fauna forest ecology ltd

Updating Bat Survey Report & Biodiversity Management Plan

108 Akeferry Road, DN9 2NF

Marek Bielenica

October 2019

Fauna Forest Ecology Limited

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This document has been prepared by Fauna Forest Ecology Limited exclusively as an Updating Nocturnal Bat Survey Report & Biodiversity Management Plan. Fauna Forest Ecology Limited accept no responsibility or liability for any use that is made of this document other than by the client for the purposes for which it was originally commissioned and prepared.

Methods used to prepare this report, including those carried out in the field followed The Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct.

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1 INTRODUCTION

1.1 Fauna Forest Ecology Limited was commissioned to carry out three nocturnal bat surveys and to produce a Biodiversity Management Plan for a site at 108 Akeferry Road, DN9 2NF (grid reference SK 77095 98759). Development proposals are to demolish the existing building and to erect a detached dwelling with appearance, landscaping layout and garage, under reference PA/2017/298.

1.2 The site has been subject to previous bat surveys by Fauna Forest Ecology Limited in 2017. Results of these previous surveys have been reviewed as part of the current report.

1.3 This report presents the findings of updated field-based studies carried out by Fauna Forest Ecology Limited in 2019.

1.4 The purpose of the updated surveys was to identify the current status of known bat roosts in the main building on site. The field visit results provide information to determine the potential ecological impact the proposed development may have on roosting bats and to inform the level of further survey effort and mitigation required to comply with relevant nature conservation policies and legislation.

1.5 In a letter dated 10th October 2017, Lincolnshire District Council state the following:

11.

No development shall commence until the local planning authority has been provided with either:

- *A) A licence issued by Natural England pursuant to Regulation 53 of The Conservation of Habitats and Species Regulations 2010 authorising the specified development to go ahead; or*
- *B) A statement in writing from the relevant licensing body to the effect that it does not consider that the specified activity/development will require a licence.*

Reason

To conserve European Protected Species in accordance with CS5 and CS17 of the Core strategy

12.

No development shall take place until a Biodiversity Management Plan has been submitted to and approved in writing by the Local Planning Authority. The plan shall include:

- *A) Details of measures to avoid harm to hedgehogs, bats and nesting birds during demolition, vegetation clearance and construction works;*
- *B) Details of at least three bat roosting features to be installed;*
- *C) Details of nesting sites to be installed to support barn swallow and garden birds;*

D) *Restrictions on lighting to avoid impacts on bat roosts, bat foraging area, bird nesting sites and sensitive habitats;*

E) *Provision for hedgehogs to pass through any fencing installed between gardens and between areas of grassland;*

F) *Prescriptions for the retention, planting and aftercare of native trees and shrubs of high biodiversity value*

G) *Proposed timings for the above works in relation to the completion of the dwelling*

Reason

To conserve and enhance biodiversity in accordance with policies CS5 and CS17 of the Core Strategy.

13.

The Biodiversity Management Plan shall be carried out in accordance with the approved details and timings, and the approved features shall be retained thereafter, unless otherwise approved in writing by the Local Planning Authority. The applicant or their successor in the title shall submit photographs of the installed bat roosting and bird nesting features, within two weeks of installation, as evidence of compliance with this condition.

Reason

To conserve and enhance biodiversity in accordance with policies CS5 and CS17 of the Core Strategy.

Site Location

1.6 The site is situated in an urban setting approximately 1km south-west of Haxey and 2.3km south-east of Westwoodside.

Limitations

- Fauna Forest Ecology Limited recommended a local biological records search was carried out for protected species within 2km of the site.

2 METHODOLOGY

Nocturnal Bat Surveys

2.1 Three updated nocturnal bat surveys were carried out with a view to identify the current status of known bat roosts in the site building. To give additional strength to data, four surveyors were used for the surveys. Ecologists Martin Kessel (bat licence number 2018-33025-CLS-CLS), Ian Myatt (bat licence number 2018-37098-CLS-CLS), Nathan Rimmer and Beth Thomason carried out the first dusk emergence survey on 24th May 2019. The second survey was carried out at dusk on 17th June 2019 by Martin Kessel, Ian Myatt, Nathan Rimmer and Beth Thomason. The final survey was at dawn on 5th July 2019. It was carried out by Martin Kessel, Ian Myatt, Philip Playford and Nathan Rimmer.

2.2 Work was completed in line with official assessment guidelines[1] and largely followed that recommended by the Chartered Institute for Ecology and Environmental Management (CIEEM) [2]and British Standard Code of Practice[3]. The assessment followed the standard methodology.

2.3 For the dusk emergence surveys, surveyors took up separate positions surrounding the building for 15 minutes prior to and for 1.5 hours after sunset. During the dawn re-entry survey, surveyors took up separate positions for 1.5 hours prior to and for 15 minutes after sunrise. At any one time between surveyors, all visible areas of the external aspects of the building were being observed. Visual observations of bat activity were noted and bat species were identified using bat detectors. Information recorded included weather, timings, whether bats emerged from or entered the building, direction of travel, species and activity e.g. foraging or commuting. Equipment models used included SSF Bat 2, EM Touch II Pro devices (coupled to Apple and Android tablets), Batbox Duet and the Magenta.

[1] Collins J (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd edn. Bat Conservation Trust, London.
[2] CIEEM (2015) Guidelines for Ecological Report Writing. CIEEM, Winchester.
[3] British Standards Institution (2013) BS 42020:2013. Biodiversity – Code of practice for planning and development. British Standards Institution, London.

3 RESULTS

Building Description

3.1 The building on site is a detached brick-built bungalow with a complex timber-framed roof that is underlined with bitumen felt and clad with double Roman interlocking tiles. There is a loft void which can be accessed by a typical timber hatch at ground floor level. Adjoining the rear north-facing elevation is an extension with a timber-framed pitched roof that is covered with interlocking tiles; no loft void is present in this section. The main chimney stack is on the east roof pitch and adjacent to the north-east facing side aspect is a single storey garage that has a timber-framed pitched roof which is covered with corrugated fibre material. Access into the garage can be achieved via an open doorway located at the rear east-facing side aspect.

Nocturnal Bat Survey Results

24th May 2019

3.2 Activity by foraging and commuting bats was relatively high for much of the survey. Species recorded included common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and *Myotis* spp. Most activity occurred along the hedge margins surrounding the site. No bats emerged from or re-entered the building.

17th June 2019

3.3 Commuting and foraging bat activity was high until 21:24. Species recorded were noctule *Nyctalus noctula,* common and soprano pipistrelle, *Myotis* spp. and brown long-eared *Plecotus auritus*. No bats emerged from or re-entered the building.

5th July 2019

3.4 Only common pipistrelle registrations were detected during the survey; most were foraging along the surrounding hedgerow boundaries. No bats emerged or re-entered the building.

Table 1: Weather conditions

Date	Start	Finish	Sunrise/Sunset	Temp °C	Wind	Cloud %	Rain	Notes
24/05/2019	20:55	22:45	21:11	16	Calm	50	Dry	N/A
17/06/2019	21:20	23:05	21:35	17	Calm	85	Dry	N/A
05/07/2019	03:42	05:00	04:42	15	Calm	90	Dry	N/A

Table 2: Nocturnal results summary – 24/05/2019

Date	Time	Species	Activity/Notes
24/05/2019	21:39	Common pipistrelle	Constant foraging around cherry trees in front garden area
	21:55	Soprano pipistrelle	Commuting audio call
	22:06	Common pipistrelle	Constant foraging activity along garden boundaries, mostly hedge margin on eastern boundary
	22:24	*Myotis* Species	Brief registration near rear northern garden boundary
	22:30	Common Pipistrelle	Occasional commuting calls. Activity notably less than earlier

Table 3: Nocturnal results summary – 17/07/2019

Date	Time	Species	Activity/Notes
17/06/2019	22:02	Noctule	Commuting call
	22:04	Common pipistrelle	Foraging around garden and building
	22:10	Common pipistrelle	Constant activity by two or more foraging individuals
	22:24	*Myotis* species	Audio call from commuting bat
	22:39	Common pipistrelle	Occasional foraging activity. Much less than earlier in the night
	22:40	Brown long-eared	Commuting along western boundary in southerly direction
	22:44	*Myotis* species	Foraged briefly over survey building

Table 4: Nocturnal results summary – 05/07/2019

Date	Time	Species	Activity/Notes
05/07/2019	03:00	Common pipistrelle	Commuting and brief social call
	03:09	Common pipistrelle	Brief commuting audio call

	03:24	Common pipistrelle	Commuting audio call
	03:45	Common pipistrelle	On individual foraging along eastern boundary line for several minutes
	03:50	Common pipistrelle	Brief foraging audio call
	04:00	Common pipistrelle	Brief commuting audio call
	04:19	Common pipistrelle	Brief commuting audio call

4 DISCUSSION AND RECOMMENDATIONS

4.1 The proposals are to demolish a detached bungalow and the adjacent garage, then to build a replacement dwelling with associated landscaping layout and a garage.

4.2 The site is an overgrown garden with a former residential building in the centre of the plot and a garage to the rear. Other habitats consist of hard standing and a mixture of native and ornamental flora. Further beyond the boundaries, the wider landscape is dominated by arable and grazing fields which are bounded by a network of hedgerow margins and occasional mature trees.

4.3 Fauna Forest Ecology carried out a daytime building inspection and three subsequent nocturnal bat surveys during the optimal survey season of 2017. Two bat droppings were found in the loft during the daytime building inspection and while undertaking the nocturnal assessments, it was evident that the building was being used by a day-roosting common pipistrelle and four day-roosting brown long-eared bats.

4.4 Nocturnal surveys carried out by Fauna Forest Ecology Limited during 2019 found no evidence of emerging or re-entering bats, suggesting that the day roosts discovered in 2017 are either infrequently or no-longer used. Evidence shows that the site does however serve as an important foraging and commuting ground for bat species such as common and soprano pipistrelle, brown long-eared and occasional *Myotis* spp.

4.5 In light of the above, habitat clearance and the inappropriate use of nocturnal lighting may have an impact on bats and other nocturnal wildlife.

4.6 In the absence of appropriate mitigation and compensation, bats may be disturbed, injured or killed during the proposed works and any roosts would be destroyed, which may lead to a criminal offence being committed. Upon receipt of planning permission, a licence should be applied for and granted by Natural England ahead of any works commencing. In support of the licence, a Method Statement should be designed with a view to give clarity of necessary mitigation and compensation, and to ensure the safeguard of bats throughout the operation. The Method Statement can also be used to discharge any relevant planning conditions. Provided that the licence is applied for before May 2019, the site will qualify for registration under the Bat mitigation Class Licence (BMCL). Post-May 2019, surveys would either need to be repeated, or a full European protected Species Licence (EPSL) would need to be applied for.

5 BIODIVERSITY MANAGEMENT PLAN

Reasonable Avoidance Measures

5.1 To safeguard wildlife on site, it is recommended that the following Reasonable Avoidance Measures (RAMs) are strictly adhered to while works are carried out:

- A copy of these RAMs should be made available on site throughout the construction period.
- On a daily basis ahead of works commencing, areas impacted by machinery/work tools will be inspected for animals. If any are discovered, Fauna Forest Ecology Limited should be contacted for advice.
- During the operation, log piles, metal sheeting and/or timber boarding should not be left on site as they may be used as wildlife refugia.
- It is advisable that only building products to be used on the day are brought and stored on the site. If building products need to be stored on site (e.g. overnight or for more than one day) these products will be stored on pallets or retained in bags on pallets to ensure that refugia is not created.
- Building products should ideally be placed on existing hard standing or bare soil.
- All holes created during the construction period (e.g. to lay a concrete pad) will be filled in and finalised on the same day so as not to leave any pitfall traps. If this is unavoidable, they should be left with a sloping end or ramp to allow any animals that may fall in to escape. Holes should be covered over at night and any pipes over 150mm in diameter should be capped off at night to prevent animals entering.
- Any spoil resulting from excavations will either be spread and compacted within the area on the same day or be removed from the construction area on the same day. It will not be left in loose heaps overnight.

Method Statement for Breeding Birds

5.2 Impacts to nesting birds can be avoided by timing works outside the bird nesting season which generally runs from late February until September. If works are carried out during the nesting season, best practice would be for a suitably qualified ecologist to inspect the site for nesting birds in good time of works commencing. The following Method Statement should be adhered to at all times during the development process:

- If an active nest is discovered when an ecologist is not onsite, works should halt and Fauna Forest Ecology Limited should be contacted for advice. It is likely that a suitably qualified ecologist will need to attend site.
- Irrespective of the time of year, if any nesting birds are discovered on site, an area around the nest site will be protected from disturbance with a suitable fence (not HERAs fencing) that would include an appropriate buffer zone, as determined by the suitably qualified supervising ecologist. Work will

then be avoided in this area until the nest is no longer in use. Buffer zones in this respect will normally be 5m in diameter and will be delineated by canes, cordon tape and signage.

- Once the nest has been vacated, immediately prior to works commencing, the supervising ecologist will carry out another site inspection for nesting birds. Works will then only commence if the ecologist confirms that no other nesting birds are present. Should nesting birds be discovered the actions described above will be implemented/repeated.

Safeguard of Bats & Site Supervision

5.3 As the roof has been used for day-roosting, it is recommended that it is stripped over the winter months when bats are less likely to be present. Before stripping the roof, a licence should be issued by Natural England. To offer a temporary roosting provision for any bats found during the roof strip, a Schwegler 1FF (or similar) bat box will be temporarely installed on site. Provided that bats are not using the box, it can be removed post-development.

5.4 Before works commence, a bat-licenced ecologist should undertake a further building inspection and check for the presence of any bats.

5.5 All contractors working on the proposed development must be briefed on the legal protection afforded to bats and their places of shelter and on how to proceed if a bat is discovered during the course of the work.

5.6 A licensed bat worker should be present to supervise the roof strip. The client will provide secure scaffolding or a cherry picker to provide the ecologist with safe access to the external roof aspects.

5.7 If a bat is discovered when a licensed ecologist is not present on site, works should halt, and Fauna Forest Ecology Limited must be contacted for advice.

Bat Roosting Features

5.8 Four bat tiles will be incorporated in the roof of the new garage building. There are a number of options with regards to tiles. They may include the following:

Modified Slates

- Slate modifications are made from code 6 lead with a prising 20mm gap, providing adequate access/roosting space for bats.
- Bat access slates on all roof pitches should be situated approximately 0.75m below the top of the ridge tile.

Bat Tile (non-slate)

- Alternative bat access tile options are available for clay and concrete roofs. They can be purchased from companies such as NHBS: www.nhbs.com.
- All bat tiles should be situated approximately 0.75m below the ridge tile.

Birds

5.9 Impacts to nesting birds can be avoided by timing works outside the bird nesting season, which generally runs from late February until September. If works must be carried out during the nesting season, best practice would be for a suitably qualified ecologist to inspect the site for nesting birds in good time of works commencing.

5.10 To compensate for nesting bird habitat loss, the following mitigation measures are recommended:

- Two open-fronted bird nesting boxes are to be installed at least 3m above ground level, ideally in locations sheltered from prevailing wind.
- One close-hole nesting box should be fitted to any retained trees or on the side aspects of a building.
- It is recommended that three sparrow streets are created, which would usually comprise at least three connected nest boxes no lower than 3m from ground level. Boxes (streets) could be installed on one or more side aspects of the new dwelling or the adjacent garage. They should be positioned away from direct sunlight, prevailing winds, and ideally under the eaves. It is advised that boxes are not installed above a doorway or a well-used path. For further design specifications, visit the RSPB website[4]:

Hedgehogs

5.11 With hedgehog numbers declining in recent years, Biodiversity Management Plans are critical to aid with their conservation status. Given that foraging hedgehogs can travel through a number of gardens each night in a bid to successfully forage, it is important that provisions are made in each boundary line (if fenced or gated) with a view to allow them to successfully commute. Gaps in fences and under gates should be at least 130mm X 130mm. It is also recommended that any nearby waterbodies have at least one sloping side to allow hedgehogs and other animals to escape, should they fall in.

[4] https://www.rspb.org.uk/globalassets/downloads/activities-pdfs/createasparrowstreet.pdf

Noise & Lighting

5.12 A low-level lighting scheme should be implemented during and after construction to avoid indirect disturbance to bats and other nocturnal animal species that may exploit local habitats. We recommend that:

- During the construction phase, works are not carried out after dusk and do not commence until after dawn. It is strongly recommended that generators and machinery that emit significant noise levels are not left to run through the night.
- Light spill is controlled and if lighting is required at night, hooded shields are fitted to prevent spill onto nearby habitats that likely to support wildlife.
- Lighting is not directed towards bat and bird mitigation boxes/tiles.

Hedgerow Planting

5.13 A new hedgerow will be planted along the northern boundary of the site. Prior to planting the hedgerow, the ground should be broken up and cleared of any existing vegetation which may compete with new plants. Bare roots must be carefully handled and protected prior to planting to prevent them from drying out. Ideally, they should be kept in bags in a cool, damp location.

5.14 The hedgerow will be planted in areas of organic mulch such as well-rotted woodchip, bark, coconut fibre, grass cuttings, horse manure or farmyard manure, which can be laid around the base of the hedge to a 100mm depth. This will be applied early summer, no later than May, and will require topping-up in subsequent years.

5.15 The hedge itself should be planted between October and March provided no ground frost is present, and it should be laid at six plants per metre in two staggered rows about 250mm apart with plants at approximately 450mm in each row. A buffer or strip no less than one metre should be left around the hedge and this should be appropriately managed to increase biodiversity value.

5.16 Hedge plants should be approximately 0.5m transplants of locally common native species and of British provenance (preferably local) and should comply to British Standard 3936[5]. A diverse mixture of species is recommended to enhance the wildlife value of the hedgerow and provide a good feeding resource for both pollinating insects and birds. The composition of species should include 10% Hazel *(Corylus avellana),* 60% Hawthorn *(Crataegus monogyna)*, 10% Field Maple *(Acer campestre),* 5% Holly *(Ilex*

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https://apps2.staffordshire.gov.uk/SCC/TrimDocProvider/?ID=003/07/06/04/1039

aquifolium), 10% Blackthorn *(Prunus spinosa),* 5% Dog Rose *(Rosa canina)* with the addition of Wayfaring Tree *(Viburnum lantana)* and/or Guelder rose *(Viburnum opulus)* with no less than six species in total.

5.17 No less than three standard trees should be planted along the northern boundary hedgerow. Tree species suitable would include Wild Cherry (*Prunus avium)*, Oak (*Quercus robur*), Hornbeam (*Carpinus betulus)*, Field Maple (*Acer campestre)*, Alder (*Alnus glutinousa)*, Silver Birch (Betula pendula) and Rowan (*Sorbus aucuparia)*.

Lawns

5.18 We recommend the lawn areas be planted with a seed mix from Emorsgate Seeds called EL1 – FLOWERING LAWN MIXTURE. This contains a good mix of grasses and forbs, allowing for the long-term development of perennial wildflowers under a mowing regime. A list of species included in the mix is shown in Appendix C.

Future Management/Maintenance of Habitat Creation

- If the weather becomes adversely dry in the growing season following planting (as was seen in 2018), consideration may have to be given to watering the plantings, and in dry conditions they should be regularly monitored to check for undue levels of mortality. For the first year any plants which die should be replaced by new plantings and once the scrubs are mature, tree guards should be removed and disposed of.
- The hedgerow should be laid by a suitably qualified person.
- Small notches/gaps may be created where trees are to be planted (experienced personnel should be aware of best practice in this instance).
- Supports/ties and other associated equipment used to aid with growth will be regularly checked and adjusted accordingly. Once trees and shrubs are well established, supports will be removed.
- Any holes left by the removal of supporting equipment will be filled with soil.
- Trim the hedgerow outside of the bird nesting season which generally runs from late February until late August.
- Annual cutting of the hedge is not recommended because it weakens the shrubs and reduces winter food for wildlife.
- Work on a rotation of cutting once every 2-3 years, which in turn, will be cost-effective and help to produce a more natural-looking hedge.
- Do not trim trees that are planted in the hedge. These can be marked so they are not cut accidentally.
- Trimming the hedge into an A-shape up to 2m high and 1.5m wide rather than the traditional box cross-section encourages bush growth from the base of the hedge and prolongs life.
- The hedgerow will need to be laid on a 10-15-year cycle. Diseased or dead trees will be cut back by a suitably qualified person and if need-be, they should be removed. Dead trees must be

removed from the site by suitably qualified personnel whom prior to removal, should design a biosecurity Method Statement. Dead trees should be replaced.

- Tree boles will be sprayed annually between June and September and plants should be fed once in spring and once late summer using only approved liquid feed at a rate of 60g/m². It is important to ensure plants are watered during drought.
- Ways to ensure the hedgerow is not impacted by rabbits, deer and other pests, is by using clear spiral guards which can be used with most species and will expand with growth of the plant. Other options are the use of plastic mesh guards which are useful for branching species such as holly (guards should be removed once plants have become established after 3-5 years)..
- The buffer strip adjacent to the hedgerow may need to be managed for weeds in the first few years, with excessive amounts of aggressive species reduced in cover, although it should be stressed that the presence of occasional thistles and dock should be tolerated as these provide a resource for a wide range of invertebrates. The area should be cut in August and if the sward becomes too thick and species-poor, consideration should be given to a secondary cut at the end of February if the ground is dry enough. Following mowing, the grass should be raked off.
- Similar to the hedge, if the planting is followed by adversely dry and hot conditions, the strip will need to be watered, and if any areas suffer excessive dieback, they should be re-seeded.

Biosecurity

5.19 We recommend the below biohazard precautionary measures are followed:

- Prior to works commencing all site workers should receive a tool-box talk regarding the level of potential threat Schedule 9 plants pose to the environment.
- Workers disinfect boots and use hand sanitiser prior to entering the site and before leaving the site.

Pollution Management & Measures of Best Practice

5.20 At all stages throughout the course of the construction phase, the new series of Guidance for Pollution Prevention (GPP)[6] should be strictly adhered to.

[6] http://www.netregs.org.uk/media/1303/gpp-5-works-and-maintenance-in-or-near-water.pdf

APPENDIX A: LEGISLATION SUMMARY

Birds

All common wild birds are protected under The Wildlife and Countryside Act 1981 (and as amended). Under this legislation it is an offence to:

Kill, injure or take any wild bird

Take, damage or destroy the nest of any wild bird while it is in use or being built

Take or destroy the egg of any wild bird

Certain rare breeding birds are listed on Schedule 1 of The Wildlife and Countryside Act 1981 (and as amended). Under this legislation they are afforded the same protection as common wild birds and are also protected against disturbance whilst building a nest or on or near a nest containing eggs/unfledged young.

Bats

In England and Wales, bats and their roosts are protected under the Conservation of Species and Habitats Regulations 2010 (as amended), and the Wildlife & Countryside Act 1981 (as amended). Taken together, this legislation makes it an offence to:

- Deliberately capture (or take), injure or kill a bat
- Intentionally or recklessly disturb a group of bats where the disturbance is likely to significantly affect the ability of the animals to survive, breed, or nurture their young or likely to significantly affect the local distribution or abundance of the species whether in a roost or not
- Damage or destroy the breeding or resting place of a bat
- Possess a bat (alive or dead) or any part of a bat
- Intentionally or recklessly obstruct access to a bat roost
- Sell (or offer for sale) or exchange bats (alive or dead) or parts of bats

A roost is defined as being ‘any structure or place that is used for shelter or protection’, and since bats regularly move roost site throughout the year, a roost retains such designation whether or not bats are present at the time.

APPENDIX B: SITE PLANS & MAPS

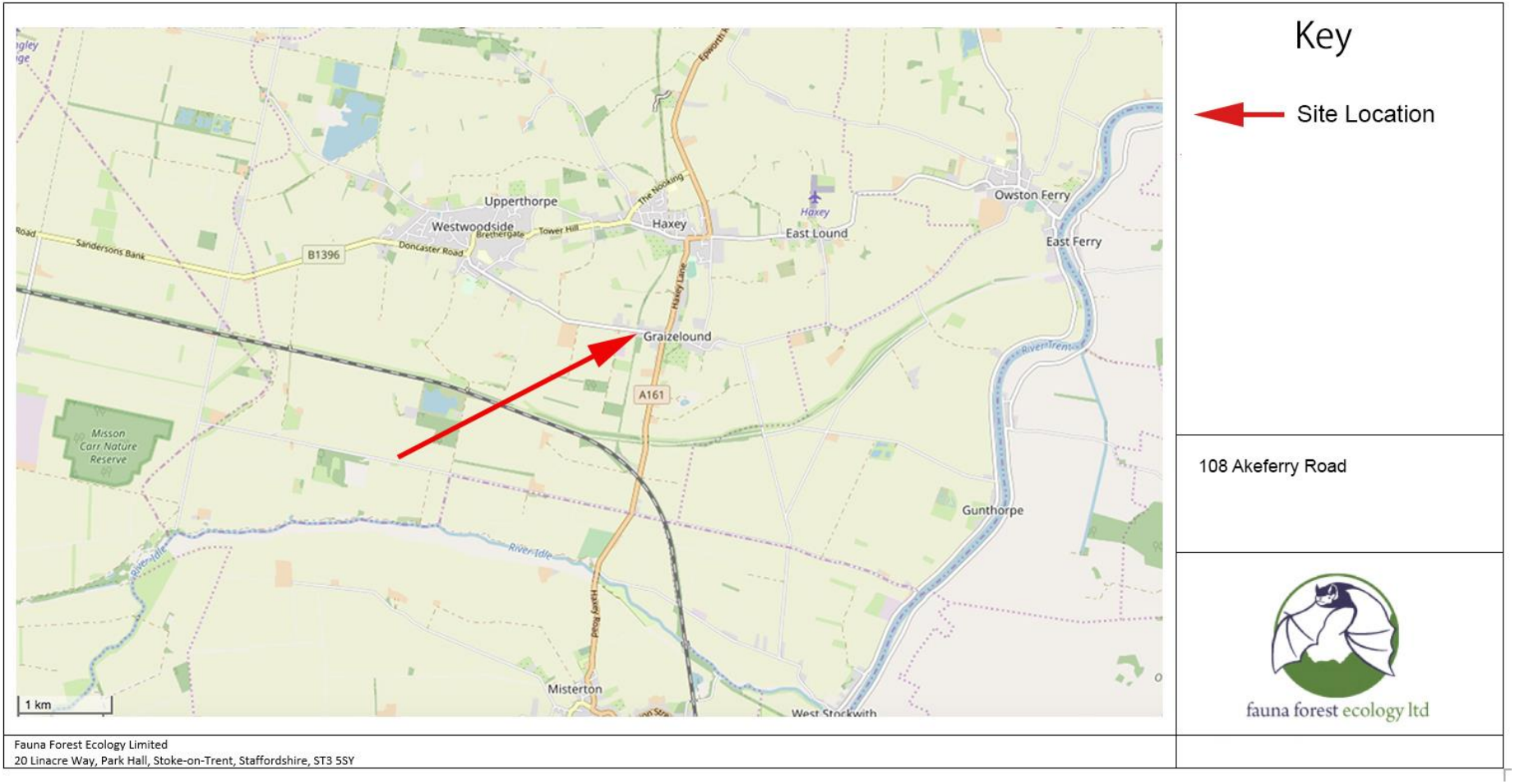


Figure 1: Site Location Map

Key

Survey Building

S1 Surveyor Positioning

108 Akeferry Road

fauna forest ecology ltd

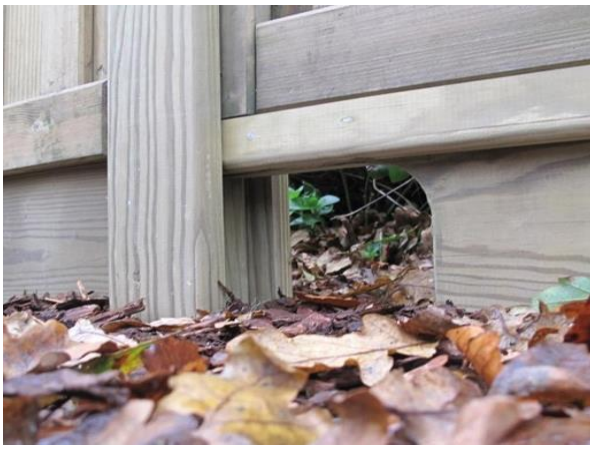
Fauna Forest Ecology Limited
20 Linacre Way, Park Hall, Stoke-on-Trent, Staffordshire, ST3 5SY

Figure 2: Nocturnal Surveyor Positioning Map

Figure 3: Habitat Creation Design

APPENDIX C: HABITAT CREATION

Quercus Fencing
Hedgehog friendly oak woven fencing panels



Jacksons-Fencing
Hedgehog friendly gravel board for use with slotted posts

Recommendations for installing hedgehog friendly fencing:
(Sourced from Hedgehog Street www.hedgehogstreet.org)

A hedgehog friendly fence should have a gap measuring at least 130mm by 130mm in the gravel board. These gaps allow any hedgehog to pass through but are too small for nearly all pets.

At least one hedgehog friendly fence panel should be located on each side of your garden, to provide unimpeded access.

Almost all fencing materials can be made hedgehog friendly but may require DIY adaptations. Please note that some concrete gravel boards contain metal rods running along the length of the boards to provide strength and rigidity and cannot be cut. To overcome this, a gap can be left between the gravel board and post to provide the required gap.

Bird nesting boxes

Create a sparrow street

What you will need:

- a plank of wood
  150 mm x 1400 mm x 15-18mm thick
- pencil and tape measure
- saw
- nails
- strip of waterproof rubber.
- drill
- Optional: a special drill bit for making 32mm holes
- ladder
- screws

Step by step guide

1 **Make sure you have a suitable place for your nestbox.** Ideally, it will be under the eaves of your house or high on a wall, and you'll need to have permission before erecting any box on a property.

The box will need to be at least 3 m (10 feet) from the ground, facing somewhere between north and east to avoid it getting too hot or wet. Avoid placing it in direct sunlight, and don't put it over a doorway or well used path.

2 **Buy a sparrow box.** If you're short on time or DIY skills you can buy a box, but check it's the correct size. The round entrance hole should be 32 mm in diameter, and it should be at least 150 mm from the floor of the box. It shouldn't have a perch directly below the hole – that would be an open invitation to predators.

3 **Make sure you have the right wood.** The thickness is importance to insulate the box from cold and heat and to stop the box warping). You can use exterior-quality plywood (for a light box) or hardwoods (such as oak and beech) or soft wood (such as pine, but this will deteriorate more quickly). Buy timber approved by the Forest Stewardship Council - look for the FSC label.

4 **Measure and cut your wood.** Mark your plank of timber with your pencil first. Then saw your plank according to the diagram.

If you don't have the special drill bit for making the 32 mm round hole, you can use a jigsaw to cut a square or wedge shaped hole at the top of the front, as in the diagram.

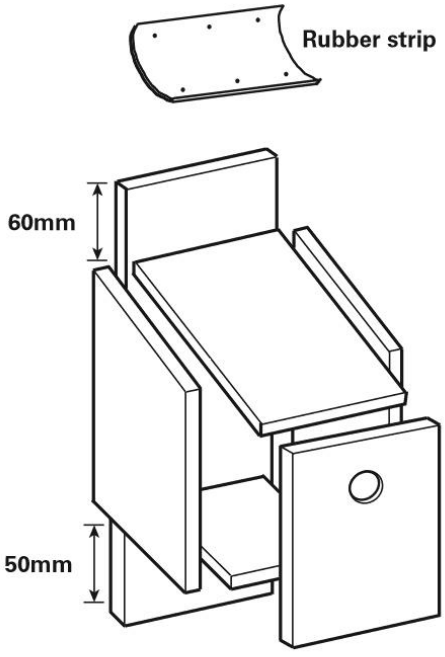
5 **Nail all the pieces, except the roof, together.** The sides, back and front 'wrap around' the base.

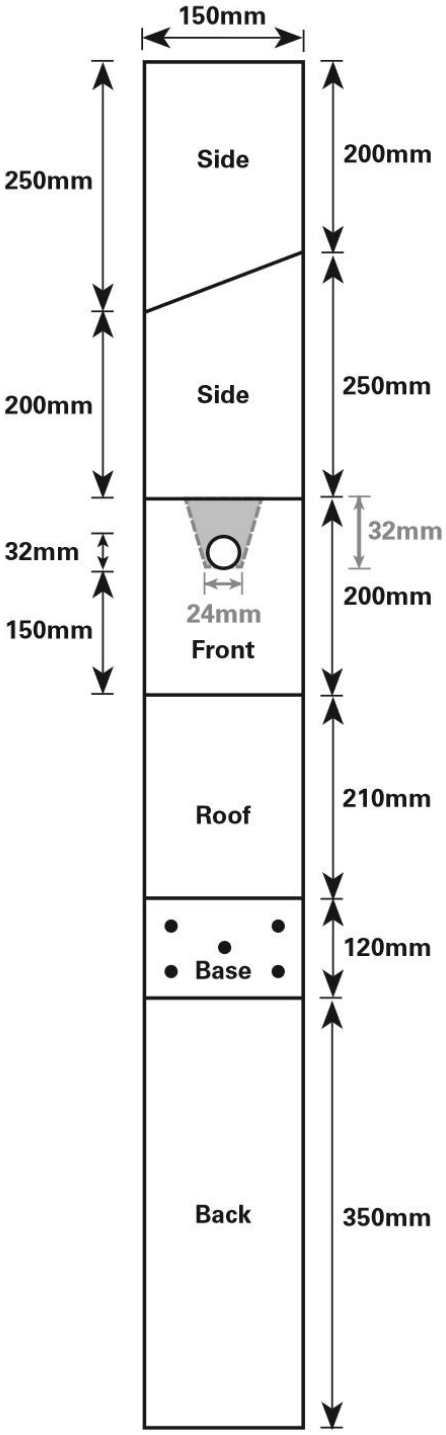
6 **Attach the roof.** By using screws, you'll be able to get into the box at a later stage to clean it out.

Use a waterproof strip to make a hinge between the top edge of the roof and the backing board. Try a piece of bicycle tyre inner tube or roofing felt.

7 **Put your box up.** Drill guide holes at the top and bottom of the box. Taking care, fix to a wall using a ladder, screws and rawl plugs.

Sparrows are sensitive to disturbance at the nest and protected by law. So watch and enjoy from a distance. You may be lucky to see them raising several broods in there in a season.



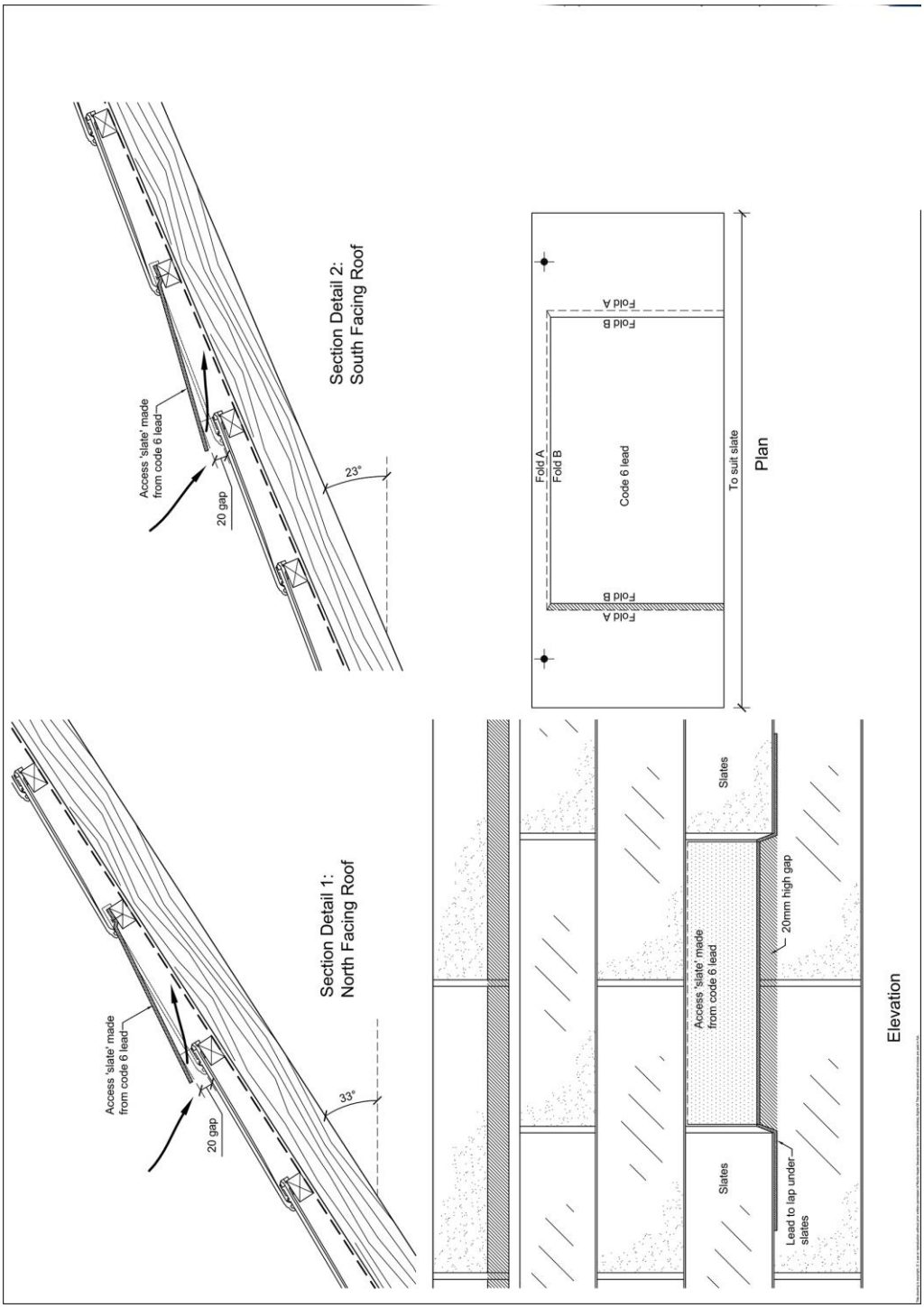


Examples of sparrow terrace nest boxes

Examples of 28mm, 32mm and open fronted bird boxes

Example of Schwegler Brick Nest Box

Bat access tiles



Seed mix for lawn area and 1-2m buffer strip

EL1 – FLOWERING LAWN MIXTURE

Mixture EL1 contains slow growing grasses with a selection of wild flowers that respond well to regular short mowing.

Wild Flowers

%	Latin name	Common name
4	*Galium verum*	Lady's Bedstraw
0.5	*Leontodon hispidus*	Rough Hawkbit
1	*Leucanthemum vulgare*	Oxeye Daisy
3.7	*Lotus corniculatus*	Birdsfoot Trefoil
3	*Primula veris*	Cowslip
4	*Prunella vulgaris*	Selfheal
3.5	*Ranunculus acris*	Meadow Buttercup
0.3	*Trifolium pratense*	Wild Red Clover
20		

Grasses

%	Latin name	Common name
8	*Agrostis capillaris*	Common Bent
40	*Cynosurus cristatus*	Crested Dogstail
28	*Festuca rubra*	Slender-creeping Red-fescue
4	*Phleum bertolonii*	Smaller Cat's-tail
80		