



CelticEcology
and Conservation Ltd

ECOLOGICAL MITIGATION AND ENHANCEMENT STRATEGY

LAND AT BOLSTON HOUSE, BONVILSTON

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TRANSWORLD REAL ESTATE LTD

Proposed Development: Land at Bolston House, Bonvilston

Ecological Mitigation Strategy

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Drawings

Number	Title
SP612 LRP100	Proposed Location Plan
LA100	Landscape and Tree Strategy

(Drawings represented within the document and submitted separately)

NON-TECHNICAL SUMMARY

An ecological assessment was carried out of land at Bolston House in Bonvilston in the Vale of Glamorgan in south Wales by Celtic Ecology and Conservation in 2022 in support of a planning application for residential development on the site. This was updated to include a bat survey of Bolston House, the building on the land.

Following comments from the Vale of Glamorgan Council and a Welsh Government Planning Inspector, a need for a single point of reference for mitigation and biodiversity enhancements was considered to be necessary.

This Ecological Mitigation and Enhancement Strategy has been prepared to ensure the interests of protected species and other biodiversity features are provided for during any development of the site.

Mitigation will be required for:

1. Bats
2. Amphibians (excluding great crested newt)
3. Reptiles
4. Breeding birds

Biodiversity enhancements will be implemented to provide additional biodiversity benefits to those provided by the mitigation.

1 INTRODUCTION

1.1 Development application background

The development site is subject of a planning application (2021/00423/FUL).

1.2 Survey area

The zone of influence (survey area) is defined by the red line site application boundary (**drawing SP612 LRP 100 Site Location Plan**).

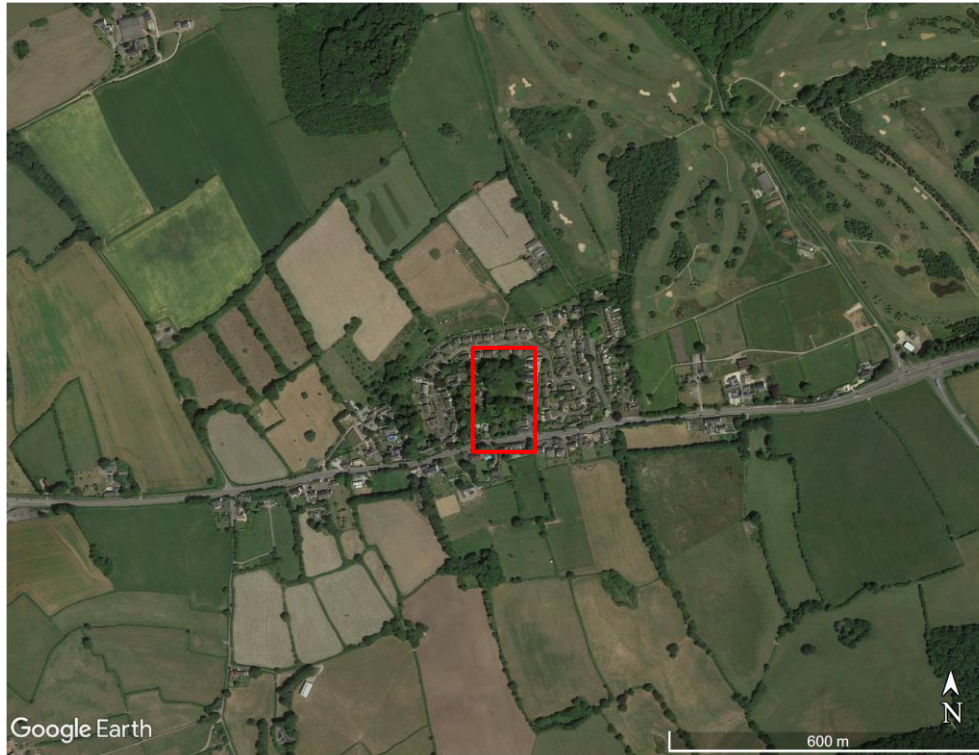
1.3 Site description

Taken from the *Ecological Assessment* (Celtic Ecology and Conservation, March 2021). Plates, Figures and Appendices referred to in this section refer to that report.

The site is approximately 0.9ha in extent and is located in the centre of Bonvilston to the west of Cardiff in the Vale of Glamorgan in south Wales (centred on NGR ST 06607410) (**Figures 1 & 2** and drawing **SP612 LRP100 Site Location Plan**). The site is approximately rectangular in shape, with its longest axis oriented north-south. This ecologically small site is comprised of a domestic property (Plates 1 – 8) surrounded by gardens (Plates 9 – 17) containing mature trees, shrubs, lawns and bare ground.

The site is bounded by vegetated fences and walls with houses, gardens and roads beyond.

Figure 1 – location of the proposed Bolston House development site (outlined red)



(Image courtesy of Google Earth)

Figure 2 – detailed view of the proposed Bolston House development site



(Image courtesy of Google Earth)

Figure 3 – habitat survey results.



2 MITIGATION STRATEGY

2.1 Mitigation Strategy Principles

This mitigation strategy has been developed in response to comments from the Vale of Glamorgan Council and Welsh Government.

Protected species are assumed to be present on and adjacent to the site as are a number of ecologically valuable habitats. In order to protect these during the construction and operational phases of the development, this mitigation strategy has the following principles:

- 1) Avoidance and minimisation of adverse impacts;
- 2) Establishment of ecological parameters and mitigation requirements in advance of detail planning design;
- 3) Minimisation of adverse impacts through the use of method statements;
- 4) Implementation of appropriate mitigation and compensation in advance of works;
- 5) Provision of a robust management plan;
- 6) Provision of robust and effective monitoring of mitigation and compensation; and
- 7) Provision of appropriate and timely remedial action should it be necessary.

2.2 Mitigation Strategy Focus

This strategy focuses on six specific ecological features:

- Bats;
- Amphibians and reptiles;
- Breeding birds; and
- Trees and shrubs

This approach will provide an appropriate level of mitigation and protection to other species as a direct result of the focus species. This approach is possible due to the nature of the site, assumed presence of protected species and the overall low – moderate ecological value of the site.

The mitigation for each feature will be set out individually following a summary of the survey information / on-site information and impact assessment with a summary of the proposed mitigation.

An over view of the mitigation is shown on the Mitigation Summary Plan at **Appendix A**. For planting and landscape details please refer to the Landscape and Tree Planting drawing at **Appendix B**.

2.3 Mitigation Strategy Subjects

Table 1 - mitigation subject and recipients

Mitigation subject	Additional ecological features covered
Bats	Trees
Amphibians and reptiles	Trees and shrubs
	Breeding birds
Breeding birds	Trees and shrubs
Trees and shrubs	All

2.4 Specific species information

For details of habitat and species surveys, results, evaluations and impact assessments, please refer to the *Ecological Assessment*¹.

Extracts and summaries are provided in each section below to provide relevant background information.

2.5 Land ownership

All the land within the red line boundary and that proposed for mitigation and compensatory use is currently owned by Transworld Real Estate Ltd and managed by them.

2.6 Development phasing

None.

2.7 Implementation

The mitigation detailed within this strategy will be implemented through the use of a Construction Environmental Management Plan (CEMP) and a (separate) detailed Green Infrastructure Plan, thereby ensuring that both the construction and operational phases are both managed to prevent, minimise and negate adverse environmental impacts and maintain and enhance the site's ecological value.

2.8 Responsibilities

The responsibility for the implementation of this mitigation strategy lies with Transworld Real Estate Ltd., any and all successors in title and all respective employees, consultants, contractors, sub-contractors and agents employed by them and involved in the project delivery and management during the construction and operational phases of the development.

¹ *Proposed Development: Bolston House, Bonvilston - Ecological Assessment*. Celtic Ecology and Conservation Ltd (March 2021).

2.9 Ecological Monitoring

An Environmental Clerk of Works (ECoW) will be appointed to supervise all elements of the site clearance, mitigation establishment and initial management plan implementation. On completion, a report will be submitted to the Vale of Glamorgan Council for evaluation.

It is anticipated that there will be monthly summary reports to Transworld Real Estate Ltd. during construction periods.

The necessity for remedial actions, if any, will be based on these reports. The Vale of Glamorgan Council will audit the works against this EMES. The CEMP will integrate the monitoring of this site and ensure that appropriate actions are enacted as necessary. Any failings will be reported to the relevant body.

The monitoring will be undertaken by a suitably experienced and (where necessary) licensed ecologist.

It should be noted that the demolition of Bolston Hose will require a development licence from Natural Resources Wales. There will be a requirement for ecological supervision of various elements of that part of the project by a licensed bat ecologist.

3 MITIGATION

3.1 Trees

3.1.1 Scattered trees – evaluation

The trees in this habitat are all mature standards, predominantly broadleaved species with occasional conifers. A number of the larger trees provided roosting features suitable for use by roosting bats. It is likely that they will be used by breeding birds.

It is considered that with the exception of the potential bat roost trees, that the trees are generally of a **low** ecological importance at a **local (site)** level.

Until determined otherwise by further surveys, the trees with potential bat roost features should be considered as being of **high** ecological importance at a **local (site)** level.

3.1.2 Scattered trees - impact characterisation

It is anticipated that all the mature trees with potential bat roosting features within the red line boundary will be retained. The majority of the trees to the south of the line of conifers across the centre of the site will be lost.

3.1.3 Scattered trees - impact assessment without mitigation

It is considered that as the mature trees within the boundary will be retained there will be a **potential very minor short term adverse** impact on a small proportion of the habitat at a **local (site)** level.

3.1.4 Scattered trees - mitigation measures

Mitigation will be required to prevent any damage to retained trees; therefore, the following measures will be implemented:

- all retained trees will be protected from the development by the implementation of root protection areas and other measures as necessary in accordance with BS 5837:2012 Trees in relation to design, demolition and construction.

Any tree removal shall be undertaken in accordance with the mitigation measures as applied to breeding birds (**section 7.3** below). Wherever possible, trees will be planted to replace those lost. There will be a preference for planting native tree species of as local a provenance as possible.

3.1.5 Scattered trees - impact assessment with mitigation

It is considered that there will be a **certain minor long term adverse** impact at a **local (site)** level with a **possible significant long term adverse** impact at a **local (site)** level as a result of the loss of bat roosts.

3.1.6 Scattered trees – significance of the impact

Without mitigation:

It is anticipated that the significance of the impacts due to the development will be **major**.

With mitigation:

It is anticipated that the significance of the impacts due to the development will be **slight**.

3.2 Bats

3.2.1 Bats - evaluation

Buildings

In 2016, a single soprano pipistrelle bat was observed emerging from the western gable of the garage building and a total of 5(no.) soprano pipistrelle bats were observed emerging from 3 separate roost sites on the site, locations unconfirmed but assumed to be the main house.

The numbers observed in 2021 were lower with a peak count of three bats seen on one occasion from 2 different roost sites, the emergence points being different to those seen in 2016. However, the number of bats and the number of emergence points from the buildings were different at every survey visit in 2021, indicating that the varying number of animals observed are using the building on an adventitious basis for non-maternity day roosting purposes.

A peak count of two animals was observed using the garage building during the first survey visit in 2021 and single animals thereafter. No animals of this species were observed using the building in 2016. It is therefore considered that the garage building at Bolston House is being used on an occasional, possibly adventitious basis, by varying numbers of animals, probably no more than 2, for occasional non-maternity day roosting purposes.

Trees

Trees on the site were subject of ground based and aerial inspections. Neither bats nor evidence of bats was observed. All the trees were in fact classified as being of negligible or negligible – low potential to and for bats and therefore no further survey or mitigation work is required for those trees.

3.2.2 Bats - impact characterisation

The demolition of Bolston House and the garage building would likely result in disturbance of bats while in a place of shelter, the killing and or injury of bats and the disturbance and destruction of a bat roost.

3.2.3 Bats - impact assessment without mitigation

It is considered that there would be a **certain significant long-term adverse** impact at a **local (site)** level).

3.2.4 Bats - mitigation measures

Temporary mitigation

Temporary mitigation will not be required as the permanent mitigation will be implemented in advance of any demolition works commencing.

Permanent mitigation

A dedicated standalone structure will be provided for use by bats. This will take the form of a structure measuring a minimum of 3m wide x 4m long with a floor to ridge height of approximately 3m, providing a total volume of around 28.8m³. The long axis of the building will be oriented north to south with the northern elevation facing the trees on the western boundary of the site (as per **Figure 4**).

There will be a letter box style access point for lesser horseshoe bats on the northern elevation no less than 600mm wide and 300mm high set in an external opening 600 x 450mm, the base of which will be angled at 45° sloping upwards front to back and lined with aluminium to prevent birds nesting and deter cats. The exterior of the entrance will be fitted with a storm lintel to prevent the worst of bad weather getting in.

A no more than 15mm gap along the eaves and gable ends will provide access for crevice dwelling species. Slots (150 x 30mm) will cut into the felt at no less than 1500mm centres immediately above the long elevation wall plates to provide access for crevice dwellers to the gap between the felt lining and slate roof.

The building will be of rendered block under a roof of slate over Type 1 bitumen felt on untreated (or tanalised) timbers. There will be a "hot box" at the southern gable end to provide a more sheltered and warmer roosting space for horseshoe bats within the roost.

Landscape planting around the structure will provide shelter to it. However, there will be no planting of any tree or shrub around it which will result in the roof being shaded. The exception to this would be the planting of one tree of an open canopy form, for example rowan (*Sorbus aucuparia*). There will be shrub planting along the roadside alongside the northern end of the bat house to help ensure that light from (baffled and shielded) bollards can be shielded from the entrance to bat house. This will be detailed in the separate landscaping design documents.

There will be no lighting of the bat roost structure or any of the trees on the western boundary. There is likely to be lighting of the footpath opposite the bat mitigation feature required; this will be bollard style lighting which will be PIR operated and on timers so that the light is on for the least amount of time to ensure safety of pedestrians. The details (e.g. location of bollards, type of lighting, duration of light etc.) will be on a separate lighting drawing.

Figure 4 – location of mitigation bat roost and direction of entrance



3.2.5 Bats - impact assessment with mitigation

It is considered that there will be a **probable minor short term adverse** impact at a **local (site)** level.

3.2.6 Bats - significance of the impact

Without mitigation:

It is anticipated that the significance of the impacts due to the development would be significant.

With mitigation:

It is anticipated that the significance of the impacts due to the development will be neutral.

3.3 Breeding birds

3.3.1 Summary

A full breeding bird survey or assessment was not undertaken as it can be assumed that all the areas of scrub and woodland are likely to be used by birds for nesting purposes during the breeding season.

The nature of the habitats present mean that ground nesting species are very unlikely to utilise the site.

3.3.2 Bird ecology

Most British avian species are found breeding during the spring and summer months, between April and August, although some, such as pigeons, and doves will frequently breed at all times of year, as they are not dependent on small, soft-bodied invertebrates to provide food for their chicks. Some other species, such as barn owl have also been recorded breeding in the winter months, in years when winters have been mild, and small mammal prey plentiful, although such breeding attempts are unusual, with chicks frequently failing to fledge. The breeding season can be extended for most species if the weather is mild, and food plentiful.

Contrary to common belief, whilst some bird species, such as crows and rooks, nest high in trees, often more than 10m high, the majority of British breeding birds will nest within 2m of the ground (or on the ground) within dense scrub or within holes and other natural and manmade cavities in rocks and walls.

Most bird species take considerably less than 60 days from egg-laying to chick fledging, whilst others, such as barn owl, can take more than 90 days. Many, but not all British species will make multiple breeding attempts if environmental conditions and food availability allow.

3.3.3 Legislation

In Britain, all naturally occurring avian species are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended). The legislation protects all birds, their nests and eggs, and it is an offence to:

- Intentionally kill, injure or take a wild bird;
- Intentionally take, damage or destroy the nest of any wild bird whilst it is in use or being built; and
- Intentionally take or destroy the egg of any wild bird.

In addition, birds listed on Schedule 1 of the Act, such as the red kite (*Milvus milvus*), are afforded further protection, and it is an offence to:

- Intentionally or recklessly disturb the bird whilst nest building or while at (or near) a nest with eggs or young; and

- Disturb the dependant young of such a bird.

3.3.4 Breeding birds - evaluation, impact characterisation and assessment

3.3.4.1 Birds - evaluation

Birds should be considered to be of high national importance as a result of the legislation protecting them.

All the trees and shrubs on the site should be assumed to be used by birds during the breeding season. Within the context of the site, it is considered that birds are of a generally low local (site) ecological importance.

3.3.4.2 Birds - impact characterisation

It is anticipated that a significant amount of the vegetation on the site will be lost to the development; however, the largest mature trees and associated vegetation will be retained, thereby reducing the impact that the development will have.

However, if the removal of vegetation from the site to facilitate the development was to be undertaken during the breeding season, there is the potential for birds to be disturbed, killed or injured and / or their nests to be disturbed, damaged or destroyed.

3.3.4.3 Birds - impact assessment without mitigation

In the absence of mitigation, the removal of vegetation during the breeding season could result in the probable disturbance and destruction of nests and the disturbance, killing and injuring of birds (both adults and juveniles). This would constitute a **potential moderate short term adverse** impact at a **local (site)** level.

3.3.4.4 Birds - mitigation measures

Mitigation will be required and should include (but not be limited to) the following measures:

- All vegetation removal will be minimised through design;
- All vegetation and brash removal should preferentially be undertaken outwith the breeding season i.e. between mid-August / September and April inclusive;
- Any clearance close to the start and end of this period should only be undertaken following an assessment by a suitably experienced ecologist as the breeding season is not fixed and is subject to annual variation;
- Where clearance is required during the breeding season, all areas should be subject to an assessment no more than 48 hours in advance to check for the presence of breeding birds;
- Should evidence of breeding birds, in particularly nests, be recorded, no clearance may be undertaken within 20m of any nest site until such time as the nest is vacated naturally; and

- Any post-development landscaping plan should include the provision of scrub &/or shrub habitats that can be utilised by breeding birds.

3.3.4.5 Birds - impact assessment with mitigation

It is considered that there will be an **unlikely minor short term adverse** impact at a **local (site)** level on breeding birds as a result of the proposed development.

3.3.4.6 Birds - significance of the impact

Without mitigation:

It is considered that the impact would be of a **slight** significance.

With mitigation:

It is considered that the impact will be of a **neutral** significance.

3.3.5 Breeding birds - detailed mitigation

Please refer to section 3.2.4.4 above.

3.3.6 Monitoring & maintenance

Not required.

3.4 Reptiles and amphibians

3.4.1 Summary

No reptile survey was undertaken on the site due to the time of year the visit was carried out; however, a habitat assessment indicated that the site provides only limited suitable habitat for reptiles.

A full trapping and translocation exercise is not considered necessary as long as clearance of the site is undertaken in strict adherence to a method statement designed to prevent harm to reptiles.

3.4.2 Herpetofauna ecology

Reptiles are ectothermic, meaning they have to rely on external heat sources to warm their blood sufficiently to allow foraging and other activity. During the winter they are in brumation (similar to hibernation), emerging in April (or when the temperatures are consistently warm enough). Males tend to emerge before females, to enable them to prepare for mating. Females emerge a few weeks later and mating takes place. Female reptiles in the UK generally breed every other year to allow them to build up sufficient energy reserves. Grass snakes are the UK's only egg-laying reptile, eggs are laid in summer in warm piles of decomposing vegetation (or similar) and left to develop and hatch on their own. Young reptiles are born/hatch in late summer/early autumn. Brumation (hibernation) starts again as temperatures fall in the autumn.

The four more commonly occurring species of reptile in the UK (adder (*Vipera berus*), grass snake (*Natrix natrix*) slow worm (*Anguis fragilis*) and common lizard (*Lacerta vivipara*) have different preferences for habitat and diet. Adders generally prey on small mammals in drier habitats, grass snakes primarily hunt amphibians in wetter areas and aquatic habitats, slow worms take small, slow-moving invertebrates and inhabit drier areas and common lizards prey on small, faster-moving invertebrates and tolerate both wet and dry habitats.

Amphibians in the UK are represented by 4 common species: common frog (*Rana temporaria*), common toad (*Bufo bufo*), smooth newt (*Lissotriton vulgaris*) and palmate newt (*Lissotriton helveticus*). Great crested newt (*Triturus cristatus*) are less common. All require ponds or similar waterbodies to breed in but other than this they spend their life in terrestrial habitats but hiding away during the day and appearing at night to feed on small invertebrates.

3.4.3 Legislation

The four common species of reptiles listed above are protected by the Wildlife and Countryside Act 1981 (as amended) against killing, injury and sale.

Smooth snake (*Coronella austriaca*) and sand lizard (*Lacerta agilis*) are not found in this area, having very specific geographical distribution within Britain, and so will not be referred to in this report despite the higher legislative protection afforded to them.

The four common species of amphibian are also protected by the Wildlife and Countryside Act 1981 (as amended). Great crested newts are protected by the Conservation of Habitats and Species Regulations 2019 (as amended) and the Wildlife and Countryside Act 1981 (as amended).

3.4.4 Results of habitat assessment

Gardens are generally suitable for reptiles as there are varied opportunities for sheltering, hibernation, basking and foraging. However, this potential is perhaps limited by the mature trees surrounding the site and shrubs which result in large shaded areas; the levels of management may have a part on reducing the overall suitability a little.

Amphibians will utilise gardens due to the varied habitats and rich food sources therein. The woodland edge feel to much of the Bolston House garden will suit this group very well. However, there are no waterbodies on the site for them to breed in and while there are ponds in the vicinity, access between them and the gardens may prove problematic.

3.4.5 Herpetofauna - evaluation, impact characterisation and assessment

3.4.5.1 Herpetofauna - evaluation

Reptiles and amphibians are protected by UK legislation and therefore they are of **medium** to **high national** ecological importance. Great crested newts are of **international** ecological importance.

It should be assumed that the site could be used by low numbers of common reptile and amphibian species. It is unlikely that great crested newts are present.

Overall the site appears to be generally of **low** value at a **local (site)** to reptiles.

Due to the suitability of the site (the open nature of the site, shading from trees and shrubs and availability of natural refugia), it is uncertain as to whether a full refugia survey would provide any information other than presence or absence. Therefore, an assumption of presence and undertaking site clearance work in accordance with a method statement is a pragmatic and effective mitigation measure.

3.4.5.2 Herpetofauna - impact characterisation

In the absence of mitigation, it is possible that both reptiles and amphibians may be killed or injured during the clearance for the site.

3.4.5.3 Herpetofauna - impact assessment without mitigation

It is considered that in the absence of mitigation there would be a **probable minor short term adverse** impact at a **local (site)** level.

3.4.5.4 Herpetofauna - mitigation measures

As long as their presence is assumed and site clearance is undertaken in accordance with an appropriate method statement, it is considered that a full trapping and translocation exercise is not required, and that habitat manipulation and denial is an appropriate method of ensuring that reptiles and amphibians are not harmed during the site clearance.

A hibernacula will be created in the north western corner of the site (**Appendix C, Figure 5**; example construction methodology at **Appendix D**) to provide an ecological enhancement for the site as well as a receptor site for any reptiles which might be found during the course of the clearance operation.

Therefore, the following mitigation will be adopted:

- Vegetation clearance, particularly of scrub and bracken habitats, will be minimised wherever possible;
- Clearance will be conducted in accordance with a Method Statement (**Appendix C**) to ensure that should reptiles or amphibians be found in the course of site clearance or any other development activity, they will not be harmed and can be adequately cared for;
- Clearance will be undertaken during the active season (April-October, inclusive);
- Clearance outwith this period should be avoided and is dependent on weather and temperatures being suitable to ensure that animals are likely to be active; and
- Animals will be excluded from entering or re-entering the site during clearance/operational phase of works by ensuring that the site is kept as bare ground i.e. clear of any vegetation or other shelter. If this is not possible, one way fencing may be required.

3.4.5.5 Herpetofauna - impact assessment with mitigation

It is considered that there will be an **unlikely minor short term adverse** impact at a **local (site)** level as a result of the proposed development.

3.4.5.6 Herpetofauna - significance of the impact

Without mitigation:

It is anticipated that the significance of the impact is **slight**.

With mitigation:

It is anticipated that the significance of the impact is **neutral**.

3.5 Detailed mitigation

See section 3.4.5.4 above.

3.6 Monitoring & maintenance

Monitoring will only be required if animals are identified by the ecologist during the clearance operation. A methodology for this will be developed, and agreed with the LPA ecologist, should it be necessary.

4 GENERAL MITIGATION / CONSIDERATIONS

4.1 Induction

All site personnel will be given an induction prior to work commencing to ensure that they are aware of the ecological issues, particularly those relating to bats.

4.2 Enhancements

It is considered that other measures are implemented to provide additional benefits for biodiversity:

1. The areas outwith the red line development boundary will be fenced off from construction activities, plant, machinery and personnel and marked as “no work” zones on drawings and with signs on the fence;
2. A range of bat boxes will be erected on new properties in the development;
3. A range of bird boxes will be erected on new properties within the development;
4. If required, all close boarded / solid fences to have either a 100mm gap between the bottom of the fence and the ground OR a 150mm x 150mm hole at ground level no less than every 10m to allow passage at ground level for hedgehogs and other small mammals;
5. There will be a range of tree and shrub planting undertaken as part of a landscaping scheme; and
6. There will be an area set aside for tree planting outwith the development site.

4.3 Lighting

The lighting design will ensure that there will be no lighting of any retained vegetation, hedge, buffer, habitat corridor or mitigation feature, particularly the bat house unless it is an absolute requirement (due to safety concerns and / or design standards).

Lights in the vicinity of vegetation likely to be used by bats, otters and breeding birds will be positioned carefully, being directed away from those areas wherever possible and provided with baffles and / or shields to prevent light spill onto vegetation and up into the sky.

Lights should preferentially be PIR operated and on timers to reduce the amount of “on time”.

The use of bright security lighting could potentially be avoided by using either infra-red or light gathering cameras.

5 MITIGATION SUMMARY

Ecological feature	Outline mitigation
Statutory sites	<ul style="list-style-type: none"> • Not required
Non-statutory sites	<ul style="list-style-type: none"> • <u>Not required</u>
Trees	<p>All retained trees will be protected from the development by the implementation of root protection areas and other measures as necessary in accordance with BS 5837:2012 Trees in relation to design, demolition and construction.</p> <p>Any tree removal shall be undertaken in accordance with the mitigation measures as applied to breeding birds (section 7.3 below). Wherever possible, trees will be planted to replace those lost. There will be a preference for planting native tree species of as local a provenance as possible.</p> <p>There will be infill boundary tree and hedge planting to ensure that that there will be no net loss of trees from the site</p> <p>There will be an area of tree planting outwith the development site boundary to provide additional mitigation and enhancement of existing habitats.</p>
Bats	<p><u>Temporary mitigation</u></p> <p>Temporary mitigation will not be required as the permanent mitigation will be implemented in advance of any demolition works commencing.</p> <p><u>Permanent mitigation</u></p> <p>A dedicated standalone structure will be provided for use by bats. This will take the form of a structure measuring a minimum of 3m wide x 4m long with a floor to ridge height of approximately 3m, providing a total volume of around 28.8m³. The long axis of the building will be oriented north to south with the northern elevation facing the trees on the western boundary of the site (as per Figure 8).</p> <p>There will be a letter box style access point for lesser horseshoe bats on the northern elevation no less than 600mm wide and 300mm high set in an external opening 600 x 450mm, the base of which will be angled at 45° sloping upwards front to back and lined with aluminium to prevent birds nesting and deter cats. The exterior of the entrance will be fitted with a storm lintel to prevent the worst of bad weather getting in.</p> <p>A no more than 15mm gap along the eaves and gable ends will provide access for crevice dwelling species. Slots (150 x 30mm) will cut into the felt at no less than 1500mm centres immediately above the long elevation wall plates to provide access for crevice dwellers to the gap between the felt lining and slate roof.</p> <p>The building will be of rendered block under a roof of slate over Type 1 bitumen felt on untreated (or tanalised) timbers. There will be a “hot box” at the southern gable end to provide a more sheltered and warmer</p>

Ecological feature	Outline mitigation
	<p>roosting space for horseshoe bats within the roost.</p> <p>Landscape planting around the structure will provide shelter to it. However, there will be no planting of any tree or shrub around it which will result in the roof being shaded. The exception to this would be the planting of one tree of an open canopy form, for example rowan (<i>Sorbus aucuparia</i>). There will be shrub planting along the roadside alongside the northern end of the bat house to help ensure that light from (baffled and shielded) bollards can be shielded from the entrance to bat house. This will be detailed in the separate landscaping design documents.</p> <p>There will be no lighting of the bat roost structure or any of the trees on the western boundary. There is likely to be lighting of the footpath opposite the bat mitigation feature required; this will be bollard style lighting which will be PIR operated and on timers so that the light is on for the least amount of time to ensure safety of pedestrians. The details (e.g. location of bollards, type of lighting, duration of light etc.) will be on a separate lighting drawing.</p> <p>Bat boxes will be erected on house within the development.</p>
Breeding birds	<ul style="list-style-type: none"> • All vegetation removal will be minimised through design; • All vegetation and brash removal should preferentially be undertaken outwith the breeding season i.e. between mid-August / September and April inclusive; • Any clearance close to the start and end of this period should only be undertaken following an assessment by a suitably experienced ecologist as the breeding season is not fixed and is subject to annual variation; • Where clearance is required during the breeding season, all areas should be subject to an assessment no more than 48 hours in advance to check for the presence of breeding birds; • Should evidence of breeding birds, in particularly nests, be recorded, no clearance may be undertaken within 20m of any nest site until such time as the nest is vacated naturally; and • Any post-development landscaping plan should include the provision of scrub &/or shrub habitats that can be utilised by breeding birds. • A range of bird boxes will be erected on houses within the development.
Herpetofauna	<p>A hibernacula will be created in the north western corner of the site (example construction methodology at Appendix D) to provide an</p> <p>Vegetation clearance, particularly of scrub and bracken habitats, will be minimised wherever possible;</p> <p>Clearance will be conducted in accordance with a Method Statement (Appendix C) to ensure that should reptiles or amphibians be found in the course of site clearance or any other development activity, they will not be harmed and can be adequately cared for;</p> <p>Clearance will be undertaken during the active season (April-October, inclusive);</p>

Ecological feature	Outline mitigation
	<p>Clearance outwith this period should be avoided and is dependent on weather and temperatures being suitable to ensure that animals are likely to be active; and</p> <p>Animals will be excluded from entering or re-entering the site during clearance/operational phase of works by ensuring that the site is kept as bare ground i.e. clear of any vegetation or other shelter. If this is not possible, one way fencing may be required.</p>

6 CONCLUSION

Overall the site is of a low - moderate ecological value at a local level despite its size, as it is a previously managed garden and now a disturbed site, the dominance of mature trees and shrub borders and its location in a village centre location.

Impacts on wildlife can be mitigated for as long as the measures outlined above are implemented.

Additionally the provision of the enhancement measures listed above will further add value for biodiversity as part of the development.

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APPENDIX A – LOCATION OF MITIGATION AND ENHANCEMENT FEATURES



APPENDIX B – LANDSCAPE AND TREE PLANTING



Bolston House,
 Bonvilston

**Landscape
 strategy and tree
 planting**

LA.100

Number of Plants	Abbreviation	Species	Specimen Rating	Height	Width
2	AC	Alder	Specimen 20	Clear Stem min. 200cm	100-150cm x 20-25cm
2	ACTF	Alder composite Thicket	To Heavy Standard, clear stem min. 200cm, 1 trunk, B	200-450cm	12-14cm
2	AC	Alder composite Thicket	To Heavy Standard, 1 trunk, B, C, Clear Stem min. 200cm	100-450cm	10-15cm
2	AC	Alder composite	To Heavy Standard, 1 trunk, B, C, Clear Stem min. 200cm	100-450cm	10-15cm
24	BA	Betula pendula	To Heavy Standard, 20-30, Clear Stem min. 200cm	100-450cm	20-30cm
1	CL	Cornus florida	Specimen 10	Clear Stem min. 200cm	100-150cm x 20-25cm
2	LQ	Liquidambar styraciflua	To Standard, clear stem 175-200cm, 1 trunk, B	150-200cm	30-40cm
5	PL	Platanus	To Heavy Standard, 20-30, Clear Stem min. 200cm	100-200cm	20-25cm
15	PSB	Prunus Sarcococca	To Heavy Standard, clear stem 175-200cm, 1 trunk, B	100-450cm	12-14cm
15	PS	Prunus Sarcococca	To Heavy Standard, clear stem 175-200cm, 1 trunk, B	100-450cm	12-14cm
15	PS	Prunus Sarcococca	To Heavy Standard, clear stem 175-200cm, 1 trunk, B	100-450cm	12-14cm
2	PR	Prunus avium	To Heavy Standard, 20-30, Clear Stem min. 200cm	100-200cm	20-25cm
2	PR	Prunus avium	To Heavy Standard, 20-30, Clear Stem min. 200cm	100-200cm	20-25cm
4	SOA	Sorbus aucuparia	To Heavy Standard, clear stem min. 200cm, 1 trunk, B	100-450cm	20-25cm
1	UC	Ulmus	To Heavy Standard, clear stem min. 200cm, 1 trunk, B	100-450cm	10-15cm

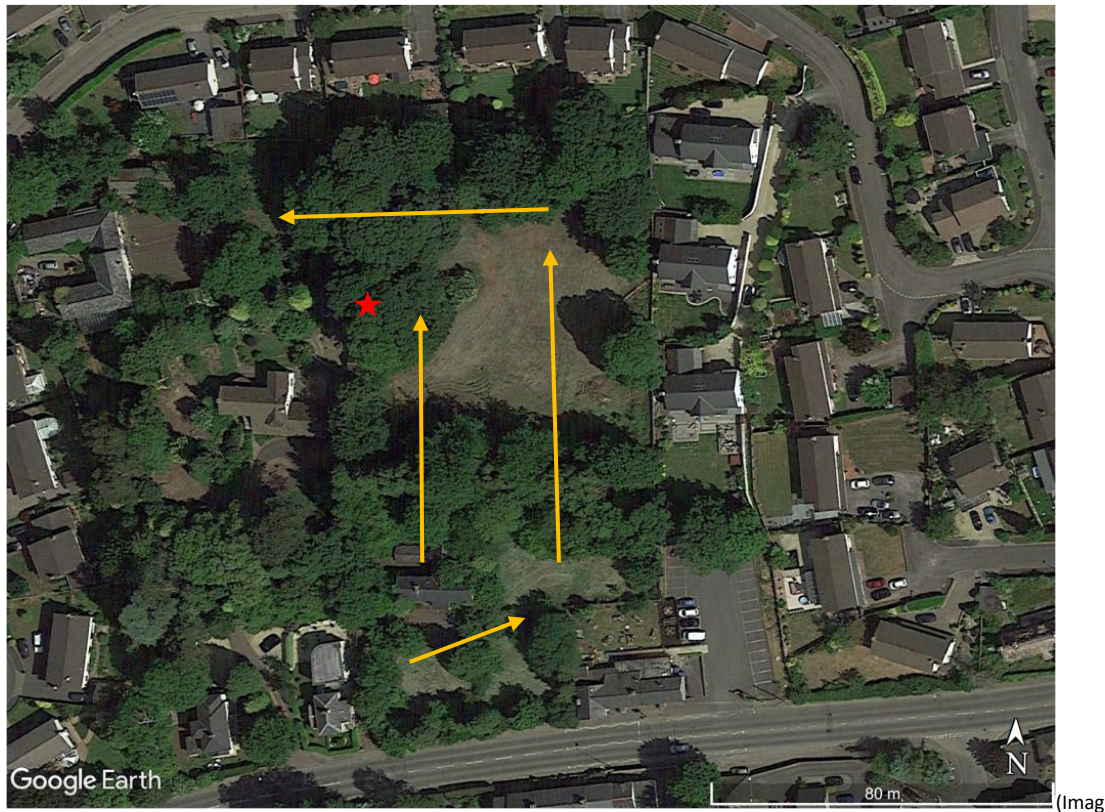
Number	Abbreviation	Species	Height	Width	Percentage Contribution
10	ACTF	Alder composite Thicket	175-200cm	12-14cm	10%
10	ACTF	Alder composite Thicket	175-200cm	12-14cm	10%
10	ACTF	Alder composite Thicket	175-200cm	12-14cm	10%
10	ACTF	Alder composite Thicket	175-200cm	12-14cm	10%
10	ACTF	Alder composite Thicket	175-200cm	12-14cm	10%
10	ACTF	Alder composite Thicket	175-200cm	12-14cm	10%
10	ACTF	Alder composite Thicket	175-200cm	12-14cm	10%
10	ACTF	Alder composite Thicket	175-200cm	12-14cm	10%
10	ACTF	Alder composite Thicket	175-200cm	12-14cm	10%
10	ACTF	Alder composite Thicket	175-200cm	12-14cm	10%



APPENDIX C - METHOD STATEMENT: SITE CLEARANCE & REPTILES

1. Following a habitat assessment, it was considered that the site has the potential to support a (probably) low population of common reptiles and amphibians. The presence of these species should be assumed, hence the need for this Method Statement to ensure that works are carried out in such a way as to avoid harm to reptiles and amphibians.
2. Vegetation will be cleared from directly affected areas only e.g. areas to be built on, used for storage, be part of the construction site or which will form part of the landscaping scheme.
3. Once cleared, the vegetation will be maintained as close to bare ground as possible either by spraying or ongoing repeated cutting using brush cutters with knife blades to ensure that there is no potential for animals to utilise the site after the initial clearance. This is the preferred method as it reduces the potential for killing and injuring of reptiles, amphibians and other animals when using tractor towed flails and mowers. One way fencing will not be required as long as the bare ground / short vegetation habitat is maintained.
4. All arisings will be raked off and spread (creating habitat piles) on unaffected land or as a result of the likely amount of material generated, removed from site for disposal.
5. Where necessary, trees and scrub will be cleared to ground level using a chainsaw with the stem material saved to be used for the creation of a hibernaculum on unaffected land. Stumps and roots will only be removed by machine (under ecological supervision) once the clearance is complete.
6. The orientation of the cutting will be designed to push animals into unaffected areas once the areas for clearance have been identified without having to undertake a full translocation exercise. In this instance, cutting will start at the south end of the site and progress in a north westerly direction (**Figure 5** below).

Figure 5 – Directional cutting of vegetation



(Image courtesy of Google Earth)

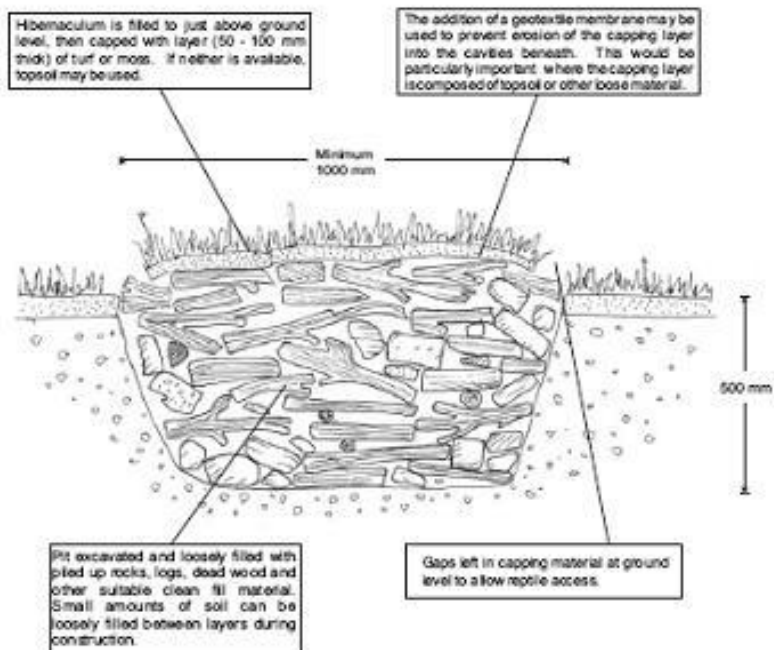
7. Vegetation will be cut in three phases. The first phase will reduce the vegetation height to 75mm; the second will reduce it to ≈ 30 mm; the third phase will reduce the height to as close to ground level as possible. There will be a time delay of 48 hours between the first and second cuts.
8. After clearance, should the vegetation be allowed to regrow above 150mm high, it will be cut and raked as short as possible, ≤ 30 mm wherever possible.
9. Clearance may only take place during the reptile active season.
10. Potential hibernacula will only be cleared while day time temperatures are consistently over 12°C for a period of at least seven days prior as otherwise animals may be killed or injured as a result of inconsistent (low) temperatures (during the day and night) and/or low prey availability. Potential hibernacula will only be dismantled by hand unless the supervising ecologist gives the approval for machine dismantling.
11. If reptiles or amphibians are observed within the clearance area during the works, a decision on how to deal with them will be made on site in light of the conditions on site at the time and the state of the animals themselves. There are three options for dealing with them:
 - It may be possible to leave the animals alone to find their own way into cover, depending on where they are seen, what they are doing and their apparent activity levels; or

- Capture, remove from site and take into temporary captivity until such time as they can be released adjacent to the cleared area (a vivarium has been prepared in case it is required); or
 - Should conditions allow, capture and translocate the animals to a safe area immediately adjacent to the site.
12. Habitat for other species can be identified and avoided by following this method statement.
 13. All vegetation and site clearance will be supervised by a suitably experienced ecologist.
 14. A hibernacula will be created in the location starred at **Appendix A** above.

APPENDIX D - REPTILE HIBERNACULA DESIGN OPTIONS

Hibernaculum on free-draining ground

Where ground conditions allow, the hibernaculum should be incorporated into a shallow pit. This design is more likely to remain frost-free, and will be less obtrusive and thus unlikely to be subject to interference.



Hibernaculum on impermeable ground

Where ground conditions are impermeable, then an 'above-ground' or mounded design should be utilised in order to prevent the hibernaculum from flooding. This design should also be used if it is not possible to excavate a pit for any other reason.

