ecosulis ltd

Registered Office:
The Rickyard
Newton St Loe
Bath BA2 9BT
tel: 01225 874 040
fax: 01225 874 554
email: info@ecosulis.co.uk
web: www.ecosulis.co.uk

Registration No:
372 4176
VAT Registration No:
601216305

Chester Office:
Herons Way
Chester Business Park
Chester CH4 9QR
tel: 01244 893 130

London Office:
2 Sheen Road
Richmond TW9 1AE
tel: 0208 973 2428

Welsh Office:
Y Beudy, Buckholt,
Monmouth
Wales, NP25 5RD
tel: 01600 715 712

MITIGATION STRATEGY FOR LAND AT WITHIES PARK, MIDSOMER NORTON

CLIENT: DAVID WILSON HOMES

OUR REF: DAVWIL-CAUCLO-2728-MS

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DAVWIL-CAUCLO-2728-ES

MITIGATION STRATEGY FOR LAND AT WITHIES PARK, MIDSOMER NORTON

NON-TECHNICAL SUMMARY

Site location and size	Land at Withies Park, Midsomer Norton; 3.67ha
Scope of Works	To consider the key impacts of the proposals on ecological receptors and to provide mitigation measures and biodiversity enhancements (Surveys are on-going for dormouse and horseshoe bats; anticipated to be completed in September 2010. Presence has been assumed for the purpose of this assessment and precautionary mitigation provided)
Purpose of Works	To support a planning application for the development of the site
Overview	The site supports a number of ecological receptors, which would be affected by the proposals, including the River Somer, hedgerows, badger, bats, birds, otter, dormouse, reptiles and amphibians This Strategy identifies key impacts on these receptors; primarily these include the loss of foraging habitats (a small loss), a reduction in habitat connectivity, and disturbance during the construction and operational phases of the development Mitigation is then identified to address these impacts with consideration to the informed masterplan (refer to sections below for a summary of key mitigation)
Recommendations for protection of ecological features of value	Protection measures include: • The retention of the river, woodland, boundary hedgerows and the majority of scrub and trees • Protection fencing around these retained habitats • A Precautionary Method of Working document to be followed for the duration of the construction works and to include a Pollution Control Strategy and Reptile Strategy • Appointment of an Environmental Champion and Ecological Clerk of Works to oversee works • Measures to protect retained trees and hedgerows from root compaction and dust pollution

Key recommendations and other recommendations for enhancement	Mitigation and enhancement measures include: • Retention, creation and enhancement of a river corridor and hedgerow buffers • Appropriately-designed bridge, which spans the river and banks between 4-8m beyond the top of the banks to allow access for mammals, such as badger, bats, otter and dormouse • Appropriate lighting strategy, which is sensitive to retained habitat features (hedgerows and the river corridor and hedger buffers) • Planting strategy that enhances foraging opportunities, maintains connectivity and deters access to sensitive areas (river corridor, for example) and acts to direct wildlife beneath the road • Provision of species-specific features including ten bat boxes on trees, ten built-in bat bricks, ten nest boxes on trees, ten built-in nest features and four reptile refuges • Provision for dormouse mitigation should this species be found present

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1 INTRODUCTION

1.1 This Mitigation Strategy has been produced by **e**co*sulis* ltd on behalf of David Wilson Homes for land at Withies Park, Midsomer Norton, to accompany a planning application for the residential development of this site. The Strategy refers to the baseline ecological conditions at the site from the surveys undertaken to date and provides an assessment of likely impacts from the proposals on the ecological receptors identified, and outlines mitigation measures proposed to offset any negative impacts.

1.2 Surveys have been undertaken by **e**co*sulis* ltd at the site in 2010. A Phase 1 habitat survey and desktop study of the site was undertaken in February 2010, which recommended further surveys for hedgerows, bats, water vole, otter, dormouse, kingfisher, great crested newt (Habitat Suitability Index (HSI) assessment), reptiles and white-clawed crayfish. Members of staff from **e**co*sulis* ltd visited the site in April, May, June and July 2010 to undertake these surveys. The bat activity surveys and dormouse surveys will be completed in September 2010.

1.3 This report does not detail the results of the desktop study and surveys and should therefore be read with reference to the detailed reports themselves (Phase 1 habitat survey report reference: DAVWIL-CAUCLO-2693 and Phase 2 survey report reference: DAVWIL-CAUCLO-2728).

2 NOMENCLATURE

2.1 The common name only of flora and fauna species is given in the main text of this report; however, Latin names are used for species where no common name is available. A full list of all species mentioned in the text is given in Appendix I with their Latin names. All plant names follow the nomenclature of Stace (1997).

3 DEVELOPMENT PROPOSALS

3.1 The development proposals (Planning Layout 13039/5002, Pad Design, July 2010); include the construction of 112 units of residential housing and associated car parking, access roads, paving, landscaping and drainage features. The proposals include the retention of existing boundary hedgerows and provision of at least a 10m wide buffer between the River Somer Site of Nature Conservation Importance (SNCI) and built development. This buffer will incorporate the existing woodland and will contain new grassland and swale features. A 5m grassland buffer will be created along the eastern boundary hedgerow to provide a wildlife corridor and o area of public open space. The majority of the existing trees will be retained. Some mature and semi-mature native and non-native trees and scrub will be removed for the construction of an access road through 100 Withies Park and a new bridge over the River Somer. The trees to be retained are illustrated within a Tree Protection Plan produced by Greenman (Drawing number: 100729-CC-TCP-Rev A-AM (July 2010).

4 ECOLOGICAL RECEPTORS

4.1 The desk study and surveys undertaken have identified the following ecological receptors on or adjacent to the site:

- *River Somer SNCI*: The River Somer forms the western boundary of the site. It is an SNCI and supports: commuting and foraging bats, commuting and foraging otter, and bullhead (the river also provides suitability for white-clawed crayfish, and limited suitability for water vole and kingfisher, but presence not recorded during the surveys)
- *Hedgerows*: One hedgerow on site has been identified as important under the Hedgerow Regulations 1997. The remaining six hedgerows are not considered to be hedges as defined by the Regulations. Six hedgerows are considered UK Biodiversity Action Plan (BAP) priority habitat as they comprise more than 80% native species. Ancient and/or species-rich hedgerows are a Local BAP (LBAP) habitat and as such the one important hedgerow (defined by the Hedgerow Regulations) is considered to be LBAP habitat
- *Badger*: Site is used by badgers for foraging and commuting (no setts known to be present)
- *Foraging and Commuting Bats*: No/low roosting potential on site (building and trees) and low numbers of eight species of bat using the site for foraging/commuting, namely the river corridor and hedgerows. Horseshoe bats are considered to be using the site (in the absence of a full survey data set)
- *Otter*: Otter is using the River Somer as foraging and commuting habitat
- *Dormouse*: Dormouse are considered to be using the hedgerows and adjacent woodland on site (in the absence of full survey results)
- *Birds*: The site has suitability to support nesting birds in the form of woodland and hedgerows. A tawny owl was recorded on site, and the River Somer offers suitable habitat for feeding kingfisher
- *Reptiles and Amphibians*: The site supports an exceptional population of slow worm (peak count of 25 adults has been recorded). Suitable habitat is limited to the margins of the field and the garden. Six common toad were recorded incidentally on site during the reptile survey

- *Fish*: Bullhead (adults and juveniles) were recorded within the River Somer

5 CONSIDERATIONS TO THE IMPACTS OF THE DEVELOPMENT

5.1 Consideration to the impacts of the proposals during both the construction and operational phases of the development with respect to habitats/species is based on the identification of ecological receptors and the proposed site plans (Planning Layout 13039/5002, Pad Design, July 2010).

Designated Sites

5.2 The proposed development will involve the construction of a bridge over the River Somer SNCI at the location of 100 Withies Park (to provide access into the site), which will result in the direct loss of a short section of predominatly scrub habitat, amenity grassland and a few trees (a 10m section). The bridge will be of a suitable design so that it spans the river and extends between 4m and 8m from the tops of the banks (the design will refer to Highway Agency, 1997). Whilst the banks of the river through this section are artificial, being comprised of vertical stone revetment, the sensitive design of the bridge will ensure the existing channel and banks are maintained; therefore, there will be no direct impacts to in-channel habitats.

5.3 There are likely to be indirect impacts to this section of the River Somer due to elevated levels of disturbance from traffic and increased activity across the site during both the constrution and operational phases of development. However, the masterplan incorporates a 10m wide buffer where no built development will occur; only low key recreational activities are expected due to the provision of public open space, The SNCI is currently subject to low levels of recreational pressure and disturbance from the informal bike trail, proximity of a riverside walk along the northern bank and and its proximity to the urban environment to the south and west and playing fields to the north and east. Species associated with the SNCI are therefore likely to be habituated to some level of disturbance; however, the construction works and operational phase is likely to increase such pressures on this river habitat.

Habitats

Hedgerows

5.4 All seven hedgerows bounding the site will be retained, including the western boundary hedgerow, which has been identified as important under the Hedgerow Regulations 1997. The retained hedgerows provide a green corridor around the site, maintaining connectivity with the river corridor and other hedgerows, gardens and recreational playing fields in the surrounding area.

5.5 In the absence of mitigation, the hedgerows are likely to be subject to pollution from dust and run-off and risk of tree root damage from ground compaction during the construction and operational phases of development. Inappropriate management and pressure for removal due to shading effects could risk the long-term future of the trees.

Species

Badger

5.6 The development is likely to cause some disturbance during construction and potential disruption to normal foraging activity should daily migration routes be obstructed (open trenches and construction of the access road over the river, for example). However, this is unlikely to significantly impact the local badger population considering that the key foraging habitat around the site boundaries will be retained. The urban edge location of the site means that badgers using it are likely to be habituated to some levels of disturbance. The road bridge construction will temporarily sever connectivity along the river; however, the retention of hedgerows around the other site boundaries will continue to provide alternative habitat connectivity so that all surrounding foraging habitat will remain available.

5.7 Increased road traffic during construction and operation will increase the risk of road mortalities; however, the retention of the hedgerows around the site will continue to provide a safe passage around the site.

Foraging and Commuting Bats

5.8 The main features used by foraging and commuting bats will be retained within the development, namely the hedgerows, woodland and the river corridor with 10m wide buffer where no built development will occur. However, for avian species, the river corridor could be severed by the creation of a bridge across it for access into the site due to the loss of a 10m section of vegetation. Furthermore, a small area of suitable foraging habitat in the form of scrub and trees within the garden of 100 Withies Park will be removed for the road bridge, contributing to the overall small loss of foraging and commuting habitat.

5.9 Mature trees will be retained either side of the road bridge, which will contribute to provide some continuous canopy cover. An existing commuting route will be maintained by the retention of the hedgerows around the site; therefore, the road bridge could fragment the river corridor habitat but connectivity would still be provided by the boundary hedgerows. Horseshoe bats are likely to be affected most,

as these species are more light sensitive and may be discouraged altogether from using the river corridor as a commuting route. However, the scale of this impact is reduced as the river corridor is already fragmented by a well-lit road bridge at the southern end of the site and also a well-lit footpath that runs along the western river bank. Therefore, whilst the addition of another road bridge will further reduce the suitability of this habitat, it is not considered that it will have a significant impact on its current value to foraging and commuting bats.

5.10 The proposed development will be accompanied by a lighting strategy, which will increase lighting levels overall across the site. However, the western and southern boundaries are already affected by street lighting/lighting from residential housing beyond and as such species using the site are generally those that are more tolerant to lighting, such as common and soprano pipistrelle bats, which have been recorded. These species are unlikely to be significantly affected by the proposals. Indeed, some benefits could be provided compared with the current dominant arable land use, which has characteristically low invertebrate biomass. The addition of elevated artificial lighting could attract invertebrate species and the mosaic of gardens and open space with planted borders and shrubs could also enhance the value of the site for invertebrate prey.

5.11 The woodland along the river and the southern and eastern boundaries of the site are currently less disturbed by light pollution and they offer suitable commuting and foraging for horseshoe bats as well as more common bat species. Unmitigated, lighting proposals could disrupt foraging and commuting bats along these boundaries. There is also potential for lighting over the road bridge to further reduce the suitability of the river corridor to bats.

5.12 There is an abundance of suitable habitat adjacent to the site (hedgerows around recreational fields, the River Somer SNCI and residential gardens) and the low number of bats recorded using the site during the activity surveys undertaken so far (between May and July 2010) indicate that the site is unlikely to contribute significantly to local bat foraging habitats.

Otter

5.13 The construction of the road bridge will result in the temporary disturbance of the river corridor for commuting and foraging otter and could affect habitat connectivity along the river in the longer-term. The operational phase will bring continuous elevated levels of traffic and general disturbance. Unmitigated, otter could be deterred from using this stretch of the river altogether, other than to access less

disturbed stretches of the river. Unmitigated, lighting schemes have potential to increase disturbance to otter along the river; however, the river corridor is already lit along the western boundary by the footpath and the existing road bridge to the south of the site. Pollution from the road bridge construction works could enter the watercourse, which would have a negative impact on fish within the river and therefore an indirect impact on foraging otter.

5.14 During the operational phase, road traffic will increase disturbance along this river section; however, the river is already crossed by a road bridge and the presence of otter signs under the existing bridge indicates that this species is habituated to this level and type of disturbance. An additional bridge, if inappropriately designed so that wildlife is not able to pass beneath, would increase the risk of road mortalities.

Dormouse

5.15 The proposals include the retention of all the boundary hedgerows and woodland, which provides suitable habitat and connectivity for dormouse. A short section of scrub (predominantly bramble) and a few trees within the garden of 100 Withies Close will be removed for the construction of the road bridge, which will result in the direct loss of a very small area of suitable resting and foraging habitat and will fragment the river corridor habitat. However, connectivity will continue to be provided by the boundary hedgerows. The loss of this short section of sub-optimal habitat is unlikely to have a significant impact on dormouse, if present, due to the retention of better quality habitat on site. The vegetation removal for the road bridge is likely to result in a disturbance to dormouse if present. During the operational phase, the bridge could provide a barrier to the movement of dormouse, although connectivity will still be provided by the other boundaries of the site.

5.16 Disturbance from the operational phase of the development, in the form of noise and light pollution, and low key recreational activities, such as dog walking, and increased predation from cats is considered to form the main impacts to dormouse.

Birds

5.17 The construction works will result in the loss of a small area of scrub and a low number of trees within the garden of 100 Withies Park, which provide foraging and nesting habitats for birds. Given the abundance of suitable nesting and foraging habitats within the hedgerows, and woodland and scrub along the river corridor, the proposed development is unlikely to significantly impact on the availability of foraging and nesting habitats for birds. However, the works have potential to disturb nesting birds and destroy nests if present within or adjacent to the works area.

5.18 The proposals include the planting of trees and shrubs within the river corridor and within landscaped areas, which will provide a small area of replacement suitable habitats for birds in the long-term (gardens will also provide additional opportunities for nesting and foraging birds in the long term). The trees over-hanging the river will be retained (except in the location of the proposed road bridge) and will continue to provide suitable perches for kingfisher. The retained mature trees will continue to provide resting sites for tawny owl.

Reptiles and Amphibians

5.19 The proposals will result in the retention of the majority of suitable slow worm and common toad habitats (woodland, majority of the scrub and grassland margin along the eastern site boundary). However, there will be a direct small loss of suitable foraging habitat (a 10m section of grassland field margin) and refugia (a small area of scrub and trees) for the construction of the road bridge. Unmitigated, there is risk of injury and death to reptiles during habitat destruction.

5.20 The grassland margins along the northern, southern and western boundaries of the arable field are likely to be subject to some disturbance during the construction phase (they will form part of the gardens of new residential properties). The site lies adjacent to an abundance of suitable habitats for these species within gardens, recreational grassland and the river corridor and therefore the loss of a small area of suitable habitats is unlikely to significantly affect the conservation status of these species on site or locally.

5.21 Disturbance from the operational phase of the development, in the form of noise and light pollution, and low key recreational activities, such as dog walking, and increased predation from cats is considered to form the main impacts to reptiles.

Fish

5.22 There will be no direct impacts to the river channel from the construction works, as the bridge will be supported on the bank at a distance of approximately 4m-8m from the top of each bank. There is no bankside vegetation through this section, the banks comprise stone revetment and therefore the habitat structure will remain unaffected. Unmitigated, there is a risk of water pollution and sedimentation from the bridge construction works, which could have an indirect impact on fish.

6 MITIGATION

General Mitigation

6.1 A Precautionary Method of Working (PMW) will be drawn up for the site clearance and construction phases to minimise disturbance to wildlife. This will include sensitive timing of works, protection measures for retained and adjacent habitats, specific consideration to protected species (badger, bats, otter, dormouse (if present), nesting birds, small mammals, reptiles, amphibians and fish; see sections below) during site clearance and environmental monitoring during works.

6.2 Consideration will be given to maintaining water quality and pollution control measures within a Construction Environmental Management Plan (CEMP), Pollution Prevention Strategy or within the PMW.

6.3 Prior to any works commencing on site, an Ecological Clerk of Works (experienced ecological advisor, such as **e**co*sulis* ltd) and an Environmental Champion from the site contracting team will be appointed. Their roles will be to ensure that the mitigation detailed here and the works within the PMW are followed, to undertake site inspections and to ensure that any incidents are reported and appropriate action taken.

6.4 Protective fencing will be installed on site to protect retained habitat features (hedgerows, woodland and river corridor and associated buffers) prior to any works commencing on site.

6.5 The appointed Ecological Clerk of Works will visit the site prior to construction commencing to confirm the alignment of exclusion fencing to protect retained habitats and to confirm the areas that will be subject to a working methodology prior to clearance (reptile clearance and nesting bird checks, for example). The Clerk of Works will provide an initial ecological toolbox talk to contractors to ensure the PMW is understood. The PMW will remain on site at all times for reference purposes.

Designated Sites

6.6 The PMW will include measures for the removal of vegetation for the road bridge construction to minimise disturbance to wildlife and the river habitat itself, including appropriate timing of the works, hand searches and supervision by the appointed Ecological Clerk of Works. Measures will also be detailed within the PMW (or CEMP) to ensure that indirect impacts are minimised throughout construction, for example, through the use of dust/silt screens and water quality monitoring.

6.7 A 10m wide strip of land from the top of the river bank to the built development will be retained. This 10m wide buffer will incorporate the existing woodland. The buffer will include grassland and swale features within an area of public open space, which will complement the river corridor habitats. All trees within the buffer will be retained and additional broadleaved trees and shrubs planted to enhance this corridor. Planting will aim to provide a patchy mosaic of scrub, shrubs, trees and grassland. This will have multiple functions: To offer refuge for wildlife using the river corridor (otters and reptiles, for example) that are sensitive to disturbance; to provide areas of high quality foraging for wildlife, such as badgers (use of fruit- bearing species within planting schemes), bat and birds (use of flowering species that attract invertebrates); and to deter access by the public to some areas.

6.8 The buffer between the construction site and the river bank will be fenced off to construction workers. Materials and machinery storage areas will be located away from the river and buffer. Construction works will avoid the period from dusk until dawn to minimise disturbance to wildlife using the river corridor, such as nesting birds and nocturnal species, namely bats, badger and otter. This will be relayed to site workers through the PMW and toolbox talks.

6.9 No lighting is proposed across the road bridge over the River Somer SNCI or within the river buffer. Mature trees either side of the road bridge will be retained and additional trees and shrubs will be planted either side of the bridge and between the proposed housing and the river corridor. These measures will aim to reduce disturbance to wildlife from light spill and recreational activities along the river corridor and will provide compensatory habitat for that removed for the road construction.

6.10 Construction will consider the minimum tree root protection areas for retained trees. These areas will be fenced to make it clear to all construction staff that no works will occur in these areas. Measure will also be taken to protect retained trees from dust pollution, such as dust screens where necessary. Further detail is provided within the Tree Report (Greenman, 2010).

Habitats

Hedgerows

6.11 Construction will consider the minimum root protection areas for retained hedgerows. These areas will be fenced to make it clear to all construction staff that no works will occur in these areas. Measures will also be taken to protect retained

hedgerows from dust pollution, such as dust screens where necessary. Further detail is provided within the Tree Report (Greenman, 2010).

6.12 A 5m buffer will be retained along the hedgerow identified as important under the Hedgerow Regulations (1997) (between the hedge along the eastern boundary and built development). The buffer will be planted with grassland species and will function as public open space.

6.13 Ecological input will be sought for the landscape plans and planting schemes proposed on the site in order to maximise the biodiversity potential of the proposed development. Additional tree planting is proposed within the site and within the hedgerow buffer (eastern boundary), which will provide additional habitat for nesting and foraging birds and improve habitat connectivity and foraging opportunities for bats and invertebrates.

Species

Badger

6.14 To ensure precautions are taken to minimise impacts to badger during construction, an ecological toolbox talk will be provided to site contractors. This toolbox talk will include measures to ensure that badgers are not harmed during construction works. Further detail will be provided in the PMW, but would include ensuring a means of escape for badgers within any trenches left open overnight, such as a plank angled from the bottom of the trench to the top, and sensitive daily working hours (i.e. noisy machinery and construction lighting will not be used after dark to reduce potential disruption to foraging activity).

6.15 The loss of the small area of suitable badger foraging habitat to the development is unlikely to have a significant effect on badger and therefore specific mitigation is not proposed; however, consideration will be given to badger within the planting schemes for the development, for example, by including native fruit and nut-bearing species. Furthermore, a green corridor (hedgerows and associated buffers, river corridor and buffer, and gardens and public open spaces) will be retained/created around the boundaries of the site to maintain habitat connectivity. This also offers benefits to other species for which there are records in the area, such as invertebrates, bats and birds.

6.16 The bridge will be of an appropriate design to allow wildlife passage beneath. The bridge will be designed to span the riverbank providing between 4-8m of bank on either side under the bridge, which would effectively provide a mammal ledge above

high water level. This bridge will be built to the specifications within the Design Manual for Roads and Bridges (Highways Agency, 1997) (refer to the technical drawing of the bridge: Jubb consulting Engineers, P9396/S001/revC, 16 July 2010). Strategic shrub planting (and fencing, as appropriate) will aim to direct badgers along the ledges beneath the bridge with the aim of preventing road mortalities.

Foraging and Commuting Bats

6.17 Enhancement planting within the river corridor buffer (between the proposed housing and the banks of the river, and either side of the road bridge) and within the hedgerow buffer along the eastern boundary, will consist of native broadleaved trees and shrubs, which will provide suitable compensatory foraging habitat for bats in place of the small area of scrub and a few trees within 100 Withies Park. This will also maintain habitat connectivity for bats along the site's key commuting boundaries. The drainage swale within the river corridor buffer will support damp grassland and provide foraging opportunities for bats. The retention of the boundary hedgerows will ensure that commuting features are retained around the site, particularly the retention and enhancement of the eastern boundary, which provided the majority of bat records during the surveys (along with the river corridor). The road bridge could fragment the habitat along the river corridor; however, the retention and planting of further trees, if required, either side of this bridge will ensure a continuous canopy cover and improve connectivity along this section as the trees mature in the long term.

6.18 The bat surveys have recorded a low number of common species of bat using the river corridor for commuting and foraging. The corridor may also be used by horseshoe bats later in the year (August/September). There is a low risk of injury or death to bats from road traffic across the proposed road bridge. It is documented that lesser horseshoe bats fly at low levels (below 1m) when crossing gaps, for example, in hedgerows, where light levels are higher to avoid predation (Schofield, 2009). Furthermore, lesser horseshoe bats are known to readily use culverts or unlit underpasses to negotiate roads (Schofield, 2009), therefore, in reference to the Lesser Horseshoe Conservation Handbook (Schofield, 2009) provision has been made within the road bridge design to include a 1m gap under the bridge (between the bridge and high water level), which is also in accordance with the DMRB guidance (1997). Strategic dense shrub planting within the river corridor buffer on either side of the road bridge, will aim to direct bats to the entrance.

6.19 There will be no lighting along the river corridor buffer (including the area of public open space) and over the new bridge. Lighting along or near to the other boundaries of the site will be directed away from the boundaries themselves. A sensitive lighting design will be implemented on site, which will be in accordance with current CIE publication 150:2003 – guide on the limitations of the effect of obtrusive lighting from outdoor lighting installation and will refer to Bat Conservation Trust Guidelines (2007). This is expected to minimise lighting impacts, however, it is unlikely to remove them completely.

6.20 Consideration will be given to planting schemes to include species of known benefit to bat prey species such as honeysuckle and knapweed.

6.21 A total of ten bat boxes will be erected on five retained trees within the river corridor buffer and a total of ten bat bricks will be incorporated within properties facing the river corridor buffer to provide additional suitable roosting habitat for bats (this will also assist the development in achieving biodiversity gain in line with PPS9). The development proposals will retain and protect the primary features of interest to bats (namely the trees within the river corridor buffer and other boundary features) and overall will provide additional roosting opportunities for bats.

Otter

6.22 The PMW will detail the following measures during construction; Noisy machinery and construction lighting will not be used close to the river corridor buffer after dark to reduce potential disruption to foraging activity; all work trenches left open overnight will include a means of escape for animals, such as a plank angled from the bottom of the trench to the top; and fencing will be erected prior to construction works commencing to delineate a no go area along the river corridor and buffer for construction staff and vehicles (with the exception of the footprint of the bridge).

6.23 Habitat creation and enhancements, including planting within the river corridor buffer will be undertaken prior to commencement of construction, where possible, and will ensure continually suitable habitats are present for otter and will maintain suitable undisturbed areas away from the works. Buffer enhancements will include the planting of patchy scrub along the river to provide cover for commuting otter. A Pollution Prevention Strategy will be developed to manage any pollution run-off should it occur. The river corridor and road bridge will not be lit at night. This will help maintain lighting conditions as near as possible to their current levels.

6.24 To maintain habitat connectivity and reduce risk of road mortality, access under the road bridge will be provided by the retention of 4m-8m of river bank. The bridge will

be built to the specifications within the Design Manual for Roads and Bridges (Highways Agency, 1997) (refer to the technical drawing of the bridge: Jubb consulting Engineers, P9396/S001/revC, 16 July 2010) with respect to the provision of access under the bridge for otter. Appropriate measures will be put in place (strategic planting and fencing, if required) to direct otters underneath the bridge.

Dormouse

6.25 A licence will be sought from Natural England to undertake any works that are likely to affect (damage/destroy) suitable habitat for dormouse, such as tree and scrub removal for the access road, or for works that would disturb or risk killing/injuring dormouse. This would be accompanied by an appropriate mitigation strategy in reference to the Dormouse Conservation Handbook (Bright *et al*., 2006). Mitigation is likely to include some of the following measures:

- A strategy of 'persuasion' to remove dormouse from areas prior to vegetation clearance to avoid disturbance, killing and injuring of dormouse by progressive clearance and allowing the animals to relocate of their own accord
- Clearance in winter to avoid the hibernation period
- Enhancement planting of the river corridor and eastern boundary to provide additional habitat for dormouse and provide some compensation for the small area of sub-optimal habitat (bramble scrub and trees within the gardens of 100 Withies Park) to be removed for the road bridge
- The installation of nest boxes to help dormouse to adjust to newly created or modified habitats and to increase the carrying capacity of the existing habitats
- Additional planting and next boxes will help to bolster the population and improve the populations resilience to a perceived increase in predation by cats
- The road bridge will fragment the habitat along the river corridor; however, the retained boundary hedgerows will continue to provide connectivity around the site. The provision of access for otter and badger under the road bridge will also provide an access route for dormouse under the road. Logs and brash from felled vegetation would be placed along the upper part of the banks under the bridge to provide some cover and improve its attraction to dormouse (as this species typically prefers to remain above ground within trees and scrub)

Birds

6.26 The removal of trees and scrub will avoid the bird nesting season, which is generally from March through to September, inclusive, wherever practicable. If this is not possible a check of the vegetation will be undertaken by an Ecological Clerk of Works prior to removal. Should nesting birds be present they will be left undisturbed until chicks have fledged. Methods for vegetation clearance, including supervision, visual checks and exclusion zones for any active nests (if works are undertaken during the nesting season) will be detailed in the PMW.

6.27 Enhancement planting of the river corridor and eastern boundary hedgerow will provide additional habitat for foraging and nesting birds. In addition, ten bird boxes will be installed on retained trees within the river corridor and ten integral bird nest boxes (such as swift and swallow nest boxes) will be installed on properties around the boundaries of the site.

Reptiles and Amphibians

6.28 To protect reptiles and amphibians present on site, a suitable strategy will be drawn up detailing the protection measures to be put in place with respect to these species groups. The strategy, which could form part of the PMW, would be drawn up in agreement with Bath & North East Somerset Council in advance of ground clearance. The strategy would detail a sequence of works, to include habitat manipulation, destructive searches and supervision works, to enable and encourage reptiles to move to suitable adjacent and undisturbed habitats, or retained and protected habitats on site.

6.29 Enhancement planting of trees, shrubs and grassland within the open space areas along the river corridor and eastern boundary hedgerow will provide compensation for the small area of grassland field margin to be removed for the road crossing. Four hibernacula will be created within the retained woodland, which will provide additional refuge for these species. The drainage swale within the river corridor buffer, will support damp grassland and foraging opportunities for these species. The gardens within the proposed residential housing are also likely to provide additional opportunities for these species in the long term as they mature. The additional habitat creation and refugia will help to maintain the reptile population and improve the population's resilience to any increase in predation by cats.

Fish

6.30 Consideration will be given to maintaining water quality and pollution control measures with the PMW (or CEMP or Pollution Control Strategy).

7 MITIGATION SUMMARY

7.1 Inherent design features and mitigation measures are summarised below:

- A PMW including Pollution Prevention Strategy and Reptile Strategy
- Appointment of an Environmental Champion and Ecological Clerk of Works to oversee mitigation works
- Protective fencing around retained habitat features and other measures, such as dust screens, as required
- Retention, creation and enhancement of river corridor and hedgerow buffers
- Appropriately-designed bridge, which spans the river and banks between 4-8m beyond the top of the banks to allow access for wildlife, such as badger, bats, otter and dormouse
- Appropriate lighting strategy, which is sensitive to retained habitat features (river corridor, hedgerows and associatedbuffers)
- Planting strategy that enhances foraging opportunities, maintains connectivity, deters access to sensitive areas (river corridor, for example) and acts to direct wildlife beneath the road
- Provision of species-specific features including ten bat boxes on trees, ten built-in bat bricks, ten nest boxes on trees, ten built-in nest features and four reptile refuges
- Provision for dormouse mitigation should this species be found present

8 LIMITATIONS

8.1 This report provides a summary of the ecological baseline for the site and an assessment of likely impacts and proposals for mitigation, based on the results of the data searches and ecological field surveys to date and taking into account the proposed site masterplan (Planning Layout 13039/5002, Pad Design, July 2010). This is not a detailed Ecological Impact Assessment.

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Appendix I: SPECIES LIST MENTIONED IN THE TEXT

Fauna	
Common Name	**Latin Name**
Badger	*Meles meles*
Bullhead	*Cottus gobio*
Common toad	*Bufo bufo*
Dormouse	*Muscardinus avellanarius*
Kingfisher	*Alcedo atthis*
Horseshoe bat species	*Rhinolophus sp.*
Lesser horseshoe	*Rhinolophus hipposideros*
Otter	*Lutra lutra*
Slow worm	*Anguis fragilis*
Tawny owl	*Strix aluco*
White-clawed crayfish	*Austropotamobius pallipes*