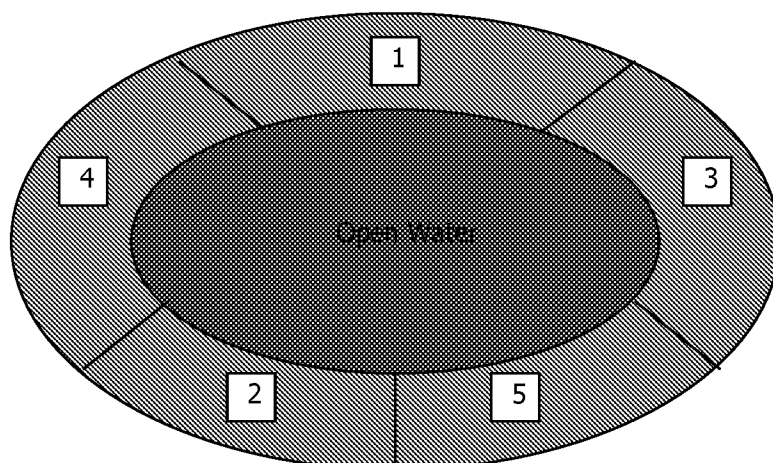
Optimal timing for pond works is between October and February inclusive. Pond planting will be done between mid-spring to early summer, as this is when the water is beginning to warm up.

The planting for the new pond will be monitored in Year 1 to confirm whether or not the vegetation is establishing and growing healthily. Any failed planting within the pond will be replaced like-for-like so that the pond develops as intended. It is considered that no management of emergent vegetation planting will be necessary in Years 1-3, other than to replace specimens that have failed.

After this time, emergent vegetation in the pond will be cleared on a 5-year rotation to open up an equivalent of 20% of the perimeter area. This will create clear channels out into the main open water areas, helping to maintain a diversity of marginal conditions within the ponds. Following each clearance, plant material will be left for no less than 48 hours to allow invertebrates and amphibians to move back into the water prior to their removal. Alongside this, the pond will be dredged once every five years to prevent the build-up of silt.

An example of the proposed emergent vegetation management scheme is provided below: if the Areas 1 to 5 below represent the areas of emergent vegetation to be cut, then in Year 1: Section 1 is cut and removed; in Year 2: Section 2 is cut and removed etc. This cutting rotation will continue such that each section is cut once every 5 years.

Diagram 3: Waterbody maintenance



It will also be necessary to monitor vegetation encroachment into the open water habitat annually to maintain important open water habitat within the pond. This will be for both potentially invasive native species such as common reed *Phragmites australis*, but also to identify the potential establishment of any invasive non-native species which can be brought in accidentally or by wildfowl such as:

- ✧ Canadian Pondweed or Waterweed *Elodea canadensis*;
- ✧ Floating pennywort *Hydrocotyle ranunculoides*; and
- ✧ New Zealand Pigmyweed *Crassula helmsii*.

These non-native species can spread rapidly and choke small waterbodies. Should any such encroachment by invasive non-native species be identified, it will be necessary to remove these species as soon as feasibly possible.

Table 10: Management and Timings for Pond

Item	Timing
Pond digging	During construction in autumn and winter
Pond planting	During construction Mid-spring to early summer
First 3 years	Replace any plants which have failed
Year 4 onwards management	Management on a 5-year rotation, to be undertaken October to February

3.2 Ecological Features

3.2.1 Bird Boxes

Although not essential, it would be beneficial to clean out all non-integrated bird boxes annually during the winter months (October to February) as this will remove any parasites from the previous year.

Table 11: Timescales and Management for Bird Boxes

Item	Timing
Installation of all bird boxes	During construction any time of year – ideally in winter
Maintenance check	Once every two years during winter months – October to February. This can be done in combination with bat box maintenance To clean out the box, old nesting material and failed nests (including eggs) will be removed

3.2.2 Bat Boxes

The bat boxes do not require cleaning out, however a maintenance check will be done every two years from the ground to check they are still securely in place. If an internal check of the box is required, then a suitably qualified and licenced bat ecologist will be required to undertake this.

Table 12: Timescales and Management for Bat Boxes

Item	Timing
Installation of boxes	During construction for integrated boxes or post construction
Maintenance check	Every two years

3.2.3 Hedgehog Boxes

Hedgehog boxes do not require cleaning out.

Table 13: Timescales and Management for Hedgehog Boxes

Item	Timing
Installation of boxes	Post construction

3.2.4 Log Piles

The log piles will require thinning of the vegetation on an annual basis to prevent them from becoming inundated with vegetation.

The log piles will require minimal work, only requiring replenishing with brash and logs once a year when trees and bushes are cut back.

Table 14: Management and Timings for Log and Refugia Piles

Item	Timing	Management
Check for need to replenishing brash and logs	Annually in January	Topped up using brash and logs from when trees and bushes are cut back, when required
Thinning of vegetation growing	Annually between October and February	The strim around the refugia will be to 150 mm

Item	Timing	Management
on hibernacula refugia	Every two years between October and February – trim vegetation around refugia and thin vegetation on remaining slopes	The removal of vegetation from the refugia will prevent a thick root mat from developing

3.3 Responsibilities

The implementation will be undertaken by the Principal Contractor during construction. Management of the enhancements post-construction, is yet to be appointed.

Any changes to the details found within this document will be agreed with the LPA and Persimmon Homes Thames Valley prior to any amended works taking place.

3.3.1 Contacts

Table 15 details the contacts for the project, should any technical support or further advice be required.

Table 15: Project contacts

Contact	Details
Robert Clark Head of Planning Persimmon Homes Thames Valley	Persimmon House Knoll Road Camberley GU15 3TO [REDACTED]
WYG Marc Anderton Project Ecologist	Wharf House Wharf Road Guildford GU1 4RP [REDACTED]
WYG Vivienne Greenough Associate Ecologist	Wharf House Wharf Road Guildford GU1 4RP [REDACTED]

4.0 References

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- ✧ English Nature (2001) *Great Crested Newt Mitigation Guidelines*, 1st Edition, English Nature, Peterborough.
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- ✧ WYG (2016), *Preliminary Ecological Appraisal Dapper's Lane, Angmering*, Report on behalf of Persimmon Homes, Project No. A085519.
- ✧ WYG (2017), *Great Crested Newt eDNA Survey Dapper's Lane, Angmering* Report on behalf of Persimmon Homes, Project No. A085519-4
- ✧ WYG (2018a), *Update Ecology Walkover Survey, Dapper's Lane, Angmering* Report on behalf of Persimmon Homes, Project No. A085519-4
- ✧ WYG (2018b), *Bat Activity Survey Report, Dapper's Lane, Angmering* Report on behalf of Persimmon Homes, Project No. A085519-4
- ✧ WYG (2019), *Dormouse Survey Report, Dapper's Lane, Angmering* Report on behalf of Persimmon Homes, Project No. A085519-4
- ✧ WYG (2020), *Dapper's Lane Landscape Planting*, A109012 LA100-106[A].dwg

FIGURES

Figure 1 – Site Location Plan

**Figure 2a – Indicative Enhancement Locations –
Bird and Bat Boxes**

**Figure 2b – Indicative Enhancement Locations –
Hedgehog boxes, Refugia and Log Piles**



Rev	Date	Notes
A	23/06/20	Initial map production

Legend

 Site boundary

0 50 100 200 Metres



Site Location Plan

Dappers Lane, Angmering Persimmon Homes

Scale at A3: 1:5,000	Project No: A085519-7	Drawing No: Figure 1	Revision: A
Drawn by: Maddie Errington	Drawn date: 23/06/2020	Approved by: Marc Anderton	

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Rev	Date	Notes
A	07/08/20	Initial map production

Legend

- Site boundary
- Bat boxes
- Garden species boxes
- House sparrow boxes
- Swift boxes
- Tit species boxes



Indicative Enhancement Locations - Bird and Bat Boxes

Dappers Lane, Angmering Persimmon Homes

Scale at A3: 1:1,000	Project No: A085519-7	Drawing No: Figure 2a	Revision: A
Drawn by: Ben Blowers	Drawn date: 07/08/2020	Approved by: Jo Sykes	

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Rev	Date	Notes
A	19/08/20	Initial map production

Legend

- Site boundary
- Hedgehog highway
- Hedgehog box
- Log pile



Indicative Enhancement Locations -
Hedgehog boxes, Refugia and Log Piles

Dappers Lane, Angmering
Persimmon Homes

Scale at A3: 1:1,000	Project No: A085519-7	Drawing No: Figure 2b	Revision: A
Drawn by: Ben Blowers	Drawn date: 19/08/2020	Approved by: Jo Sykes	

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Appendix A – Report Conditions

This Report has been prepared using reasonable skill and care for the sole benefit of Persimmon Homes Thames Valley ("the Client") for the proposed uses stated in the report by WYG Environment Planning Transport Limited ("WYG"). WYG exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder's permission.

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The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections'. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times. No investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather-related conditions. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions. The "shelf life" of the Report will be determined by a number of factors including; its original purpose, the Client's instructions, passage of time, advances in technology and techniques, changes in legislation etc. and therefore may require future re-assessment.

The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. WYG accept no liability for issues with performance arising from such factors.

Appendix B - Species Legislation

Breeding Birds

Under the W&CA and the CRow Act all wild birds, their eggs and active nests are protected by law and it is an offence (with certain exceptions) to:

- ✧ Kill, injure or take any species of wild bird;
- ✧ Take, damage or destroy a nest while that nest is in use or being built; and/or
- ✧ Take or destroy their eggs.

Some bird species (such as barn owl *Tyto alba*) receive further protection under Schedule 1 of the Wildlife and Countryside Act, 1981 (as amended). In addition to the standard protection afforded to all wild birds, it is an offence to disturb Schedule 1 birds and their young whilst at, on or near their nest.

There are 59 bird species specified as SPI for the Conservation of Biodiversity in England and are noted in accordance with the requirements of Section 41 of the NERC Act.

Bats

All British bat species are given special protection within England by their inclusion on Schedule 2 of the Conservation of Habitats and Species Regulations 2017 and Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

As a result, it is an offence to:

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

With specific reference to the offence of disturbance, regulation 41(1) of the Habitat Regulations states that a person commits an offence if they:

"deliberately disturbs wild animals of any such species [i.e. European Protected Species] in such a way as to be likely significantly to affect:

- ✧ *the ability of any significant group of animals of that species to survive, breed, or rear or nurture their young; or*
- ✧ *the local distribution or abundance of that species."*

Bats are also afforded more general protection in England (and Wales) within the NERC Act 2006. Consequently, attention should be given to dealing with the modification or development of an area if aspects of it are deemed important to bats, such as roosts, flight corridors and foraging areas.

Species of Principal Importance for the Conservation of Biodiversity in England are listed under Section 41 of the NERC Act. This list includes barbastelle bat, Bechstein's bat *Myotis bechsteinii*, noctule, soprano pipistrelle, brown long-eared bat, greater horseshoe bat *Rhinolophus ferrumequinum* and lesser horseshoe bat *Rhinolophus hipposideros*.

Great crested newts

Great crested newts are afforded protection under the Habitats Regulations and Schedule 5 of the W&CA which makes it an offence to:

- ✧ Deliberately, intentionally or recklessly kill, injure or take a great crested newt;
- ✧ Deliberately, intentionally or recklessly take or destroy the eggs;
- ✧ Possess or control any live or dead specimen or anything derived from a great crested newt;
- ✧ Deliberately, intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a great crested newt; and
- ✧ Deliberately, intentionally or recklessly disturb a great crested newt while it is occupying a structure or place which it uses for that purpose.

Great crested newts are also afforded more general protection in England (and Wales) in accordance with the requirements of Section 41 of the NERC Act (2006).

Hedgehog

Section 41 (S41) of this Act requires the Secretary of State to publish a list (in consultation with Natural England) of Species which are of Principal Importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers such as public bodies including local and regional authorities, in implementing their duty under Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal (e.g. planning) functions.

Hedgehogs are listed as a UK 'Priority Species' under S41 of the NERC Act (2006). Additionally to this they have limited protection under Schedule 6 of the Wildlife and Countryside Act (1981) as amended, meaning they may not be caught or trapped without a licence.

Reptiles

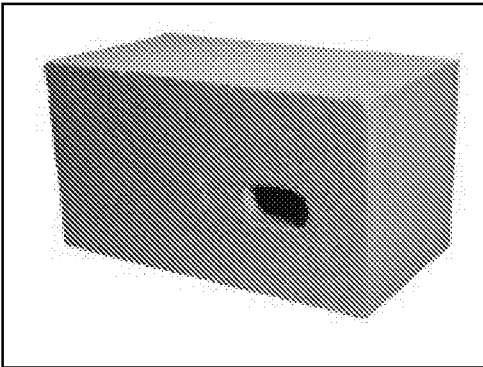
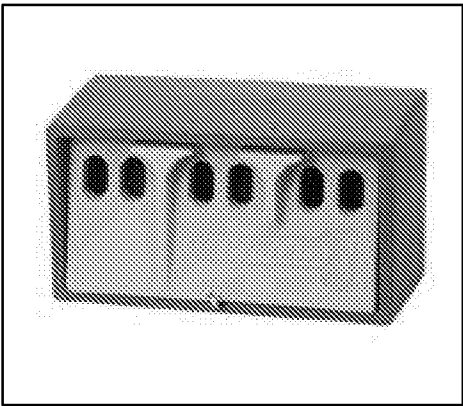
There are six reptile species native to the UK; these comprise the slow worm *Anguis fragilis*, smooth snake *Coronella austriaca*, sand lizard *Lacerta agilis*, grass snake *Natrix helvetica*, adder *Vipera berus* and common lizard *Lacerta Zootoca vivipara*. All UK reptile species are protected under the Wildlife and Countryside Act 1981 (as amended) and benefit from various levels of protection. The adder, grass snake, slow-worm and common lizard receive partial protection under Section 9 of the Wildlife and Countryside Act 1981 (as amended). This legislation makes it an offence to:

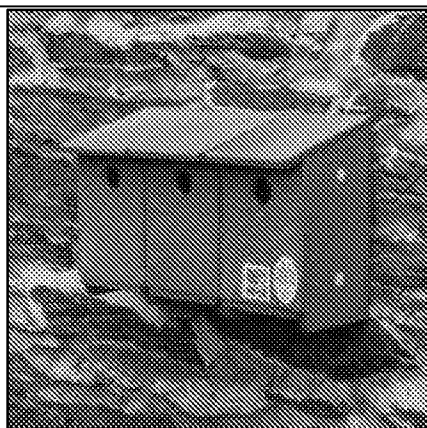
- ✧ Intentionally or recklessly kill or injure these animals; and
- ✧ Sell, offer for sale, possess or transport for the purpose of sale or publish advertisement to buy or sell individual reptiles.

All six reptile species native to the UK are also afforded more general protection in England (and Wales) in accordance with the requirements of Section 41 of the NERC Act 2006.

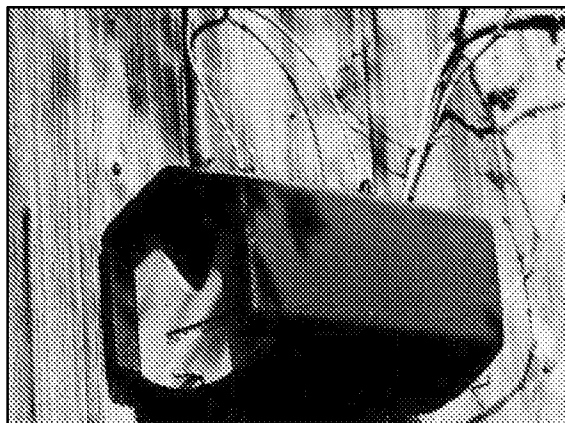
Appendix C – Landscape Master Plan

Appendix D – Examples of Ecological Enhancements

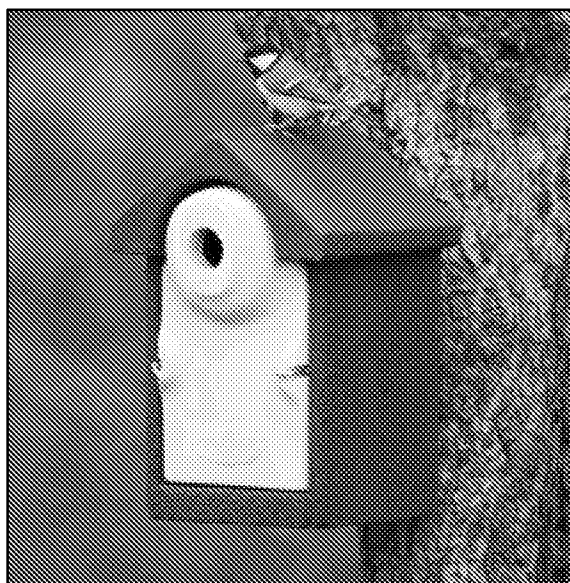
Enhancement	Example
Bird Boxes	WoodStone Build-in Swift Nest Boxes
	
	1SP Schwegler Sparrow Terrace
	
	Sparrow Terrace FSC Nest Box



2HW Schwegler Nest Box

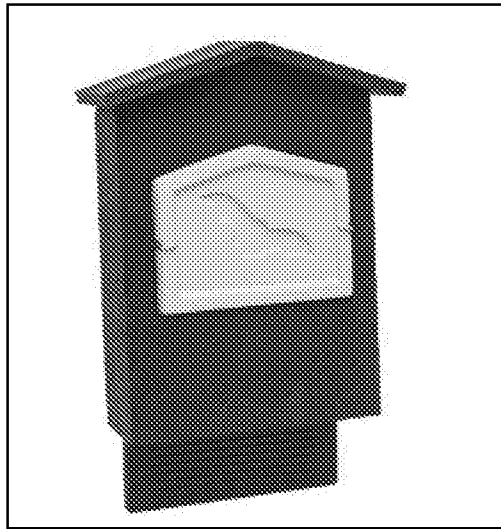


Vivara Pro Seville WoodStone Nest Box (28mm and 32mm hole)

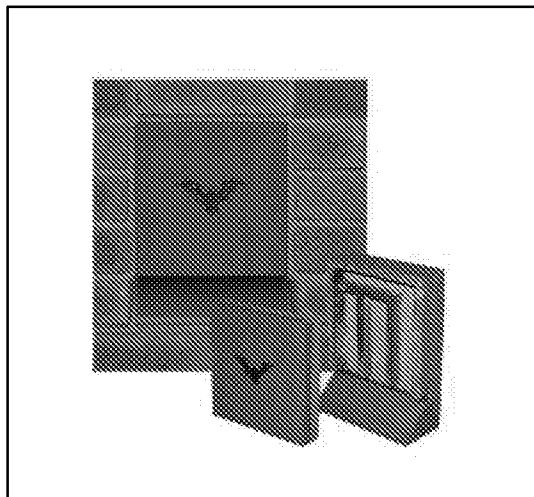


Bat Boxes

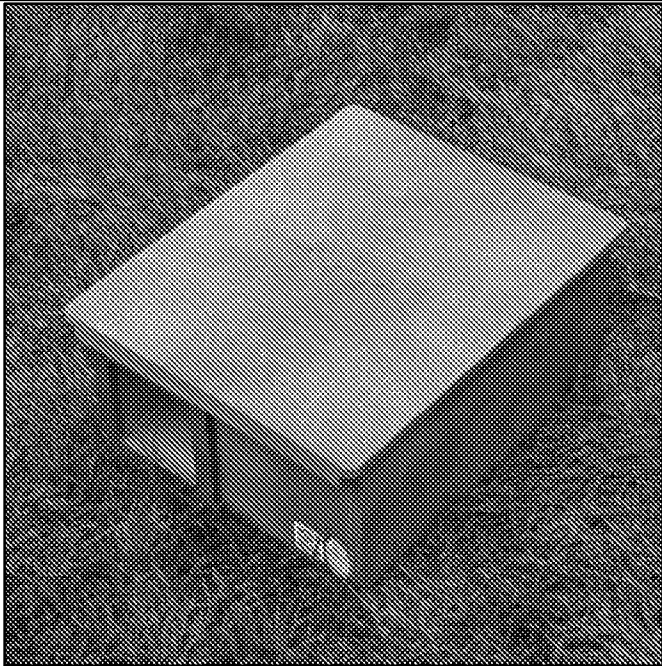
Low Profile WoodStone Bat Box



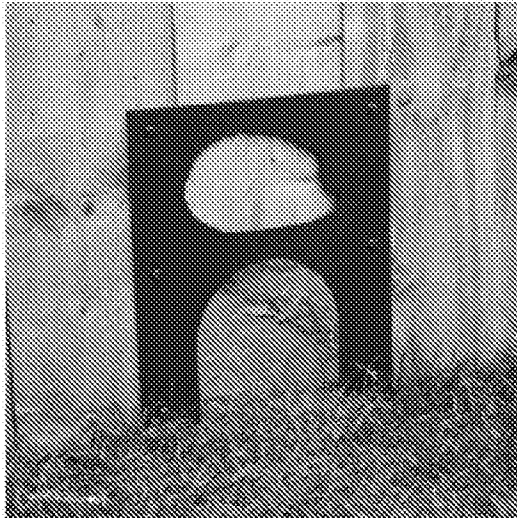
Ibstock Enclosed Bat Box 'C'



Vincent Pro Bat Box

	
Hedgehog Boxes	

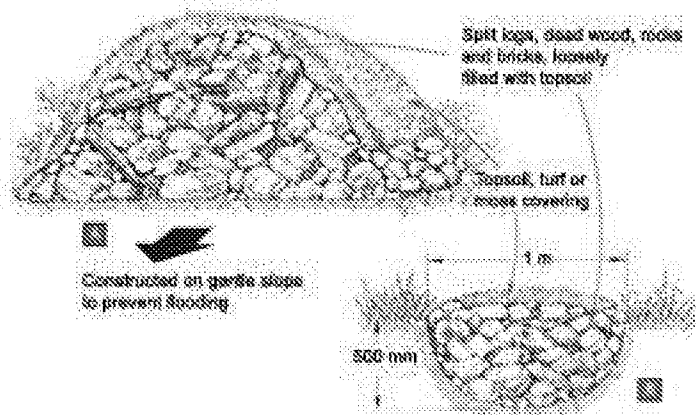
Hedgehog (small mammal holes)



Available at NHBS

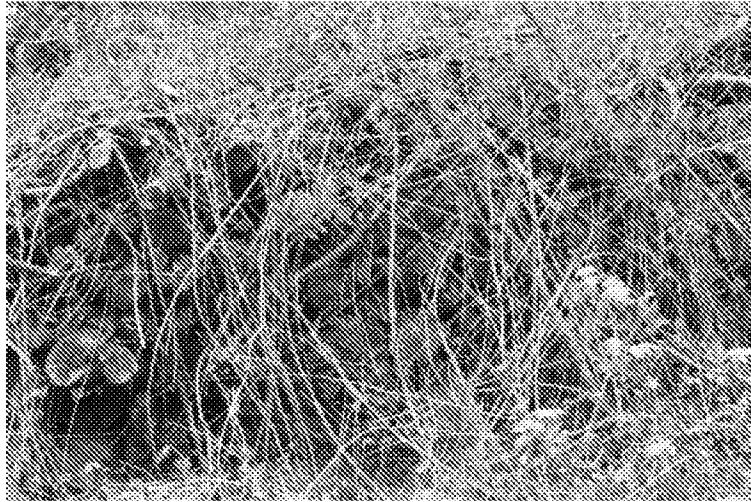
Refugia and log pile

Refugia ([pinterest.com](https://www.pinterest.com), ecologylink.com)





Log pile (gibside.blogspot.com, herpetofauna.co.uk)



Compost Heap (ebay.com, newlifeonahomestead.com)

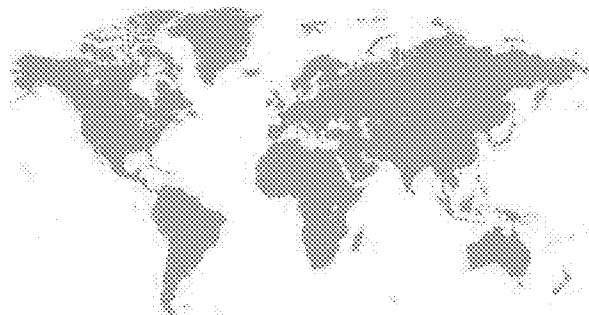




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