SPECIES PROTECTION AND HABITAT ENHANCEMENT SCHEME

Building at Magnis Works,
Roman Road, Bobblestock, Hereford
Herefordshire HR4 9QR

Report
28th August 2015

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CONTENTS

QUALITY CONTROL

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28.08.15	Checked by	Lisa Kerslake CEcol FCIEEM Principal Ecologist/Director	[redacted]
28.07.15	Reviewed and issued	Dr Nick Underhill-Day ACIEEM Senior Ecologist	[redacted]

The information which we have prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

Every reasonable attempt has been made to comply with BS42020 (Biodiversity: Code of practice for planning and development). If compliance has not been achieved, justification/explanation has been given.

1 INTRODUCTION

1.1 Background

A Preliminary Ecological Appraisal (PEA), including a Phase 1 habitat survey and protected species assessment, and a bat roost assessment were undertaken by Swift Ecology Ltd. in June 2014 of a several industrial buildings and surrounding land at Magnis Works, Hereford, at approximate OS grid reference SO496424. Two bat activity surveys (dusk emergence survey and dawn re-entry survey) were carried out on one of the buildings, considered to have low to medium potential to support roosting bats, during July and August 2015. Details of the PEA/bat roost assessment and bat activity surveys are provided in the associated reports (Swift Ecology Ltd., 2014 and 2015 respectively).

This work was undertaken in relation to an outline planning application to develop the site, which would include demolition of the existing buildings occupying the site, followed by construction of five new residential dwellings.

This report has been produced in connection with the proposed development for which planning consent has been approved by Herefordshire District Council (P134556/O).

The purpose of this report is to provide a strategy for ecological mitigation and biodiversity enhancement, particularly in relation to protected species that might be present on the site, and to satisfy legislative and local authority requirements. This report should be read in conjunction with the PEA/bat roost assessment and bat activity survey reports, also produced by Swift Ecology Ltd, which provide an evaluation of bat roosts and other protected species on the site and give recommendations for their protection, where relevant.

The conditions specified in the planning approval that will be addressed by this document are stated below:

Condition 17

'Prior to the commencement of development the recommendations set out in Section 5 of the ecologist's report from Swift Ecology dated July 2014 should be followed in relation to species mitigation and habitat enhancement. Prior to commencement of the development, the survey results and method statement (if necessary) for bats together with a habitat enhancement plan integrated with the landscape proposals should be submitted to, and be approved in writing by, the local planning authority, and the work shall be implemented as approved.

An appropriately qualified and experienced ecological clerk of works should be appointed (or consultant engaged in that capacity) to oversee the ecological mitigation work.'

'Reasons: To ensure that all species are protected having regard to the Wildlife and Countryside Act 1981 (as amended), the Conservation of Habitats and Species Regulations 2010 and Policies NC1, NC6 and NC7 of Herefordshire Unitary Development Plan

To comply with Policies NC8 and NC9 of Herefordshire's Unitary Development Plan in relation to Nature Conservation and Biodiversity and to meet the requirements of the National Planning Policy Framework and the NERC Act 2006'

This report has been prepared by Dr Nick Underhill-Day. Nick is employed as Senior Ecologist with Swift Ecology Ltd. and is a licensed bat worker (NE Bat licence WML-CL18 2015-11688-CLS-CLS). He has carried out numerous habitat and protected species assessments, and has considerable experience in the associated ecological appraisal of protected species, including bats, badger, otter, water vole, dormouse, reptiles and amphibians, and in methods required for appropriate ecological mitigation and biodiversity enhancement.

This report should be read in conjunction with the following drawing associated with the development:

- Amended Site & Location Plans 30.3.15

This report incorporates the relevant elements of the original ecological surveys and addresses the relevant condition of the planning permission P134556/O dated 22nd April 2015.

Swift Ecology Ltd. will be available to advise on all aspects of the Ecological Mitigation Plan, for any pre-development checks and Ecological Clerk of Works supervisory roles required, and to help ensure compliance with the plan is achieved

1.2 Site Description

Magnis Works lies to the north of the A4103 public highway and is accessed via a short track, approximately 200 m in length, running from the A4103 public highway, and which also serves several adjacent residential properties adjacent to the site. The site is occupied by two buildings, including a large Dutch barn with two adjoining breeze block/brick extensions and a single-storey brick building with a pitched, slate-tiled roof, areas of hardstanding, and patches of peripheral scrub and tall herb vegetation along its northern and western boundaries. There is also a septic tank beneath the hardstanding at the site entrance which receives waste from the buildings; from the tank, water soaks away into a drain running along the eastern boundary, and which empties into a small pond some 40 m from the south-east corner of the site.

The site is surrounded by open farmland, predominantly arable crops, lined by hedgerows and hedgerow trees; these features provide ecological connectivity with

semi-natural habitats within the surrounding area. There are few woodlands nearby; the nearest, Breinton Wood, lies some 3.75 km to the south-west; Credenhill Park Wood is approximately 4.5 km to the north-west. The nearest watercourse, the Ayles Brook, lies 500 m to the south-east. This flows into the Yazor Brook, roughly 1 km to the south-west. The River Lugg lies over 3.5 km to the east and north-east.

There are several residential dwellings, associated gardens and hedgerows nearby which provide some opportunities for roosting, commuting and/or foraging bats; however, these areas are relatively small and there are no large areas of semi-natural habitat in the locality, and thus foraging opportunities are not extensive.

2 SUMMARY OF ECOLOGICAL ISSUES

2.1 Designated Sites

There are no statutory wildlife or nature conservation sites within 2 km of the site.

No impacts on to statutory wildlife sites are anticipated as a result of the development.

2.2 Habitats

Land within the application site boundary contains predominantly buildings and concrete hardstanding (see Figure 1, Appendix 1); there are several young trees and small areas of scrub and tall herb vegetation within the proposed development area, particularly along the northern and western boundaries, between the areas of hardstanding and fields of arable crops. To the immediate south-west is an area of scrub and tall herb vegetation, bordering a drain which flows into a small pond approximately 40 m to the east (Figure 1, Appendix 1).

The access track from the A4103 public highway is bordered by managed hedgerows and there are residential dwellings and associated gardens either side of the access track where it meets the public highway, and immediately to the south of the site, to the west of the access track; there are several mature trees within the residential garden bordering the southern boundary of the site (Figure 1, Appendix 1).

The development could result in damage to nearby hedgerows and trees unless protection measures are adopted.

2.3 Protected and other notable species

Badgers

The site comprises buildings and concrete hardstanding and has few areas suitable for sett building or foraging, although badgers may occasionally cross the site from time to time. A full survey for this species was not considered necessary and it is considered highly unlikely that there are any badger setts on the site.

There are fifteen badger records within 2 km of the site.

Impacts on badgers are likely to be insignificant as long as there is no potential disruption of badger commuting routes.

Bats

Evidence collected during the initial roost assessment in 2014 revealed no evidence of bats or bat roosts in the buildings occupying the site, although one building, the single-storey brick building adjacent to the eastern boundary was considered to have low to moderate potential to support roosting bats.

Bat activity surveys of the brick building in 2015 did not detect any roosting bats and it is concluded that bats are unlikely to be roosting within this structure. Nonetheless, the presence of roosting bats cannot be completely ruled out in this building.

During activity surveys, common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus* bats were recorded commuting across the site, generally from the south-west to the north-east, and *vice versa*, and thus the site lies along a bat commuting route between unknown roosting sites and foraging grounds. Bats were also detected foraging in trees to the east and south-west, and over scrub/herb vegetation along the site's northern and western boundaries; the main compound of the site provides limited foraging habitat.

There are 126 records of six bat species within 2 km of the site, including records for common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared bat *Plecotus auritus*, Natterer's bat *Myotis nattereri*, Daubenton's bat *Myotis daubentonii* and noctule *Nyctalus noctula*.

No major impacts on bats are anticipated as a result of the development. Indirect impacts upon bat flight lines and localised foraging areas might arise from lighting and disturbance during construction and following development.

Damage of any hedgerows or trees associated with the access track, or adjacent to the site's boundaries, has the potential to impact on the foraging and commuting behaviour of bats at the local level. However, it is assumed that none of these features will be directly affected while the planting or enhancement of hedgerows and/or other habitat features means that any impacts will be minor.

Dormice

The site is unsuitable for dormice *Muscardinus avellanarius*. A full survey for this species was not considered necessary and it is considered highly unlikely that dormice are present on the site.

There are no records of dormice within 2 km of the site.

No impacts on dormice are anticipated as a result of the development.

Water Voles

The nearest watercourse, the Ayles Brook, lies approximately 500 m to the south-east, across fields of arable crops and dense urban housing, while the Yazor Brook is located approximately 1 km to the south-west. A full survey for this species was not considered necessary and it is considered highly unlikely that water voles are present on the site.

There are no records of water vole within 2 km of the site

No impacts on water voles are anticipated as a result of the development.

Otters

Otters *Lutra lutra* occur along the Yazor Brook and River Lugg, the latter some 3.5 km to the east; however, there is no vegetation on the site that could provide suitable habitat for otters to rest in and no features on the site that might support otter holts. A full survey for this species was not considered necessary and it is considered highly unlikely that otters are present on the site.

There are six records for otter within 2 km of the site; the nearest record is associated with the Yazor Brook, over 1 km to the south-west.

No impacts on otters are anticipated as a result of the development.

Reptiles and great crested newt

The site comprises mostly buildings and concrete hardstanding and is generally not suitable for reptiles or great crested newts, although there are features on the site, such as piles of slates and wood, that might offer opportunities for reptile or amphibian shelter or hibernation. The small patches of scrub and tall herb vegetation along the boundaries might offer suitable foraging habitat for amphibians and reptiles, although the site is surrounded by exposed arable fields, and thus relatively isolated from other areas of semi-natural habitat.

A short drainage channel leads from a septic tank on the site to a small pond approximately 40 m from the south-eastern corner of the site (Figure 1, Appendix 1); the pond was assessed by Swift Ecology in 2014 for its suitability to support great crested newts *Triturus cristatus*. A Habitat Suitability Index (HSI) assessment was carried out and calculated an HSI score of 0.48 or 'poor', which gives a predicted presence for this species of 3%.

There are 22 records for great crested newt within 2 km of the site; the nearest record is from a confirmed breeding pond approximately 670 m to the north, across open arable fields. There are 73 records for slow worm *Anguis fragilis* and two records for common lizard *Zootoca vivipara* within 2 km of the site.

Full surveys for reptiles and great crested newts were not considered necessary and it is considered highly unlikely that they are present on the site. However, individual reptiles or great crested newts may occasionally cross the site if they are present in the local area, and may occasionally take shelter in areas of peripheral scrub and tall herb vegetation.

Impacts on reptiles and great crested newts are likely to be insignificant as long as precautionary methods are adopted to reduce the risk of harm to individual animals if they are present in any small areas of scrub and tall herb vegetation to be cleared, and measures are put in place to allow safe passage of animals across the site during construction. Efforts should be made to prevent pollution or contamination of the small pond to the east of the site (see Section 3.2.4).

Nesting birds
The buildings are suitable for use by nesting birds. During the surveys, species confirmed using the buildings included house sparrow *Passer domesticus* and possibly barn swallow *Hirundo rustica*. Both species are listed as 'Birds of Conservation Concern' (Eaton *et al*., 2009).

Demolition of the buildings may interfere with nesting by these species.

Other species
The habitats present were not suitable to support other protected species or species of high conservation concern, such as Biodiversity Action Plan priority species, and no evidence or signs of such species were observed during the surveys. There are unlikely to be any significant impacts upon other such species.

The protected species that could be impacted upon by the development, and are therefore addressed further within this ecological mitigation and biodiversity enhancement plan are listed below:

- Badgers
- Bats
- Reptiles and great crested newts (and other amphibians)
- Nesting birds

3 SPECIES MITIGATION PLAN

3.1 General

Construction activity, which includes site clearance, demolition of the buildings on the site, ground preparatory works and new building construction works, will be limited to clearly defined areas and specified time periods; this is outlined below for each relevant species. Figure 1 in Appendix 1 provides an overview of the current layout of the site, and highlights sensitive ecological features; habitat and wildlife features will require either protection, such as a suitable physical barrier including temporary fencing, or appropriate precautionary measures and sensitive working practices to ensure retained features and/or habitats adjacent to the site are appropriately protected and that no protected species are adversely impacted during development. Measures for habitats and each relevant protected species are outlined below under separate headings, in sections 3.2 and 3.3.

3.2 Habitats

3.2.1 Trees

Trees adjacent to the site boundary and any trees within the site to be retained (Figure 1, Appendix 1) will be protected from the development by the erection of a temporary fence at least 2 m from the outer canopy of the tree. No disturbance will be allowed within the buffer zone behind the fence, including no access by personnel or vehicles and no storage of materials or equipment. This is in order to maintain a root protection zone along the line of trees to ensure it is not negatively impacted by the development.

3.2.2 Hedgerows

Hedgerows growing along the access track, where there may be limited space for vehicles to pass through, should be protected by the adoption of reasonable precautions to avoid unnecessary damage. This should include erection of temporary fencing (as above) where space allows.

3.2.3 Scrub and tall herb vegetation

Clearance of small areas of scrub and tall herb vegetation from the boundaries of the site will be undertaken at an appropriate time of year, using precautionary methods to minimise impacts upon nesting birds, and harm to reptiles and amphibians if they are present. Details are provided in the sections below for each relevant protected species or taxa.

Scrub and tall herb vegetation surrounding the drainage ditch and small pond, adjacent to the south-east part of the site, will be protected from damage by the erection of a temporary fence along the site boundary. No disturbance will be allowed behind the fence, including no access by personnel or vehicles and no storage of materials or equipment.

3.2.4 Drainage ditch and pond

These features should be protected from pollution or contamination during development in accordance with the relevant conditions (14-16) set out in the planning approval document.

3.3 Protected Species

3.3.1 Badgers

It is unlikely that badgers will be impacted upon by the proposed development. However, as badgers may commute across the site, measures will be adopted that will allow their safe passage including:

- Any excavations undertaken during construction, including deep trenches or holes, that will be left overnight, should be fitted with suitable ramps at either end to allow badgers, and other mammals, a means of escape; and
- During the construction period the site should not be illuminated by any lighting outside of working hours as this could deter badgers from using their foraging or commuting routes through the site.

If a new sett is discovered during construction all work must stop immediately and the advice of a suitably qualified ecologist should be sought. If it is determined that works are likely to cause interference, damage to or disturbance of the sett, an exclusion licence from Natural England will be required with an appropriate mitigation plan.

3.3.2 Bats

Buildings

There is no evidence that the buildings to be demolished are used as a bat roost (Figure 1, Appendix 1). No signs of bats or evidence of roosting bats was found during surveys in 2014 and 2015 and these structures are considered to have a very low likelihood of supporting roosting bats. Consequently, the risk of impacts upon bats or their roosts from demolition of these buildings is low and there is no requirement for a European Protected Species (EPS) licence from Natural England.

However, as the presence of bats in these buildings cannot be completely ruled out, the following precautions and mitigation will be needed in order to minimise the risk of committing offences during demolition of these buildings:

- All site workers will be made aware of the possibilities of finding bats and the procedure to follow should they be found. If at any point during works a bat is discovered, contractors will stop work immediately and telephone an ecological professional qualified to deal with bats. Telephone numbers of such will be held on site (Swift Ecology numbers: 07719 329170 or 01588 660592);

- All demolition works to the brick building, involving removal of roofing materials, should be undertaken after the 30th September and before the 1st May (i.e. during the period when bats are usually not present);
- Roof coverings, particularly those of the single-storey brick building, including timbers, ridge tiles and slates, barge boards, soffit boxes and any roof linings, should be removed in a sensitive manner;
- Should any bats fall out of structures or be injured, they will be gently placed in a secure ventilated box (*e.g.* a cardboard box) by the contractor and left in a cool dark place, until appropriate advice can be sought. Bats should not be handled without gloves; and
- A copy of these recommendations will be available to site workers and displayed on site.

In the unlikely event that a bat is discovered during building demolition or at any other time during works, all work must stop immediately and Natural England will be consulted. Further surveys and a European Protected Species licence may be required.

Lighting and disturbance

To minimise the impact on bats during development, night-time working will be avoided and the site will not be illuminated at night during the construction phase.

Lighting and other disturbance (e.g. excessive noise) to the adjacent residential gardens, hedgerows and trees, should be avoided during the hours of darkness to safeguard the suitability of these linear features for commuting and/or foraging bats.

Any lighting should be directional, pointing downwards to the area where illumination is required, to reduce the effects of light-spill upon bat activity. General recommendations for the installation of external lighting during construction include the following measures:

- Minimise lighting and prevent illumination of hedgerows, trees and other semi-natural habitats;
- Choose motion-sensor lighting or timed lighting;
- Choose low-level bollard lighting over column lighting;
- Choose low-lux lighting over high-lux; and
- Install directional cowls on lighting to avoid illumination of boundary hedgerows, trees and other semi-natural habitats.

3.3.3 Reptiles and great crested newt

Vegetation clearance

The site contains patches of habitat that might be suitable for great crested newts and reptiles but these areas are small, and thus there is a low risk that such species occur on the site. However, precautions will be needed to reduce the risk of harm to individual animals if they are present.

- Clearance of vegetation should take place between March and October (weather dependent), when reptiles and amphibians are less likely to be hibernating;
- Hand clearance of vegetation (e.g. using strimmers) should be undertaken to minimise any impacts to individual animals if they are present;
- Cleared areas of vegetation must be kept short prior to development in order to ensure that the sward does not become suitable for use by reptiles or amphibians;
- Any features on the site, such as piles of logs, wood, bricks, stone and other debris, which may be used for reptile or amphibian shelter or hibernation, should be dismantled carefully by hand during March to October (weather dependent);
- Any building materials (e.g. bricks, stones, timber, roof tiles) stored overnight must be kept on land unsuitable for reptiles or amphibians (i.e. areas of hardstanding) and should be stored on pallets to discourage reptiles or amphibians from using them as shelter. Stored materials should be checked carefully beneath before moving; and
- Any demolition materials, such as bricks, stones etc. will be stored in skips or similar containers.

Safe passage

Occasional movements of individual amphibians or reptiles across the site cannot be ruled out completely; consequently, precautionary measures will be adopted that will allow their safe passage. Measures include:

- Any excavations undertaken during construction, including excavation of deep trenches or holes, that will be left overnight, should be fitted with ramps at either end to allow amphibians and reptiles a means of escape.

If a newt or reptile is discovered at any point during works, development shall stop immediately and a suitably qualified ecologist or Natural England will be consulted on the best way to proceed.

3.3.4 Nesting birds

As all nesting birds are protected by law, the following measures are needed to ensure compliance with legislation during clearance of vegetation and demolition of buildings:

- To avoid committing an offence, any vegetation clearance or demolition works to the buildings should be undertaken outside the bird breeding season (March to August inclusive). If this is not possible, the feature to be cleared or buildings should be checked immediately prior to works commencing by a suitably qualified ecologist. If there are breeding birds present, works cannot continue until the chicks have fledged and left the nest; and
- Mitigation for the loss of nesting sites within the buildings for house sparrows should include erection of bird boxes targeting these species (see Appendix 3).

3.4 Timing Restrictions

Table 1 provides a summary of ecological mitigation and protection measures and outlines the general timing constraints of development works in relation to reduction of impacts upon retained habitats and protected species.

Table 1: Ecological protection measures and timing constraints of development works for habitats and protected species.

Ecological Feature	Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Trees, hedgerows and areas of scrub	Erect fencing at least 2 m from outer canopy prior to development commencing.	To remain *in situ* through development works											
Badgers, reptiles and great crested newts	No night-time working during development and installation of ramps into any trenches/holes	Throughout development works											
Reptiles and great crested newts	Clearance of potential refuge features	X	X									X	X
Nesting birds	Clearance of vegetation and demolition of buildings			X	X	X	X	X	X				
Bats	Demolition of buildings					X	X	X	X	X			
General	No night-time working (lighting or disturbance) during development	Throughout development works											

4 BIODIVERSITY ENHANCEMENT PLAN

4.1 General

The existing buildings and scrub/herb vegetation on the site may provide nesting and foraging opportunities for breeding birds. Indirect impacts upon protected animal species may result from disturbance to trees, hedgerows, adjacent gardens and areas of scrub/tall herb vegetation as a result of the proposed development, thus care must be taken to ensure that foraging areas or ecological corridors remain undisturbed wherever possible.

Biodiversity enhancement measures outlined below are designed to benefit such species and, where relevant, take into account Local Biodiversity Action Plan (LBAP) priority habitats and species as listed in the Herefordshire Biodiversity Action Plan[1].

Relevant LBAP priority habitats and Habitats of Principal Importance for the purpose of conserving biodiversity within section 41 of the Natural Environment and Rural Communities Act 2006, and which should be considered within the biodiversity enhancement strategy for this development include:

- Hedgerows

Relevant LBAP priority species and Species of Principal Importance for the purpose of conserving biodiversity within section 41 of the Natural Environment and Rural Communities Act 2006, and which should be considered within the biodiversity enhancement strategy for this development include:

- House sparrow, dunnock, starling, song thrush.
- Species of bat: including common pipistrelle and soprano pipistrelle.

4.2 Habitats

4.2.1 Hedgerows and hedgerow trees

The existing hedgerows bordering the access track will be retained. To provide significant biodiversity enhancements to the development, additional native hedgerows will be planted along the site's boundaries and between housing plots; this will improve ecological connectivity between existing habitats across the site and provide benefits for invertebrates, amphibians, reptiles, nesting birds, bats and other mammals. Native species to be used in this planting can be taken from the list below (ornamental varieties will not be used):

Replacement hedgerow species:

- Oak *Quercus robur*
- Hawthorn *Crataegus monogyna*
- Blackthorn *Prunus spinosa*

[1] https://www.herefordshire.gov.uk/media/268315/building_biodiversity_into_the_LDF.pdf

- Wild privet *Ligustrum vulgare*
- Field maple *Acer campestre*
- Hazel *Corylus avellana*
- Wayfaring tree *Viburnum lantana*
- Guelder rose *Viburnum opulus*
- Holly *Ilex aquifolium*
- Dogwood *Cornus sanguinea*
- Goat willow *Salix caprea*

Hedgerow planting and future management

- Any supplementary new hedgerow planting will be carried out between November and March;
- All planting stock will be 40-60 cm bare rooted trees and shrubs;
- Newly planted stock will be protected by 75 cm clear spirals supported by 90 cm 12/14 lbs canes;
- Hedgerows should be trimmed on a 2-3 year rotational basis, ideally at the end of winter after berries have been eaten by birds and small mammals and before the nesting season begins. By trimming on a rotational basis, the destruction of overwintering populations can be avoided. Trimming will be avoided during periods of frost.

Locations for planting new hedgerows are provided in Figure 2, Appendix 1.

4.2.2 Trees

To improve the long-term biodiversity benefits of the site, trees will be planted at intervals along the new sections of hedgerow and within communal grass areas at the entrance to the shared courtyard. The trees will be native species taken from the following list and will be encouraged to grow up as standards:

- Oak *Quercus robur*
- Field maple *Acer campestre*
- Goat willow *Salix caprea*
- Ash *Fraxinus excelsior*
- Apple *Malus* sp.
- Wild cherry/gean *Prunus avium*

Depending upon space, smaller/ornamental trees could be planted instead of the above species within the new area of landscaping at the entrance to the shared courtyard. Suitable smaller species, which provide important food resources for invertebrates and birds, include:

- Wild crab *Malus sylvestris* or other apple *Malus* sp. varieties
- Pear *Pyrus* sp.
- Bullace/damson *Prunus domestica* ssp. *insititia*
- Plum *Prunus domestica*
- Rowan *Sorbus aucuparia*
- Birch *Betula* sp.

Planting and future management of newly planted trees

Establishment and management of newly planted trees will include the following measures:

- Specimen trees will need to be pruned to maintain forms typical of respective species and to ensure the safety of the site users;
- The ideal months to carry out pruning are January-March, whilst trees are dormant;
- Watering will be carried out as necessary to allow establishment of trees for the first 3 years following planting;
- All failures within the first 12 months will be replaced during the following winter period; and
- Deadwood should be kept on the site, as log piles in a suitable location, to provide refuge opportunities for reptiles and amphibians.

Locations for planting new trees are provided in Figure 2, Appendix 1.

4.2.3 Landscaping: wild flower zones

Planting of wildflower areas will enhance the site for pollinating insects and should comprise a native seed mix appropriate to the local area. A species-rich lawn mix (as opposed to grass monoculture) should be sown to form the communal grass area at the entrance to the courtyard.

Locations for species-rich lawn landscaping are provided in Figure 2, Appendix 1.

4.3 Protected Species

4.3.1 Badgers

The development should remain open to badger (and other mammal) commuting and foraging movements across the site. This can be achieved by planting hedgerows along the existing boundaries rather than installing less permeable fencing. This planting will also provide additional biodiversity benefits (see Section 4.2.1) to the development.

4.3.2 Bats

Foraging and commuting enhancements

The site can be enhanced in the long-term by providing improved bat commuting habitat and vegetative cover. This will include planting new hedgerows and hedgerow trees that provide nectar and act as food plants of Lepidoptera and other invertebrates. Provision of new habitats which should fulfil this function has already been described in Section 4.2.

Roosting enhancements

Bat roosting opportunities can be enhanced by integration of bat bricks into suitable walls of the new dwellings. Bat bricks should be located in relatively quiet and unlit locations, such as gable end walls at the rear of the new housing units, and should be installed in more than one orientation so as to provide a range of internal roost

microclimates and thus offer choice of roosting conditions; at least one of the bat bricks should be located where it will receive full or partial sunlight. Bat bricks should be installed at least 5-7 m above the ground to avoid disturbance from humans and predators, such as domestic cats, and should be placed near to adjacent vegetation, including newly planted hedgerows and trees to provide security in the long-term and allow access to commuting features. They should not be sited above doors or windows.

It is suggested that at least one bat brick is installed on each new housing unit as part of the Biodiversity Enhancement Scheme. Appendix 2 provides details of suitable bat bricks to be installed on the site.

Indicative locations for bat bricks are provided in Figure 2, Appendix 1.

Long-term mitigation for lighting

To minimise potential long-term disturbance on natural habitats, such as hedgerows and trees, all external artificial lighting on newly constructed dwellings will be sensitively designed. Artificial lighting should be kept to a minimum and away from hedgerows, trees or building areas supporting integrated bat bricks; any artificial light falling on bat bricks will make it unlikely that the potential roost will be used. Any lighting should be directional, pointing downwards to the area where illumination is required, and to reduce the effects of light-spill

General recommendations for the installation of external lighting during construction are provided in Section 3.3.2.

4.3.3 Reptiles and Amphibians

The reinstatement and planting of new hedgerows along the site boundaries will provide suitable opportunities for foraging and commuting reptiles.

4.3.4 Nesting birds

Planting of new sections of hedgerows and hedgerow trees will ensure that there are ample nesting opportunities for breeding birds in the long-term.

Enhancement of the development site for nesting birds can also be made by provision of bird nest boxes, installed upon undisturbed building walls (see Appendix 3 for suitable products). Box designs should be used to cater for different bird species and boxes should be located at least 2 m above the ground away from potential access from predators. Boxes should be mounted on walls or retained trees and located at a reasonable distance (e.g. 25 m) from each other; they should not be located in areas receiving bright sunshine.

It is suggested that a minimum of five nest boxes are installed on the new housing units or on retained trees.

Three additional nest boxes targeting house sparrows should also be installed on the new housing units. Sparrow terrace boxes, such as the Schwegler 1SP sparrow

terrace, should be placed below the eaves either on a wall surface or integral to the wall. They should not be sited above doors or windows and their location should be relatively undisturbed and away from potential access from predators, including domestic cats.

Appendix 3 provides details of suitable bird nest boxes to be installed on the site.

5 REFERENCES

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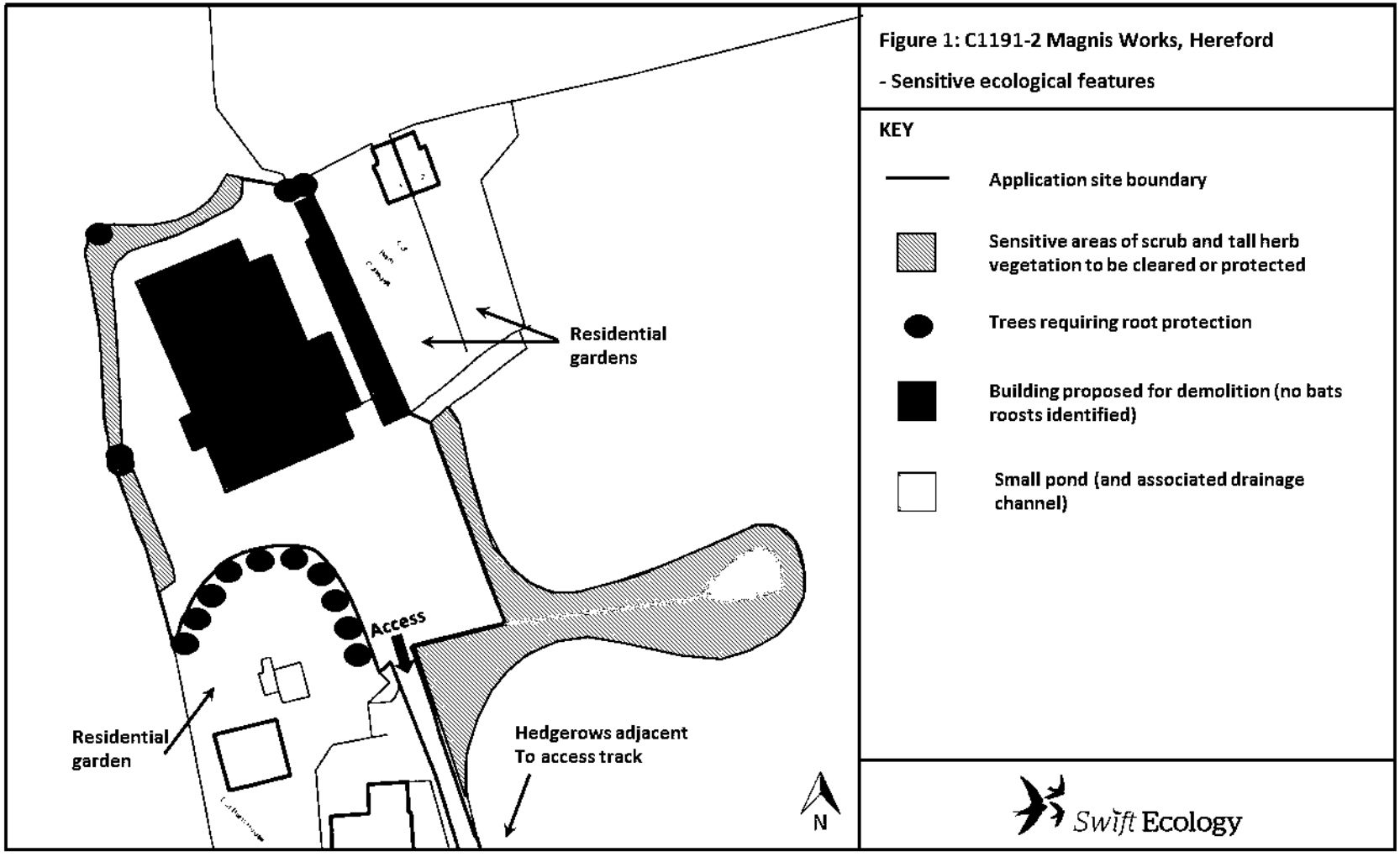
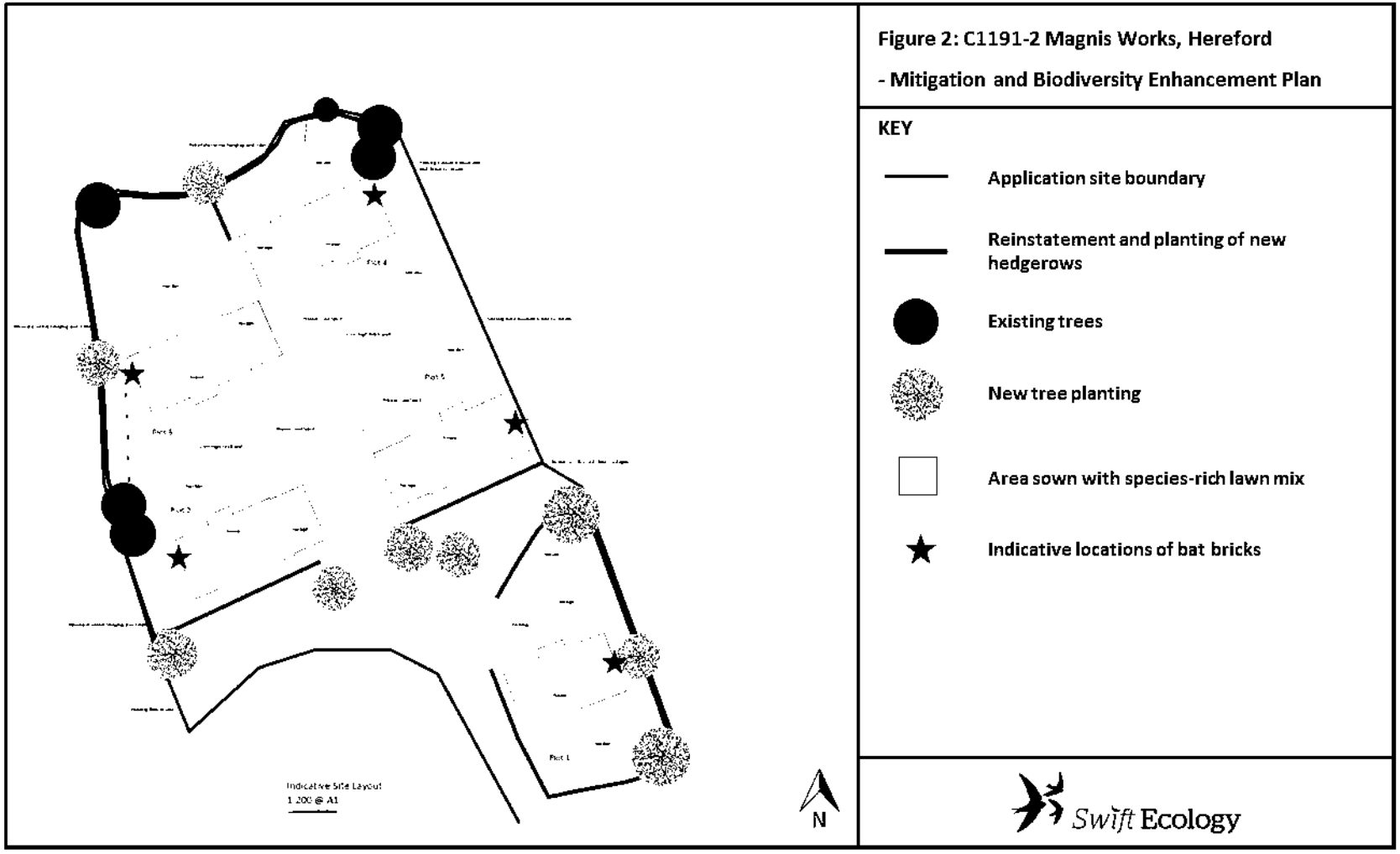
APPENDIX 1: SENSITIVE ECOLOGICAL FEATURES, MITIGATION AND BIODIVERSITY ENHANCEMENT




Indicative Site Layout
1:200 @ A1
N
Figure 2: C1191-2 Magnis Works, Hereford
- Mitigation and Biodiversity Enhancement Plan
KEY
Application site boundary
Reinstatement and planting of new hedgerows
Existing trees
New tree planting
Area sown with species-rich lawn mix
Indicative locations of bat bricks
Swift Ecology

APPENDIX 2: BAT ROOST PRODUCTS

All bat boxes should be installed according to manufacturer's instruction.

Bat Roost Products

A downloadable leaflet giving details of bat bricks can be obtained from:
http://www.bats.org.uk/pages/bats_and_buildings.html

Suitable bat brick products to be incorporated in new property include:

- Schwegler FE bat access panel
- Schwegler 1FR bat tube
- Ibstock enclosed bat box

Figure 1: Schwegler 1FR bat tube (bat brick)

APPENDIX 3: BIRD BOXES

Bird Box Products

All bird boxes should be installed according to manufacturer's instruction. Suitable general purpose bird box products include:

- Schwegler 1B nest box
- Traditional wooden nest box
- Open fronted wooden nest box

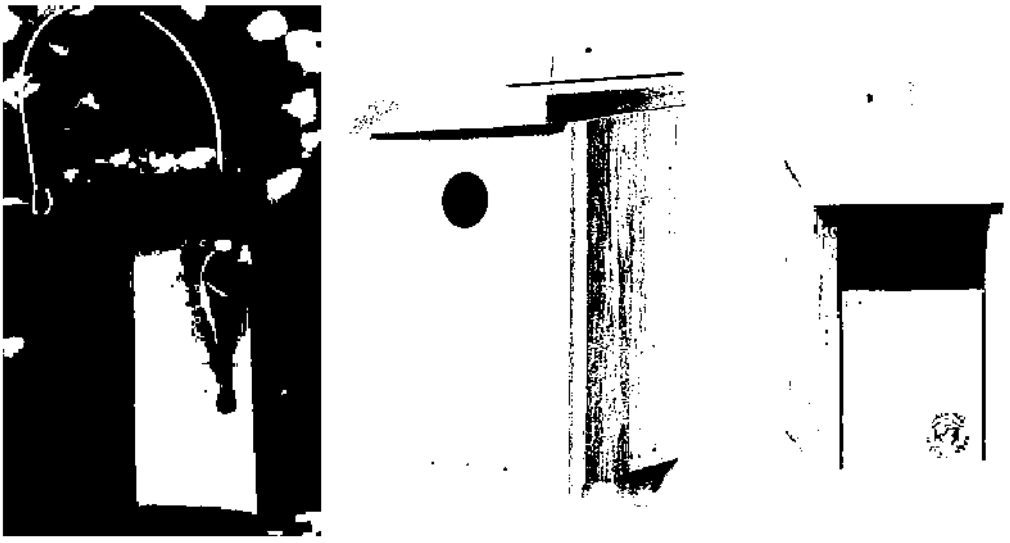


Figure 1: from left to right - Schwegler 1B nest box, traditional wooden nest box, open-fronted wooden nest box

Products for target species (e.g. house sparrow) could include the following:

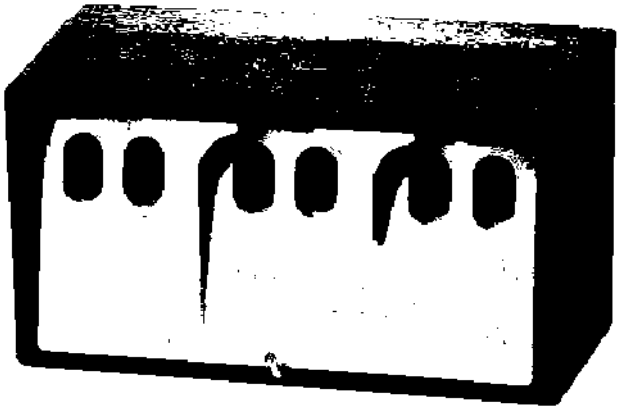


Figure 2: Schwegler 1SP sparrow terrace