

WYG Environment

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Linden Homes

Hampshire Farm, Emsworth

Ecological Management Plan

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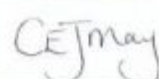
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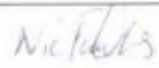
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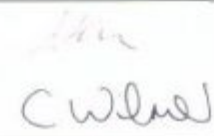
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1.0 Introduction

1.1 Background

WYG Environment (WYG) was commissioned by Linden Homes to prepare an ecological management plan for land at the Hampshire Farm development site and the Open Space land that lies directly to the east of the development site (Figure 1).

This ecological management plan has been developed using information collected during an ecological assessment which was completed to guide ecological mitigation, compensation and enhancement proposals to fulfil the objectives provided in the outline planning permission, condition 13:

13. No development hereby permitted shall be commenced until a complete Ecological Management Plan has been submitted to and approved in writing by the Local Planning Authority. This will include (but not limited to):

- i. A strategy for external lighting with particular reference to bats;*
- ii. Details of bat commuting/foraging habitat compensation and enhancement;*
- iii. Details of mitigation and enhancement proposals for invertebrates;*
- iv. Phasing of various biodiversity measures together with wider construction programme;*
- v. Details of on-going maintenance of wildlife area and Public Open Space for biodiversity.*

Unless otherwise approved in writing by the Local Planning Authority, the Ecological Management Plan shall be implemented in accordance with the approved programme.



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A preliminary Phase 1 habitat survey and ecological assessment was completed of the development site in May 2009 with a subsequent extended Phase 1 habitat survey undertaken of the Open Space land in April 2010 (Figure 1).

On the development site the following surveys have been completed:

- reptile presence/absence survey,
- entomological surveys
- bat roost assessment
- subsequent bat emergence/re-entry surveys.
- dormice presence/absence surveys

The Open Space land was considered to have potential to support the following protected species:

- roosting bats in trees
- badgers
- water voles
- reptiles
- dormice

Protected species surveys were not completed in the open space land, with the exception of dormice surveys, as a small section of hedgerow will be removed along the southern boundary for access, however none of the mature trees or tree lines will be affected and therefore there is not considered to be a negative impact to the bat population. No development is to be undertaken with 30 metres of the potential badger setts, although subsequent visits to the site by WYG ecologists has found no signs of badgers and they therefore are not considered to represent a constraint. The ditches are not being affected by the development and no works are to be undertaken within 5 metres of bank side and hence there will be no impact to water voles. The areas which hold reptile potential are to be retained as part of the open space plans except for a small area where the allotments are proposed which will be included within the reptile



translocation at the development site, the arable field will become a grassland meadow with areas of woodland stands which will provide an extensive area of suitable habitat for reptiles.

1.2 Priority Setting

Priorities identified during the ecological assessment include protecting habitats or species of importance, ensuring no net loss of biodiversity, and improving habitats within the final design to enable, where possible, biodiversity gain. This is in accordance with the requirements of Planning Policy Statement 9 (PPS9) Biodiversity and Geological Conservation (Office of the Deputy Prime Minister – ODPM, 2005).

1.3 Location

The Hampshire Farm site lies beyond the north eastern boundary of Emsworth, Hampshire, near the county border with West Sussex. Hampshire Farm is bordered by residential areas to the west, south and north. The eastern boundary of the development site is bordered by agricultural fields which are to form the land to be used as 'Open Space'. Beyond the eastern boundary of the 'Open Space' lies the River Ems and the Westbourne Rural Enterprise (WREN) Centre. The site is approximately 24.9 hectares in area including the 'Open Space' land.

1.4 Planning History

Outline planning permission has been granted, dated 12 May 2011 to develop 280 residential units on the 8 hectare housing site and to provide public open space on the residual land. The site is identified within the Local Plan as a 'reserve housing' site with a requirement of the Plan being to maintain the 'Open Space' area to the east of the site between Emsworth and the village of Westbourne to the west of the site. It is intended that the area designated as 'Open Space' land, once acquired by Linden Homes, will be laid out and thereafter maintained as open land in perpetuity and transferred to the local community to safeguard and managed appropriately.



2.0 Pre-development Site Description

The below is a summary of the ecological surveys completed at the site to date. Full details can be found in the individual reports.

2.1 Description of the development site habitats prior to development

WYG Phase 1 Survey Hampshire Farm, Emsworth report, updated June 2010.

At the time of the phase one survey a larger surrounding area was surveyed which is now not part of the development, therefore only Field B and C are discussed below as these are the areas within the development site. Field B and C refer to drawing A056755/Hab within Appendix D of the Extended Phase One Habitat Survey (WYG, 2009). The Open Space land lies to the east of these areas. For this purpose, Field B, C and the Open Space land are marked on Figure 1.

Field B has been ploughed in the past (some years ago, pers.comm; local resident) and was actively farmed up until five years ago. The grassland is described as improved to semi-improved neutral grassland. The grassland appears to have recovered well from the previous intensive farming activity and currently the ecological trend is towards increasing botanical diversity. Numerous vascular plants were observed during the survey, including orchids (*Dactylorhiza* sp.). The southern-most area of Field B had been recently cut by the farmer (pers. comm. residents of 'The Glen'). Field B is bordered by hedgerows and tree lines. Along the eastern, northern and western boundary of Field B running parallel at the base of the hedgerows and tree lines are dry ditches.

Field C is dominated by neutral grassland, with scattered scrub. At the time of the phase one survey, the field was grazed. Along the boundary between Field B and Field C, there is a wet ditch which is obscured by a hedgerow, dense scrub and ruderal vegetation. The ditch in winter contains standing water and is likely to drain water off the land (pers. comm), however during the initial Phase 1 survey in May, this ditch was dry with some water cress (*Rorippa* sp.) indicating it had been wet earlier in the year.

The northern and western boundary of Field C comprises a tree line/hedgerow, including the following species; pedunculate oak (*Quercus robur*), ash (*Fraxinus excelsior*), holly (*Ilex aquifolium*), poplar (*Populus* sp.) and elder (*Sambucus nigra*).



Along the northern boundary of Field C lies a tree line and a dry ditch which does not extend the full length of the boundary between these fields. The southern and eastern boundary of Field C is dominated by a hedgerow.

2.2 Description of the Open Space habitats prior to development

WYG Phase 1 Survey Hampshire Farm Open Space, Emsworth report, updated June 2010.

The majority of the site comprises a large agricultural field which, at the time of the survey, was planted with wheat with occasional rough meadow grass (*Poa trivialis*), scarlet pimpernel (*Anagallis arvensis*), field speedwell (*Veronica persica*), chamomile (*Chamaemelum nobile*), oil seed rape (*Brassica napus*) and ivy leaved speedwell (*Veronica hederifolia*). The field margins were herb rich and included a diverse range of species; the abundant species included sweet vernal grass (*Anthoxanthum odoratum*), annual meadow grass (*Poa annua*), cow parsley (*Anthriscus sylvestris*), greater stitchwort (*Stellaria holostea*) and bugle (*Ajuga reptans*). Occasional areas of ruderal species were noted in field corners, dominated by common nettle (*Urtica dioica*) with occasional garlic mustard (*Alliaria petiolata*), dock sp (*Rumex sp.*), cow parsley (*Anthriscus sylvestris*), red dead nettle (*Lamium purpureum*), hogweed (*Heraculum sphondylium*), dandelion (*Taraxacum officinale agg.*), ivy (*Hedera helix*), creeping buttercup (*Ranunculus repens*) and spear thistle (*Cirsium vulgare*). Along the northern and eastern boundaries are hedgerows with standard trees dominated by hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), field rose (*Rosa arvensis*), pedunculate oak, ash, willow (*Salix sp.*), elder (*Sambucus nigra*), field maple (*Acer campestre*), dogwood (*Cornus sanguinea*), yew (*Taxus baccata*), horse chestnut (*Aesculus hippocastanum*), hazel (*Corylus avellana*), sycamore (*Acer pseudoplatanus*), spindle (*Euonymus europaeus*) and honeysuckle (*Lonicera periclymenum*). Along the southern boundary and along the northern and eastern boundary of the horse grazed field there are hedgerows which are generally intact and comprise dogwood, honeysuckle, blackthorn, hop (*Humulus lupulus*), bramble, ivy, hazel, willow, penducualte oak, field maple, field rose, hawthorn and butchers broom (*Ruscus aculeatus*).

2.3 Reptile Surveys

WYG Hampshire Farm Reptile Presence/Absence Survey Report, 2009 and 2010.

WYG completed reptile surveys in 2009 and 2010 which confirmed the presence of a Low population of grass snake and a Good population of slow worm at the Hampshire Farm site.



- *2009 survey:* The presence/absence survey confirmed the presence of one reptile species – slow worm (*Anguis fragilis*). A maximum count of two juvenile slow worms was recorded on site during any one visit. These individuals were found along the northern boundary of the site in the field/scrub/hedgerow interface. No adult slow worms were identified during the survey and therefore the population size could not be calculated.
- *2010 survey:* Five visits were undertaken in 2010 to update results from the previous year. The presence of two reptile species, slow worm and grass snake (*Natrix natrix*), was confirmed within the development site (Field B and Field C). During this survey, artificial refugia were replaced within the horse grazed field in the north western corner of the site (Field C) and also within the grounds of the property 'The Glen' where access had not been possible in 2009. 33 adult slow worms were observed over 0.48 hectare of land (this was the margins of Field B and the main development site was infrequently cut during the reptile surveys by the tenant farmer and hence considered unsuitable to reptiles). A maximum count of three adult grass snakes was recorded on site during any one visit along the northern boundary of the site and within the horse grazed field within the north western corner of the site (Field C) indicating a Low population of grass snakes.

Mats had remained onsite since the 2009 survey and were more likely to be used by reptiles than mats that had been placed out closer to the 2010 survey start date. Due to the infrequent cutting of the main development site, it is considered that the reptiles had been pushed to the margins of the fields and hence the margins of the fields supported an elevated population. As a result, it is considered that the reptile populations at the site are best assessed as Good for slow worms and Low for grass snakes.

2.4 Bats

WYG Hampshire Farm Bat Roost Assessments and Emergence / Swarming surveys, 2009

Bat roost assessments were undertaken of 'The Glen' and associated buildings. No signs of bats were identified during the bat roost assessment and the buildings were considered to be of low potential to roosting bats. As a precautionary approach, Hampshire County Council has recommended that an ecologist is present on site during the removal of the roofs

Many trees were found to hold Moderate and High potential to support roosting bats. Emergence/re-entry surveys were undertaken focussing on the trees that form the northern boundary as at the time there was some uncertainty as to whether these trees would be affected by the development, however many were



considered to have potential to be bat roosts and two trees were thought to be used by roosting bats during the emergence/return surveys. It has now been confirmed that no trees along the northern boundary or any other trees of bat roosting potential will be felled as part of the development. The existing hedgerows on site proved to be important commuting routes to bats.

2.5 Dormice

WYG Hampshire Farm Dormice Surveys, 2011

Due to revisions of the proposed plans to affect hedgerows and the relaxation of the cutting of the hedgerows, dormice surveys have been set up across the development site and open space area within the hedgerows and suitable tree lines. One hundred nest tubes have been installed throughout suitable habitat during March 2011, and have subsequently been checked every month since April. To date no signs of dormice have been recorded and therefore it is considered highly likely that these species are absent from the site given that 18 'points' have already been achieved of a recommended minimum of 20 'points' as per Dormouse Conservation Handbook (Bright, Morris & Mitchell-Jones, 2006) Therefore these species are not discussed further in the report. If these species are found to be present, the report will be revised and resubmitted to Hampshire County Council.

2.6 Water Voles

Whilst the ditches within the Open Space land have been identified as holding potential for water voles, the ditches are not going to be affected by the development. The arable field margins will be retained as part of the reptile mitigation; therefore it is not considered that any works will impact within 5 metres of the ditch banks and hence no mitigation is required and therefore these species are not discussed further in this report.

2.7 Invertebrates

WYG Invertebrate Survey, 2010

The most heavily utilised areas of the site by insects were the hedgerows and those areas where there was an abundance of vetches including hairy tare (*Vicia hirsuta*), other *Vicia* sp, black medick (*Medicago lupulina*), red clover (*Trifolium pratense*), buttercup *Ranunculus* sp., hawk's beard (*Crepis* sp.), germander



speedwell (*Veronica chamaedrys*) and umbels, including cow parsley (*Anthriscus sylvestris*) which were scattered throughout the site but predominantly within the northern section of Field B.

2.8 Landscaping

Recommendations within this ecological management plan have also been based on preliminary proposals for soft-landscaping on site, including:

- Retention of the mature trees and hedgerows along the northern, eastern, southern and western boundaries of the development site and Open Space land;
- Management of hedgerows and trees;
- Management and enhancement of Open Space land including grassland, hedgerows, attenuation pond and swale;
- Management and enhancement of reptile receptor site.



3.0 Ecological Mitigation, Compensation and Enhancement

3.1 Habitats and Vegetation

Planting and management in relation to habitats are detailed in the EDP Landscape Strategy: Residential Area and Open Space area (Figures 2 and 3 respectively).

3.1.1 Trees and Hedgerows

Prior to felling any trees, please also refer to sections 3.3 and 3.7 and WYG Bat Roost Assessment, 2009. The development has incorporated the majority of mature trees on site and all those identified as holding bat roosting potential (WYG, 2009). However, some trees are to be lost due to the development of the access road into the site, predominantly from the current garden area of the property 'The Glen' but the loss of these trees will be compensated for by native woodland planting of the open space land (Refer to EDP Landscape Strategy: Public Open Space) and any gaps in the hedgerows along the northern, eastern and western boundaries of the development site will be enhanced with the planting of hedgerow woody species (refer to EDP Landscape Strategy: Residential Area). This enhancement will create continuous linear feature, which will enhance the site for commuting and foraging bats and hazel dormice.

Where trees are felled, these should be cut to at least three metres in length, and piled up and placed along the field edges of the Open Space land and within the receptor site. The log piles will be positioned in a location that is in partial shade which will receive sunshine for a few hours each day, as this provides optimal conditions for invertebrate larvae to develop, such as stag beetles (Natural Environment and Rural Communities (NERC) Act 2006 Sect. 41 species, National Biodiversity Action Plan (BAP)) and other dead wood species. Furthermore, the log piles will benefit reptiles as they will provide suitable hibernation sites.

3.2 Woodland

Tree planting will be used to enhance the visual and biodiversity aspects of the 'Open Space' land.

The Landscape Architects, EDP, have selected the following trees to be planted within the woodland areas refer to Figure 3, Appendix A. Tree species which will be planted are listed below:

- ash
- hornbeam
- pedunculate oak



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- silver birch
- small leaved lime

As per EDP Landscape Management Plan (Figure 3), the tree species to be planted along the eastern boundary of the attenuation pond include:

- alder
- dogwood
- goat willow
- hawthorn

3.3 Orchids

During the Phase 1 habitat survey, a number of orchids (*Dactylorhiza* sp.) were recorded along the northern boundary of the main field. Whilst the boundaries are to be retained, some areas where the orchids were recorded are to be lost as a result of the development. During the reptile destructive search in September/October the turf from these areas will be lifted and translocated into the receptor area to maintain the local population of orchids.

3.4 Reptiles

To prevent contravention of the Wildlife and Countryside Act (1981), reptiles will be translocated outside of the development footprint to a receptor site which is located in the north west corner of the Public Open Space with the retention of the surrounding arable margins. The process is defined below:

3.4.1 Site Clearance Summary

WYG's *Reptile Mitigation Method Statement* (June 2010) describes the detailed methodology to undertake the reptile translocation at Hampshire Farm and relocate the reptiles within the north west corner of the open space land but there have been small revisions to the scheme since the preparation of the report and a summary of the revisions are given below:

- Harrowing of the land is no longer being undertaken within the horse grazed field as the horses have not been present on the land for over a year and hence the soil had naturally broken up. Given the presence of reptiles at the site and the increased suitability of the site for reptiles, the process of harrowing was not considered appropriate and instead hibernacula will be installed to



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further enhance this area (Figure 4). The area that is currently arable land will be harrowed and planted to extend the reptile receptor site. Figure 3 indicates the extended area.

- The reptiles will be translocated to the receptor site that is in the north west corner of the open space land that was once used for horses to graze - marked as receptor site on Figure 1, and the arable field margins will also be retained to allow the reptiles to commute.
- The remaining area of the open space land will still be planted according to the mitigation method statement which will allow further commuting and dispersal by reptiles, however this will be completed at a point when 139 houses have been erected (it is predicted that this is approximately half way through the second year from commencement of building at the site).
- Temporary snow fencing (orange plastic fencing) will be erected surrounding the receptor site and arable margins to identify these areas as protected areas, however development works will not be taking place close to these areas (Figure 5).
- At the southern most section of the eastern boundary, the arable margins will be lost for the creation of flood attenuation ponds. As this area is very narrow, the vegetation will be trimmed and maintained to discourage reptiles from the area. An ecologist will be present to supervise any vegetation removal that is required during creation of the attenuation features.
- The translocation programme has allowed for a 70 visits to the site which follows the Herpetofauna of Great Britain and Ireland (HGBI) guidelines for a good population of slow worms and a low population of grass snakes.

3.4.2 Reptile Receptor Site

The following habitat enhancements and monitoring are proposed to be undertaken at the receptor site (Figure 4 & 6) prior to the commencement of the translocation to increase the number of reptiles it is able to support:

- Creation of refugia/hibernacula using wood/brush piles
- Extending and planting the extended area of the receptor site
- Monitor the reptile population



- Monitor and control of scrub growth

Hibernacula provide habitat for overwintering reptiles and amphibians. At least five hibernacula will be created within the receptor area and five surrounding the arable margins. The hibernacula with the receptor site will be below-ground and those surrounding the arable margin will be above ground (see Figure 4) following the construction guidelines below:

1. **Pile material:** Pile material such as rubble, split logs, decaying wood and rocks to at least 1m in height and loosely fill with top soil. Materials used are best sourced from other activities on site, such as scrub clearance and top soil removal.
2. **Top soil cap:** Create a top soil cap over the piled material and cover further with turf to prevent drying out. It is important to leave a topsoil-free exposed ring around the base of the hibernaculum, to allow reptile access (see Figure 4).

The extended area of the receptor site which is currently arable land will either be sown with a wildflower species mix which as per proposed Landscape Scheme which includes information relating to species planting mix (EDP, 2011, Figure 3). If this is unsuccessful, turf translocation will be the second option to ensure the suitable habitat area is extended.

3.5 Bats

3.5.1 Breeding and Resting Sites

As a precautionary approach an Ecological Clerk of Work's will be present on site to supervise the demolition of 'The Glen' and associated outbuildings in relation to bats. The aim of this methodology is to provide details on how to sensitively take apart (soft-strip) the potential roosting areas of the buildings to be demolished, in order to reduce impacts to potentially roosting bats, although the risk of bats being present is low.

This is not stand alone advice and must be incorporated into the contractors own demolition methodology, which details equipment and methods of safe access, etc.

In summary, the principles relating to bat mitigation will include the following:

- It is anticipated that the demolition work will take place in October/November 2011, when impacts to roosting bats will be minimised as they are unlikely to be using the structures to hibernate.



- All contractors involved with the soft-strip and demolition of the buildings will be given a toolbox talk by the ECoW (Figure 7) so that they are made aware of the possible presence of bats and nesting birds and the importance of being vigilant whilst undertaking the works on site in advance of works.
- Prior to any works on the buildings commencing, an Ecological Clerk of Works (ECoW) will check the buildings for the presence of roosting bats or nesting birds.
- The ECoW will be present to oversee the soft-strip until each building has been made unsuitable to roosting bats.

The following sequence of precautionary measures must be undertaken by the contractors and incorporated into their demolition method statement to minimise any potential impact on bats:

- remove the ridge tiles by hand/using hand tools;
- remove roof tiles by hand/using hand tools. The tiles must be lifted off as opposed to being slid off, to avoid injuring any bats that may be present beneath;
- one side of the roof must be removed and the other side should be left for 24 hours before removal;

once the ECoW is satisfied that the building is unsuitable for roosting bats, demolition can proceed as standard. In the unlikely event that bats are found during the demolition works, all works must stop immediately and the Project ecologist or Natural England contacted to seek advice.

Whilst no roosts are to be lost as a result of the development of the site, twenty bat boxes are to be located on trees surrounding the site, particularly along the northern and eastern boundaries of the site, to increase the bat roosting habitat available at the site. It should be noted that some trees are covered by *Tree Preservation Orders (TPOs)* and permission needs to be sought from Havant Borough Council prior to erecting the boxes. General guidance for bat boxes (provided by the Bat Conservation Trust) includes:

- Locate the boxes in an area that is sheltered from strong wind and exposed to the sun for part of the day (e.g. facing south east and south west).
- Put up two or three boxes on each tree facing in different directions to provide a range of temperature conditions.



- Bat boxes should be placed along linear vegetation feature in this case along tree lines along the northern and eastern boundaries or standard trees within the hedgerows along the southern, western and north-south hedgerow.
- Bat boxes are widely available (e.g. Schwegler 'woodcrete' boxes for a range of bat species). In general the boxes should not allow draughts, should be rough sawn and untreated. See Appendix C for more information.

3.5.2 Foraging and Commuting Bats

The boundaries of the site are to be largely retained intact. The existing hedgerows on site proved to be important commuting routes to bats and all the hedgerows are to be retained excepting a section of the hedgerow that runs east to west across the development site and currently divides Fields B and C (Figure 1).

Hedgerows scheduled for removal will be removed in such a way as to minimise damage to neighbouring trees and shrubs. Currently the existing hedgerow which runs from east to west and part of the northern hedgerow will be removed, totalling approximately 95 metres in length. This hedgerow was confirmed to be used by commuting serotine bats and a Myotis bat species which is considered most likely to be Whiskered/Brandt's in low numbers. Due to the use of this hedgerow as a commuting route it is important to ensure that foraging and commuting habitats around and within the site are maintained. Given the retention of other east-west hedgerows within the site, and enhancements of the hedgerows where gaps are present (EDP Landscape Strategy – Residential area: Figure 2) and the enhancement of the Open Space land (EDP Landscape Strategy – Open Space area: Figure 3) the impact of removing this hedgerow is reduced. It is considered that the woodland located to the north of the site will act as more important roosting/foraging habitat for bats and it is considered that the removal of this hedgerow will not significantly impact the local bat population. Further, existing trees are to be retained at either end of the eastern-western hedgerow and additional trees will be planted to encourage the flight path of bats up and over roads (see Figure 8).

A Myotis species (either Whiskered/Brandt's bat) was recorded along the east-west hedgerow which surrounds the property 'The Glen'; the hedgerows surrounding this property are to be removed to allow for access to the site, however the oak is to be retained. The hedgerows comprise largely hawthorn and Lawson cypress and were not considered to be as important to commuting/foraging bats as the hedgerows to be retained. A further two gaps will be created along the western boundary of the site, one along the



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eastern boundary of the development site and one along the southern boundary of the Open Space land. All of these are to be created where there are existing gaps, such as gateways, except along the southern boundary of the Open Space land. Planting trees at either end of these gaps will encourage elevated flight routes and provide light screening for bats (See Figure 8).

The northern, eastern and western hedgerows of the development site will be enhanced where gaps are present as per the EDP Landscape Strategy – Residential area: Figure 3) so that there are no longer gaps present and the tree line is continuous, which will improve commuting routes to bats.

The Open Space land has large mature tree species that will be retained, particularly along the eastern and western boundary of the site. No bat emergence surveys or commuting surveys have been undertaken of this area as the trees will not be impacted by the development. The only alterations to hedgerows in this area, are the removal of a small section of hedgerow to provide access into the allotment areas proposed within the 'Open Space' land.

Where gaps are present in the existing hedgerows, these gaps will be filled with native species providing uninterrupted green corridors (See Figure 2 & 3).

In terms of planting for bats, the aim is to have flowers in bloom throughout the year, including both annuals and herbaceous perennials. EDP have drawn up a species mix to be planted in the different habitats that will be created within the open space land : EDP Landscape Strategy: Public Open Space (Figure 3).

3.5.3 Lighting

It is recommended that measures to minimise impacts on bats potentially using the boundary habitats are implemented. Permanent lighting on site should avoid the boundary habitats, namely the broadleaved tree lines and hedgerows. Construction lighting and security lighting, can impact bats. The following measures will be adopted for the development area:

- Lighting required for security reasons will only be used at key areas within the visitor car park proposed in the open space land and along the main access roads within the development site and open space land. Figures 9 and 10 indicate areas where no light spill has been agreed by Linden Homes to ensure the site is maintained to be favourable to commuting and foraging bats;



- Where lighting is necessary this should be of sensitive specification (e.g. high-pressure sodium streetlights SON) and fitted with a hood to direct light downwards to reduce light spill. Refer to the Bat Conservation Trust 'Bats and Lighting' document for ways to minimise the impact of lighting. This will help to avoid disrupting possible bat commuting/foraging corridors and any roosts potentially present off site.
- Currently, a detailed lighting plan has not been designed, however this is required as part of the planning requirement and WYG ecologists will liaise with the lighting engineers to ensure a favourable scheme is agreed. Hampshire County Council will be notified of the scheme.

3.6 Badgers

Some mammal excavations were present along the eastern boundary of the Open Space land; at the time of the Phase 1 survey, and the potential presence of badgers could not be discounted. This area is approximately 250 metres from the main development works, however a precautionary approach will be adopted and a pre-commencement badger sett check will be completed to ensure that badgers have not moved into the working area and are not present within 30metres of any development. The current knowledge of the site is that no development works are proposed within 30m of any possible badger setts within the Open Space land. Subsequent visits to the sites by ecologists have not recorded any signs of badgers and no setts have been confirmed. However, if badger setts are identified within 30 metres of the development works, a Natural England development licence may be required prior to development which could involve temporarily or permanently closing the sett and creating artificial setts, improving the foraging habitat within the site (which has already been included within the design such as the planting of woodland along the eastern and northern boundary of the open space habitat) and ensuring that, if badger corridors are present, on site these are maintained.

3.7 Invertebrates

In general terms, the most heavily utilised areas of the site by insects were the hedgerows and those areas where there was an abundance of vetches (WYG, 2010: *Invertebrate Survey*) including hairy tare (*Vicia hirsuta*), other *Vicia* sp, black medick (*Medicago lupulina*), red clover (*Trifolium pratense*), buttercup *Ranunculus* sp., hawk's beard (*Crepis* sp.), germander speedwell (*Veronica chamaedrys*) and umbels, including cow parsley (*Anthriscus sylvestris*).



The following species will be planted within the reptile receptor site of the Open Space and seeds sown once the remaining areas of the Open Space land are planted to encourage the use of the Open Space land by the scarce/threatened invertebrate species that were recorded on the main development site. Plants to be included are as follows which are detailed in the Landscape Strategy Plan (Figure 3: EDP 5 Landscape Strategy - Public Open Space):

- **Umbel flowerheads** - The soldier beetle (*Cantharis fusca*) is reliant upon tall grassland areas, and may benefit from being on a somewhat damp substrate. It is regularly found visiting umbel flowerheads, and the presence of existing umbels within the receptor site will temporarily mitigate for the loss of this species from the development site. When the remaining area of the Open Space land is sown, it is recommended that umbel flowers are planted near to the swale/attenuation pond areas to create the habitat of damp substrate/tall grassland.
- **Germander speedwell** – The mining bee *Andrena labiata* (which is the host of the rare cuckoo bee *Nomada lathburiana* recorded during the survey) has a very close association with germander speedwell (*Veronica chamaedrys*) so the presence of this plant in any compensation or enhancement measures is highly recommended.
- **Clover and vetch-rich grassland** - The presence of clover and vetch-rich grassland nearby would add a valuable nectar resource for the two *Andrena* mining bees (in turn providing hosts for the rare cuckoo-bee).
- **Bristly ox-tongue and *Crepis* sp.** - Picture winged flies recorded at the site require presence of bristly ox-tongue and *Crepis* sp.
- **Sandy ridges**- The bees *Andrena labiata* and *Andrena cineraria* (which are the host of the rare cuckoo bee *Nomada lathburiana* recorded during the survey) both show preferences for light soils in which to nest, and the presence of such a substrate may influence their survival. Creating a series of ridges of sandy soil around the field margins would benefit these species through the provision of burrowing / nesting habitat. These will be created when the reptile hibernacula are installed in the receptor area. The sandy ground would need to be kept open with a minimum of around 40% bare ground to provide basking areas.

Many of these species have already naturally colonised the receptor site (excluding the extended area) since the surveys, following the removal of horse grazing from the site.



3.8 Birds

The majority of trees are to be retained along the boundaries of the development site as they are considered to be of good amenity value and are likely to contribute significantly to local wildlife as valuable habitat (see Figure 2). These trees are also protected by Tree Preservation Orders (TPO). The trees will be fenced off to protect them from damage during any construction phase according to specifications provided in the Arboricultural Method Statement (Barrell Tree Care, 2011).

The landscaping at the development site will involve enhancing the existing hedgerows, particularly where gaps are present. Refer to EDP Landscape Strategy: Residential Area. Furthermore, broadleaved woodland is proposed within the open space land, refer to EDP Landscape Strategy (Open Space: Figure 3). Many of the tree species planted will include species that bear berries such as hawthorn and honeysuckle to provide a food source for bird species – details of species to be planted are provided in EDP Landscape Strategy: Residential Area and EDP Landscape Strategy: Open Space Area (Figure 2 and 3 respectively). The woodland areas within the open space land along the northern and eastern boundary and the enhanced hedgerows on the development site will increase the available habitat to nesting bird species.

Established trees require minimum maintenance to remain healthy for many years. However, newly planted saplings will require some maintenance for at least the first three years for successful establishment. Details regarding trees will be set out in the landscape management plan also required by condition and the Arboricultural Method Statement.

The broadleaved trees, hedgerows, scattered scrub and ornamental planting on the site are likely to support nesting and breeding birds. Where vegetation clearance is proposed (notably the trees scheduled for felling and the removal of the hedgerows surrounding 'The Glen' and the east-west hedgerow on the development site: EDP: Landscape Strategy (Residential Area: Figure 2). These vegetation works are scheduled to be completed outside the bird breeding period (works to be undertaken during September/October). It should be noted here that birds will sometimes nest outside these months and the Wildlife and Countryside Act 1981 (as amended) will still apply if nesting birds are found and hence it is thus an offence to: intentionally kill, injure or take any wild bird; intentionally take, damage or destroy the nest of any wild bird while it is in use or being built; and intentionally take or destroy the egg of any wild bird.. Therefore the removal of the eastern-western hedgerow and the hedgerow surrounding 'The Glen' will be supervised by an Ecological Clerk of Works. The loss of this hedgerow will be compensated by enhancing the existing 'gappy' hedgerows along the eastern and western hedgerows of the site (Refer to



Figure 3: Landscape Architects: EDP 1: Landscape Strategy – Residential) and the planting of broadleaved woodland within the open space area, as discussed above.

3.9 Dormice

If dormice are found to be present, in order to remove the east-west hedgerow and part of the northern hedgerow, the hedgerow surrounding 'The Glen' and to create gaps in the hedgerows for pedestrian access paths a Natural England Development licence will need to be applied for and gained. As dormice are not known to be present at the site, mitigation is not detailed, however, if these animals are found to be present, mitigation is likely to involve creation of new hedgerows that connect to existing hedgerows and proposed woodland areas with the Public Open Space and enhancement of hedgerows at the development site.

3.10 Arable Margins

Arable field margins are a BAP habitat. BAP habitats are those habitats that have been recognised as the most threatened habitats and action plans have been set out to aid recovery. The Open Space land is currently cultivated for wheat and this area will be re-seeded as a wildflower meadow. However, the existing arable margins of the Open Space land will be retained as they are considered to be important commuting corridors for reptiles as these are dominated by tall grass species. Light cultivation (which will involve light disturbance to the soil) will be undertaken within the north western corner of the arable corridors in Autumn, between September and October which will maintain the growth of these arable species – this will be the responsibility of Linden Homes. Maintaining herb-rich "weedy" margins where they are present (the majority of the arable margins are tall grassland species opposed to typical arable margins), these will provide an invertebrate food resource for breeding birds, potentially including species of high conservation concern / BAP species and will also improve foraging habitat for bats and commuting habitat for reptiles. The herb rich margins will be achieved by mowing them once every two years and either removing the arisings from site or piling these up along the margins and within the receptor site to create egg laying sites for grass snakes.



4.0 Post Development Ecological Monitoring and Management

Monitoring is proposed for specific habitats and species, to ensure that the mitigation, enhancement and management are sufficient. Monitoring assesses the success of the mitigation and identifies/recommends where further management is required.

4.1 Reptiles

4.1.1 Monitoring

Linden Homes has commissioned monitoring at the site every other year for the next five years. The monitoring will assess the effectiveness of the reptile translocation process and long-term viability of the extant and translocated population; it will also identify any requirement for additional management practices at the receptor site.

Reptile presence or likely absence survey methodology will be used to monitor the population and allow data from pre-commencement and post-construction to be compared. Survey information on the extant population and the number of translocated individuals will be used to assess any subsequent change in the baseline populations. Frequency of young animals will be recorded to assess breeding condition.

The first monitoring survey will be undertaken during suitable weather conditions between March and October 2012, one year after completion of the translocation exercise and then alternate years thereafter. Refer to Tables 1 and 2 below for the monitoring and management schedule.

Monitoring will aim to assess the effectiveness of the translocation process and long-term viability of the extant and translocated population. In addition, the monitoring visit will include an assessment of the need for any additional habitat enhancement and management work. A monitoring report, including the results and management recommendations, will be compiled and submitted to Linden Homes and Havant Borough Council Ecologist after each monitoring survey.

Table 1: Monitoring & management schedule

WORK SCHEDULE	Years post-translocation				
	1	2	3	4	5
Reptile Monitoring & Report					
Habitat Management (informed by monitoring report)	Ongoing				

**Table 2: Annual work plan**

WORK SCHEDULE												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Reptile Monitoring												
Monitoring survey (in yrs 1, 3 & 5 post translocation)												
Monitoring report (in yrs 1, 3 & 5 post translocation)												
Scrub Control												
Scrub management												
Grassland Cutting												
Grassland strimming & removal of cuttings												

4.1.2 Long-term Management

The initial aims of the long-term habitat management plan for the receptor site will be:

- Prevention of sapling/scrub/tree encroachment into open habitat – patches of taller, shadier vegetation should occur at the fringes of the grassland.
- Promotion of floral diversity - vegetation cutting should be completed in autumn, once seed has set and all cuttings removed from site to prevent enrichment and loss of floral diversity.
- Promotion of sensitive management – works should be timed so that they do not negatively impact species lifecycles (i.e. clearance of scrub should be undertaken outside bird breeding season, in winter and subterranean roots will be left in situ).
- Promotion of organic management – pesticide use should be avoided where possible.
- Habitat connectivity across the Open Space site is good.

These habitat management aims and recommendations will be adapted according to the results of the monitoring surveys, which are detailed in the section above.

**Table 3: Habitat creation and management of grassland and scrub – a summary**

Start	Frequency	Task	Notes
Scrub Management:			
Year 1 (Dec-Jan)	Once	Thinning out scrub	Remove shrubs diam. > 250mm
Year 5 (Dec-Jan)	Once every 15 years	Coppice scrub	Follow guidelines and monitor
Grassland:			
Year 1 (Jul)	Once	Remove encroaching scrub and competitive vascular plants	Follow guidelines
Year 1 (Sep-Nov)	Once	Keep sward short	Remove cuttings
Year 2 (Apr-May)	Once	Cut sward to 5cm	Remove cuttings
Year 2 (Jul-Aug)	Every year thereafter	Cut sward to 5cm	Remove cuttings and monitor

4.2 Grassland Management

To maintain areas of grassland within the Open Space land, it is necessary to manage it yearly, to prevent it from being overrun by vigorous grasses and vascular plants. The following management is therefore proposed:

1. **For the first year, cut twice – once in April, and repeat in July or August.** The grassland should be cut to a height of approximately 10cm. This will reduce the competitive vascular plant (weed) and cut back competitive grasses.
2. **Thereafter, one cut per year in late July or August.** After the first year, the area should be cut once a year in late summer for as long as it is intended to remain as a wildflower meadow. Cutting hay crop late will ensure that most wildflowers have set seed.
3. **Remove cuttings:** in both the first year and subsequent years, grass cutting should be completely removed from site, or composted for use by local residents.

Notes: Do not cut while the soil is damp, as machinery may damage and compact the soil. Some areas of bare ground are desirable after a cut to encourage different species and more diverse sward.



4.3 Hedgerow Management

Formerly, the hedgerows were cut regularly (pers. comm local resident); however, the cutting of the hedgerows have been relaxed and this will continue. The cutting regime will cut alternate sections of 50-100m over winter every three years, this management would benefit foraging/commuting bats, breeding birds and the invertebrate assemblage, in particular butterflies and moths which may be present. Furthermore, by relaxing the cutting regime at the site, and planting 'gappy' sections of the hedgerows, it is considered to increase the potential use of the hedgerows by dormice.

4.4 Monitoring the created attenuation pond and swale for Schedule 9 invasive species

The attenuation pond will be monitored every year for three years post construction by an ecologist for the presence of Schedule 9 invasive waterweeds (provided in Appendix B).

Should a Schedule 9 invasive plant be identified on site, a management plan will need to be prepared which will include information on the timing, methodology for the eradication of the invasive species. It is important that EDP's Landscape Strategy: Residential Area and Open Space area (Figure 2 and 3 respectively) is followed to ensure no invasive species are introduced into the waterbody.



5.0 Ecological Enhancement Options

5.1 Potential Enhancements for Residential Gardens

Presented below are some recommendations which could be made available to prospective homeowners to establish gardens which are off benefit to wildlife. Some general points are worth noting as an introduction:

1. Plant as diverse a range of species as possible but avoid invasive species, particularly those listed in Schedule 9 of the *Wildlife & Countryside Act 1981* (as amended) (see Appendix B for a full list of statutorily recognised invasive species).
2. Non-native species can be used, but it is recommended that at least 50% are native and if possible sourced from local stock. Again, it is important to avoid known invasive species (see Appendix B).
3. A varied structure is important, and have a range of different sized trees and shrubs would encourage the most number of benign and beneficial invertebrates, and in turn, birds, bats and other species.
4. The use of pesticides and artificial fertilisers should be discouraged.

5.2 Bird Boxes and Insect Boxes

Gardens are excellent places for installing insect and bird boxes as they can provide a great source of interest for local residents, particularly families with young children.

It is to be recommended to future occupiers of the residential properties that at least one bird box and one insect box is installed on each individual home or its garden. Further details on bird and insect boxes are provided in Appendix D and E respectively.

5.3 Bat Boxes

Gardens are also excellent locations to place bat boxes, these can be located on both trees and buildings. See Appendix C



5.4 Compost heaps

Compost heaps provide excellent habitats for reptiles, particularly slow worms, and create egg laying habitats for grass snakes. Given the existing reptile population at the site, local residents should be encouraged to create these features within the gardens. Compost heaps are food producers of insects too.

(Source: '*Gardening for bats*', Bat Conservation Trust, 2004.)



6.0 References

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Wildlife and Countryside Act 1981. H.M.S.O., London.

WYGE (2009) Ecological Scoping/Phase One Habitat Survey Report - development site



Hampshire Farm, Emsworth: Ecological Management Plan

WYGE (2009) Reptile Presence/Absence Survey Report

WYGE (2009) Hampshire Farm - Entomological Survey Report

WYGE (2009) Bat Activity/Emergence Survey Report

WYGE (2009) Hampshire Farm - Bat Roost Assessment

WYGE (2010) Ecological Scoping/Phase One Habitat Survey Report - open space



Hampshire Farm, Emsworth: Ecological Management Plan



Figure 1: Site location plan indicating development area, Open Space land and receptor site.





Figure 2: Site location plan indicating development plans

Hampshire Farm, Emsworth: Ecological Management Plan

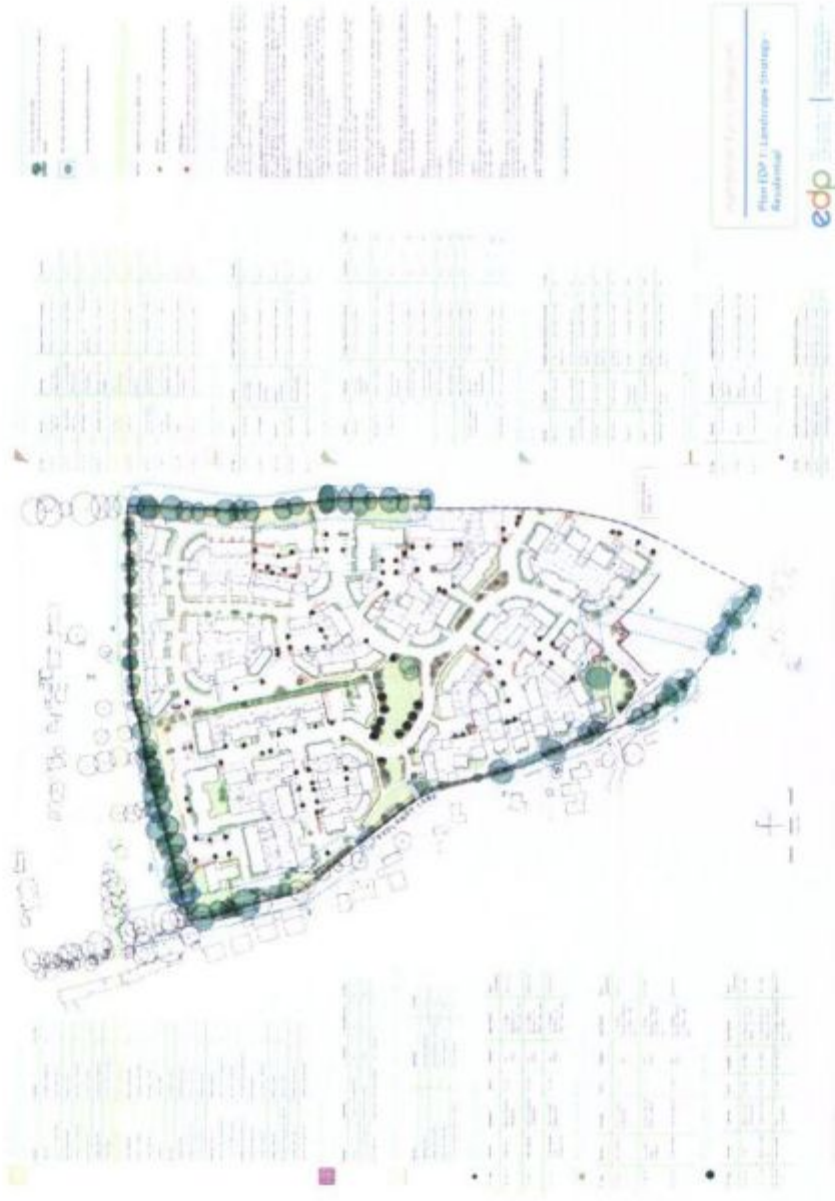




Figure 3: Proposed enhancements within the Open Space land. Within the north west corner of the Open Space land is designated as a receptor site.

Hampshire Farm, Emsworth: Ecological Management Plan

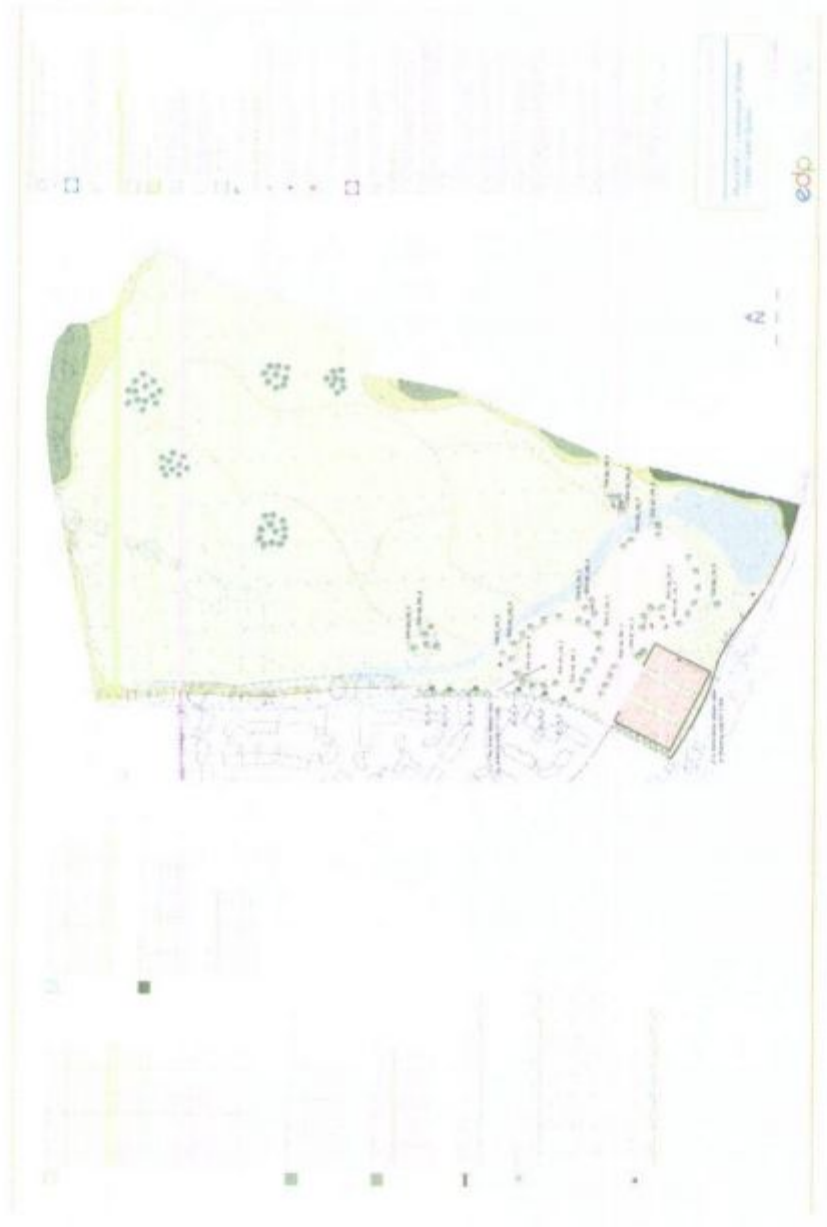




Figure 4: Typical reptile hibernaculum

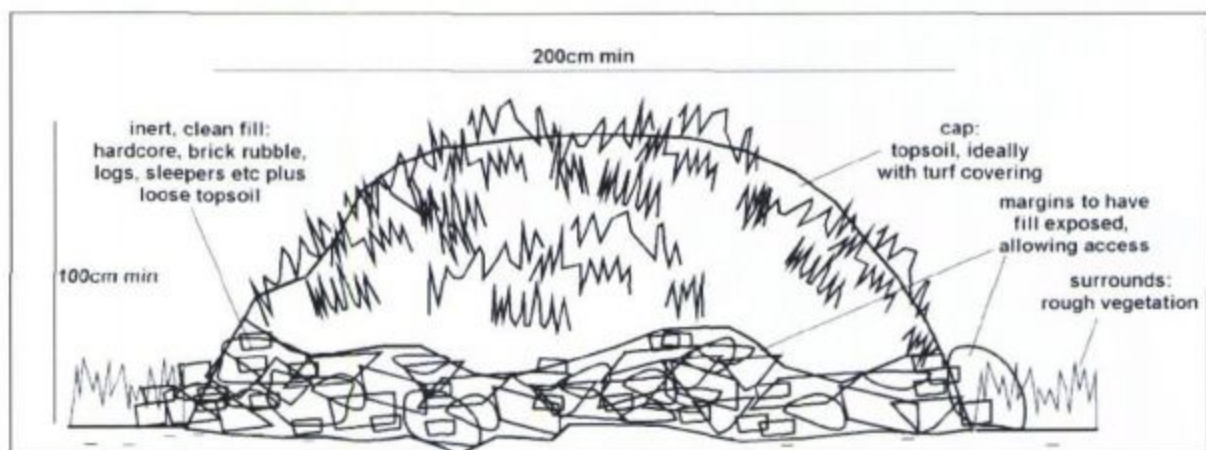




Figure 5: Location of Reptile Fencing

Hampshire Farm, Emsworth: Ecological Management Plan

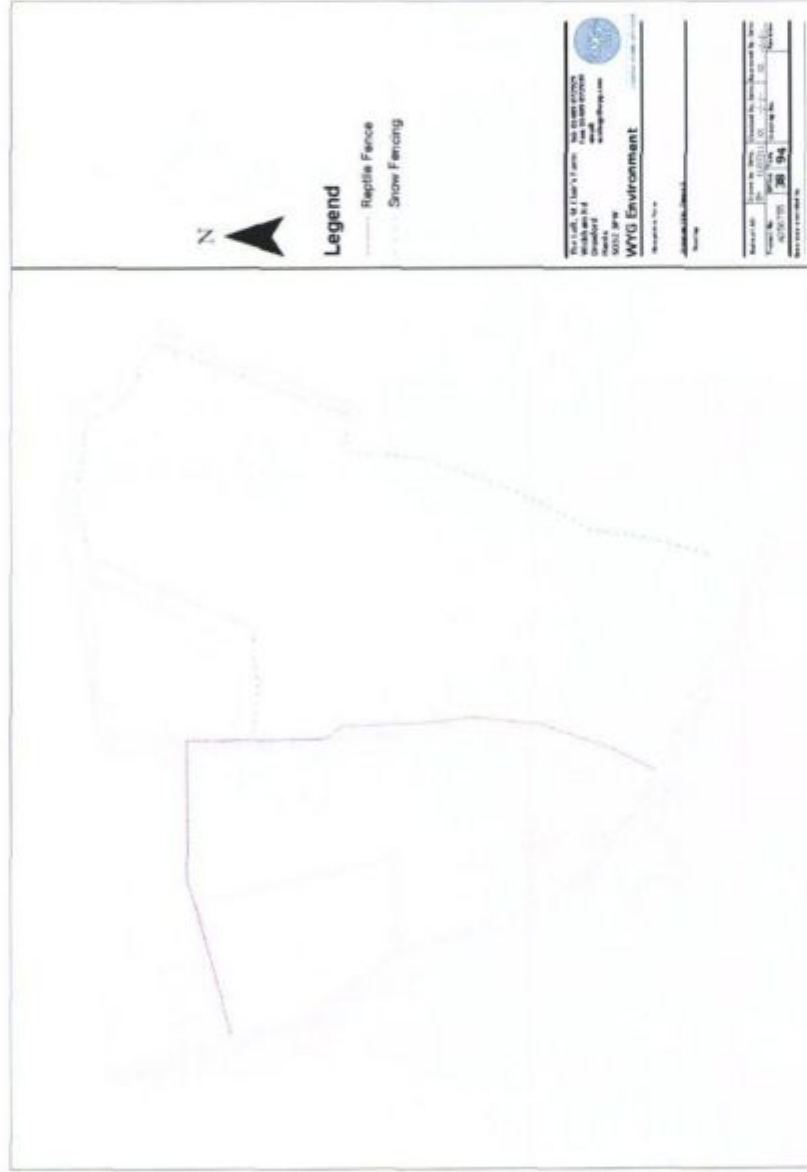




Figure 6: Ecological Enhancements

Hampshire Farm, Emsworth: Ecological Management Plan

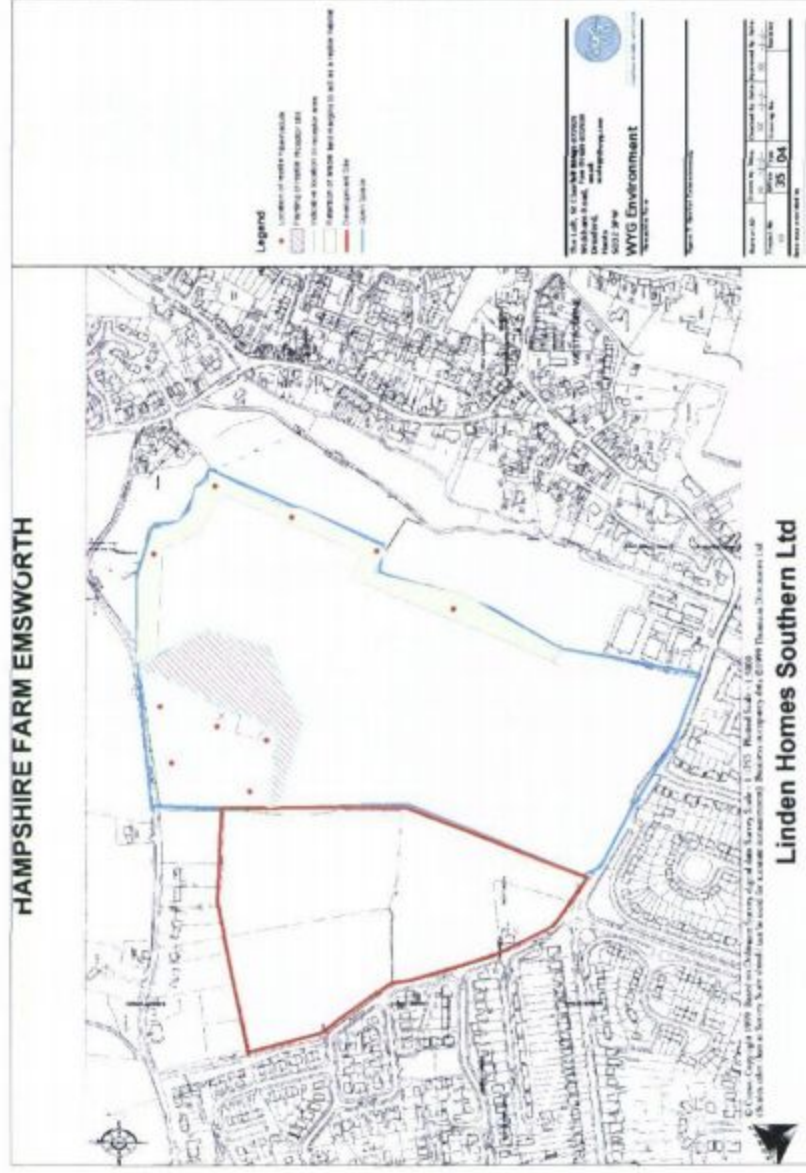




Figure 7: Ecological Clerk of Works

Hampshire Farm, Emsworth: Ecological Management Plan

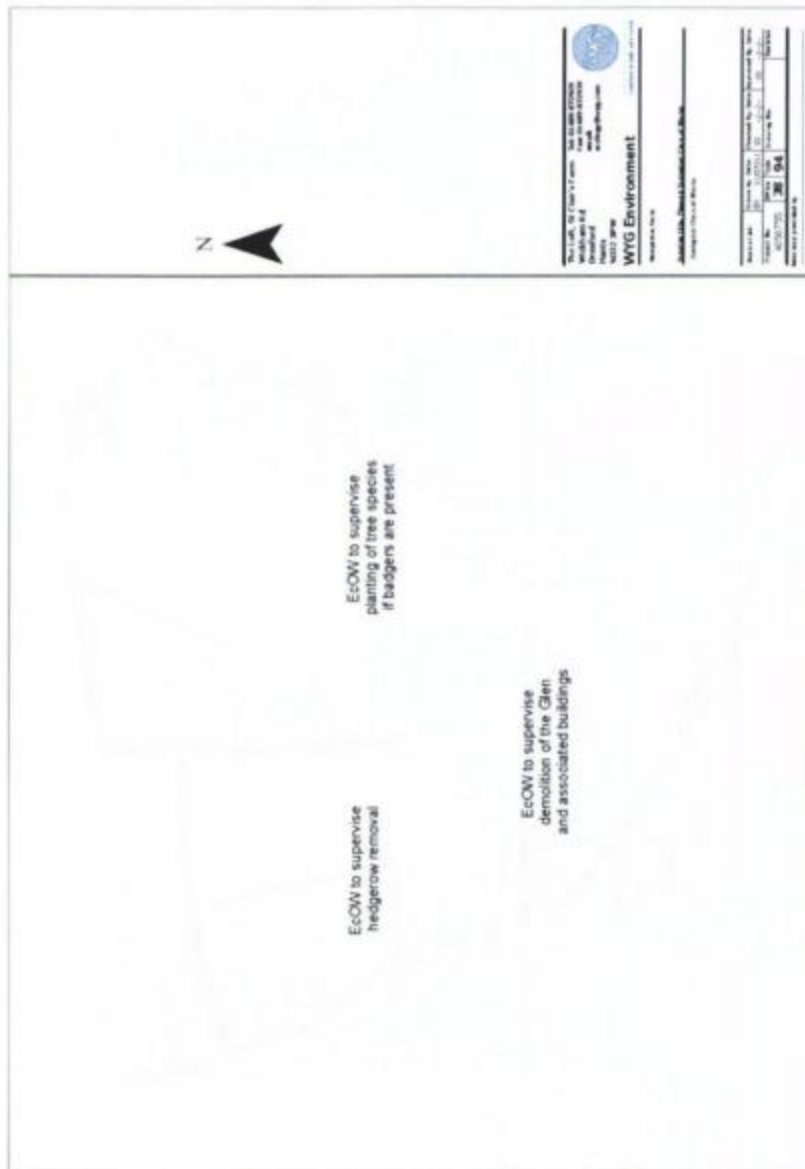




Figure 8- Planting to encourage bats to fly over roads or, on a smaller scale, hedgerow gaps.

Hampshire Farm, Emsworth: Ecological Management Plan



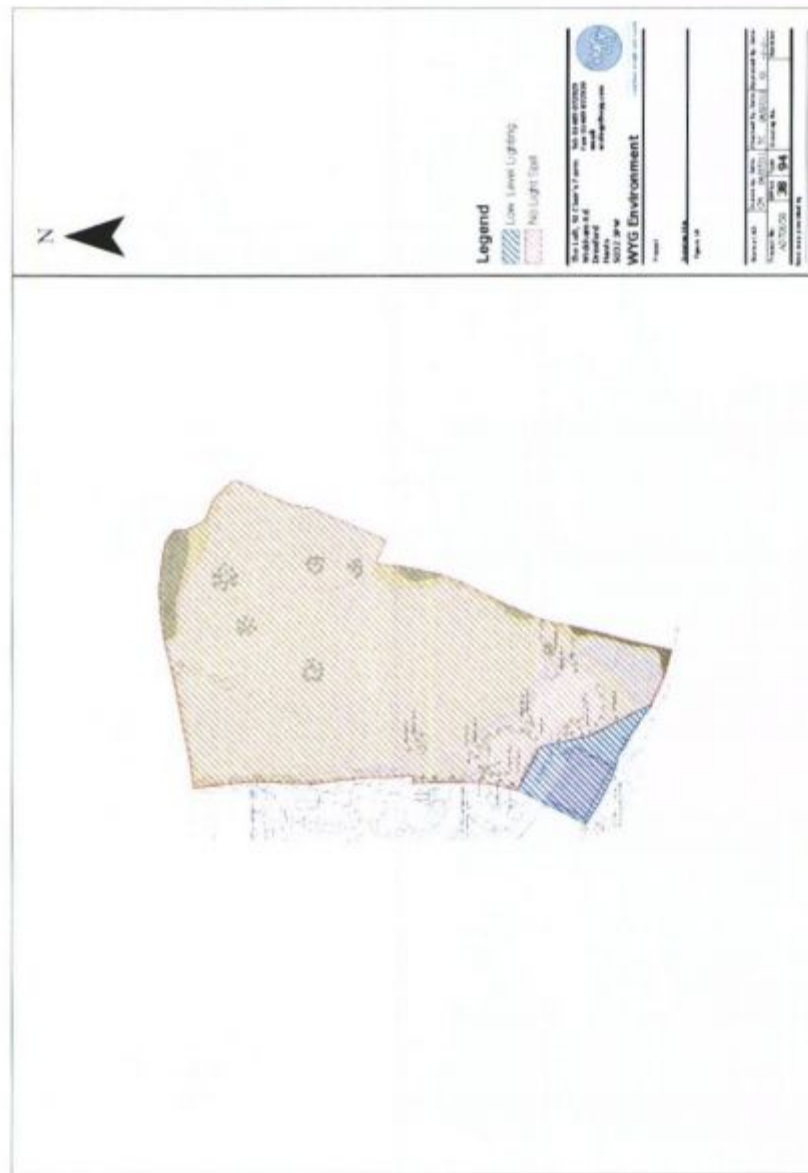
Photo © Peter Twisk www.standardsforhighways.co.uk



Figure 9: Lighting Restrictions on the Development Site



Figure 10: Lighting Restrictions on the Open Space land





Appendix A – Report Conditions



REPORT CONDITIONS

Hampshire Farm, Emsworth

This report is produced solely for the benefit of Linden Homes and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to WYGE. In time improved practices, fresh information or amended legislation may necessitate a re-assessment. Opinions and information provided in this report are on the basis of WYGE using due skill and care in the preparation of the report.

This 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.

This report is limited to those aspects reported on, within the scope and limits agreed with the client under our appointment. It is necessarily restricted and no liability is accepted for any other aspect. It is based on the information sources indicated in the report. Some of the opinions are based on unconfirmed data and information and are presented as the best obtained within the scope for this report.

Reliance has been placed on the documents and information supplied to WYGE by others but no independent verification of these has been made and no warranty is given on them. No liability is accepted or warranty given in relation to the performance, reliability, standing etc of any products, services, organisations or companies referred to in this report.

Whilst skill and care have been used, 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.

Although care is taken to select monitoring and survey periods that are typical of the environmental conditions being measured, within the overall reporting programme constraints, measured conditions may not be fully representative of the actual conditions. Any predictive or modelling work, undertaken as part of the commission will be subject to limitations including the representativeness of data used by the model and the assumptions inherent within the approach used. 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 potential influence of our assessment and report on other aspects of any development or future planning requires evaluation by other involved parties.

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. WYGE accepts no liability for issues with performance arising from such factors.

WYG Environment Planning Transport Ltd.



Appendix B – Schedule 9 Invasive Plant Species



Table B1 provides a list of known invasive species listed in Schedule 9 of the Wildlife & Countryside Act 1981 (as amended). Note that the list has been made significantly longer following changes enacted in 2010.

Table B1 Invasive plant species listed in Schedule 9 of the Wildlife & Countryside Act 1981 (as amended)

Common name	Scientific name
Perfoliate alexanders	<i>Smyrnium perfoliatum</i>
Red algae	<i>Grateloupia luxurians</i>
Variagated yellow archangel	<i>Lamiastrum galeobdolon</i> subsp. <i>Argentatum</i>
Yellow azalea	<i>Rhododendron luteum</i>
Himalayan balsam	<i>Impatiens glandulifera</i>
Cotoneaster	<i>Cotoneaster horizontalis</i>
Entire-leaved cotoneaster	<i>Cotoneaster integrifolius</i>
Himalayan cotoneaster	<i>Cotoneaster simonsii</i>
Hollyberry cotoneaster	<i>Cotoneaster bullatus</i>
Small-leaved cotoneaster	<i>Cotoneaster microphyllus</i>
Flase Virginia creeper	<i>Parthenocissus inserta</i>
Virginia creeper	<i>Parthenocissus quinquefolia</i>
Purple dewplant	<i>Disphyma crassifolium</i>
Fanwort or Carolina water-shield	<i>Cabomba caroliniana</i>
Water fern	<i>Azolla filiculoides</i>
Hottentot fig	<i>Carpobrotus edulis</i>
Three-cornered garlic	<i>Allium triquetrum</i>
Giant hogweed	<i>Heracleum mantegazzianum</i>
Water hyacinth	<i>Eichhornia crassipes</i>
Giant kelp	<i>Macrocystis</i> spp.
Giant knotweed	<i>Fallopia sachalinensis</i>
Hybrid knotweed	<i>Fallopia japonica</i> × <i>Fallopia sachalinensis</i>
Japanese knotweed	<i>Fallopia japonica</i>
Few-flowered garlic	<i>Allium paradoxum</i>
Water lettuce	<i>Pistia stratiotes</i>
Parrot's-feather	<i>Myriophyllum aquaticum</i>
Floating pennywort	<i>Hydrocotyle ranunculoides</i>
Duck potato	<i>Sagittaria latifolia</i>
Floating water primrose	<i>Ludwigia peploides</i>
Water primrose	<i>Ludwigia grandiflora</i>
Water primrose	<i>Ludwigia uruguayensis</i>
Rhododendron	<i>Rhododendron ponticum</i>
Rhododendron	<i>Rhododendron ponticum</i> × <i>Rhododendron maximum</i>
Giant rhubarb	<i>Gunnera tinctoria</i>
Japanese rose	<i>Rosa rugosa</i>
Giant salvinia	<i>Salvinia molesta</i>
Green seafingers	<i>Codium fragile</i>
Californian red seaweed	<i>Pilea californica</i>

Ecological Management Plan: Hampshire Farm, Emsworth



Common name	Scientific name
Hooked asparagus seaweed	<i>Asparagopsis armata</i>
Japanese seaweed	<i>Sargassum muticum</i>
Laver seaweeds (except native species)	<i>Porphyra</i> spp
Australian swamp stonecrop or New Zealand pygmyweed	<i>Crassula helmsii</i>
Wakame	<i>Undaria pinnatifida</i>
Curly waterweed	<i>Lagarosiphon major</i>
Waterweeds	<i>Elodea</i> spp.



Appendix C – Bat Box



For trees



Woodcrete boxes have the highest rates of occupation of all box types. The 75% wood sawdust, concrete and clay mixture allows natural respiration, stable temperature, and durability. They are long lasting (approx. 25 years) and are rot- and predator-proof. Hang from a tree branch near the trunk, or fix to a trunk with the supplied 'tree-friendly' aluminium nail. Attractive to smaller British bats.

Material: Woodcrete (75% wood sawdust, concrete and clay mixture)



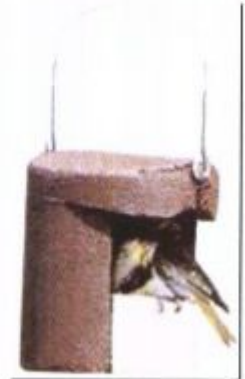
Appendix D – Bird Box Options



Open fronted bird boxes

This box is attractive to robins, pied wagtails, spotted flycatcher, wrens and black redstarts and is best sited on the walls of buildings with the entrance on one side.

These woodcrete boxes are designed to mimic natural nest sites and provide a stable environment for chick rearing and winter roosting. They can be expected to last 25 years or more without maintenance.



Boxes with entrance holes

This box is attractive to smaller birds such as tits, wrens and tree sparrows. Sparrow terraces are also available.





Appendix E - Insect Boxes



Figure 7 Wooden insect house

A general insect habitat for beneficial insects in summer and, later in the year, overwintering ladybirds and lacewings. Locate in a sheltered place near nectar or pollen plants or by a pond.

Durable and strong construction in acacia, oak or larch with no maintenance necessary. (Dimensions: 22 × 13.5 × 13.5cm.)

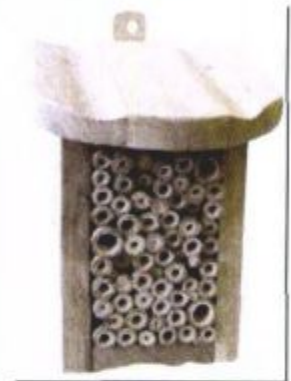


Figure 8 Woodcrete insect house

An insect nest made from long-lasting, insulating, woodcrete, with holes of different sizes providing homes for a variety of beneficial insects such as bees and solitary wasps. (Dimensions: 14 × 8 × 26cm; Weight: 3.65kg)

