



Muttonhole Road Biodiversity Enhancement Report

Prepared for: Cogeo Planning and Environmental Services Ltd.

Date: 22 June 2024

Revision: Rev.01



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Revision History

This document has been subject to a quality review process as dictated below.

Revision	Author	Date	Reviewer	Date	Approver	Date	Comment
Rev.01	C. Smart	19/06/2024	A. Laming	21/06/24	E. Paterson	22/06/24	Approved for client issue

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Contents

1	Executive summary	2
2	Introduction.....	3
2.1	Background	3
2.2	Description of Proposals	3
2.2.1	Local Planning Policy	3
2.3	Report Structure	3
2.4	Staff	3
3	Methods.....	5
3.1	Field Study	5
3.2	Data Sources.....	5
3.2.1	Boundary	5
3.2.2	Baseline Habitats	5
3.3	Limitations	5
4	Baseline Conditions	6
4.1.1	Description of Baseline Habitats	6
5	Biodiversity Enhancement.....	7
6	Management Schedule	13
7	Ecological Monitoring	15
7.1.1	Bird Boxes	16
7.1.2	Bat Boxes	16
8	Conclusions.....	17

1 Executive summary

- EP Ecology was commissioned by Cogeo Planning and Environmental Services Ltd. to provide a biodiversity enhancement plan and accompanying feasibility report to support a planning application for the construction of a battery energy storage system (BESS) and associated infrastructure off Muttonhole Road, South Lanarkshire.
- The existing PEA data, collected as Phase 1 habitats on a previous survey, were used to create the baseline habitat description.
- Suggestions for biodiversity enhancement are made for each broad habitat type.
- Suggestions were also made to enhance the post-development site for broad species expected to be regularly using the Site.
- Reference to the current landscaping drawings is made to identify enhancements already agreed upon.
- It is further recommended that a long-term post development monitoring schedule is taken up to prove the biodiversity enhancements have had a positive effect or to modify recommendations if outcomes are not as initially expected.

2 Introduction

2.1 Background

EP Ecology was commissioned by Cogeo Planning and Environmental Services Ltd. (hereafter “the Client”) to provide a Biodiversity Enhancement Plan (BEP) for the site of Muttonhole Road in Hamilton, South Lanarkshire Council (approximate central grid reference NS 68438 53538). A preliminary ecological appraisal (PEA) was completed for the site by EP Ecology Ltd. on 4 September 2023 and forms the baseline information used by this Biodiversity Enhancement report.

This report uses the preliminary ecological appraisal as a baseline for the ecological conditions of the site, to then draft proposals to improve biodiversity within and immediately around the site as part of the development proposal. The enhancements include engineering, landscaping and land management proposals to encourage biodiversity as well as post development monitoring to ensure biodiversity is achieved. The national planning policy framework, Section 2, now requires the improvement of biodiversity as part of the planning objectives, but without any strict guidance as to how a development may measure this objective. This report is a professional opinion on how the development may achieve an improvement to biodiversity.

The boundary for the Biodiversity Enhancement report is based on a slightly modified version of the red line site boundary used in the PEA for the proposed development site.

2.2 Description of Proposals

EP Ecology understands that the proposals issued by the Client include clearance and construction of a battery electrical storage site with associated infrastructure and access route.

The Client has committed to a biodiversity enhancement as part of the guidelines within the National Planning Framework 4. This report summarises options as to how this enhancement might be achieved within the area of the Site.

2.2.1 Local Planning Policy

The local planning authority, South Lanarkshire Council has no specific enhancement policy but do adhere to the Scottish National Planning Framework 4¹ policies, which are similar to the U.K national planning policy.

2.3 Report Structure

This report sets out the methods used to gather data for and create this biodiversity enhancement plan (**Section 3**), a rough description of the baseline habitat (**Sections 4**), suggestions for biodiversity enhancement with reference to their inclusion within the current landscaping plans (**Section 5**), suggestions for a management schedule of the enhanced habitats (**Section 6**), suggestions for a long term monitoring scheme (**Section 7**) and broad conclusions for the biodiversity enhancement of the Site (**Section 8**).

2.4 Staff

This biodiversity enhancement plan was written by EP Ecology Ecologist Christopher Smart. Chris has 4 years' experience as an Ecological Clerk of Works as part of a large infrastructure project and is a qualifying member of CIEEM.

Reviewed and approved by EP Ecology Director, Erik Paterson. Erik is an experienced ecological consultant with over 11 years' experience in the sector. He has worked on dozens of projects from small-scale single dwellinghouse modifications through large industrial developments to multi-million-pound road schemes across Scotland. Erik is a full member of CIEEM and holds NatureScot licenses

¹ <https://www.gov.scot/publications/national-planning-framework-4/pages/1/>

for great crested newt survey, bat survey (including hibernacula and harp trapping), and holds a NatureScot bat low impact licence.

3 Methods

3.1 Field Study

The field study was conducted on 4 September 2023. The prevalent weather conditions were dry, sunny and clear with an approximate temperature of 22°C.

3.2 Data Sources

The following data sources have been used to define the boundary for the biodiversity enhancement plan and determine the pre-development or baseline habitats.

3.2.1 Boundary

The boundary used for the biodiversity enhancement plan is the red line application boundary for the project. The red line boundary differs very slightly from the original PEA boundary, but all the surveyed areas of the PEA still fall within the new red line boundary.

3.2.2 Baseline Habitats

In order to generate the Site baseline habitat data (e.g. habitat type, condition) the following survey data were used:

An extended habitat survey of the land within the Site using Phase 1 guidance was undertaken on 4 September 2023. The survey followed the JNCC Handbook for Phase 1 habitat survey guidance, with the Site systematically walked over, and the dominant habitat type in each area recorded. Dominant plant species were noted, as were any that are legally protected (Schedule 8 of the Wildlife and Countryside Act (WCA) 1981), notable (GB/Scotland Red Listed, Section 41), or invasive species listed on Schedule 9 of the WCA 1981.

Full details of the baseline Site conditions, and habitat surveys undertaken are provided in the separate Preliminary Ecological Appraisal.

3.3 Limitations

The boundary for the Site has shifted slightly between the original Phase 1 survey and final landscape drawings. This is unlikely to have any impact on the outcomes as the boundary still contains all of the original habitats surveyed.

In committing to an enhancement protocol, this report would expect the Client is committed to the management and maintenance requirements that will be necessary to ensure the enhanced/created habitats achieve their target condition. For grassland habitats this may take 5-10 years whereas woodlands can take centuries to reach their climax values. As the woodland timescale is unrealistic, we would recommend the Client make a 30-year commitment to the maintenance of all the habitats created/modified as a result of the development.

A long-term monitoring plan would be beneficial to keeping the enhancements on track and reacting to any unforeseen developments (such as colonisation by undesirable species). This long-term monitoring plan should include the following details:

- Aftercare maintenance and long-term habitat management and monitoring of created and enhanced features;
- How management will be implemented for a minimum period of 30 years; and,
- What monitoring will be implemented during and after construction.

The details included within this report remain valid for a period of one year² from the date of issue. If works have not commenced by the end of this period, a repeat assessment may be required.

² CIEEM. (2019). *Advice Note on the Lifespan of Ecological Reports & Surveys*. CIEEM, Hampshire.

4 Baseline Conditions

4.1.1 Description of Baseline Habitats

The baseline habitats have been observed during a Phase 1 habitat survey. A full description of the habitats encountered, and floral compositions is given in a separate report³.

The Site is a resting grazing pasture, currently described as semi-improved neutral grassland, surrounded by hedgerows to the south and east. The sward is relatively uneven, dominated by common palatable grasses such as Cock's-foot (*Dactylis glomerata*) and abundant in Yorkshire fog (*Holcus lanatus*) grasses. Current management of Site is unknown but likely consists of periodic grazing with localised enrichment from the livestock. The Site slopes down to the North with the lowest point of the pasture being in the north/northeastern corner of the field. North of the Site is a broadleaved semi-natural woodland and west of the Site is a strip of mixed plantation woodland separating the pasture from the next field. To the northwest of the Site is a relatively large area of scattered scrub extending from the broadleaved semi-natural woodland west until it starts to meet marshy grassland or wetland habitat types.

If the existing grassland is removed during construction (as is currently planned), this should be replaced with habitats of the same general type and distinctiveness. Ideally, lost habitat will be offset by enhanced habitat on a like for like basis (grassland for grassland, woodland for woodland etc.).

³ EP Ecology Ltd. (2023). *Cogeo Muttonhole Road BESS Preliminary Ecological Appraisal Report*. EP Ecology Ltd., Blantyre.

5 Biodiversity Enhancement

The key biodiversity enhancements anticipated at the site for habitats and species are set out below in **Table 5.1**.

Table 5.1. Suggested biodiversity enhancements by general habitats and species.

Grasslands	<p>We would encourage the development to enhance as much of the remaining semi-improved neutral grassland as possible. We would also encourage the client consider enhancing any remaining grassland within the wider field, to keep the habitat contiguous. This can be done relatively easily as the modified grassland is of such low species variety that adding a further eight or so species would increase it by c.30%. Implementing a late winter/early spring cutting regime (January/February) would help open the sward to encourage a wider range of flora to grow via natural regeneration. The client can also consider seeding, ideally after the cuts, to provide flora that are missing from the current assemblage. A Mavisbank⁴ or MG5 meadow⁵ mixture provides many of the species we might expect to find in a lowland grassland and a wet meadow mix will provide appropriate species for the wetter areas of the field. All the mixtures also contain yellow rattle (<i>Rhinanthus minor</i>) a species which can help control grass growth without cutting as often. For a more focused planting effort (as the mixes already contain some species present within the grassland) the client may wish to consider vegetative plugs of some of the species present in the mixes (but absent from the Site). We would recommend that the client consider planting/seeding some yellow rattle as this will help the grassland develop into a more ecologically valuable area. A flowering lawn⁶ mixture is an alternative grassland mix that may be more appropriate for the spaces between the panels. This mixture is designed to be kept maintained in a way similar to typical lawns (mowed regularly to approximately 10cm) and will provide a much greater range of species than a typical lawn would have.</p> <p>We would recommend the client consider planting shade tolerant species near the woodland edges, hedgerows and underneath single planted trees. Scotia seeds also provide a woodland meadow⁷ and hedgerow⁸ mixture with more shade tolerant plants. The hedgerow mixture is lightly shade tolerant and the woodland meadow is more tolerant of shade and we would recommend planting regimes that take potential shade levels into account. For single trees outwith the woodland it would be better to use species within the hedgerow mix as these are unlikely to be heavily shaded areas.</p> <p>This report would suggest, if not already considered, the client consider biodiverse green roofs as part of the development. A biodiverse green roof, according to UKHab designation⁹, would be a green roof with a depth of substrate (not including blanket or turf) that varies between 80 and 150mm, with at least 30% of the roof at 150mm and is planted with a wide range of grassland wildflowers and <i>Sedum</i> species (stonecrops). Wildflower to sedum species should have a ratio of 60:40 with the wildflower species being equal to or greater than 25. We would recommend that the development attempt to adhere to the wildflower species goal but only using native wildflower and stonecrop species. As there are only 6 native stonecrops it will be virtually impossible to attain the 60:40 ratio and thus should be ignored in favour of establishing only the 6 native species of stonecrop.</p>
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⁴ <https://www.scotiaseeds.co.uk/shop/mavisbank-mix/>

⁵ <https://www.scotiaseeds.co.uk/shop/mg5-meadow-mix/>

⁶ <https://www.scotiaseeds.co.uk/shop/flowering-lawn-mix/>

⁷ <https://www.scotiaseeds.co.uk/shop/woodland-mix/>

⁸ <https://www.scotiaseeds.co.uk/shop/hedgerow-mix/>

⁹ UKHab Ltd (2023). UK Habitat Classification Version 2.0 (at <https://www.ukhab.org>)

Intensive green roofs are another alternative, these are green roof spaces designed as park or garden and includes shrubs, trees, perennials and grasses. It must meet the following three criteria to be classed as intensive green roof (using UKHab definitions): greater than or equal to 50% native and greater than or equal to 30% non-native species of pollinator interest; greater than or equal to 70% of the surface is soil or vegetation (including water features); and less than or equal to 30% of the area is hard standing. We would recommend the development avoid all non-native plantings and instead aim for a wide variety (greater than or equal to 80%) of native species of pollinator interest, ideally with a range of flowering times to provide maximal benefit.

After establishment, the habitats should only require a single cut per year in early spring to maintain the composition (preferably very early spring). Ideally the cuts would not be to ground level as this can damage some plant species, cutting to 15cm sward height will be appropriate in most instances. The management plan should include multiple cut heights within the habitat, if possible, to create a more complex habitat structure and we would encourage the client to consider a rotational cutting regime to create the same effect i.e a 'conservation-style cut'. It is very important that the arisings from cutting are removed from the habitat. The arisings will act as a source of nutrients that can skew the plant species quite heavily or encourage colonisation from undesirable species.

If a species becomes over dominant it may be necessary to cut more often. The ideal time to cut will vary depending on the species being controlled but generally the plan will be aiming to cut in spring or autumn and prior to the species seeding, this will often lead to a second cut in late summer or autumn. If the species being controlled is particularly vigorous it may require multiple targeted cuts throughout spring and summer. The client may wish to target scrub overflowing from the nearby woodland or scattered scrub habitat if they aim to keep the grassland as grassland habitat. We would encourage that the habitat is kept grassland although a minimal amount of scrub regeneration (ideally very scattered) is desirable.

As the area within the Site is limited it may be necessary (to demonstrate an ecological net gain) for the client to consider off-site improvements. We would recommend the client open a discussion with the local council (South Lanarkshire) as they may have a site already earmarked for improvement. If sufficient agreement is made prior to the beginning of the works the client may be able to "recycle" turf layers unable to be used within the Site by transplanting them to the improvement area earmarked by the council. If transplanting the turf becomes a viable option, we would strongly recommend that the improvement area be as local as possible to prevent the introduction of a floral composition not in keeping with the surroundings.

The current landscaping plans have advised already approved the use of MG5 meadow mix and wet meadow mixes for grassland enhancement but we would still recommend the client consider shade tolerant mixtures for the hedgerow and woodland plantings. We would also recommend meadow planting between panels if not already decided. Green roofs do not appear to be appropriate for structures within this development due to the nature of their contents (power substations and electrical monitoring equipment) but discussion with a qualified engineer with green roof experience may yield a solution. Recycling turf has not been discussed within the landscaping plans but is a discussion we would encourage is had with the local planning authority (South Lanarkshire).

Hedgerows

Hedgerows should be constructed of at least three native woody species and are typically 70% hawthorn (*Crataegus monogyna*) with the remaining 30% being other woody species. Other woody species includes blackthorn (*Prunus spinosa*), hazel (*Corylus avellana*), smaller willow species such as goat willow (*Salix caprea*), beech (*Fagus sylvatica*), yew (*Taxus baccata*) and holly (*Ilex aquifolium*). The beech and yew may have to be maintained regularly to keep them trained low and shrubby. With woody species forming the main hedgerow sections the

planting can include climbers such as honeysuckle (*Lonicera periclymenum*), guelder rose (*Viburnum opulus*), bittersweet (*Solanum dulcamara*), dog rose (*Rosa canina*), bramble (*Rubus fruticosus*) and common ivy (*Hedera helix*). Those hedgerows which can be planted with intermittent trees along the length should consider native trees such as those in the woodland section below. As beech trees are already present peripheral to the Site it may be simple to just include them within the hedgerow construction.

Ideally hedgerows will be planted in such a way that they connect to woodland habitat or other hedgerows (which eventually connect to woodland habitat) Ensuring that hedgerows form connections between semi-natural habitats enhances their value as an ecological feature.

The current landscaping plans contain two main hedgerow planting/enhancement proposals along the southern and eastern edge of the field. These proposal both create new hedgerow within the suggested parameters and enhance the existing hedgerows with additional species. Although outwith the red line boundary we would suggest the client consider installing a hedgerow along the western edge of the field underneath the mixed plantation woodland to enhance the woodland as a wildlife corridor. A hedgerow could be considered for the northern edge of the field as well but encouraging the broadleaved semi-natural woodland to expand westwards will have the same effect and is more desirable for the ecology of the wider area.

Woodland

Creating woodland is an incredibly long process as multiple decades are required for woodlands to mature, and centuries may be required for woodland communities to meet climax definitions. This process can be kickstarted by using heavy standard (or greater) plantings. We would recommend a variety of tree ages within the initial plantings and subsequent woodland management should consider thinning/further plantings to create as broad an age range of trees both for the woodland as a whole and for each individual species.

Native species such as oak (*Quercus robur*), Scot's pine (*Pinus sylvestris*), wych elm (*Ulmus glabra*), birch (both *Betula pubescens* and *Betula pendula*), beech, alder (*Alnus glutinosa*), aspen (*Populus tremula*), willow (*Salix* spp.), ash (*Fraxinus excelsior*), bird cherry (*Prunus padus*), crab apple (*Malus sylvestris*), elder (*Sambucus nigra*), cherry plum (*Prunus cerasifera*), rowan (*Sorbus aucuparia*), juniper (*Juniperus communis*) and yew (*Taxus baccata*). Given the presence of the species in the nearby woodland habitat we would recommend species appropriate for lowland woodlands but not already found nearby such as wych elm, aspen, juniper, yew, cherry plum and crab apple.

Woodlands benefit from having a defined scrub layer and so any attempt at woodland creation should include shorter shrubby species such as elder, hawthorn, blackthorn and goat willow. A shrub layer should be established enough that it is definable but should not block all light from reaching the woodland floor.

Woodland management tends to operate on much longer timescales than the other habitats mentioned in this report, but any planted woodlands should be inspected regularly to keep track of trees which have failed to establish. Selective cutting regimes may help to keep the ground layer open as the young trees establish themselves and should be considered in instances where thick shrubby vegetation begins to block young saplings (dogwood is a common offender). Further new plantings may be required if tree ages or species begin to be favoured heavily by a small number of species. In the unlikely event that all plantings become well established trees, there may a requirement for selective thinning. Thinning is unlikely to be required within the first 5-10 years but becomes gradually more likely as the age of the woodland progresses. Thinning should be selective, ensuring that the trees being removed are not of uniform age or species to maintain the woodland complexity and diversity. Any thinned trees may have to be removed from site but, if minimal dead wood exists within the habitat, the

plan should consider leaving one or two felled trees to add complexity. Felled trees can be cut into sections and left in discreet woodpiles in corners of the Site. Dead wood is a desirable feature of woodlands and as such a small number of trees failing to take is perfectly acceptable, provided is not the majority of a single age-class or species.

Due to the small area of the Site it may be advisable for the client to consider offering assistance managing the woodland habitat north of the Site as part of a negotiation to achieve biodiversity net gain. The woodland may require some thinning although this is best assessed by a qualified arborist. Some cutting of the ground flora may also be required to encourage natural regrowth of young trees or if new tree saplings are considered being planted in the periphery of the woodland. If new saplings are agreed to be planted, we would encourage considering at least one new species not already contained within the woodland. Improving the woodland habitat north of the Site would improve the ecological value of the immediate surrounding habitats by providing a relatively large core area of semi-natural habitat. The woodland north of the Site is already natural spread of the Ancient Woodland Inventory Site further northeast and so encouraging this woodland to continue spreading west would be of great ecological benefit of the wider area. Encouraging the woodland to spread may require thinning of the developing scrub, particularly the overabundant willow scrub, allowing a broader range of the species to initially establish.

Hedgehog (<i>Erinaceus europaeus</i>)	Installation of hedgehog boxes within the landscaping would encourage uptake of the site by hedgehogs. These boxes should be in a quiet area not subject to human or vehicular traffic, should face away from the prevailing wind conditions and be out of direct sunlight. A siting beneath existing or freshly planted shrubs would suffice. The boxes should include an opening of approximately 13cm x 13cm in diameter and should include an internal “baffle” with a sharp turn to prevent access from predatory species such as foxes or cats. Uptake of these boxes can be further increased by ensuring that there are suitable gaps (of 13 x 13cm) beneath any fencing instated around the development.
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Bats and Birds	<p>Installation of bat and bird boxes within the landscaping of the site would increase their suitability for these species.</p> <p>For birds, a mix of box sizes and type in line with RSPB guidance would increase the value for nesting species. Inclusion of “swift bricks” within the construction of the structures would improve nesting value for birds within the development area. Swift bricks are deeper than regular bricks and are often used at loft height to prevent the bricks extending into usable living space, this suits birds as they prefer nesting at height in most instances.</p> <p>For bats, it is recommended that woodcrete boxes which are “self-cleaning” (e.g. which are open at the bottom to allow droppings to fall free from the box and subsequently not require regular cleaning by a licensed bat worker) would enhance the site for bat species. Guidance on the type and siting of bat boxes is available from the bat Conservation Trust¹⁰. Bat bricks and bat tiles are also recommended for use within the construction of the structures. Both the bricks and tiles can be as simple as hollow features for bats to access the wall space/roof space behind to as complicated as their own fully enclosed roosts with wall brick/roof tile façade. As with the boxes they cannot be moved once installed and so careful placement with consideration to disturbance and lighting is strongly recommended.</p>
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Enhancing the Site for bats will hinge largely on ensuring that there are linear connections between foraging corridors and potential roost locations. This is largely covered by the hedgerow planting suggestions made within the landscaping plans. Having a broad selection of floral varieties both woody and non-woody species will allow for a broader range of invertebrates which in turn

¹⁰ <https://www.bats.org.uk/our-work/buildings-planning-and-development/bat-boxes>

	<p>should appeal to a wider variety of bats. Having a larger variety of flora should also widen foraging potential for birds in the form of fruits, nuts and seeds.</p> <p>The structures contained within this development will not be appropriate for bat bricks, bat tiles or swift bricks as they are liable to overheat causing mortalities. Siting bat/bird boxes in semi-natural habitats around the Site and within any new tree plantings once they have sufficiently matured will be the only available method of improving roosting potential within the Site.</p>
Amphibians, reptiles, and Invertebrates	<p>Log piles / Hibernacula could be instated within the site which would provide suitable habitat for amphibians as well as for invertebrate species including saprophytic species such as beetle larvae. These should be instated within a sunny spot and within landscaping measures. Where possible, log piles should seek not to be too tightly piled to ensure there are gaps or varying sizes to create a number of different microclimates which would suit a wider variety of species. These may need to be regularly replaced.</p> <p>A swale or rain garden should be considered within the SuDs planning for the development and we would encourage this to be constructed as a semi-natural habitat to the benefit of amphibians and invertebrates. The client can achieve this by planting the swale with marsh, wet tolerant and pond emergent vegetation to act as both a filtration system and semi-natural space for biodiversity. Encouraging the swale to lead to a semi-enclosed marshy area or even a pond could drastically expand the planting regimes available to the client encouraging a much more diverse set of species as well as introducing entirely new habitats to the immediate surroundings. Depending on how wet local climatic conditions can be maintained we could expect marsh species such as water mint (<i>Mentha aquatica</i>), marsh woundwort (<i>Stachys palustris</i>), ragged-robin (<i>Silene flos-cuculi</i>), marsh-marigold (<i>Caltha palustris</i>) and meadowsweet (<i>Filipendula ulmaria</i>) to establish relatively easily. In wetter areas/ponds, it may be possible to expect pond/emergent vegetation to establish such as flag iris (<i>Iris pseudacorus</i>), brooklime (<i>Veronica beccabunga</i>), water forget-me-not (<i>Myosotis scorpioides</i>) and creeping jenny (<i>Lysimachia nummularia</i>) with relative ease. A properly constructed swale should remain wet most of the year and could become a valuable resource for local amphibians and invertebrates to use.</p> <p>The landscaping plan does not appear to contain any SuDs feature but it is likely some form of drainage feature will be included. We would encourage the client consider the suggestions above for their SuDs plans should a feature be in place.</p>
Invertebrates	<p>Insect Hotels including solitary bee houses could be instated within the new landscaping, in a sunny area next to suitable invertebrate foraging (e.g. wildflower planting). This would serve to increase the available habitat for invertebrate species and would in turn benefit the wider ecosystem through provision of additional ecological functions and through increased food resource for predatory species.</p> <p>Many of the suggestions discussed will directly benefit invertebrate populations by providing a wider variety of micro-climates and foraging options. It is recommended that the Client consider creating mounds for invertebrates^{11 12} if possible. An invertebrate mound/bank is best placed with a long south facing aspect and a hedgerow could be installed on the northern edge of the mound to provide additional screening for the development. Invertebrates will benefit from the broadest possible floral compositions, and we would recommend a blend of seed mixtures and potentially some vegetative plug plantings around any available landscaping areas. The client may wish to specifically include certain species such as common dog-violet (<i>Viola riviniana</i>), clover (<i>Trifolium</i> sp.), dyer's greenweed (<i>Genista tinctoria</i>) and bird's-foot-trefoil (<i>Lotus corniculatus</i>) to attempt to draw nationally important species such as pearl-bordered fritillary</p>

¹¹ http://www.magnificentmeadows.org.uk/assets/pdfs/How_to_create_an_earth_mound_for_wildlife.pdf

¹² https://butterfly-conservation.org/sites/default/files/2024-01/Butterfly%20Bank%20Factsheet_FINAL.pdf

	<p>(<i>Boloria euphrosyne</i>), garden dart (<i>Euxoa nigricans</i>), white-spotted sable moth (<i>Anania funebris</i>) and dingy skipper (<i>Erynnis tages</i>) to the Site.</p> <p>The landscaping plan does not appear to contain any obvious bunds but other BESS sites often have a bund associated with the perimeter and we would suggest the client consider the above section as part of the plans.</p>
Non-native species	<p>Given the presence of invasive non-native species within the background data, it is strongly recommended that the Site is regularly surveyed for their presence. Non-native species should be removed as early as possible as it is often easier to do with young plants and should help prevent their spreading further within the Site.</p>

6 Management Schedule

This section contains a proposed management schedule for the suggested established habitats with a view to maximising the biodiversity within the habitat, shown in **Table 6.1**. It must be noted that these management schedules are suggestions and will need to be changed based on the aims for the habitats in question.

Table 6.1. Suggested management schedules

Ecological Feature	Management proposals	Timescale
Grasslands	<p>Both grassland and wildflower meadows can be managed in a similar style as the aims generally coincide. It is recommended that management of meadow habitats is done through cutting alone, it is possible to create management regimes using herbicides and pesticides, but these are generally for controlling invasive species or super dominant species. The first year after planting may require multiple cuts throughout spring to allow the full diversity of plant species seeded to establish. After establishment, the habitats should only require a single cut per year in early spring or in late autumn to maintain the composition. Ideally the cuts would not be to ground level as this can damage some of the plant species, cutting to 15cm sward height will be appropriate in most instances. The management plan should include multiple cut heights within the habitat to create a more complex habitat structure. It is very important that the arisings from cutting are removed from the habitat. The arisings will act as a source of nutrients that can skew the plant species quite heavily or encourage colonisation from undesirable species.</p> <p>If a species becomes over dominant it may be necessary to cut more often. The ideal time to cut will vary depending on the species being controlled but generally the plan will be aiming to cut in spring or autumn and prior to the species seeding, this will often lead to a second cut in late summer or autumn. If the species being controlled is particularly vigorous it may require multiple targeted cuts throughout spring and summer.</p> <p>The client may wish to target scrub overspilling from the nearby woodland or scattered scrub habitat if they aim to keep the grassland as grassland habitat. We would encourage that the habitat is kept grassland although a minimal amount of scrub regeneration (ideally very scattered) is desirable.</p>	Annually (on rotation) in late winter/early spring
Hedgerow	<p>Managing hedgerows can be a relatively simple affair depending on the final aims of the landscaping. Hedgerows should be cut once every two or three years to promote maximal blossoming for pollinators and encourage the hedgerow to grow thick. Ideally, each hedgerow would be cut rotationally i.e. half the southern hedgerow one year, the rest the following year etc. The hedgerows should be trimmed to an 'A' shape (in cross section), with a wider base narrowing towards the top, to provide maximum value/protection for wildlife whilst allowing light to reach the surrounding ground flora.</p> <p>The timing of hedgerow trimming is extremely important to wildlife. Trimming should always occur outwith the breeding bird season (March to September inclusive) and, where possible, should be delayed until January or February to allow the berries to be foraged over winter.</p>	Annually (on rotation) in late winter/early spring

Ecological Feature	Management proposals	Timescale
Woodland	<p>Woodland management tends to operate on much longer timescales than the other habitats mentioned in this report, but the woodlands should be inspected regularly to keep track of trees which have failed to establish. Selective cutting regimes may help to keep the ground layer open as the young trees establish themselves and should be considered in instances where thick shrubby vegetation begins to block young saplings. Further new plantings may be required if tree ages or species begin to be favoured heavily by a small number of species. In the unlikely event that all plantings become well established trees, there may a requirement for selective thinning.</p> <p>Thinning is unlikely to be required within the first 5-10 years but becomes gradually more likely as the age of the woodland progresses. Thinning should be selective, ensuring that the trees being removed are not of uniform age or species to maintain the woodland complexity and diversity. Any thinned trees should be removed from site but, if minimal dead wood exists within the habitat, the plan should consider leaving one or two felled trees to add complexity. Dead wood is a desirable feature of woodlands and as such a small number of trees failing to take is perfectly acceptable, provided they are not too uniform in age or species.</p>	<p>In winter every two years for the first ten years. Every decade thereafter.</p>
Amphibians, reptiles and invertebrates	Replacement of logs to maintain log piles within Sites. Ideally replaced with dead/felled wood from the Site.	Every ten years as required
Non-native/invasive weeds	Engagement of a specialist invasive weed removal contractor to survey the Site, remove any established non-native weeds and, if possible, identify a source of colonisation.	Every two years as required

7 Ecological Monitoring

In order to monitor the success of the consented mitigation and enhancement measures detailed in this plan, post-construction monitoring will be undertaken for a period of 10 years post development. Please see Table 7.1 below for a proposed monitoring schedule.

Table 7.1. Suggested ecological monitoring.

Ecological Feature	Indicator Remedial	Assessment	Remedial Works	Timescale	Target
Semi-natural woodland	Established, early succession, woodland	Check new plantings have established and for signs of common arboreal illnesses e.g. Ash dieback, sudden oak death.	Replace dead or damaged new plantings if significant losses. New plantings if tree age begins to skew heavily.	Annually for 10 years	To establish new semi-natural woodland to replace those lost by the development.
Breeding Birds	Nesting evidence	Check occupancy of nest boxes	Replace damaged or missing boxes. Relocate boxes if no nesting activity within 4 years.	Annually for 10 years (Nov-Feb)	To provide additional nesting opportunities for bird species on the Site. At least half of installed nest boxes in use.
Bats	Presence	Inspect bat boxes	Replace damaged or missing boxes. Relocate boxes if no roosting activity within 4 years.	Annually for 10 years (Oct)	To provide roosting opportunities for bats. Bats roost in at least 1 box
	Diversity of bat species	Inspect bat boxes	Replace damaged or missing boxes. Relocate boxes if no roosting activity within 4 years. Identify species Minimal disturbance e.g. take droppings for DNA Analysis.	Annually for 10 years (Oct)	To increase bat diversity on the Site. 2 species using boxes
Hedgehog	Usage of hedgehog boxes	Check occupancy of hedgehog boxes	Replace damaged or missing boxes. Relocate boxes if no activity within 4 years.	Annually for 10 years (April-October)	To increase hedgehog use of the Site.
Invertebrates	Diversity	Invertebrate surveys	Confirmation of baseline diversity is recommended.	Annually (April-September)	To increase invertebrate diversity on the site.

Ecological Feature	Indicator Remedial	Assessment	Remedial Works	Timescale	Target
			Increasing invertebrate draw to site by adding valuable features such as litter piles, installing mounds or by reassessing land management plans.		A 5-10% increase in invertebrate species diversity.
Non-native/invasive weeds	No visible non-native plants	Inspect proposed work area for signs of recurrence.	Restart control measures or, if no noticeable effect, consultation with an invasive weed specialist to reassess control measures.	Annually for 10 years	To remove invasive non-native plants from the proposed works area and prevent recolonisation.

7.1.1 Bird Boxes

Nest features are to be checked annually between November and February inclusive and any repairs or modifications undertaken. There are no legal issues associated with the installation of bird boxes. When the nest box is occupied however, all wild birds, their nests and eggs, are protected by law. Under the terms of the Wildlife and Countryside Act 1981, it is illegal to intentionally take, damage or destroy the nest of any wild bird whilst it is in use or being built. Under the terms of the Wildlife and Countryside Act 1981, if un-hatched eggs are found in the box, they can only legally be removed from October to January inclusive. The eggs must be destroyed, as it is illegal to keep them.

7.1.2 Bat Boxes

Bat boxes can be checked annually in October by a licensed bat worker and any repairs or modifications undertaken. There are no legal issues associated with the installation of bat boxes. However, once occupied, it is illegal to disturb any bat when it is roosting, or to kill, injure or handle a bat without a licence under the Habitats Regulations 2010 (as amended). If a sick or injured bat is found, the local Wildlife Trust or bat group should be contacted for further advice. If maintenance of the bat boxes is required, a licensed bat worker or local bat group should be consulted.

8 Conclusions

This Biodiversity Enhancement Plan uses the existing Phase 1 Habitat Survey as a baseline and sets out the proposed biodiversity enhancement for the proposed development.

The site currently has moderate ecological value, though it is anticipated that post development, with the inclusion of the above measures, the sites value for wildlife will be noticeably increased. The developed part of the Site will be an obvious ecological loss but this will be offset and value increased in the surrounding habitats. Further enhancements of the surrounding semi-natural habitats (not currently part of the Site) could significantly benefit the actions being taken on the Site should further enhancement be required. The proposals include improvements to the site area itself as well as improvements for the surrounding habitats.

Long-term monitoring has also been proposed to ensure biodiversity enhancement can be proven post development. During these visits, and upon agreement with the Client, National Vegetation Classification (NVC) surveys should be carried out by the Ecologists to appropriately update the species list on Site, to best provide the most up to date information and recommendations for the ongoing management.