Malmesbury to Cowbridge; Proposed Traffic-Free Path

Preliminary Ecological Appraisal and Badger Survey

January 2013



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Executive Summary

Sustrans is proposing the improvement of an existing path between Malmesbury and Cowbridge. This path links a section of public footpath on a private road with a public footpath across the River Avon via a disused railway line used informally as a path. This route is approximately 550m between ST 942 869 and ST 944 866.

Two options are proposed for the improvement of the path. Option 1 includes minor repair works and minor re-grading works. Option 2 involves the surfacing of the off-road section of the route (between ST 942 869 and ST 944 866) with tarmac in addition to the minor re-grading works.

In order to provide an initial assessment of the potential ecological baseline of the route and evaluate the impacts of the proposal on ecological features along the route a desk study, Phase 1 Habitat Survey and badger survey were conducted. This report assesses potential impacts on nature conservation sites, habitats and protected or notable fauna.

The proposed route crosses the Bristol Avon River Local Wildlife Site via a footbridge. The proposal includes the construction of new access ramps onto the foot bridge. Construction in close proximity to the River Avon which could, if not conducted in a sympathetic manner, result in siltation or pollution events affecting this designated wildlife site. It is anticipated that this work can be conducted in a sympathetic manner to avoid impacts on the river and it is recommended that a Method Statement be prepared to show how this impact will be avoided.

The main impact of the proposal on habitats is the potential for the River Avon to be affected as previously discussed. Otherwise the impacts on habitats from either route construction option were very limited. In Option 2, introducing hard surfacing in woodlands was identified as having potential to damage the root systems of the trees, although the anticipated damage was mitigated by the fact that the route already comprises compacted earth. A precautionary recommendation is made to minimise impacts to the woodland from the surfacing proposed in Option 2.

Considerations identified relating to fauna were the removal of a small area of bird nesting habitat; the likely presence of water voles in the River Avon; the potential for badgers to build setts in the future, although not currently present; and the low likelihood of dormice being present in the woodland.

Recommendations relating to the timing of works were made to avoid impacts on dormice and nesting birds. Adherence to an appropriate Method Statement for the proposed ramp creation is anticipated to enable impacts on water vole to be avoided, although a survey may be required if this is not the case. A precautionary recommendation has been made to update the badger survey if work does not commence within two years of the current survey.

Current planning policy demands that development projects should include elements of habitat enhancement. Suggestions have been provided that are proportional to the predicted scale of the impact.

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1 Background to Proposals

Sustrans is proposing the improvement of an existing path between Malmesbury and Cowbridge. This path links a section of public footpath on a private road with a public footpath across the River Avon via a disused railway line used informally as a path. This route is approximately 550m between ST 942 869 and ST 944 866 shown in Drawing 1.1.



Drawing 1.1: Proposed Path Creation

Two options are proposed for the improvement of the path. Option 1 includes minor repair works and minor re-grading works, discussed in more detail in Section 5. Option 2 involves the surfacing of the off-road section of the route with tarmac in addition to the minor re-grading works.

In order to provide an initial assessment of the potential ecological baseline of the route and evaluate the impacts of the proposal on ecological features along the route a desk study, Phase 1 Habitat Survey and badger survey were conducted. This report assesses potential impacts on nature conservation sites, habitats and protected or notable fauna.

2 Approach and Constraints

In order to provide an initial assessment of the potential ecological baseline of the route and evaluate the impacts of the proposal on ecological features along the route; a desk study, Phase 1 Habitat Survey and badger survey were conducted. This report assesses potential impacts on nature conservation sites, habitats and protected or notable fauna.

2.1 Desk Study

A desk study was undertaken to determine the presence of any designated nature conservation sites and protected or notable species recorded within 1 km of the proposed path. Records of species within 500m are usually considered to be of greatest relevance and given the limited size and scale of the proposal, a 1km search area was considered an ample area for this study. Consideration has been given in the discussion to those species with a greater range with regards to habitat connectivity and other impacts. The following statutory and non-statutory organisations holding ecological data relating to the survey area were contacted;

- Natural England MAGIC website for statutory conservation sites; and,
- Wiltshire and Swindon Biological Records Centre.

2.2 Habitat Survey

A slow walk over survey of the footprint of the proposed traffic-free route and a 30m buffer either side of this was conducted on 7th August 2012 by Hannah Lewis MIEEM. Given the limited scale of the work proposed, habitats beyond this point were considered unlikely to be affected. Habitats were recorded in and adjacent to the proposed works area using the standard Phase 1 Habitat Survey technique. This is a nationally recognised means for classifying and mapping habitats and was undertaken in accordance with the methodology issued by the Joint Nature Conservation Committee (JNCC, 2010). Supplementary information was also collected such as the presence of invasive species and descriptions of habitat condition, management and other observations that would affect habitat value. During the survey the presence of fauna or their field signs were noted and habitats assessed for their potential to support protected or notable species.

2.3 Badger Survey

A detailed search was undertaken of the route of the proposed traffic free path and a 30 m buffer area along this. Setts and badger field signs (mammal paths, footprints, latrines and hairs) within this area were recorded. An assessment of the status of any setts found was made to determine whether they were in current use or disused and where possible an identification of the sett type made (main, annexe, subsidiary or outlier).

2.4 Assessment

This report includes an assessment of the potential impacts on ecological features from the proposed works. Where impacts are anticipated, the value of the ecological feature and scale of the impact have been assessed. This has been undertaken in accordance with IEEM Guidelines for Ecological Impact Assessment (IEEM 2006). This is considered in light of current ecological legislation and planning policy and so considers impacts on designated nature conservation sites, protected and notable species and landscape scale impacts such as habitat fragmentation. This report therefore makes recommendations regarding what further surveys are required and measures to avoid, mitigate or compensate for ecological impacts.

2.5 Constraints

The survey was conducted at an optimal time of year for habitat surveys and in good weather conditions. This survey was not subject to any significant constraints but it should be noted that a single visit to a site at any time of year will miss a proportion of the species that occur there.

3 Desk Study

3.1 Nature Conservation Sites

A Local Nature Reserve (LNR) and two Local Wildlife Sites (LWS) were identified within 1km of the proposed route and are summarised in Table 3.1 below. No European designated sites (SPA< SAC or Ramsar sites) were identified within 5km of the site.

Site	Proximity to Works	Summary
Bristol Avon River LWS	0m: Route Crosses River	One of the main river systems draining northwest Wiltshire.
Cook's Meadows LWS	700m southeast	A 12ha site comprising two lowland meadows, one of which contains species rich sections and the other includes veteran trees, scrub and a wet flush with <i>Sphagnum</i> .
Conygre Mead LNR	830 m northwest	This site is dominated by grassland including damp and calcareous sections of grassland. Other habitats present include mature willows <i>Salix</i> sp., a pond, woodland, scrub and hedgerow. Notable fauna recorded here includes the rare sawfly <i>Macrophya albipuncta</i> , water vole <i>Arvicola terrestris</i> , grass snake <i>Natrix natrix</i> and slow worm <i>Anguis fragilis</i> .

Table 3.1: Designated Nature Conservation Sites Within 1km of the Proposed Works

Reference to national habitat inventories indicate that no habitats listed on National inventories are present along the proposed route. Traditional orchards, lowland meadows and sites on the Inventory of Woodland and Trees are present within 1km of the proposed works.

3.2 Protected or Notable Species

Information provided by Wiltshire and Swindon Biological Records Centre identified records of a variety of protected and notable species. Those species with statutory protection relevant to the proposed development under the Wildlife and Countryside Act (1981) are listed in Table 2.1.

In addition to the species in Table 2.1, records were provided of species with additional protection in the planning process through inclusion on the list of Species of Principal Importance in the Natural Environment and Rural Communities (NERC) Act. These were three moth species (buff ermine *Spilosoma luteum*, blood vein *Tinandra comae* and mottled rustic *Caradrina Morpheus*), two amphibians (toad *Bufo bufo* and frog *Rana temporaria*), two bird species (house sparrow *Passer domesticus* and yellowhammer *Emberiza citronella*) and hedgehog *Erinaceous europaeus*.

A number of records of plant species were also provided that were notable in the county.

Scientific Name	Common Name	Most Recent Record	Proximity of Closest Record	Number of records	
Inverebrates		•		1	
Austropotamobius pallipes	White clawed crayfish	1996	500m east	3	
Amphibians and reptiles					
Natrix natrix	Grass snake	1983	1km southwest 2		
Triturus cristatus	Great crested newt	1983	1km southwest	1	
Birds					
Alcedo atthis	Kingfisher	2008	700m northwest	5	
Turdus iliacus	Redwing	2008	Within 1km*	1	
Turdus pialris	Fieldfare	1999	1km southeast	1	
Tyto alba	Owl, barn	2008	450m sootheast	2	
Mammals		1		•	
Arvicola terrestris	Watervole	2006	150m north	18	
Chiroptera	Bat species	1991	900m west	3	
Pipistrellus sp.	Pipistrelle species	1998	850m northwest	1	
Plecotus auritus	Brown long-eared bat	1986	750m west	2	
Lutra lutra	Otter	2007	350m south	3	
Meles meles	Badger	2010	400m northwest	14	
Myotis nattereri	Natterer's bat	1995	850m northwest	1	
Rhinolophus hipposideros	Lesser horseshoe	1996	850m northwest	1	
KEY:* Four figure National Grid	Reference provided only.				

 Table 2.1: Species with Statutory Protection Identified in Desk Study

4 Site Survey

4.1 Phase 1 Habitat Survey

A site visit was conducted to the site on 7th August 2012 by Hannah Lewis MIEEM. The proposed path is situated on the embankment top along the former railway and then crosses a cattle pasture to the River Avon via a foot bridge and joining a private road. Habitats recorded are listed below;

- Arable;
- Bare Ground;
- Dense Continuous Scrub;
- Defunct Species-Poor Hedgerow;
- Dry Ditch;
- Buildings and Hard Standing;
- Improved Grassland;
- Running Water;
- Scattered Scrub;
- Scattered Trees;
- Semi-Natural Broadleaved Woodland; and,
- Standing Water.

These habitats are described in more detail and their location is illustrated on Drawing 4.1. Target Notes are used on this drawing and in the text to highlight particular features of note too small to map.

Arable

Some of the fields to the north of the former railway embankment were in use for arable farming.

Bare Ground

An informal footpath was situated along the railway embankment (Plate 4.1). This varied in width between approximately 1 and 3m. It comprised bare earth.

Various locations on the river banks, under shelter at the base of the disused railway embankment and the location where the public footpath cut through the railway embankment comprised bare earth. The ground in these locations was heavily poached by cattle and comprised churned mud. In some locations along the base of the embankment this habitat was waterlogged with many small pools of standing water in the trampled area, none of which appeared permanent.



Plate 4.1: Path Along Embankment Top

Plate 4.2: Poaching at Base of Embankment

Buildings and Hard Standing

At the west, a surfaced road was present through the cattle pasture. A bridge and weir were present at the south (Plate 4.3). The bridge was a narrow footbridge of concrete construction with wooden post and rail fence parapets. This structure was in a good state of repair.



Plate 4.3: Footbridge at South of Route.

Dense Continuous Scrub

Areas of dense continuous scrub were present along the river edge, on the embankment and at the northern and southern end of the route.

At the western end of the embankment, the bank was vegetated with dense bramble *Rubus fruticosus* agg scrub. Further east along the embankment the woodland became scrubbier and is dominated by hawthorn *Crataegus monogyna* and blackthorn *Prunus spinosa*. An open area was also present where scrub dominated the southern bank of the embankment. This comprised bramble, rose *Rosa* sp., elder *Sambucus nigra* and hawthorn.

At the southeast of the route, south of the river Avon, a bank of bramble scrub with sycamore *Acer pseudoplatanus* saplings *was present alongside the route of the proposed path.* Patches of scrub along the river edge included willow *Salix* sp., hawthorn and bramble.

Defunct Species-Poor Hedgerow

A short section of defunct hedgerow, approximately 10m in length, was present as a field boundary between the former railway and river. This comprised hawthorn, bramble, elm *Ulmus* sp. and elder with an ash *Fraxinus excelsior* tree present. Lords-and-ladies *Arum maculatum* was present underneath the hedgerow. A fence and dry ditch were present in association with the hedgerow.

Dry Ditch

A short section of dry ditch was present in association with the defunct hedgerow present as a field boundary between the former railway and river. This ditch was predominantly dry at the time of the survey. Given the saturated condition of the majority of the site and recent heavy rainfall it is therefore anticipated that this ditch does not hold permanent water.

Improved Grassland

The area surveyed was dominated by improved grassland. These were cattle pastures with short swards that were poached and boggy with puddles present. Grass species present included Cock's-foot *Datylis glomerata*, perennial rye-grass *Lolium perenne* and small cats tail *Phleum pratense bertolonii*. Forb species present within the sward included creeping thistle *Ranunculus repens*, white clover *Trifolium repens*, yarrow *Achillea millefoile* and greater plantain *Plantago major*. Occasional ruderal plants were present in the sward such as creeping thistle *Cirsium arvense*.

An area of grassland was also present on the embankment top in a gap in the woodland. This contained similar forb species to the surrounding pasture such as greater plantain, white clover, dandelion and creeping cinquefoil *Potentilla reptans*.



Plate 4.4 and 4.5: Improved Pastures

Running Water

The River Avon was present in the survey area. The river was generally between 10 m and 15 m in width although occasional restrictions were present where the width reduced down to 6m. A weir was present immediately south of the footbridge and the river was approximately 30m in width at this point.

The banks were generally approximately 1m in height. In some places the adjacent improved pastures extended to the waters edge, but for the majority of the river in the survey area large volumes of marginal and emergent vegetation were present. Reed sweetgrass *Glyceria maxima* was

the dominant species in most areas with other marginal species present including figwort *Scrophulariasp.*, water forget-me-not *Myosotis scorpioides*, fools water cressApium nodiflorum, , yellow flag iris*lris psuedacorus* and meadow sweet *Filipendula ulmaria*.

Yellow water lilly *Nuphar lutea* and duckweed *Lemna* sp. were present further into the channel. A large stand of bulrush *Scirpus lacustris* was present towards the western end of the survey area (Target Note 1).

Occasional scattered trees were present along both sides of the river. These were predominantly willow *Salix* sp, but also included ash *Fraxinus excelsior* and alder *Alnus glutinosa*. These included mature and semi-mature specimens. Patches of dense continuous scrub were also present along the river edge, dominated by bramble *Rubus fruticosus* agg.



Plate 4.6 and 4.7: The River Avon Through the Survey Area

Scattered Scrub

Scattered hawthorn were present along the former railway embankment to the northwest of the proposed improved path works.

Scattered Trees

Occasional scattered trees were present along both sides of the river. These were predominantly willow, but also included ash and alder. These included mature and semi-mature specimens. Three mature trees were also situated within the pasture at Target Note 2. These were a mature oak *Quercus robur* and two mature willows, one of which was beginning to lie down and had deadwood and broken branches in the canopy with holes and crevices present. Scattered hawthorn and semi-mature oak were also present along the former railway embankment to the northwest of the proposed improved path works.





Plate 4.8: Scattered Trees within the Pasture

Plate 4.9: Holes and Crevices in Mature Trees

Semi-Natural Broadleaved Woodland

The former railway embankment was vegetated with semi-natural broadleaved woodland. The edges of the woodland appeared to be formed from former defunct hedgerows, now a line of mature hawthorn trees. Hawthorn dominated scrubbier areas and mature ash dominated other areas. A variety of other tree species were present such as sycamore, silver birch *Betula pendula*, beech *Fagus sylvatica* and cherry *Prunus* sp and mature and semi-mature trees were present. Where the canopy was higher, an understorey was present comprising young hawthorn and patches of rose *Rosa* sp. and bramble. The ground flora was dominated by ruderal species such as nettle *Urtica dioica* with some perennial rye grass species such as sorrel *Rumex acetosa,* ground ivy *Glechoma hedera* and herb Bennet *Geum urbanum* also present. The woodland became scrubbier in the east.

Standing Water

A wet flush was present in the improved pasture at Target Note 2. This was in a dip in the topography of the field and was approximately 20cm deep at the time of the survey. This had no associated wetland plants and appeared to be flooded grassland habitat, the weather conditions prior to the survey had included a prolonged period with frequent heavy rain. It is therefore not considered to be a permanent waterbody, but given the topography may frequently hold water in wet conditions.



Plate 4.10: Wet Flush at Target Note 2



Target Note	Description
1	A stand of bulrush within the river.
2	A wet flush in a dip in the topography of the field and was approximately 20cm deep at the time of the survey. Not considered to be a permanent waterbody, but given the topography may frequently hold water in wet conditions. Three mature scattered trees present in close proximity to this point including one mature willow that had deadwood in the crown.
3	Wier and pool to immediate south of footbridge.

Table 4.1: Target Note Descriptions

4.2 Badger Survey

Grazed grassland is a valuable foraging resource for badgers and railway embankments are frequently used for sett building. However, no setts or other signs of badger activity were identified within the survey area.

4.3 Fauna Recorded

A range of bird species were recorded during the site visit including house sparrow *Passer* domensticus, dunnock *Prunella modularis*, house martin *Delichon urbica* and stock dove *Columba* oenas.

A rabbit *Oryctolagus cuniculus* warren was recorded on site. Small deer prints were also noted, probably of muntjac *Muntiacus reevesi.*

5 Discussion

5.1 Proposals

Two options are proposed for the improvement of the path. Option 1 includes minor repair works and minor re-grading works as shown in Drawing 1.1.



Drawing 5.1: Proposed Work For Option 1

Option 2 involves the surfacing of the off-road section of the route (between ST 942 869 and ST 944 866) with tarmac in addition to the minor re-grading works. The tarmac surface would be 3m wide for the majority of its length but would be restricted over the footbridge.

5.2 Nature Conservation Sites

Three designated nature conservation sites were identified within 1km of the proposed works. One of these, Conygre Mead, receives statutory protection as a Local Nature Reserve (LNR). The other sites; Bristol Avon River and Cook's Meadows, were Local Wildlife Sites (LWS) which are locally designated sites that have protection through the Planning System.

Conygre Mead LNR and Cook's Meadows LWS are grassland sites situated 830m and 700m respectively from the proposed works. No impacts are anticipated on these designated site given the limited scale of the proposals and the intervening distances. No recommendations are made in relation to these.

The route crosses the Bristol Avon River LWS via a footbridge; impacts are therefore considered below.

Under Option 1 the only construction work proposed in close proximity to the river banks is the creation of new access ramps onto the foot bridge and the replacement of a bridlegate. The access ramps are understood to measure 5m by 3m, will be situated approximately 4m back from the river edge and can be installed by hand. If this is the case, and measures are taken to ensure no run-off occurs into the river (that could result in siltation or pollution events) then the impacts on the river from the proposed work will be negligible. To ensure this is the case, a precautionary recommendation is provided in Section 6.

Under Option 2 the route either side of the bridge will be resurfaced in addition to the ramps and new gates described above. This additional surfacing will be situated further from the river. Similar controls must be in place to prevent run-off into the river but the impacts are not considered to be significantly greater than with Option 1.

5.3 Habitats

The value of, and anticipated impacts on, habitats occurring within the nature area are discussed in Section 4.2.

The most valuable habitat on site is the River Avon with its associated marginal and aquatic vegetation. This may support a range of notable and threatened species and forms an important feature in the landscape for wildlife. Its value is reflected in its designation as a Local Wildlife Site. Rivers are also sensitive habitats. The potential impacts of the work on this river have already been discussed in Section 5.2 and recommendations made in Section 6.

The mature scattered trees with deadwood also have high ecological value on a local scale. Their maturity means that they could not be replaced and they could support a variety of notable or threatened wildlife such as invertebrates, bats and fungi. These trees will be unaffected by the proposal.

The semi-natural broadleaved woodland will only have developed as a habitat since the railway closed. Woodland is not a frequent habitat in the landscape and those habitat patches present are also small in extent. The woodland further along the railway does connect with other very small remnant copses and so increases the connectivity in the landscape, which was otherwise very low. As it is an uncommon habitat in the landscape it increases habitat heterogeneity in the area. It also contained semi-mature and mature trees that could not readily be replaced and forms a natural corridor for wildlife to move along. Despite its small size and recent origin, this habitat can therefore be considered to have a moderate ecological value at a local level.

Under both construction options there will be some vegetation clearance along the embankment top. Vegetation clearance will be limited in extent as a wide compacted earth path is already present on the embankment top. It will include the clearance of a narrow strip of ground flora alongside the path and occasional small areas of scrub only. No tree removal will be required. An area of scrub at the end of the embankment will be removed to re-grade the slope, but the majority of this habitat will readily re-establish once work is complete. Despite the small area of woodland, this habitat loss is not considered to be significant, particularly as the installation of a fence along the bottom of the embankment will allow ground flora and scrub to develop in areas that are currently poached by cattle. Taking the fencing into consideration, the development may lead to an increase in the naturalness of the woodland and extent of the ground flora. Option 2 will also include surfacing the path. Introducing hard surfacing in woodlands can damage the root systems of the trees, although the anticipated damage resulting from this is mitigated by the fact that the route already comprises compacted earth, which is damaging for root systems itself. The extent to which surfacing will

cause additional damage is therefore unclear but a precautionary recommendation is provided in Section 6.

The other habitats on site are frequently occurring in the local area and have limited potential to support notable species. As such they are considered to have low ecological value. Under Option 1 a very small area of improved grassland will be lost to create the ramps to the footbridge. Under Option 2 a larger area of grassland would be lost, approximately 180m², but this is still a very small proportion of the overall habitat and this habitat loss is not considered to be a significant impact of the proposal.

5.4 Fauna

This section discusses the likelihood of protected or notable fauna occurring at the site and assesses the potential for impacts to occur from the proposed works. This assessment takes into account species with statutory protection and species afforded protection through the Natural Environment and Rural Communities Act (NERC Act, 2006), enforced through the planning process. Where appropriate, other notable species are considered.

This identifies those species that need to be considered further. Mitigation measures or the requirement for further surveys for these are then discussed in Section 5.

Invertebrates

The River Avon could support a variety of riverine invertebrates. Wiltshire and Swindon Biological Records Centre identified records of white clawed crayfish in the Avon 500m east of the proposed works. Although the most recent record was 1996, there is a significant likelihood of this species still being present in the Avon adjacent to the proposed development. Construction work in close proximity to the Avon, if not conducted in a sympathetic manner could cause siltation into the river which may negatively impact crayfish and other riverine invertebrates. As discussed in Sections 5.2 and 5.3, this impact could readily be avoided and recommendations are provided in relation to this impact in Section 6.

The mature trees, particularly the mature willow near Target Note 2 which contained deadwood has high value to invertebrates. No mature trees will be removed as part of the proposal.

Other habitats along the route have limited value to invertebrates and the small scale of the proposals make impacts on notable invertebrates unlikely. There will not be a reduction in the variety of habitats or structural diversity as a result of the proposals.

Amphibians

Wiltshire and Swindon Biological Records Centre identified records of frog, toad and great crested newt within 1km of the proposed works.

The habitats within the survey area are not high quality foraging habitat for amphibians, although the semi-natural habitats along the river edge and the sides of the embankments could be used by foraging amphibians.

In Option 1, the extent of the proposed work is extremely limited and no impacts are anticipated on the long-term conservation status of amphibians, i.e. no loss of ponds, no significant loss of foraging habitat or fragmentation of habitats. Although in Option 2 the proposed work is more extensive, the habitat to be lost was generally of low value to foraging amphibians and again, no long-term impacts on amphibians are anticipated.

Great crested newts have additional protection against harm and injury during the construction process and must be considered in more detail. The record of this species was from 1983 and was situated 1km from the proposed work. This cannot be taken as evidence that this species is not present in ponds closer to the proposed work.

Great crested newts are generally considered to use the terrestrial habitat within 500m of their pond, being found most frequently within a 250m radius. Reference to 1:25,000 Ordinance Survey Mapping and aerial photography identify no permanent ponds within 250m of the proposed route. Four ponds are present on Ordinance Survey Maps between 250m and 500m of the proposed route, although reference to online aerial mapping could not confirm that these ponds are extant. A wet flush was recorded just over 100m to the west of the proposed route but this was thought to be temporary in nature present due to the extended periods of rain had preceded the survey (as discussed in Section 4).

Great crested newts are therefore considered unlikely to be present in the works area. The Natural England Risk Assessment tool indicates that the loss of up to 0.03ha of habitat (the maximum anticipated for Option 2) more than 250m from a pond would be unlikely to result in an offence against great crested newts occurring.

Amphibians, including great crested newts are therefore not considered further in this report.

Birds

A range of bird species were recorded during the site visit including species listed on the RSPB red and amber lists of species of conservation concern; house sparrow, dunnock, house martin and stock dove. The desk study identified records of four bird species present in the area that are afforded additional protection under Schedule 1 of the Wildlife and Countryside Act (1981).

The proposed work (in both options) will not result in significant loss of foraging habitat for birds. Disturbance to breeding birds is the only potential impact of the proposal on birds.

Kingfisher are likely to nest along the River Avon but the banks immediately adjacent to the footbridge were more gently sloping and not likely to be used by nesting kingfisher. No features suitable for barn owl to nest were noted along the route. No disturbance is anticipated to nesting Schedule 1 species.

In both options, the only anticipated clearance of nesting habitat is the clearance of bramble scrub for the creation of the ramp at the west of the route. If conducted in the breeding season this could disturb nesting birds in contravention of current legislation. A recommendation is therefore provided in Section 6.

Mammals (badger)

Wiltshire and Swindon Biological Records Centre identified fourteen records of badger within 1km of the proposed route. Grazed grassland is a valuable foraging resource for badgers and this species is likely to be use the fields around the proposed route. Both options for route improvement works will not result in a significant loss of foraging habitat and will not fragment badger habitats.

Railway embankments are also frequently used for sett building, however, no setts or other signs of badger activity were identified within the survey area.

As such, no impacts are anticipated on badgers, although, as this species does frequently build new setts, and often enlarge rabbit holes for their own use, a precautionary recommendation has been provided in relation to this species in Section 6.

Mammals (bats)

Wiltshire and Swindon Biological Records Centre identified records of four bat species including lesser horseshoe bat.

The disused railway line and river are likely to be used by foraging and commuting bats. The proposal will not result in significant loss of habitat that would affect the amount of foraging habitat or habitat connectivity for bats. No lighting is proposed that could interrupt flight patterns of light sensitive bat species. No impacts are therefore anticipated on foraging or commuting bats.

The scattered trees near Target Note 2 were mature and had features that could be used by roosting bats. These trees will be unaffected by the proposal. The bridge and trees along the former railway embankment were not noted to have features that could be used by roosting bats and will not be affected by the proposal.

No impacts are anticipated on bats from either option.

Mammals (Riparian mammals; otter, water vole and water shrew)

Wiltshire and Swindon Biological Records Centre identified records of otter and water vole within 1km of the proposed work. The river in this location has copious marginal vegetation and is suitable for water vole, otter and water shrew *Neomys fodiens* to be present.

Otters are likely to be present on this stretch of the Avon, however, no impacts are anticipated on this species from the proposed work. Neither option will result in any habitat loss or fragmentation for otter. The risk of disturbance to this species from the construction work and from future users is also considered to be insignificant due to the large home-ranges of otters and their nocturnal habits. No features suitable for use as a holt or resting area were noted in close proximity to the footbridge. No recommendations are therefore made in relation to this species.

The river Avon adjacent to the proposed path provides suitable habitat for water voles and this species had been recorded 150m from this site in 2006. This species is likely to be present in the survey area. The proposed work will not result in the loss of foraging habitat for water vole. Work within close proximity to the watercourse has potential to damage water vole burrows and disturb this species in contravention of current legislation.

Under both options work within 5m of the waters edge will be very limited in scale. The only construction work proposed in close proximity to the river banks is the creation of new access ramps onto the foot bridge. To the south of the foot bridge the banks are not suitable for burrows as they comprise concrete walls along the weir edge. Burrows could be present in the bank under and to the north of the bridge. The access ramps are understood to measure 5m by 3m and will be situated approximately 4m back from the river edge, but closer to the bank top. These can be installed by hand. If this is the case it is anticipated that risks to watervole burrows if present could be avoided through the implementation of an appropriate method statement. A recommendation is provided in Section 6.

The proposals will not result in the loss of water shrew habitat and no impacts are anticipated on this species.

Mammals (Dormice)

Wiltshire and Swindon Biological Records Centre held no records of dormice within 1km of the site and the closest record on freely available online resources is approximately 10 km from the site. It should be noted however that the absence of records cannot be taken as evidence that a species is not present. An assessment of the likelihood that this species being present is therefore made; The woodland on site is suboptimal for this species as it does not have a dense understorey and of the three main species that are important to dormice, no hazel is present, oak is rare and bramble occasional only. However, dormice are known to occur in similar suboptimal habitats.

The entire woodland along the railway corridor is less than 10ha. A woodland of this small size is unlikely to support a population of dormice unless part of a wider patchwork of connected woodlands. This land is only likely to have developed into a woodland since the railway closed and is only likely to have supported dormice since closure if present in adjoining woodlands. The railway corridor does not have high connectivity to other areas of woodland. A single woodland is situated within 500m of the disused railway, Angrove Wood, situated 2.5km south of the survey area. This is a 14ha ancient woodland that could support dormice. The likelihood of dormice (if present) colonising the railway line from Angrove Wood is limited however by the present of the River Avon between the two.

The presence of dormice is therefore considered to be unlikely but cannot be ruled out.

Under both construction options the only clearance of potential dormouse habitat proposed is the clearance of very small areas of scrub at the ends of the embankment to allow re-grading to create ramps and the removal of occasional brambles along the path edge. The majority of this vegetation will re-establish subsequent to the re-grading work. This clearance is not anticipated to result in a significant loss of foraging habitat for dormice in the short or long-term. Given that these areas are also at the ends of the woodland, this clearance will not fragment habitats for dormice moving around the landscape. No impacts are therefore anticipated on the long-term conservation status of dormice from this proposal, however, a precautionary recommendation is made to avoid the risk that dormice, if present, are harmed by the proposal.

Mammals (Other species)

Wiltshire and Swindon Biological Records Centre identified records of hedgehog and field signs deer were also noted during the survey. The proposal will not result in significant habitat loss or fragmentation and so no impacts are anticipated on other mammal species using the land.

Reptiles

Wiltshire and Swindon Biological Records Centre identified records grass snake within 1km of the site. This species has a large range and is likely to occur along the banks of the Avon. Otherwise, the habitats within the survey area had very limited value for reptiles, being either heavily grazed or shaded.

The proposed work will not result in the los of reptile foraging habitat, will not form a barrier to dispersal and is unlikely to result in injury to reptiles. As such reptiles are not a consideration of the proposal.

6 Conclusions and Recommendations

6.1 Nature Conservation Sites

The route crosses the Bristol Avon River Local Wildlife Site via a footbridge. New access ramps onto the foot bridge are to be constructed. Construction in close proximity to the River Avon which could, if not conducted in a sympathetic manner, result in siltation or pollution events affecting this designated wildlife site. It is anticipated that this work can be conducted in a sympathetic manner to avoid impacts on the river. The following recommendation is made;

R1 A Method Statement must be prepared for work within 5m of the river to show how potential impacts will be prevented. This should be developed in consultation with the Local Authority.

6.2 Habitats

The main impact of the proposal on habitats is the potential for the River Avon to be affected by siltation or pollution events. This has already been discussed in Section 6.1. Otherwise the impacts on habitats from either route construction option were very limited. In Option 2, introducing hard surfacing in woodlands was identified as having potential to damage the root systems of the trees, although the anticipated damage was mitigated by the fact that the route already comprises compacted earth. The following precautionary recommendation is provided in relation to hard surfacing in the woodland;

R2 If installing a hard surface through the woodland, consideration should be given to positioning the path further from more mature native trees and using no dig construction and cell-web to protect tree roots from further damage.

Current planning policy demands that development projects should include elements of habitat enhancement. These would not be expected to be out of proportion to the limited scale of the proposal. The proposed fencing along the bottom of the embankment will allow a greater area of natural ground flora and woodland understorey to develop in areas that are currently heavily poached.

6.3 Species

In Section 4, no impacts were identified on notable invertebrates, amphibians (including great crested newts), reptiles or other protected and notable mammal species The following considerations for the proposal were identified;

- Habitat that could be used by nesting birds will be removed.
- Badger setts were not present at the time of the survey but this species is considered likely to be in the area and do frequently build new setts; often enlarging rabbit holes for their own use. They could therefore colonise this embankment in the future.
- Water voles are likely to be present in the River Avon. The proposed work will not result in the loss of foraging habitat for water vole but work within close proximity to the watercourse has potential to damage water vole burrows and disturb this species in contravention of current legislation. The creation of ramps to the footbridge poses a risk to water voles if not conducted in a sympathetic manner.
- The presence of dormice is considered to be unlikely but cannot be ruled out. The proposed work is not anticipated to impact the long-term conservation status of dormice as no

significant habitat loss or fragmentation is anticipated. However, if conducted at the wrong time of year, vegetation clearance to create the ramp at the west of the route could harm dormice (if present).

Recommendations relating to these impacts are outlined below.

R3 A Method Statement should be prepared to ensure that the vegetation clearance for the ramp at the west of the route is conducted in a manner that will avoid disturbance to nesting birds and dormice.

R4 Should work not commence within 2 years of the date of this survey, the badger survey should be updated to confirm that this species has not created a sett within 30m of proposed work. During the construction process, should any holes be noted within 30m of the work that could be attributable to badger, work should cease and advice sought from a suitable experienced ecologist.

R5 The Method Statement outlined in Section 6.1 must also include measures to protect water vole. No work is to be undertaken within 1m of the river, work within 2m would have to be very strictly controlled to prevent risk of damage to water vole burrows and care must be taken for any work within 5m. Should work not be possible in a manner that would avoid damage to burrows if present, a survey for this species, a detailed search for burrows in close proximity to the works and if necessary a Natural England licence may be required.

Current planning policy demands that development projects should include elements of habitat enhancement. These would not be expected to be out of proportion to the limited scale of the proposal. Suitable enhancement measures should be agreed in consultation with the Local Planning Authority and/or nature conservation bodies who can advise on local conservation priorities, however suitable enhancement opportunities for fauna could include the creation of log piles for invertebrates from felled trees, installing bat or bird boxes in the woodland or fencing off areas of the river bank to prevent cattle access and allow a more natural riverside vegetation to establish.

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