

**Ecological Enhancement and Habitat management
Scheme for
Blythe Bridge**

Author: Dr. Stefan Bodnar

MCIEEM Ecologist and
Environmental Consultant February

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Client:

Harper Group Construction

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1. SITE INFORMATION

1.1 Brief

This Ecological Impact Assessment and Enhancement scheme has been drawn up in order to ensure that adequate protection measures and safeguards for breeding birds, bats, amphibians and reptiles are in place and that the measures proposed to enhance the area are detailed. In addition it aims to ensure no Biodiversity loss and the statutory 10% Biodiversity Net Gain as part of the development. See condition below:

Application no: SMD/2023/0368

Determined on: 15th October 2024

**Town and Country Planning Act 1990
Town and Country Planning (Development Management Procedure) (England) Order 2015
(as Amended)**

HYBRID PERMISSION FOR DEVELOPMENT

This permission does not carry any approval or consent which may be required under any enactment, bylaw, order or regulation (e.g. in relation to Building Regulations or the Diversion of Footpaths etc) other than Section 57 of the Town and Country Planning Act, 1990.

Location of Development:

Land at Uttoxeter Road Blythe Bridge Staffordshire ST11 9JR

Description of Development:

Demolition of all existing buildings and (a) full planning permission for the erection of 12 self-contained flats for the elderly along with car parking, landscaping and associated private amenity space, a new public car park to serve the village centre; and (b) outline planning permission with all matters reserved for the erection of a new community building.

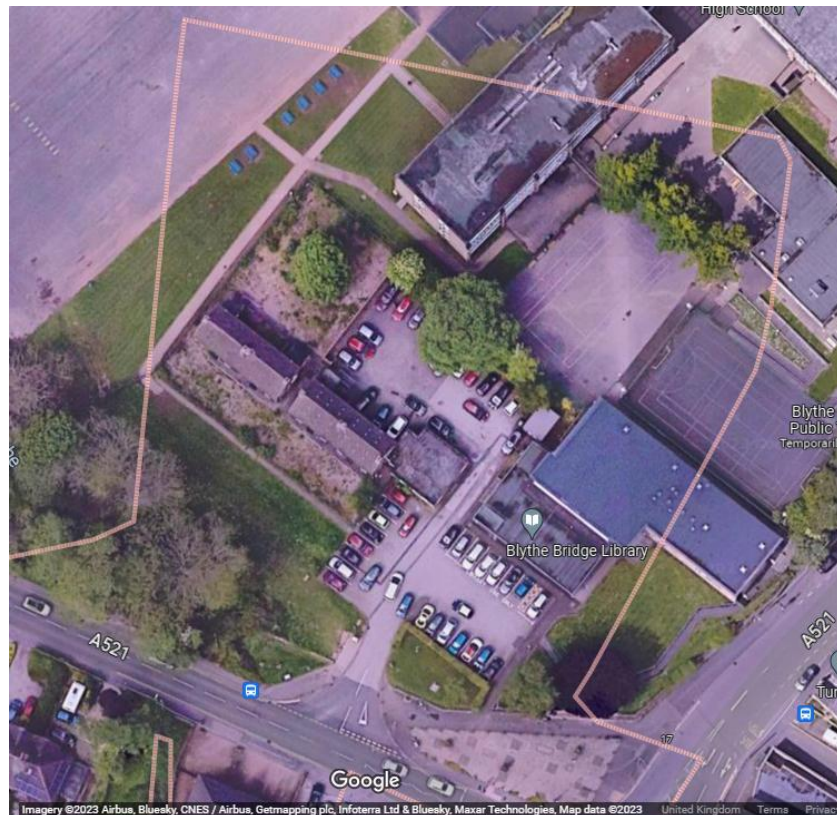
18. Prior to first occupation of any of the residential units hereby approved, an Ecological Management Plan (EMP) relating to the Biodiversity Net Gain habitat creation on site detailed in the Preliminary Ecological Appraisal dated November 2023 prepared by Dr Stephan Bodnar and the Metric 4 calculator shall be submitted to and approved in writing by the Local Planning Authority. The Plan shall include details for the ongoing management of hedgerow/ tree planting and grassland enhancement to target conditions. The development shall thereafter be carried out in accordance with the approved EMP.

Reason:- To ensure a net gain in biodiversity

Site Location

The site is area of land off the A521 Uttoxeter Rd, Blythe Bridge, Stoke-on-Trent ST11 9JR known as Blythe Bridge, Staffordshire. The site location is described on the image below. A satellite image and Phase One diagram (see Appendices) also show the area concerned.

Figure 1a. Showing site location



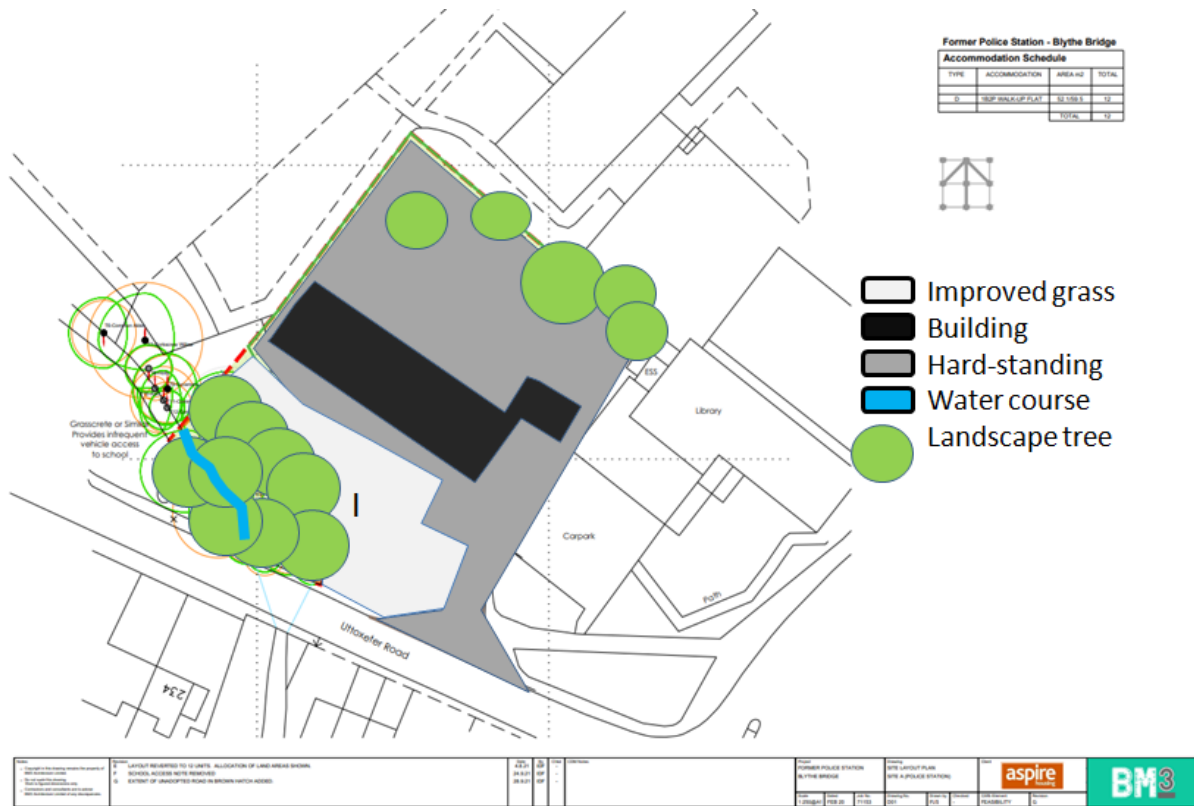
1.3. Site Description

The site consists of two adjacent two storey former police stations/houses, constructed in the 1970s, of brick, with wooden soffits and UPVC windows and doors. There is an area of car parking, hardstanding access and single storey buildings to the rear, which have flat mineral felt roofs, and wooden weatherboards. There is an area of improved amenity grassland, dominated by Perennial ryegrass *Lolium perenne*, and ruderal plant species growing in the hardstanding such as Creeping thistle *Cirsium arvense*, Cow parsley *Anthriscus sylvestris*, Broad leaf willowherb *Epilobium montanum*, Creeping Buttercup *Ranunculus repens*, Common ragwort *Senecio jacobaea*, Spear Thistle *Cirsium vulgare*, Field horsetail *Equisetum arvense* Stinging nettle *Urtica dioica*, Broad leaved Dock *Rumex obtusifolius*, and *Buddleia Buddleja davidii*. A small stream runs along the site frontage, *with the Uttoxeter road*. The water is clear, the stream bed is stony, it is shaded, tree lined and the banks are covered with dense bramble *Rubus fruticosus* agg. and ivy *Hedera helix* growth. *Along the site frontage and stream course are mature ash Fraxinus excelsior, holly Ilex aquifolium, hazel Corylus avellana, Elder Sambucus nigra, Alder Alnus glutinosa and Common lime Tilia x europea*, with ground cover of dense ivy.

There are early mature trees growing along the site edges, including Sycamore *Acer pseudoplatanus*, Rowan *Sorbus aucuparia*, Goat willow *Salix caprea*, Alder *Alnus glutinosa* and Birch *Betula pendula*. There are signs of moles and *a mammal track on site, probably fox*. (See Phase 1 Habitat Map, appendix 1d). See satellite images above and below.

1.5 Biological information

The biological information relating to the proposed development is provided in a Preliminary Ecological Appraisal (Phase 1 Ecology survey) of the site by Dr. Stefan Bodnar, last updated in November 2023:



Habitat Types

- **Amenity grassland:** There is an area of improved amenity grassland, dominated by Perennial ryegrass *Lolium perenne*, with Daisy *Bellis perennis* and Dandelion *Taraxacum officinale* also present. #
- **Landscape trees:** Along the site frontage with the Uttoxeter road are mature ash *Fraxinus excelsior*, holly *Ilex aquifolium*, hazel *Corylus avellana*, Elder *Sambucus nigra*, Alder *Alnus glutinosa* and Common lime *Tilia x europea*, with ground cover of dense ivy. There are early mature trees growing along the site edges, including Sycamore *Acer pseudoplatanus*, Rowan *Sorbus aucuparia*, Goat willow *Salix caprea*, Alder *Alnus glutinosa* and Birch *Betula pendula*.
- **Water course:** a small stream runs along the site frontage, the water is clear, the stream bed is stony, it is shaded, tree lined and the banks are covered with dense bramble *Rubus fruticosus* agg. and ivy *Hedera helix* growth.

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- **Drainage**

The water course is a small tributary of the River Blithe, this could be indirectly impacted by run-off during the construction and operational phase of the development, it is recommended that a CEMP (ecology) is provided to detail construction operations and how this will be avoided.

- **Tall herb:** There are ruderal plant species growing in the hardstanding such as Creeping thistle *Cirsium arvense*, Cow parsley *Anthriscus sylvestris*, Broad leaf willowherb *Epilobium montanum*, Creeping Buttercup *Ranunculus repens*, Common ragwort *Senecio jacobaea*, Spear Thistle *Cirsium vulgare*, Field horsetail *Equisetum arvense* Stinging nettle *Urtica dioica*, Broad leaved Dock *Rumex obtusifolius*, and *Buddleia Buddleja davidii*.
- **Hard standing & Buildings:** The site consists of two adjacent two storey former police stations/houses, constructed in the 1970s, of brick, with wooden soffits and UPVC windows and doors. There is an area of car parking, hardstanding access and single storey buildings to the rear, which have flat mineral felt roofs, and wooden weatherboards.

Conclusions

- This Phase 1 Ecology Report confirms that the Construction Zone is of 'low ecological value' consisting primarily of amenity grassland.
- Newly created garden and amenity grassland areas on site, are recommended to be sown without the introduction of top soil, using subsoil and flowering lawn mix, to create attractive, biodiverse areas with minimal management requirements.
- Additional tree and hedge planting is recommended.
- The features of highest ecological value within the development site are the trees.
- There are no Statutory or Non-Statutory Designated Nature Conservation Sites within or adjacent to the site.
- The Biological Data Search no protected species were recorded within the site.
- There is no evidence of badger use of the site, therefore no further surveys are required.
- No buildings on site have bat roost potential.
- The mature trees along the site frontage have moderate bat roost potential.
- The majority of the site is of low suitability for both reptiles and Great Crested Newts, therefore no further surveys are required, although a series of precautions should be taken during development, as detailed in section 4.3b. The trees within the survey site are suitable for bird nesting. Site clearance should be

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undertaken outside of the bird breeding season (mid March to mid August) or undertaken under ecological supervision.

- The water course is a small tributary of the River Blithe, this could be indirectly impacted by run-off during the construction and operational phase of the development, it is recommended that a CEMP (ecology) is provided to detail construction operations and how this will be avoided.

- Within the appended species list of floral species recorded onsite) is Japanese Rose (*Rosa rugosa*). However, it is not stated within the report that this is a Schedule 9 Species under the Wildlife and Countryside Act 1981, in which it is an offence to allow this species to grow in the wild. Appropriate industry methods will be used for removal from the Site, and to avoid the spread of Japanese Rose.

2.0 Screening for protected species and main precautions:

The trees and scrub could provide suitable nesting structures, therefore any site clearance should be carried out outside of the peak bird breeding season. Peak bird breeding season is between mid March and mid August, although certain species can breed outside these months and if breeding birds are found then work should cease and the advice of an ecologist sought.

All retained trees should be treated in accordance British Standard BS5837 (2012) Trees in Relation to Design, Demolition and Construction – Recommendations, to ensure require adequate root protection fencing, with BS5837 (2012) Guidance followed in regard to removal of hardstanding or fencing within the root zones of retained trees.

To protect any reptiles or amphibians which might be using the site, it is recommended appropriate precautions should be taken during development. These include;

- If great crested newts are discovered at any time during processes involved with the development, work should cease immediately and the advice of a licensed ecologist sought.
- All site staff involved with site clearance and construction works are to be made aware of the potential for encountering great crested newts and reptiles through a tool kit talk and the appropriate measures to be taken if great crested newts are encountered.
- Keep duration of groundworks as short as possible.
- Undertake during the day works that might only affect newts above ground.
- Backfill trenches and other excavations before nightfall, or leave a ramp to allow newts to easily exit.
- Raise stored materials (that might act as temporary resting places) off the ground, e.g. on pallets.
- Ensuring storage of piles of materials and excavated earth on the site should be kept to a minimum.
- Storing piles of materials and excavated earth away from the field boundaries to deter reptiles from using them for temporary cover.

Appropriate precautionary measures are recommended, in case badgers or other mammals enter the working areas at night:

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- Ensure that all those in work are aware of the potential for setts or badgers to be encountered, and the actions to be taken if these are discovered at anytime.
- All excavations to be covered over or ramped so that any badgers could get out of an excavated structure. Further measures are detailed below:
- Any ground-works that are to be left open overnight will be provided with a means of escape should a badger enter. This could simply be in the form of a roughened plank of wood placed in the trench as a ramp to the surface. This is particularly important if the trench fills with water.
- Any trenches/pits will be inspected each morning to ensure that no badgers have become trapped overnight. Should a badger become trapped in a trench it will likely attempt to dig itself into the side of the trench, by forming a temporary sett. Should a trapped badger be encountered the Ecologist should be contacted immediately for further advice who, if necessary, will contact Natural England in respect of legislative and licensing issues.
- The storage of topsoil or other 'soft' building materials on site will be given careful consideration. Badgers will readily adopt such mounds as setts; so as to avoid the adoption of any mounds, these will be kept to a minimum and any essential mounds subject to daily inspections (or nightly patrols if 24 hour security is present on site), with consideration given to temporarily fencing any such mounds to exclude badgers.

2.1 Opportunities for Biodiversity Gain and Off-setting requirements

It is important that this proposed development should demonstrate No Net Loss of Biodiversity, in accordance with National Planning Policy Framework 2024.

Any trees unavoidably lost to accommodate the development, will require more than compensation planting at a minimum of 1:1 ratio, as young, newly planted trees have a lower ecological value than the existing semi-mature tree and scrub, therefore on site mitigation in the form of garden and boundary tree and hedge planting will be required to prevent biodiversity net loss.

Following the built development there will be opportunities for enhancement of the site's ecological value by on site landscaping measures designed to encourage wildlife into the site, including native planting, bird and bat boxes on built structures. Species should be selected, that are both native and wildlife friendly, focusing on measures to encourage birds and foraging bats, wherever possible. See appendices 4 - 8 for detailed information. The opportunities for enhancement lie in the following main areas:

1. Supplementary tree planting with native species and creation of boundary hedge and tree features.
2. Newly created grass areas on site, are recommended to be sown without the introduction of top soil, using subsoil and flowering lawn seed mix, to create attractive, biodiverse areas with minimal management requirements.
3. Introduction of bat and bird friendly native planting schemes, hibernacula, and wildflower hedgerow edge mix seeding.
4. Bird and bat boxes incorporated within or on the new buildings or other built fabric, in particular should be included.
5. Selection of wildlife-friendly shrub/planting species as part of the terrestrial landscaping scheme within the development. The specification should include 4 elements of landscaping details selected from a palette of species beneficial to wildlife (further information can be found in Appendix 4):
6. A number of bird and bat boxes could be attached to the built structures, in particular, two Black redstart boxes should be attached to the buildings following development.

7. **Bird box specifications:** Bird boxes can be ordered from NHBS Ecology details can be found in appendix 5. **Bat Box Specifications:** It is also suggested that bat boxes be attached to the corners of the built structures. Details can be found in appendix 5.

3. Enhancement Measures

3.1 Details of landscaping features, to maintain and enhance the biodiversity of the site.

The principle enhancement measures will be shown within the Landscape plan, which is devised from the recommendations made in the PEA and the Biodiversity Net Gain information presented, see below:

BNG information: (BM3 Architecture)

2 BIODIVERSITY IMPACT ASSESSMENT

Information from the Preliminary Ecological Assessment (PEA) and details of the landscape design created by BM3 Architecture, have been used in the DEFRA 4.0 BIA Calculator Tool following associated guidance. This allows for the establishment of the changes in 'biodiversity units', with respect to 'habitat units', 'hedgerow units' and 'watercourse units'.

2.1 Existing Site Habitats (Pre-development)

Refer to the Preliminary Ecological Assessment prepared by the project ecologist for details of the areas of habitat identified with the site (Dr. S. Bodnar, 2023).

2.1.1 Modified grassland

This comprises an area of improved amenity grassland with dominant perennial rye grass, totalling approximately 0.091 ha of the site area.

A conditions assessment of the grassland sward was carried based on the ecological survey and site photographs. Table 1 below provides detailed results. The results are representative of a frequently mowed area of amenity grassland that may supports a few weed species and has limited ecological value.

Table 1 – Grassland 'Condition' and 'Distinctiveness' assessment results.

Quality Elements	Result and rationale
Distinctiveness	Very low – Likely fewer than 6-8 species per m ² .

Condition	'Good' - Passes 3 of 7 – Likely fewer than 6-8 species per m ² ; physical damage evident in less than 5 %; cover of bracken less than 20%; there is an absence of invasive non-native plant species.
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A total of 0.0212ha of this habitat type will be retained.

2.1.2 Urban trees

The site contains 14no. groups of trees or individual trees totalling an area of 0.1188ha. Collectively the trees receive a score of 'Moderate' under the condition assessment criteria. Table 2 provides details of the results.

Refer to the Pre-development Tree Survey BS 5837:2012 for further details of each individual trees.

Table 2 – Urban trees 'Condition' assessment results.

Quality Elements	Result and rationale
Condition	'Moderate' – Passes 3 out of 6 criteria – Native species; No evidence of adverse impacts, The tree canopy is predominantly continuous,

All 0.1188ha of tree cover within the site will be retained.

2.1.3 Introduced Shrubs

A small area of introduced shrubs is proposed within the site, totalling approximately 0.00068ha. This habitat type is assigned a 'Low' distinctiveness score and a condition assessment is 'not applicable',

2.1.4 Development land; sealed surface

The site comprises predominantly 'Development land; sealed surface'. This habitat category has no value in the metric calculator and scores '0' automatically. There are approximately 0.14817 ha of this category within the existing site.

2.1.5 Bramble scrub

The site contains approximately 0.03127ha of bramble scrub. A condition assessment for this type of habitat is 'not applicable' and a total of 0.014ha of this habitat type is proposed for retention.

2.1.6 Ruderal/Ephemeral

The site contains approximately 0.08142ha of 'Vegetated garden', comprising areas of gravel mulch colonised by ruderal species such as spear thistle *Cirsium vulgare*, stinging nettle *Urtica*

dioica, Buddleia and common ragwort *Senecio jacobaea*. A condition assessment is identified as 'poor' and is explained on Table 3.

Table 3 – Urban trees 'Condition' assessment results.

Quality Elements	Result and rationale
Condition	'Poor' – Passes 1 out of 4 criteria – Not a good representation of this habitat type; cover bracken, scrub and trees is less than 25%; species indicative of sub-optimal condition make up more than 5% of the vegetated ground cover and vegetation cover is not between 5- and 50%

None of this habitat type is proposed for retention.

2.2 Habitat Creation (Post-development)

Refer to the proposed landscape plan for a summary of all proposed habitats on site.

2.2.1 Urban trees

A total of 11no. native and non-native trees will be planted as part of the landscape scheme for the development, totalling an estimated 0.255 ha of canopy cover.

Target conditions has been set to 'Poor' owing to the situation of each proposed tree within the scheme and as a reasonable achievable target.

2.2.2 Introduced shrub

Approximately 0.02977ha of introduced shrub is proposed to the parking court of the proposals and are to be managed in a conventional manner.

Target condition for this habitat type cannot be assigned.

2.2.3 Development land sealed surface

All new buildings and areas of hard surface are included in this category. This habitat category has no value in the metric calculator and scores '0' automatically. There are approximately 0.196ha of this category within the site.

2.2.4 Mix scrub

An area of 0.01381ha of mixed native scrub is proposed as part of the development. This area of habitat creation is required to ensure that the scheme meets habitat trading rules, and is required due to the loss of bramble scrub. Target conditions has been set to 'Moderate'; mixed native scrub will develop relatively quickly and easily and require relatively low maintenance.

2.3 Habitat Enhancement (Post-development)

2.3.1 Lowland meadow

An area of 0.091ha of existing modified grassland (amenity lawn) is proposed for enhancement through rotivation of the 50mm of topsoil and seeding with a wildflower mix. The area will subsequently be managed as wildflower meadow with a single or twice cut per year, with a regime of pernicious weed removal. This habitat type has been assigned a target condition of 'Moderate' as an achievable condition.

2.4 Biodiversity Impact Score

The results from the DEFRA Biodiversity Metric 4.0 calculates a gain of 0.18 habitat units, or 12.75% increase.

3 HEDGEROW IMPACT ASSESSMENT

3.1 Existing Hedgerow (Pre-development)

The site does not contain any existing hedgerows of any type.

3.2 New Hedgerows (Post-development)

A total of 0.067km of non-native and native ornamental hedges will be established as part of the landscape scheme, to be managed in a conventional manner.

An additional 0.084km of species-rich native hedgerow will be created as part of the development and managed in a manner that sympathetic to wildlife, to encourage foraging and use as nesting habitat.

These features together will deliver 0.79 'hedgerow units'.

3.3 Hedgerow Biodiversity Impact Score

The results from the DEFRA Biodiversity Metric 4.0 calculates a gain of 0.79 hedgerow units, or a 100% increase.

4 WATERCOURSE IMPACT ASSESSMENT

4.1 Existing Watercourse (Pre-development)

The site contains a short length of watercourse – 0.01221km, the watercourse is assessed with 'Good' condition and is proposed for retention in its entirety.

4.2 Watercourse Biodiversity Impact Score

The results from the DEFRA Biodiversity Metric 4.0 calculates 0 net gain in watercourse units, given that full retention of the feature is proposed with no alterations.

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5 SUMMARY & CONCLUSIONS

The results of the DEFRA Biodiversity Metric 4.0 calculator show that there will be a net gain of 0.18 habitat units and a gain of 0.79 hedgerow units as a result of the proposed development.

This is equivalent to a net gain in habitat credits of 12.75% and a net gain in hedgerow credits of 100%.

There will be no change in units with regard to watercourse credits.

6 REFERENCES

Dr. S. Bodnar. (2023). *Blythe Birdge Staffordshire, Preliminary Ecological Appraisals*. Staffordshire.

Natural England. (2023). *Biodiversity Metric 4.0 - User Guide*.

Natural England. (2023). *The Biodiversity Metric 4.0 - Technical Supplement*.

Summary of measures below: (landscape scheme)

Blythe Bridge, Uttoxeter
Soft Landscape Plan



The measures will be as follows:

3.1.1 Creation of semi-improved grassland in area above to comprise Emorsgate EM5

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Suggested Sowing Rates

40kg/ha 16kg/acre 4g/m²

Sowing rates can be reduced to 20kg/ha (8kg/acre) for large scale projects and environmental stewardship options.

Description

EM5 contains a good range of the wild flowers and grasses once common in unimproved flower-rich lowland meadows. Loamy soils are medium textured soils: a mixture of clay, silt and sand with none predominating. They are usually found in low lying areas developed from alluvium and other material, the soils usually range from neutral to slightly acidic.

Ground Preparation prior to establishment

Endeavour to select ground that is not highly fertile and does not have a problem with perennial weeds. Good preparation is essential to success so aim to control weeds and produce a good quality seed bed before sowing.

To prepare a seed bed first remove weeds using repeated cultivation. Then plough or dig to bury the surface vegetation, harrow or rake to produce a medium tilth, and roll, or tread, to produce a firm surface. Loamy soils are easily worked and can usually be prepared for seeding in either the autumn or spring.

Sowing

Seed is best sown in the autumn or spring but can be sown at other times of the year if there is sufficient warmth and moisture. The seed must be surface sown and can be applied by machine or broadcast by hand. To get an even distribution and avoid running out divide the seed into two or more parts and sow in overlapping sections. Do not incorporate or cover the seed, but firm in with a roll, or by treading, to give good soil/seed contact.

First Year Management

Most of the sown meadow species are perennial and are slow to establish. Soon after sowing there will be a flush of annual weeds, arising from the soil seed bank. These weeds can look unsightly, but they will offer shelter to the sown seedlings, are great for bugs, and they will die before the year is out. So resist cutting the annual weeds until mid to late summer, especially if the mixture contains Yellow Rattle, or has been sown with a nurse of cornfield annuals. Then cut, remove and compost. Early August is a good time. This will reveal the young meadow, which can then be kept short by grazing or mowing through to the end of March of the following year. Dig out any residual perennial weeds such as docks.

Management Once Established

In the second and subsequent years EM5 sowings can be managed in a number of ways which, in association with soil fertility, will determine the character of the grassland. The best results are usually obtained by traditional meadow management based around a main summer hay cut or in this case a 'cut and collect' regime, in combination with autumn and possibly spring mowing or grazing.

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Meadow grassland is not cut or grazed from spring through to late July/August to give the sown species an opportunity to flower. After flowering in July or August take a 'hay cut': cut back with a scythe, petrol trimmer or tractor mower to c 50mm. Leave the 'hay' to dry and shed seed for 1-7 days then remove from site. Mow or graze the re-growth through to late autumn/winter to c 50mm and again in spring if needed.

Loamy soils tend to be more fertile, encouraging the growth of grasses. Increasing the frequency of mowing or grazing to remove surplus grass can help to maintain a balanced sward structure with a good flower content.

Wildflower meadow area

Ground preparation:

PREPARATION FOR SOWING INTO BARE SOIL CLEARED OF

VEGETATION

Ground preparation to produce a clean seed bed has two components: site clearance and soil cultivation. The time needed to complete this can vary from a few weeks to years depending on the condition of the site and the type of weeds present.

Site clearance and weed control

In open ground control of 'weeds' can be achieved by repeated applications of a herbicide (e.g. glyphosate) over the growing season and/or repeated cultivation to exhaust weeds (fallowing).

Recently cultivated land with annual weeds can be cleared for sowing in a few weeks.

Neglected plots which contain perennial weeds with extensive root systems (eg couch grass) may need more than one treatment and take more than one season to complete. It does not pay to rush this process as it is very difficult to deal with residual perennial weeds after sowing.

Unwanted vegetation can be cut back and removed from site or chopped up to be incorporated during cultivation

Seed bed cultivation

To prepare a seed bed first remove weeds using repeated cultivation or a herbicide. Then plough or dig to bury the surface vegetation, harrow or rake to produce a medium tilth, and roll, or tread, to produce a firm surface.

Cultivate the soil to sufficient depth to bury remaining trash and to alleviate compaction, then rake or harrow and roll to produce a fairly fine, firm surface.

The finished seedbed should be firm enough to walk on without leaving impressions. As the area will be mown at a later stage the finished surface should be free of obstructions such as large stones or bricks, and free of deep ruts or ridges.

The "**stale seedbed technique**" can work well for annual weeds whose seeds will remain in the soil after clearance. This method involves preparing a seedbed then delaying sowing to allow a flush of weed seed germination from the surface layers. This flush of weeds is then killed, by spraying or shallow cultivation, before sowing your seed mixture onto the cleaned "stale" seedbed - the surface of which now has a reduced weed seed burden.

Soil cultivation around established trees and hedges can be very damaging to tree and shrub roots - only surface treatments are safe here

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Re-seeding and establishment of new sward

The seed mixture chosen is Emorsgate EM2 a wildflower seed/grassland mixture, reproduced here, sowing rate 5 g/square metre.

Timing:

Seeds need both warmth and moisture to grow and may be sown at any time of year when these conditions are met.

August-September and March-April usually produce the best conditions for sowing outside in most parts of the UK. May to July sowings also work well in wetter western regions. Late autumn sowings should be avoided on sites prone to water-logging in winter and late spring and summer sowings should be avoided on droughty sites. Sowings into existing grass work best in autumn.

Sowing rates:

Recommended sowing rates for wild seed mixtures are much lower than conventional lawn and amenity grass rates (2-5g/m² compared with 25-50g/m²). This is deliberate, as rather than aiming for rapid ground cover to suppress all weeds, wild seeding aims to allow an extended period of establishment with room for both fast growing grasses and slower germinating flower seeds. There is some scope for increasing or reducing rates to suit circumstances or budget. Be careful not to sow a standard mixture too heavily as even on difficult sites this can lead to overcrowding or an imbalance in the establishing sward - they are designed to work optimally at their specified rate.

Continued and long term maintenance:

Aftercare

Sound aftercare of sowings and management of sites, using ecological principles to work with nature, is the key to obtaining diverse, interesting and sustainable results.

Sowing seed on a prepared site is only the first stage in a process of transforming ground from bare soil to an established plant community. Sowing seed does not on its own determine the final outcome. Experienced practitioners will have noticed that sowing the same seed mixture on different sites frequently produces quite varied outcomes.

The two main factors which shape and control the development, structure and species balance of each sowing are:

Nature: the soil, local climate and other ecological processes and interactions

Site management: its type and intensity

Management objectives

In practice the objectives of individual schemes vary considerably. In the management advice we have presented a range of options and choices which can be taken and tailored to match local circumstances both for biodiversity and habitat objectives, as well as real world considerations of budget, manpower and equipment availability.

Initial establishment maintenance

Most sown meadow wild flower and grass species are perennial; they will be slow to germinate and grow and will not usually flower in their first growing season. There will often be a flush of annual weeds from the soil in the first growing season which may grow up and obscure the meadow seedlings beneath. This annual weed

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growth is easily controlled by topping or mowing.

Mow newly sown meadows regularly throughout the first year of establishment to a height of 40-60mm, removing cuttings if dense. This will control annual weeds and help maintain balance between faster growing grasses and slower developing wild flowers.

Carefully dig out or spot treat any residual perennial weeds such as docks.

Meadow mixtures are composed mainly of perennial grass and wild flower species which take at least a full year to establish from sowing. Do not expect plants to develop enough to flower in their first summer.

Mow regularly throughout the first year of establishment; this will help maintain balance between faster growing grasses and slower developing wild flowers. Quick growing meadow components will tolerate cutting and may even benefit from this 'pruning,' pushing them to develop more robust compact plants. Mowing to remove surplus top growth will give smaller slower growing plants more light and space to grow into.

In the first summer meadow mixtures sown on to bare soil are frequently dominated by a flush of annual weeds which come from the soil. Regular mowing will remove annual weed competition and prevent them seeding.

Mow to a height of 40-60mm. Ideally collect and remove arisings to avoid leaving behind a damaging mulch of decomposing cut grass. If you can mow frequently enough it may be possible to disperse the cuttings without leaving a mulch. The number and timing of cuts will depend on site productivity, weather, manpower and equipment available. Mowing can start as soon as there is enough growth of either weeds or sown species to take a cut.

Management once established

In the second and subsequent years the grassland can be managed in a number of ways which, in association with soil fertility, will determine the character of the grassland. The best results are usually obtained by traditional meadow management based around a main summer hay cut in combination with autumn and possibly spring mowing (cut and collect) .

Meadow grassland is not cut or grazed from spring through to late July/August to give the sown species an opportunity to flower. After flowering in July or August take a 'hay cut': cut back with tractor mower to c 50mm. Leave the 'hay' to dry and shed seed for 1-7 days then remove from site.

Mow the re-growth through to late autumn/winter to c 50mm and again in spring if needed.

The second year from sowing is the first in which a sown meadow is left uncut to flower, and a first "hay crop" taken in mid-summer. The early years of a sown meadow (years 2/3 from sowing) are characterised by the more quickly establishing pioneer perennials such as oxeye daisy and sorrel, and the growth is vigorous. In following years the meadow will become more diverse as slower establishing species like cowslip appear and growth is less vigorous as nutrients become fixed in root systems and herbage.

The character and composition of the meadow will continue to change with time. Eventually a relatively stable community will develop, the balance of which will reflect management, soil fertility and the natural environment of the site. In this way the outcome of each sowing will in practice differ, and will not be a direct reflection of the species balance in the sown mixture.

A mowing regime for managed grassland will the following elements:

A main mid-summer hay cut mowing of the regrowth 'aftermath' in late summer and autumn

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mowing of lush spring growth

Summer hay cut

The main cut each year is the summer "hay cut". This is when the main part of the year's growth is cut back using a suitable mower. The growth should be cut back to a height of 40-75mm.

The cut grass should be dried on site, turning it to assist drying and disperse seeds (this also significantly reduces the weight and bulk of material to be removed). The dried 'hay' should be removed within 7 days of cutting. On larger areas it may be practical to cut and bale quality hay. Where hay making is impractical, arisings may be composted or placed in heaps on sacrificial parts of a site. A meadow will yield 2 - 8 tonnes of dry hay per hectare (0.2 - 0.8 kg/m²). A 250m² (tennis court size) meadow will produce about 5 x 25kg hay bales (typical small square type).

Timing of the summer hay cut

There are a number of conflicting factors that determine the best time for the main hay cut. One of the 3 options below can be used, however consistency is important and the same method (whichever chosen should be used annually and not varied).

Early hay cutting commencing in late June produces the best hay feed quality with optimum sugar and mineral content. Hay removal at this optimum time also means the maximum harvest of nutrients from site which may be important in the longer term for the fertility balance of the soil. However early cutting brings a premature end to enjoyment of the flowers and can compromise nesting birds which don't fledge until late July as well as insects and other wildlife using the meadow. Mowing a meadow in sections at different dates prolongs the overall flowering season and gives wildlife a chance to move aside. Start by cutting lush areas where nutrient removal will be of most benefit. Areas with dense, lush or laid vegetation are also likely to be the least attractive to nesting birds.

Mid-summer hay cutting. The period from July into early August is generally the best time for mowing meadows for both wildlife and practical hay making considerations. Evidence suggests that this is the optimum time for maintaining floral diversity. If mowing in sections over time, aim to cut the biggest proportion of the meadow during this period.

Late hay cutting in August and September when the meadow is 'over-stood' is more difficult as the plant stems become dry and tough. Grassland which is consistently cut late in the season year on year loses species diversity as late cutting gives more time for coarse grasses and other dominant plants to grow unchecked. Whilst in the short-term later cutting avoids any disturbance to birds and insects, in the long term the richness of the meadow as a source of pollen and nectar is lost, also the coarse structure of the sward becomes less attractive to breeding birds. Again varying the mowing times both within the meadow and from year to year is the best way to maintain a diverse balanced sward.

Haytime summary to maintain maximum diversity and flowering interest mow the meadow in sections at different times from late June to the end of August. Do not cut meadows in May or early June as you might disturb nesting birds. The main mowing season is July. To maintain flowering interest and balance it is best to complete hay cutting by the end of August. Parts of the meadow may be left occasionally (one year in three in rotation) into September so that late flowering species can seed. Leave some patches or

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edges uncut through winter to provide winter refuge for insects.

Thin open swards, that stand well and retain interest, can be left longer than dense or collapsing vegetation. If the grass collapses because it is too lush or because of bad weather a hay cut needs to be taken sooner (this is most likely with young swards on fertile soils). Most meadow species are perennial and do not need to set seed each year - some species will last indefinitely in a meadow without ever setting seed.

Autumn cutting

After the main cut, additional mowing or grazing during late summer and autumn is very effective in removing excessive grass growth and encouraging flowers -particularly on more fertile sites. Mow with a rotary, flail or other suitable mower to 40-75mm. Ideally cut at least twice from the time the hay is removed to the end of November, aiming to leave the grass short through winter. The amount of mowing required will again depend on the fertility of the site; areas can be mown regularly (weekly) if a more tidy appearance is wanted. If any cut produces significant quantities of material this should be removed

Weed control

On most soils there will be some initial problems with perennial weeds. Most grassland weeds such as docks and thistles are suppressed by the annual hay cut in July and will gradually decline with good management. Low level weed populations may be spot sprayed with a herbicide, or pulled (eg ragwort). Selective herbicides are only worth using as a last resort for serious infestations as they will result in the loss of many wild flower species.

Long term management summary

These will be annually cut and collected, using a late summer cut in July or August of each year. See guidance below which will be followed in terms of the maintenance of this grassland habitat:

(Improved Management of Semi-Improved Grassland), taken from UK Ecosystem Assessment Technical Report

visitors were able to recognise Semi-natural Grasslands with higher plant richness and that their stated aesthetic appreciation of the grasslands increased with plant diversity (Lindemann-Matthies *et al.* 2010). This important study counters suggestions that there is a lack of connection between people's aesthetic appreciation of landscapes and the ecological value of ecosystems. As described in Section 6.3.2.5, it is suggested that the maintenance of biodiversity in churchyards may enhance the resulting spiritual and religious experience of visitors.

6.5 Near-term Options for Sustainable Management

In this Section, we consider options for management to optimise individual ecosystem services. This is done partly to illustrate any conflicts among alternative objectives. However, we end with a consideration of how Semi-natural Grasslands might be managed for multiple services, that is, how they may be 'multifunctional'.

6.5.1 Maintenance of Semi-natural Grassland Biodiversity

Biodiversity of Semi-natural Grassland has effects on cultural values and a range of physical services such as pollination (Section 6.4.2). Maintenance of the Semi-natural Grassland habitat requires extensive (i.e. non-intensive) management such as no or light fertiliser additions (usually manure rather than inorganic fertilisers), traditional grazing or cutting regimes and appropriate seasonal water levels. These traditional farming methods were fine-tuned to the grassland type, the geographic region and the required products (e.g. wool, beef or dairy; hay for winter feed or an extended grazing season; etc.). Alternative extensive management regimes and their impacts on grassland biodiversity are well-researched and described (Crofts & Jefferson 1999, Jefferson 2005). The optimal management varies among different groups of species (Bullock *et al.* 2001). For example, bumblebees are more

activity encourages bumblebee forage plants (Carvell 2002). Indeed, an important aspect of traditional management was the variation in practices from one field or farm to the next and from one year to the next. This would lead to dynamic habitat characteristics which would maintain a high diversity of species. For example, Smith and Jones (1991) showed how historical variation in cutting dates among hay meadows in the Pennines had large effects on the plant species composition. Therefore, a critical aspect of the conservation of Semi-natural Grassland is to allow variation in management practices over space and time, and within a region.

6.5.2 Restoration of Semi-natural Grassland Habitat

Several issues require the Semi-natural Grassland habitat to be expanded in order to conserve its intrinsic biodiversity. Fragmentation of Semi-natural Grasslands into small, isolated sites is a major issue for the persistence of the grassland and the possible local extinction of plants and animals (Section 6.2.5.6). For example, persistence of the marsh fritillary butterfly on purple moor-grass and rush pastures is largely dependent on the connectivity and area size, as well as the quality of the grassland patches (Bulman *et al.* 2007). Climate change is likely to exacerbate these problems as species will need to migrate to track suitable habitat. Therefore, conservation planning requires the restoration of Semi-natural Grassland habitats and the creation of linked networks of Semi-natural Grasslands (e.g. the European Ecological Network and The Wildlife Trusts' 'Living Landscapes'). The UK BAP has ambitious restoration targets for Semi-natural Grassland (Table 6.15).

Restoration techniques are well-developed for all types of Semi-natural Grassland, for example, upland (Smith *et al.* 2008) and lowland (Pywell *et al.* 2002) hay meadows, calcareous grasslands (Pywell *et al.* 2002) and purple moor-grass and rush pastures (Tallowin & Smith 2001). Restoration is implemented through various conservation organisations, as well as the national agri-environment schemes. Agri-environment schemes provide detailed prescriptions for habitat restoration and, in some cases, are aiming to target such actions in the regions where environmental outcomes are likely to be greatest (www.naturalengland.org.uk/ourwork/farming/funding/es/hls/targeting/approach.aspx).

Semi-natural Grassland creation is most fruitfully carried out on ex-arable land or improved grassland (Walker *et al.* 2004). Problems to be overcome in such schemes include reducing soil fertility, introducing target species and establishing appropriate management. Residual soil fertility can be addressed through soil stripping (Walker *et al.* 2004), but appropriate grazing or cutting management can also ameliorate the effects (Pywell *et al.* 2002, 2007). However, restoration techniques require further research. Fagan *et al.* (2008) surveyed 40 English Calcareous Grassland restorations and found that even after 60 years restored grasslands were not identical to target ancient grasslands. Indeed, a meta-analysis by Pywell *et al.* (2003) showed that during restorations, generalist and competitive plant species tend to out-perform the Semi-natural Grassland specialists.

Table 6.15 UK BAP targets for restoration of Semi-natural Grassland priority habitats from the Biodiversity Action Reporting System. Source: data from www.ukbap-reporting.org.uk/outcomes/targets.asp. Estimated achieved restorations are given under 2005.

Habitat	UK restoration target (ha)			
	2005	2010	2015	2020
Lowland acid grassland	31	313	597	879
Upland calcareous grassland	0	250	362	0
Lowland calcareous grassland	10	399	789	1,176
Purple moor-grass and rush pasture	260	642	926	1,408
Lowland meadows	1,259	1,736	2,210	2,687
Upland hay meadows	0	25	51	75

3.1.2 Wildlife friendly planting in landscape areas: see the existing landscape design plan

Further details of ecological enhancement in the landscape design

The landscape design plan will incorporate all the required ecological protection and mitigation that is to be achieved via the terrestrial landscaping scheme.

The detailed final design plan will need to be reflective of recommended wildlife-friendly species (a palette of species from which the design is informed). In particular:

- a. Where possible, the scheme should use UK native species.
- b. Where non-native species are used these should have a recognised wildlife value
- c. The final balance of UK native to non-native species should be at least 75% UK native.
- d. Incorporation of grass/wildflower mixture into the design scheme

However the landscape design will need to recognise the constraints associated with such a development and species selection should also reflect:

- a. The desire for prevention of root penetration into foundations and other features of hard landscaping such as walls and footpaths.
- b. Avoidance of excessive shading of the new buildings and eventual size in relation to new build.
- c. The future maintenance that the species planted are likely to receive and incorporating minimal maintenance costs.
- d. The landscape impacts of the species selected, both singly and in combinations.
- e. Suitability of ground conditions to the species selected.

The main opportunities in respect of ecological mitigation within the design come from the landscape plantings. These would be in a number of areas, as follows:

1. Primary Avenue trees: Preferably UK Native deciduous.
2. Secondary avenue trees: Preferably UK native deciduous. Examples would include silver birch, rowan,
3. Entry point specimens; Can be non-native, ideally select species with proven value for wildlife .
4. Boundary trees and Replacement UK native trees: Preferably UK native deciduous.
5. Planting beds: a UK native/non-native mixture: all with proven wildlife benefits. Examples are certain varieties of Buddlejia.
6. Climbers: a mixture of UK native species such as honeysuckle, with a variety of other non-natives such as Wisteria and Clematis. All must have a proven benefit to wildlife

3.1.3 External lighting

Any new outside lighting for the proposed development should conform to Bat Conservation Trust (BCT) guidelines. The exterior lighting plan for the new proposed development should be sympathetic to the needs of roosting, foraging and commuting bats. The retained woodland and retained/created wood/scrub strips on the site boundaries should not be illuminated by the proposed housing development. All areas towards the perimeter of the development should not be illuminated; however, if lighting is required for security only shrouded down lighters used on the lighting poles in these areas should be used or lights should be positioned close to the ground and directed downwards to minimise light spill. The lights should be activated by a time sensor with a low movement sensitivity, so as not to be triggered by wildlife. The most significant area is the woodland to the SW of the site, we consider that the proposed housing development should not add to the level of illumination to these areas.

- Sensitive lighting scheme
- Where lighting is proposed, this should be designed to prevent unnecessary light spill into naturally dark corridors suitable for use by nocturnal species (including bats).
 - The following guidelines should be used as a reference when designing external lighting in relation to light spill and bats:
 - Guidance Note 1 for the Reduction of Obtrusive Light GN01-20 (ILP, 2020);
 - Bats and Artificial Lighting in the UK Bats and the Built Environment Series GN08/18 (ILP / BCT, 2018);
 - Artificial Lighting and Wildlife Interim Guidance: Recommendations to help minimise the impact artificial lighting (BCT, 2014);
 - EUROBATS - Guidelines for Consideration of Bats in Lighting Projects (UNEP/EUROBATS, 2018);
 - Domestic exterior lighting: getting it right! Guidance Note 9/19 (ILP, 2019);
 - Bats and Lighting (Fure, 2006);
 - Impact of Lighting on Bats (Jones, 2000).

To avoid post-construction impacts from increased artificial light levels, the following can be used to minimise adverse impacts from lighting on bats (and other wildlife):

- Type of lamp: using low - or high-pressure sodium instead of mercury or metal halide lamps;
- Use of UV filters/glazing;
- Light levels: Within standards for safety and security, light levels should be at the minimum

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required;

- Timing: Use of timers and/or movement sensors to ensure lighting is only used when required;
- Minimising light spill by design of luminaire and use of accessories such as hoods, cowls louvres and shields; and
- Use directional lighting to avoid illuminating important commuting corridors and foraging habitat, as well as potential bat roost features within trees.

Of particular importance will be lighting in proximity to any retained habitats as well as along the periphery of the Site boundary, where lighting should avoid illumination of adjacent residential gardens and other vegetative habitats. See general guidance below:

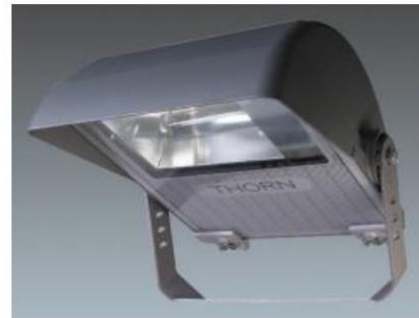
MITIGATION OF LIGHTING IMPACTS ON BATS

- **FORAGING AND COMMUTING** Type of lamp (light source) The impact on bats can be minimised by the use of low pressure sodium lamps or high pressure sodium instead of mercury or metal halide lamps where glass glazing is preferred due to its uv filtration characteristics.
 - Luminaire and light spill accessories Lighting should be directed to where it is needed and light spillage avoided. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only. Planting can also be used as a barrier or manmade features that are required within the build can be positioned so as to form a barrier. **Suitable examples shown below:**

Double Asymmetric Luminaire



Simple Hood



- **Lighting column** The height of lighting columns in general should be as short as is possible as light at a low level reduces the ecological impact. However, there are cases where a taller column will enable light to be directed downwards at a more acute angle and thereby reduce horizontal spill. For pedestrian lighting this can take the form of low level lighting that is as directional as possible and below 3 lux at ground level. **Aim for lighting column of 5m or less, hooded and cowled to prevent light spill, for main lighting columns**
- **Light levels** The light should be as low as guidelines permit. If lighting is not needed, don't light. **Timing of lighting** The times during which the lighting is on should be limited to provide some dark periods. Roads or trackways in areas important for foraging bats should contain stretches left unlit to avoid isolation of bat colonies. These unlit stretches should be 10 metres in length either side of commuting route. **Direct lighting so that the hedgerow dark corridors to the northern edge and southern edge of the site remain unlit. So the lighting to be restricted to the main buildings and roadways in and out, and car parking areas angle lighting inwards.**
- **SECURITY LIGHTING** Power It is rarely necessary to use a lamp of greater than 2000

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lumens (150 W) in security lights. The use of a higher power is not as effective for the intended function and will be more disturbing for bats.

- Movement sensors Many security lights are fitted with movement sensors which, if well installed and aimed, will reduce the amount of time a light is on each night. This is more easily achieved in a system where the light unit and the movement sensor are able to be separately aimed. Timers If the light is fitted with a timer this should be adjusted to the minimum to reduce the amount of 'lit time'.
- any bats' roost access points or flight paths from the roost. A shield or hood can be used to control or restrict the area to be lit. Avoid illuminating at a wider angle as this will be more disturbing to foraging and commuting bats as well as people and other wildlife.
- Suitable types shown below (note that these are wall mounted and directed downwards)

Circular Louvre



Cowl & Louvre



Cowl (or Hood)



References: Bats and lighting BCT guidance and Guidance notes for the reduction of obtrusive lighting.

3.1.4 Hedgerow planting, establishment and management:

Planting mixture as specified in landscape design plan, the landscape contractor will provide a specification for planting and establishment however the following would apply in the case of doubt: (refer to Hedge planting and maintenance guide online: Woodland Trust)

Planting

- 3.2 Remove any weeds and roots from the area and, if possible, mulch with organic matter like bark to help retain water and feed roots.
- 3.3 If you're planting a single hedge, plant shrubs 30cm apart in a line.
- 3.4 For a double row hedge, begin by setting out two parallel string lines. Plant in a zig-zag pattern with five plants per metre, maintaining a 30-40cm gap between each plant.
- 3.5 Plant a tree every 6m with a tube and stake to protect it. Allow it to grow to full height to maximise the benefits of your hedge.
- 3.6 Allow your new hedge to establish itself for at least a year. In the following spring, cut the shrubs just above a bud so that they are around 60cm tall. This encourages the plant to bush out. After this initial trim, let your hedge settle for another two years before you start regular trimming.

When to Cut hedges:

Trimming is essential for long-term maintenance, but it's best not to cut an established hedgerow every year. Allow your new hedge to establish itself for at least a year before you start trimming it, then in the following spring, you can cut the shrubs just above a bud to encourage dense, bushy growth, especially from the base. After this initial period, you can leave it to settle for a couple of years before cutting more regularly - every 2-3 years is ideal as this will increase flowers and berries, and provide good cover for wildlife.

Hedge cutting season is October to February, as you may disturb nesting birds from March to September. To help wildlife, waiting for February or March is recommended, as cutting in autumn reduces fruit available for overwintering birds that rely on this food source. Waiting for late winter will help:

- birds and mammals that rely on fruit to survive winter
- early emerging insects that rely on spring flowers
- moths and other animals that need shelter.

A winter cut is great for the hedge too as this is when trees and shrubs are dormant, so a shape-up won't stress them out.

How often should you prune a hedge?

A lot of native hedgerow shrubs only flower and fruit on the previous year's woody growth, so cut hedges no more than every other year if you want to see blossom and berries. If you want a more formal look for your

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hedge, you may need to trim once or twice a year. Hedges are generally 2m tall and 1.5m wide, and are made of continuous stretches of shrubs dotted with taller trees

Before you start hedge trimming

Pruning needs to be done correctly to encourage blossom and fruit while improving the hedge's structure and value for wildlife. Remember that trimming in February and March is recommended.

What tools do you need to trim a hedge?

- Secateurs - perfect for fine cuts.
- Hand shears - great for small hedges.
- Electric or petrol trimmer - for tackling a large hedge.
- Twine or string - for setting out a line to follow.
- Ladder - so you can approach cutting from the right height.
- Personal protective equipment like gloves and goggles.

Be safe

- Always consider your own safety and that of others before you start.
- Wear protective eyewear, heavy-duty gardening gloves and make sure your path is clear.
- Check your equipment is in good working order, well adjusted, clean, sharp and lubricated.
- Make sure you have solid footing so you're not at risk of falling.
- Get to know your hedge species. Make sure you know if any harmful plants, like laburnum, grow in your hedgerow.
- If you're using an electric hedge trimmer, place the cable over your shoulder so you don't trip up or cut through it.

How to trim your native hedge

Hedges could easily get out of hand, become leggy and turn into lines of trees. Follow our hedge trimming tips to help keep their structure.

1. Assess and plan

Look at the hedge's shape and how the limbs sit. Consider that the structure will attract different species – wren prefer the lower sections while bullfinch like the taller parts of a hedge. Set up your string line as a guide to help keep your cuts level. Choose whether to retain some of the current year's growth for flowers and fruit next year. You could plan to trim one side of the hedge one year and the other side the next.

Shape your hedge

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Decide on the height and cut the topmost branches off to encourage the hedge to grow outwards rather than upwards.

3. Get your technique right

Choosing the right tool is important. Keep the blade of your shears or hedge trimmer parallel and cut in a sweeping motion from the bottom of the hedge upwards if you are using an electric or petrol hedge trimmer.

4. Create internal structure

After you have given your hedge a good shape, reach into the hedge every metre and cut a stem just above a bud. Do this at a 45-degree angle so that rain can drip off away from the bud. This will make your hedge light and airy inside, instead of lifeless.

5. Allow trees to keep growing

Trees should be tall and can overhang, but should be trimmed if they interfere with public areas, such as roads or paths. If you're cutting back overhanging branches, avoid removing the main structure of the hedge. Cut protruding branches back to where you would like them.

3.1.5 Bird and Bat boxes and Gaps in fencing for mammals:

These will form part of the discharge of the following conditions:

19. The development hereby approved shall be carried out strictly in accordance with the following:-

a) The mitigation measures at para 4.3a) and 4.3b) of the Preliminary Ecological Appraisal dated November 2023 prepared by Dr Stephan Bodnar.

Reason:- To provide biodiversity enhancement

20. No development above slab level on any phase shall be commenced until such time that a Scheme for the provision of bird and bat boxes and bat bricks for that phase has been submitted to and approved in writing by the Local Planning Authority. Each phase of the development shall be implemented in accordance with the approved details of that phase prior to any of the units hereby approved first coming into use.

Reason:- To provide biodiversity enhancement.

3.1.6 Five and Twenty year work programme

A timing of planting and landscaping will be provided by the Landscape contractor, who will also specify the timing of subsequent operations.

Hedges and Trees (new and existing)

Annually the grounds maintenance contractor will be responsible for removing any dead or diseased plant matter and branches overhanging in a manner which interferes with the use of the footpath/highway/roads/paths/car parking. Trees will only be pruned where necessary for H&S reasons or where they obstruct or affect the safe use of the property, ensuring the trees remain as natural-looking as possible. Any trees which are subject to Tree Preservation Orders will be protected and any work undertaken only by a tree surgeon and with the prior approval of the Local Planning Authority.

Establishment maintenance

All planting shall be maintained for a period of 5 years from planting. Maintenance operations shall include

Weed control: All planting areas to be kept weed free by hand weeding or herbicide treatment. Top up mulch as required to a minimum depth of 75mm.

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Formative pruning: Any damaged shoots/branches are to be pruned back to healthy wood. Plants are to be pruned in accordance with good horticultural practice to maintain healthy, well shaped specimens.

Checking trees: All tree stakes and ties are to be checked and adjusted if too loose, tight or if chaffing is occurring. Any broken stakes to be replaced.

Replacement planting: replace all plants which are missing, found dead, or failing to make satisfactory extension growth to ensure full stocking levels within planting beds.

4. Summary of development impacts on features of ecological interest.

The works prescribed will have the following impacts on ecological interests.

Ecological Interest	Impact during construction	Long term impact
Nature Conservation sites	Minimal loss of low quality habitat, any construction related adverse impacts mitigated for in CEMP	Mitigated for in the Landscaping, no significant impact. (this document)
Habitats	Loss of low quality habitats	Mitigated for in biodiversity Off setting with 0.091 ha. of species rich semi improved grassland (lowland meadow) created and species rich boundary hedgerows planted.
Species		
Bird	Loss of potential nesting sites and small area of foraging habitat loss	Fully compensated for by provision of artificial nesting sites, new hedgerow planting, no significant impact. Conditions 19/20
Bat	Loss of small area of foraging habitat, roost potential, mitigated for by boxes to replace potential roost features	Mitigated for in the Landscaping and Lighting Specifications, no significant impact. Conditions 19/20
Reptile/amphibian/other	Slight loss in habitat	Mitigated for in the Landscaping and enhancement scheme, no significant impact. (this document)

Overall, with the Biodiversity Enhancement Area works (particularly the semi-improved grassland and species rich native hedgerow), a small net Biodiversity Gain is predicted for the site overall.

Appendix 1: Bat box

1FR Schwegler Bat Tube



[View larger images](#)



Schwegler



178018 | Availability: **Usually dispatched within 1 week** [Details](#)

NHBS Price: **£74.95** inc VAT \$120/€95 approx

[Add To Basket](#)

Description

[Write a review](#)

[Specification](#)

The 1FR Bat Tube is designed to be installed on the external walls of buildings, either flush or beneath a rendered surface. This makes it ideal for situations where you wish the box to be discrete as only the entrance hole will be visible. It can also be painted to match your building with an air permeable paint if desired.

The 1FR is specifically designed to meet the characteristic behavioural requirements of the types of bats that inhabit buildings. It has an integrated wooden panel onto which bats can cling and a ridged entrance slope which makes it easy for them to enter and leave the box safely. The design maintains excellent climatic conditions inside providing bats with a safe and stable environment in which to roost and it requires no maintenance because droppings fall out of the entrance ramp.

Appendix 2: Bird boxes



Schwegler Avianex Bird Nest Box code:DSJJ057

£37.95 (Delivery from £3.95)
RRP: £39.95 You Save: £2.00 (5%)

Item in Stock |

Brown

ADD TO BASKET

VISA Mastercard American Express Apple Pay Amazon Pay

product details delivery & returns payment & security

- Premium quality bird nest box
- Designed for wall fixings
- Durable Woodcrete construction
- Weatherproof and rot proof
- Outstanding 25 year guarantee
- Excellent insulation and durability
- Removable front panel for cleaning
- Galvanised screw hook & wall plug
- 32mm multi special entrance hole
- Size: H27 x W19 x D23cm

The Schwegler Avianex Bird Nest Box is a premium quality bird house, designed for fixing to the outside wall of a house, patio or balcony. Due to the decline in the birds natural environment, it is increasingly important for us to compensate for this loss by putting up nest boxes – and now you can help even if you don't have a garden!

Constructed from Woodcrete, a blend of wood, concrete and clay, this [nest box](#) delivers performance, reliability and durability, backed by a 25 year anti rot, weatherproof guarantee. Woodcrete nest boxes are naturally insulating, keeping your birds and their chicks warm during the cold winter months. The interior of this Avianex Nest Box has been designed to replicate a natural tree hollow, creating an inviting and desirable nest which has been proven to enjoy high occupancy rates.

Woodcrete nest boxes require no maintenance from the elements, however a removable front panel allows easy access to clean the bird house each year, after the birds have finished using the nest. The 32mm entrance hole will appeal to most small garden birds, including including sparrows, nuthatches and tits.

This beautiful modern nesting box is available in a choice of three colours.

Tawny owl box type:



Appendix 3 Wildlife Friendly Plants

3.1 Native trees and shrubs

British Native Trees - Habitats and Growing conditions.



Species	Average mature / ultimate height			Growth rate			Soil/ground conditions					Tolerant of sites that are				Valuable for	
	0.5-5m	6m-15m	16m+	Fast	Medium	Slow	Wet ground	Light sandy soils	Heavy soils	acid	alkaline	Shaded	Polluted	Coastal	Exposed	Birds	Insects
Alder		•		•			■	•	•		•	•	•		•		•
Ash			•		•		▲	•	•		•	•	•	•	•		
Aspen		•		•				•	•	•	•		•	•	•		•
Beech			•			•		•			•	•					•
Birch, Downy		•		•			▲			•			•		•		•
Birch, Silver		•		•				•		•			•				•
Blackthorn	•			•				•	•	•	•			•	•	•	•
Broom	•				•			•		•	•	•	•	•			•
Buckthorn, Alder	•					•	▲			•							
Cherry, Wild		•			•			•	•		•		•				
Cherry, Bird		•			•			•	•	•	•	•				•	•
Crabapple		•			•			•	•	•	•	•				•	•
Elder			•	•				•	•	•	•	•	•	•	•		•
Elm, Wych		•			•				•	•	•	•	•	•	•		•
Gorse	•				•			•		•	•					•	•
Hawthorn	•				•			•	•	•	•		•	•	•	•	•
Hazel		•		•				•	•	•	•	•		•	•		•
Holly		•				•		•	•	•	•	•	•	•	•	•	•
Lime, small-leaved			•		•				•		•	•					•
Maple, Field		•			•				•		•	•	•				
Oak, Pedunculate			•			•			•		•				•	•	•
Oak, Sessile			•			•	▲	•	•	•		•				•	•
Pine, Scots			•		•			•		•					•		•
Poplar, Black			•	•			▲	•	•		•					•	•
Rose, Dog	•				•			•	•		•	•	•		•		•
Rose, Guelder	•				•		▲		•		•	•					•
Rowan		•		•				•		•			•	•	•	•	•
Spindle	•				•				•		•	•					
Whitebeam, Common		•			•			•									•
Wild Service	•					•			•		•	•		•		•	•
Willow, Crack		•		•			■				•		•	•	•	•	•
Willow, Goat		•		•	•				•		•	•	•	•	•	•	•
Willow, White			•	•			■				•	•	•	•	•	•	•
Yew		•				•		•			•	•			•		•

■ Only species to survive waterlogged sites with anaerobic conditions.
 ▲ Will tolerate wet ground if there is some seasonality of "flushing" (water movement) within the soil.

Appendix 3.2: Non-native plants to attract wildlife

Buddleja X weyeriana cultivars

You can plant the orange-flowered B. X weyeriana hybrids with a clear conscience as they don't appear to produce viable seed, they also attract a broad spectrum of insects including both butterflies and bees, and they flower late into the season when nectar is scarce. The beautiful B. x fallowiana 'Lochinch' with silver leaves is attractive to butterflies and is also said not to produce seeds. The orange ball Buddleja (B. globosa) from South America seems to attract bees rather than butterflies.

Bupleurum fruticosum ('Shrubby Hare's Ear')

A shrubby evergreen umbellifer from Southern Europe, where it is often cultivated. It has leathery aromatic foliage and umbels of yellowish flowers, a bit like those of Fennel, that are very attractive to hoverflies and other small insects. Well worth growing for this reason.

Ceanothus X 'Gloire de Versailles'

Ceanothus come from the Western United States. Most Ceanothus have bunches of very small flowers that don't seem very attractive to insects. 'Gloire de Versailles' however is a hybrid with loose bunches of pale blue tubular flowers that are very attractive to butterflies and bees.

Caryopteris X clandonensis 'Kew Blue'

A deciduous shrub from China for a sunny position, has small tubular blue flowers attractive to insects.

Clethra alnifolia ('Sweet Pepper Bush')

A deciduous shrub from the Eastern United States that likes damp, acid or woodland soil. Has

spikes of small scented white flowers attractive to moths and butterflies.

Hebe X 'Great Orme' and H. X 'Midsummer Beauty'

Hebes are close relatives of the herbaceous genus Veronica, and come from New Zealand. Some are much more attractive to insects than others. 'Great Orme' is a medium-sized hybrid with pale pink flowers that are attractive to butterflies. It is a distinctive cultivar and available true to name in the nursery trade.

'Midsummer Beauty' seems to be more of a generic name for a series of large shrubs with

blue or grey-blue flowers in long spikes, attractive to both bees and butterflies. There are a number of other blue and white flowered Hebes that seem very popular with bumblebees.

Myrtus communis ('European Myrtle')

An attractive evergreen shrub from the South of France and Spain with small evergreen aromatic leaves. It has been grown in our gardens for centuries, but is susceptible to hard frost and prefers a site against a warm sunny wall. Fluffy white flowers in early summer are bumblebees' heaven. Purplish berries follow later which are stripped by blackbirds in January.

Amelanchier species ('Shad Bush')

Shrubs with white cherry-like blossoms early in the year, followed by blackish berries in late summer. Valuable for the berries as a source of food for berry-eating birds when most other berries are not yet ripe.

Erica terminalis ('Corsican Heath')

A shrubby heather-like plant popular with bumblebees. The Cornish Heath, *Erica vagans*, from the Atlantic fringes of Europe is also a good bee plant. *Erica manipuliflora*, from Southern Europe, and its hybrid *Erica X griffithii* have fragrant flowers that attract butterflies.

Eupatorium ligustrinum

A late-flowering evergreen bush that looks very like a privet, but has bunches of white fluffy flowers in September and October. These flowers seem very attractive to range of insects, especially hoverflies.

Ribes sanguineum (Flowering Currant)

It is a very good early flower for bumblebees, as indeed are the flowers of the closely related blackcurrants and gooseberries.

Appendix 3.3: Plants good for moths, with species of moth they encourage beside

Bird's Foot Trefoil (*Lotus corniculatus*) - *Burnet*, *Belted Beauty*, *Chalk Carpet*, *Latticed Heather*
Bladder Campion (*Silene vulgaris*) - *Campion*, *Marbled Coronet*, *Nettle Pug*, *Marbled Clover*, *Dark Brocade*, *Sandy Carpet*
Borage (*Borago officinalis*) - *Crimson Speckled*
Chives (*Allium schoenoprasum*)
Wild Clary (*Salvia horminoides*) - *Twin-spot Carpet*
Biting Stonecrop (*Sedum acre*) - *Yellow Ringed Carpet*, *Northern Rustic*
Cowslip (*Primula veris*) - *Plain Clary*, *Northern Rustic*
Daisy - *Bordered Straw*
Dropwort (*Filipendula hexapetala*) - *Satyr Pug*
Evening Primrose (*Oenothera biennis*) - *Elephant Hawk*
Field Scabious (*Knautia arvensis*) - *Marsh Fritillary*, *Narrow Bordered Bee Hawk*, *Lime Speck Pug*, *Shaded Pug*
Foxglove (*Digitalis purpurea*) - *Lesser Yellow Underwing*, *Foxglove Pug*
Golden Rod (*Solidago*) - *Lime Speck Pug*, *Bleached Pug*, *Golden Rod*, *Wormwood Pug*, *V Pug*

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Greater Stitchwort (*stellaria holostea*) - *Dart, Yellow Underwing, Marsh Pug, Plain Clary*
Hedge Bedstraw (*gallium mollugo*) - *Ruddy Carpet, Royal Mantle, Common Carpet, Wood Carpet, Water Carpet, Beech Green Carpet, Mottled Grey, Green Carpet*
Hedge Woundwort (*stachys sylvatica*) - *Rosy Rustic, Plain Golden Y, Sub-angled Wave*
Hemp Agrimony (*eupatorium cannabinum*) - *Wormwood Pug, V Pug, Lime Speck Pug, Marsh Pug, Gem, Scarce Burnished*
Herb Bennet (*geum urbanum*) - *Riband Wave*
Herb Robert (*geranium robertianum*) - *Barred Carpet*
Hollyhock (*althaea rosea*) - *Mallow*
Kidney Vetch (*anthyllis vulneraria*) - *6-belted Clearwing*
Lady's Bedstraw (*gallium verum*) - *Hummingbird Hawk, Small Elephant Hawk, Gallium Carpet, Plain Wave, Riband Wave, Bedstraw Hawk, Archer's Dart, Red Chestnut, Ruddy Carpet, Royal Mantle, Common Carpet, Water Carpet, Beech Green Carpet, Red Twin Spot Carpet, Wood Carpet, Mottled Grey, Green Carpet*
Lady's Mantle (*alchemilla mollis*) - *Red Carpet*
Lesser Knapweed (*centaurea nigra*) - *Silver Y, Lime Speck Pug, Satyr Pug*
Lesser Meadow Rue - *Marsh Carpet*
Maiden Pink (*dianthus deltoides*) - *Marbled Coronet*
Marjoram (*majorana origanum*) - *Sub-angled Wave, Lace Border*
Marshmallow (*althaea officinalis*) - *Marshmallow*
Meadow Clary (*salvia pratensis*) - *Brown Spot Pinion, Hebrew Character, Powdered Quaker, Emperor*
Meadowsweet (*filipendula ulmaria*)
Mullein - *Mullein, Striped Lychnis*
Navelwort (*umbilicus rupestris*) - *Weaver's Wave*
Pink - *Hawk*
Primrose (*primula vulgaris*) - *Pearl Bordered Yellow Underwing, Double Square Spot, Green Arches, Triple Spotted Clary, Ingrained Clary, Silver Ground Carpet*
Purple Loosestrife (*lythrum salicaria*) - *Emperor, Small Elephant Hawk, Powdered Quaker*
Ragged Robin (*lychnis flos cuculi*) - *Campion, Lychnis, Twin-spot Carpet, Marbled Clover*
Red Campion (*melandrium rubrum*) - *Rivulet, Campion, Lychnis, Twin-spot Carpet, Sandy Carpet, Marbled Clover*
Red Clover (*trifolium pratense*) - *Latticed Heath, Chalk Carpet, Belted Beauty, Mother Skipton, Shaded Broad Bar, Narrow-bordered 5-spot Burnet*
Red Valerian (*centranthus ruber*) - *Elephant Hawk*
Rock Rose (*helianthemum mummularium*) - *Amulet, Cistus Forester, Silky Wave, Ashworth's Rustic, Argus, Wood Tiger, Northern Brown*
Rosebay Willowherb - *Twin-spot Carpet, Small Phoenix, White Banded Carpet*
Small Scabious (*scabiosa columbaria*) - *Lime Speck Pug, Shaded Pug*
Soapwort (*saponaria officinalis*) - *Marbled Clover*
St John's Wort - *Treble Bar*
Sweet Rocket (*hesperis matronalis*)
Sweet Violet (*viola odorata*) - *Broad Bordered Yellow Underwing, Lesser Broad Bordered Yellow Underwing*
Tansy (*tanacetum vulgare*) - *Essex Emerald*
Thrift (*armeria maritima*) - *Amulet, Feathered Ranunculus, Thrift Clearwing, Black Banded*
Thyme - *Thyme Pug, Satyr Pug, Lace Border*
Toadflax (*linaria vulgaris*) - *Toadflax Pug, Marbled Clover*
Valerian (*valeriana officinalis*) - *Valerian Pug, Lesser Cream Wave*
Viper's Bugloss (*echium vulgare*)

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White Campion (*silene latifolia alba*) - *Marbled Coronet, Marbled Clover, Sandy Carpet*
Wild Basil (*clinopodium vulgare*)
Wild Clematis (*clematis vitalba*) - *Lime Speck Pug, Haworth's Pug, Small Emerald, The Fern, Pretty Chalk Carpet, Least Carpet, Pug, Chalk Carpet, Small Waved Usher*
White Clover (*trifolium repens*) - *Cloudy Wing Skipper, Orange, Clouded Sulphur*
Wild Pansy (*viola tricolor*) - *Pluvia*
Wild Strawberry (*fragaria vesca*) - *Amulet, Yellow Shell, Beautiful Carpet, Dark Marbled Carpet*
Wild Wallflower - *Flame Carpet*
Wormwood (*artemesia absinthium*) - *Wormwood Pug*
Yarrow (*achillea millefolium*) - *Essex Emerald, Lime Speck Pug, Straw Belle, Wormwood Pug, Ruby Tiger, Yarrow Pug, V Pug, Sussex Emerald, Grey Pug, Tawny Speckled Pug, Common Pug, Mullein Wave*
Yellow Flag Iris (*iris pseudacorus*) - *Belted Beauty, Water Ermine*
Barberry - *Scarce Tissue, Wheat*
Blackthorn/Sloe - *March, Common Emerald, Little Emerald, Mottled Pug, Feathered Thorn, Orange, Scalloped Hazel, Scalloped Oak, August Thorn, Brimstone, Early Thorn, Pale Brindled Beauty, Blue Bordered Carpet, Broken Barred Carpet, November, Pale November, Winter, Sloe Pug, Green Pug, Sharp Angled Peacock, The Magpie*
Broom - *Grass Emerald, The Streak, Broom-tip, Lead Belle, Spanish Carpet, Frosted Yellow*
Dog Rose - *V Pug, Little Thorn, Shoulder Stripe, Barred Yellow, Streamer*
Hawthorn - *March, Common Emerald, Little Emerald, November, Pale November, Winter, Mottled Pug, Pinion Spotted Pug, Common Pug, Grey Pug, Peppered, Brindled Beauty, Pale Brindled Beauty, Feathered Thorn, Scalloped Hazel, The Magpie, Scalloped Oak, Large Thorn, Early Thorn, Oak Tree Pug, Broken Barred Carpet*
Hazel - *Oak Beauty, Small White Wave, The Magpie, Clouded Border, Barred Usher, Winter, Pale November Oak - Brindled Pug, Oak Tree Pug, Spring Usher, Peppered, Oak Beauty, Brindled Beauty, Pale Brindled Beauty, Small Brindled Beauty, Feathered Thorn, Orange, Lunar Thorn, Purple Thorn, Scalloped Hazel, Scalloped Oak, Scorched Wing, Large Thorn, August Thorn, November, September Thorn, Pale November, Winter, March, Blotched Emerald, Common Emerald, Little Emerald, False Mocha, Maiden's Blush, Marbled ug, Red-green Carpet, Broken Barred Carpet*
Rowan - *Orange Underwing, Welsh Wave, Mottled Pug, Red-green Carpet*
Wild Privet - *Lilac Beauty, Barred Toothed Striped, Yellow Barred Brindle, Small Bloodvein*

Appendix 3.4: Plants and habitats to attract bats

1.1.1 *Flower Borders and Lawns*

Larvae and adults of many insects will be catered for by introducing a wide range of food, in the form of nectar, seeds and fruit as well as vegetation.

- Grow night scented flowers. These attract moths and other night flying insects of particular importance to bats.
- Plant herbs and old fashioned cottage-garden annuals attractive to insects.
- Leave part of your lawn un-mown from about mid May to encourage insect larvae which feed on grass. Allow to seed before cutting, and rake up the hay afterwards.

- Sow wild flower seed collections in your borders.

1.1.2 *Trees and Shrubs*

At woodland edges space and sunshine combine with the trees to give shelter and warmth, and insects will concentrate there. So even in the smallest garden try to have at least one tree or shrub. Native trees are more attractive to insects than foreign species.

If space is limited, silver birch and goat willow are quick growing and are host to many insect visitors. With a little more space, try to make a bank of vegetation to give your garden a woodland edge structure.

1.1.3 *Shelter Belts*

Rows of bushes or trees can be created or improved, encouraging concentrations of insects and providing a feeding area for bats,

- Plant up gaps in natural hedges,
- A row of fast-growing cypress can be valuable.
- Train climbers using battens against a wall or fence, to provide possible roosting sites.
- Create a sheltered corner by using any combination of walls, fences, hedges or woodland edge at two angles.

Scented herbs

Chives, Borage, Lemon balm, Marjoram, Mint - many varieties **Night scented flowers for the border** (in approximate order of flowering)

Bedding Plants

Nottingham catchfly	<i>Silene nutans</i>
Night-scented catchfly	<i>S. noctiflora</i>
Bladder campion	<i>S. vulgaris</i>
Night-scented stock	<i>Matthiola bicornis</i>
Sweet rocket	<i>Hesperis matronalis</i>
Evening primrose	<i>Oenothera biennis</i>
Tobacco plant	<i>Nicotiana glauca</i>
Cherry pie	<i>Heliotropium x hybridum</i>

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Soapwort

Saponaria officinalis

Climbers

European honeysuckle

Lonicera caprifolium

July-November

Italian honeysuckle

L. etrusca superba

July-August

Japanese honeysuckle

L. japonica halliana

August-October

Honeysuckle (native)

L. periclymenum...

July-August

White jasmine

Jasminium officinale

Dogrose

Rosa canina

Sweetbriar

R. rubiginosa

Fieldrose

R. arvensis

Ivy

Hedera helix

Bramble - many species

Large trees, small trees and shrubs

Oak

Quercus robur & Q. petraea

Ash

Fraxinus excelsior

Silver birch

Betula pendula

Field maple

Acer campestre

Hawthorn

Crataegus monogyna

Alder

Ainus glutinosa

Goat willow

Salix caprea

Guelder rose

Viburnum opulus

Hazel

Coryllus avellana

Blackthorn

Prunus spinosa

Elder

Sambucus nigra

Buddleia davidii

Rock plants for walls

Ivy-leaved toadflax

Cymbana muralis

Wall pennywort

Umbilicus rupestris

Stonecrop

Sedum acre bertianum

Appendix 3.6: Plants to feed birds.

Many shrubs, climbers, trees, garden and 'wild' plants provide food, directly or indirectly, through berries, seeds or the insects they attract.

Berry or fruit bearing trees and shrubs will attract members of the Thrush family, Blackbird, Fieldfare, Mistle and song Thrush, Redwing and Robin. Also Starlings and, in some winters, Waxwing and even some Warblers, e.g., Blackcaps who eat berries in the early autumn before they migrate. Unless mentioned, the berries attract all the above birds plus others as specified.

Shrubs with berries.

- ❑ *Aronia arbutifolia* (Red Chokeberry) : bright red fruits
- ❑ *Berberis*: most forms have black/purple berries, especially loved by Blackbirds.
- ❑ *Callicarpa* 'Profusion': bright violet coloured berries.
- ❑ *Cornus* (Dogwood): blue tinted white berries (not *C.Mas*).
- ❑ *Cotoneaster* : prolific red, orange or yellow berries - birds often choose red first, through orange to yellow last. (Note berries are poisonous to humans).
- ❑ *Euonymus europaeus* (spindleberry): large bright red fruits which open to emit orange red seeds.(Note berries are poisonous to humans).
- ❑ *Ilex* (Holy): red, orange or yellow berries - red berries preferred (need partner to fruit).(Note berries are poisonous to humans).
- ❑ *Mahonia*: decorative black berries.
- ❑ *Rosa rugosa* : large red hips, particularly attractive to Greenfinches which pick out the seeds.
- ❑ *Sambucus* (Elder): red or black berries - over 32 species reported eating them, especially Blackcap and, occasionally, Collar Doves.
- ❑ *Viburnum opulus* (Guelder Rose) : translucent berries
- ❑ *Viscum album* (Mistletoe): familiar white globular berries of this parasite that grows in trees, especially apple, are a good food source for Blackbirds.

Climbers With Berries.

- ❑ *Chaenomeles* (Flowering Quince/*Cydonia*): Autumn Quinces.
- ❑ *Hedera* (Ivy) : shiny black berries
- ❑ *Lonicera* (Honeysuckle: red or black berries attract Thrushes plus Bullfinches and Marsh and Willow Tits. (Note berries are poisonous to humans).
- ❑ *Pyracantha* (Firethorn) :red, orange or yellow berries - choose red for the birds to eat before Christmas usually with orange or yellow to follow in a hard winter.
- ❑ *Clematis vitalba* (Old Man's Beard): seed heads are enjoyed by many birds.

Trees with Berries or Fruits.

- ❑ Crataegus monogyna (Hawthorn : red berries.
- ❑ Malus (Crab Apple: red fruited varieties are best for birds.
- ❑ Prunus (Cherries): fruits quickly picked off.
- ❑ Sorbus aucuparia (Mountain Ash/Rowan) :red, orange or pink flushed white berries. The darker the fruits the more attractive they are to birds. Occasionally bring Spotted Flycatchers to the garden.
- ❑ Taxus (Yew): sparse red berries attract a wide range of birds. Attractive also to Badgers.(Note berries are poisonous to humans).

Trees with Seed Cones.

- ❑ Alnus glutinosa (Alder), and Betula (Birch): seeds from cones enjoyed by Goldfinches, Greenfinches, Redpolls, Siskins and Tits.
- ❑ Pinus sylvestris (Scots pine) : pine cones from which Crossbills and Great Spotted Woodpeckers prise seed.

Trees with Blossom.

- ❑ Although not always welcome, Bullfinches strip the buds of fruit trees in late winter and early spring.

Garden Plants.

- ❑ Crocus: yellow and orange flowers are attractive to Sparrows because they contain yellow pigment carotene to brighten up their plumage for the breeding season.
- ❑ Echinops ritro (Globe Thistle: seed heads are eaten by Goldfinches and flower heads attract insects.
- ❑ Helianthus (Sunflower: seed heads are eaten by Greenfinches. The nectar attracts a wide range of insects.
- ❑ Lavandula (Lavender): flowers going to seed are attractive to Goldfinches.
- ❑ Primula (Polyanthus/Primrose): yellow and orange flowers are attractive to Sparrows.

Wild Plants.

You can provide a haven for wild plants to exist in their own right recreating a wild meadow to attract insects which, in turn, attract birds and other wildlife. We sell nursery grown 'wild' plants throughout the year so that you can go wild in a corner of your garden.

- ❑ Betony.
- ❑ Bird's Foot Trefoil.
- ❑ Common Poppy - seeds are favourite food of Finches.
- ❑ Field Scabious.
- ❑ Greater Knapweed.

- ❑ Meadow Cranesbill.

- ☐ Musk Mallow.
- ☐ Ox Eye Daisy.
- ☐ Oxlip.
- ☐ Primrose.
- ☐ Rough Hawkbit.
- ☐ Self Heal.
- ☐ Teasel - seed heads are a favourite food of Goldfinches.
- ☐ Wild Strawberry

The Lawn.

This is one of the principal sources of food for birds who enjoy feeding on insects including:-Ants eaten by Green Woodpeckers; Leatherjackets by Starlings; Snails by Song thrushes; Slugs by Toads and Worms by Blackbirds, Robins and Thrushes.

Cover and Protection.

By surrounding your garden by thick and often prickly hedging and dotting suitable shrubs around, you can provide safe nesting havens that are protected from marauding cats and even the unwelcome attention of unfriendly humans.

The most successful shrubs and trees for this purpose include:-

- ☐ Conifers especially chamaecyparis, Taxus (Yew) and Thuja Placata.
- ☐ Crataegus.
- ☐ Eleagnus.
- ☐ Hedera (Ivy) up a tree.
- ☐ Ligustrum (Privet) especially for Blackbirds.
- ☐ Lonicera (Honeysuckle).
- ☐ Pittosporum.
- ☐ Salix caprea (Weeping Kilmarnock Willow).
- ☐ Viburnum.

Appendix 4: Lighting guidance

MITIGATION OF LIGHTING IMPACTS ON BATS

- FORAGING AND COMMUTING Type of lamp (light source) The impact on bats can be minimised by the use of low pressure sodium lamps or high pressure sodium instead of mercury or metal halide lamps where glass glazing is preferred due to its uv filtration characteristics.

- Luminaire and light spill accessories Lighting should be directed to where it is needed and light spillage avoided. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only. Planting can also be used as a barrier or manmade features that are required within the build can be positioned so as to form a barrier. **Suitable examples shown below:**

Double Asymmetric Luminaire



Simple Hood



- Lighting column The height of lighting columns in general should be as short as is possible as light at a low level reduces the ecological impact. However, there are cases where a taller column will enable light to be directed downwards at a more acute angle and thereby reduce horizontal spill. For pedestrian lighting this can take the form of low level lighting that is as directional as possible and below 3 lux at ground level. **Aim for lighting column of 5m or less, hooded and cowled to prevent light spill, for main lighting columns**
- Light levels The light should be as low as guidelines permit. If lighting is not needed, don't light. Timing of lighting The times during which the lighting is on should be limited to provide some dark periods. Roads or trackways in areas important for foraging bats should contain stretches left unlit to avoid isolation of bat colonies. These unlit stretches should be 10 metres in length either side of commuting route. **Direct lighting so that the hedgerow dark corridors to the northern edge and southern edge of the site remain unlit. So the lighting to be restricted to the main buildings and roadways in and out, and car parking areas only. Car parking areas angle lighting inwards.**
- SECURITY LIGHTING Power It is rarely necessary to use a lamp of greater than 2000 lumens (150 W) in security lights. The use of a higher power is not as effective for the intended function and will be more disturbing for bats.
- Movement sensors Many security lights are fitted with movement sensors which, if well installed and aimed, will reduce the amount of time a light is on each night. This is more easily achieved in a system where the light unit and the movement sensor are able to be separately aimed. Timers If the light is fitted with a timer this should be adjusted to the minimum to reduce the amount of 'lit time'.
- Aim of light The light should be aimed to illuminate only the immediate area required by using a sharp downward angle as possible. This lit area must avoid being directed at, or close to, any bats' roost access points or flight paths from the roost. A shield or hood can be used to control or restrict the area to be lit. Avoid illuminating at a wider angle as this will be more disturbing to foraging and commuting bats as well as people and other wildlife.
- Suitable types shown below (note that these are wall mounted and directed downwards)

Circular Louvre



Cowl & Louvre



Cowl (or Hood)



References: Bats and lighting BCT guidance and Guidance notes for the reduction of obtrusive lighting.

Appendix 5: Wildflower mixture maintenance

The number and timing of cuts required each year will depend on soil fertility (how fast the grass grows) and site objectives. More cuts will be needed on sites with fertile soil and for a tidy managed appearance. Low profile sites on poor soils need less mowing. There is considerable scope to vary the pattern of mowing and grazing both from one spot to another and from one year to another to create different effects - experiment to find what suits your site.

The aftercare of sown grassland has two components:

- **first year management**
- **management of established grassland.**

These two phases of management require different mowing regimes.

First year management

Meadow mixtures are composed mainly of perennial grass and wild flower species which take at least a full year to establish from sowing. Do not expect plants to develop enough to flower in their first summer.

Mow regularly throughout the first year of establishment; this will help maintain balance between faster growing grasses and slower developing wild flowers. Quick growing meadow components will tolerate cutting and may even benefit from this 'pruning,' pushing them to develop more robust compact plants. Mowing to remove surplus top growth will give smaller slower growing plants more light and space to grow into.

In the first summer meadow mixtures sown on to bare soil are frequently dominated by a flush of annual weeds which come from the soil. Regular mowing will remove annual weed competition and prevent them seeding.

Mow to a height of 40-60mm. Ideally collect and remove arisings to avoid leaving behind a damaging mulch of decomposing cut grass. If you can mow frequently enough it may be possible to disperse the cuttings without leaving a mulch. The number and timing of cuts will depend on site productivity, weather, manpower and equipment available. Mowing can start as soon as there is enough growth of either weeds or sown species to take a cut.

Where cornfield annuals have been sown as '[nurse cover](#)' with a meadow mixture cutting must be postponed from spring through to mid-summer to permit flowering. These sown annuals should be cut back and removed promptly once flowering declines (typically late July). Do not wait for the annuals to set seed and, if the growth is lush and begins to collapse, cut and remove soon rather than later to avoid them smothering and killing the meadow seedlings below. Once the annual cornfield cover is cut back and the cut material removed, the sown meadow species will be revealed as small green plants, separated by bare ground. These seedlings will then have

an opportunity to grow on through the latter half of the growing season using the light and space provided.

Yellow rattle is an exception in meadow mixtures, being annual rather than perennial. Where yellow rattle has established well from an autumn sowing avoid mowing between late April and mid-July to give it a chance to ripen and shed seed for the following year. Where there is an over-riding need to mow through this period to control growth, replacement yellow rattle seed can be sown in the autumn.

Sowings into existing grass can be managed as an established meadow, with perhaps extra cutting or grazing where growth is lush.

Management of established grassland

The second year from sowing is the first in which a sown meadow is left uncut to flower, and a first "hay crop" taken in mid summer. The early years of a sown meadow (years 2/3 from sowing) are characterised by the more quickly establishing pioneer perennials such as oxeye daisy and sorrel, and the growth is vigorous. In following years the meadow will become more diverse as slower establishing species like cowslip appear and growth is less vigorous as nutrients become fixed in root systems and herbage.

The character and composition of the meadow will continue to change with time. Eventually a relatively stable community will develop, the balance of which will reflect management, soil fertility and the natural environment of the site. In this way the outcome of each sowing will in practice differ, and will not be a direct reflection of the species balance in the sown mixture.

A mowing regime for managed grassland will contain one or more of the following elements:

- A main mid-summer hay cut
- mowing or grazing of the regrowth 'aftermath' in late summer and autumn
- mowing or grazing of lush spring growth

Summer hay cut

The main cut each year is the summer "hay cut". This is when the main part of the year's growth is cut back using a scythe, heavy duty strimmer, reciprocating knife or other suitable mower (lawn mowers are generally not up to this task). The growth should be cut back to a height of 40-75mm.

The cut grass should be dried on site, turning it to assist drying and disperse seeds (this also significantly reduces the weight and bulk of material to be removed). The dried 'hay' should be removed within 7 days of cutting. On larger areas it may be practical to cut and bale quality hay. Where hay making is impractical, arisings may be composted or placed in heaps on sacrificial parts of a site, where if you are very lucky they could provide habitat for breeding grass snakes! A meadow will yield 2 - 8 tonnes of dry hay per hectare (0.2 - 0.8 kg/m²) A 250m² (tennis court size) meadow will produce about 5 x 25kg hay bales (typical small square type).