Local Nature Recovery Toolkit Appendix II: Description of the natural environment, challenges, constraints and opportunities by area

Explainer

This section breaks down the area covered by the toolkit into 21 areas, and for each of these describes:

- The current state of the natural environment in the area;
- The key issues and challenges facing nature in the area; and
- The constraints to and opportunities for nature recovery in the area.

This detail enables a greater understanding of the factors that have gone into identifying the priorities for nature recovery, and the mapping of focus areas for nature recovery.

Note that the areas used here are not all the same as the sub-areas used to organise priorities for nature recovery. Some of the areas in this appendix have been broken down further to organise priorities, to best reflect where each priority is relevant.

A variety of sources have been used to inform the descriptions in this Appendix. More information on these sources can be found in Appendix V: Evidence used in the development of the Toolkit and how it was interpreted.

Description by Area

North Somerset Levels

Area	10,832 ha
Summary	A large, low-lying and flat floodplain drained by a series of rhynes (ditches), hosting wading birds and rare invertebrates and offering opportunities for restoration of wetland habitat, but negatively affected by freshwater pollution. Also includes the urban area of Weston Super Mare.
Key priority habitats present	Coastal and floodplain grazing marsh
'Crown Jewel' sites	Tickenham, Nailsea and Kenn Moor SSSI Biddle Street, Yatton SSSI Puxton Moor SSSI
Notable species	Lapwing, Redshank, Snipe, Curlew Greater Horseshoe Bat, Lesser Horseshoe Bat Otter, Water Vole European eel 11 nationally notable water beetles including great silver water beetle, hairy dragonfly, water scorpion Fennel-leaved pondweed, frog-bit, rootless duckweed, various stoneworts, whorled water milfoil.
Potential opportunities for nature recovery	Peatland restoration, and associated creation of wet meadow, reedbeds and carr woodland Creation of wetland and reedbed habitats within the floodplain Creation/restoration of floodplain grazing marsh and wet grassland/meadows Reconnection of rivers to the floodplain Targeted reedbed/wetland creation to address urban pollution from Nailsea and pollution from the M5 Modification of barriers in rhynes and ditches to allow passage for eels and other fish Improving management of rhynes and ditches Improving water quality in rivers, streams, rhynes and ditches

Part of National Character Area 142 - Somerset Levels and Moors

Sub-areas used to organise priorities for nature recovery:

- 2 – North Somerset Levels and Moors, and Bleadon Moor
- 3 – Weston Super Mare
- 47 – Lowland peat Gordano Valley and NSLM

Description and current value to nature

The North Somerset Levels is a large area of largely flat, low-lying ground located between Weston-Super-Mare, Clevedon and Nailsea, with the Mendip Hills to the South. Much of the land is grazed or used for hay during the summer, with a series of ditches – known locally as 'rhynes' – draining the land to make it available for agriculture. Before drainage, the land would have likely been wetland habitat, such as 'reed swamps', with a greater overall value to biodiversity but little use for agricultural purposes.

There is over 1,000 ha of peaty soils between Tickenham and Yatton, most of which is part of Tickenham, Nailsea and Kenn Moors (see below), and the rest of the area is naturally wet loamy and clayey soil.

Parts of the Levels host wading birds such as lapwing, snipe and redshank, and numerous nationally scarce invertebrates such as great silver water beetle, hairy dragonfly and water scorpion; Puxton Moor SSSI alone hosts 11 species of nationally notable water species, as well as 65 locally or nationally rare, scare or uncommon plant species[1]. Otters and water vole (on the England red list for mammals) are also present across the Levels. However, populations of wading birds on the Levels and Moors have declined significantly over the last few decades, likely due to agricultural intensification.

The most valuable sites for nature in the area have been designated as SSSIs and SNCIs, primarily for their rich plant and invertebrate communities. The most of extensive of these sites is Tickenham, Nailsea and Kenn Moors at 986 ha (129 ha of which is designated as SSSI). Puxton Moor (235 ha SNCI, of which 31ha is SSSI), part of which is managed by Avon Wildlife Trust, and the land adjacent to Congresbury Yeo (281 ha of SNCI) are the two other most significant designated sites in the area.

Parts of the Levels close to the Mendip Hills and woodlands are also of value for local populations of bats, including the greater and lesser horseshoe, with the rhynes, pastures and hedgerows being used for foraging.

This area also includes Weston-super-Mare, which is urban and suburban in nature, and a small area of woodland (Weston Woods) on a higher piece of land adjacent to Weston-super-Mare.

Issues and challenges for nature

Historic drainage, grassland 'improvements' for agriculture, intensive grazing and a lack of water level management across much of the area means the area of suitable wetland and wet grassland habitat for wading birds, such as lapwing, and other species associated with the Levels has declined.

Additionally, the presence of the invasive American mink may be an obstacle to recovering populations of water volve.

Low in-field water levels on Tickenham and Nailsea Moors during the summer already leads to drying out of peat, which can be expected to worsen as the climate change leads to hotter, dryer summers; it is unknown how this is affecting the ability of the peat to sequester and store carbon. The water levels are managed by the North Somerset levels Internal Drainage Board (IDB) and are currently at a level that the farming community is happy with, which means that peat degradation could continue.

All of the SSSIs in the North Somerset Levels and Moors, which are designated as 'Standing open water and canals', are in 'unfavourable – declining' condition due to freshwater pollution. Pollution in this area comes from both agricultural and urban sources, as well as septic tanks in some areas, and

[1] https://www.avonwildlifetrust.org.uk/nature-reserves/puxton-moor

affects the quality of water in the rhyne network, which impacts on invertebrate communities and further up the food chain. In the southern parts of the Levels and Moors, rapid run-off from the Mendip Hills can often bring a concentrated source of pollution and sediment load.

One of the most damaging sources of pollution is the Nailsea outfall, which carries 70% of surface waters from Nailsea to the Tickenham and Nailsea Moor ditch network. The Yatton outfall is likely to have a similar impact on Kenn Moor, although there currently little information on its impacts.

Poor management of ditches (e.g. fencing off) further reduces their value to biodiversity in some areas. The northern section of Puxton Moor suffers from low water levels in winter due to water being released to avoid flooding, which can lead to drying out of the SSSI-designated ditches.

Additionally, some of the barriers (e.g. gates and sluices) used for maintaining water levels in rhynes prevent passage of eels and other fish through the ditch network.

There are areas of the invasive non-native floating pennywort (hydrocotyle ranunculoides) near Banwell Moor and Weston-super-Mare, which, if allowed to spread, could have highly detrimental effects on freshwater habitats.

The condition of the hedgerows across the levels is variable; although plenty are in a good condition for wildlife, many are poorly managed or were lost during the 20th century, reducing the overall value of the hedgerow network to wildlife.

There has also been a significant amount of maize farming established on the Levels, particularly on the coastal side of the M5, which may exacerbate run-off and pollution.

Although the North Somerset Levels and Moors are part of Flood Zone 2, development on their periphery has placed direct (through habitat loss) and indirect (through urban pollution, light pollution and recreation) pressure on nature.

The M5 motorway runs alongside the valley, and the outfalls from the road are significant sources of pollution from petrochemicals, sediments, nutrients, and vehicle tyres and brakes (which is increasingly being recognised as potentially harmful to freshwater ecosystems[2]) The planned Banwell Bypass could have significant impacts on water quality without appropriate mitigation measures.

Constraints and opportunities

From Clevedon to St Thomas' Head, the Shoreline Management Plan Policy is for 'Managed Realignment' of coastal flood defences. Based on this, the North Somerset Local Plan designates of the area between Weston-super-Mare, Clevedon and the M5 as a 'Coastal Change Management Area' where residential development will not be permitted.

This area will, therefore, be subject to the effects of rising sea levels in the future, and some of it could become permanently or periodically inundated with seawater. However, it is not expected that the shoreline will change significantly over the next decade.[3]

As noted above, there is over 1,000 ha of peaty soils between Tickenham and Yatton, which is relatively scarce across the UK; with raising of the water level, lowland peat restoration offers

[2] https://www.weforum.org/agenda/2022/03/tire-particle-pollution-may-be-harming-freshwater-and-estuary-ecosystems/

[3] Severn Estuary Coastal Group (2021), Shoreline Management Plan 2 Part B Policy Statements: Kingston Seymour

significant opportunities for carbon sequestration, as well as supporting wet meadow, reed bed and carr woodland habitats. As this land is currently drained, it is fertile and largely designated as Grade 2 Agricultural land, although it is largely used for grazing rather than arable farming.

A potential 'middle ground' that would enable continued productivity while reducing the degradation of peat is paludiculture: farming on rewetted peat. This involves raising the water table to achieve wetland conditions, and the farming of appropriate species such as bulrush and farmed sphagnum[4]. However, the commercial growing of such crops in the UK is at an early stage.

Raising water levels in the current ditch system could also help to avoid the drying out of peat during summer, which would at least reduce the rate at which peat degrades.

The low-lying and wet nature of the Levels means the area is suitable for the creation of wetland and reedbed habitats, as well as floodplain grazing marsh (which would require restoring a functioning flood plain), at a scale that would not be possible in many locations. This would benefit the populations of wading birds that have suffered historic declines, among a host of other wetland species, as well as sequestering carbon, improving water quality, and potentially providing natural flood management.

Any re-wetting of the landscape and creation of wetland habitats should benefit the plant and invertebrate communities that are largely confined to rhynes and ditches at present by both providing more habitat and improving water quality. This could also sequester carbon and provide a measure of flood management. However, any rewetting would need to be considerate of the drainage regime and potential impacts on other land.

While large-scale woodland creation is generally not suitable in this area, there WWNP mapping identifies opportunities for riparian woodland creation (including willow pollards) on both the River Kenn and the Congresbury Yeo, which are both lacking in riparian habitat in stretches. Pollarding of willows and other species would also be beneficial along the rhyne network, enhancing habitat connectivity and landscape character.

Restoration of wetland habitat may enable wet woodland to be created. It would also be beneficial for nature and heritage to restore and extend existing orchards, and create new traditional orchards in the area. Thatcher's Cider owns a large area of orchards in the south of the Levels and Moors.

Where drainage is maintained, which will likely be on most of the land, better management of the rhynes and ditches would increase their value to biodiversity, and modifying barriers to allow fish passage would upon up the ditch network to eels and other fishes in the Severn Estuary.

Reducing the amount of agricultural and urban pollution entering the NSLM would help restore freshwater wildlife, as would creating wetland habitats to filter out certain sources of pollution. At the farm level, this could include the creation of grassland buffer strips or semi-natural habitat alongside watercourses, as well as improved manure management, and reduced/sensitive use of pesticides, fertilisers and worming medication.

An opportunity has also been identified to create a Multi-functional Constructed Wetland to the west of Nailsea to reduce the impact of urban pollution coming from the Nailsea outfall. Attenuation/settlement facilities (such as constructed wetlands) at M5 outfall locations would help to reduce the impact of pollution from the M5.

[4] https://naturalengland.blog.gov.uk/2022/09/30/paludiculture-the-future-of-farming-on-peat-soils/

Almost all of the farmed part of the Levels and Moors is Grade 3 land and grazed, with smaller areas of Grade 2 land that are still largely grazed. Restoration of areas of wetland habitat is, therefore, mostly possible without large impacts on the most productive land. More extensive grazing systems, using native cattle breeds, for example, could enable food production to go hand-in-hand with nature recovery.

Any future development near Weston-super-Mare and Nailsea could remove areas of floodplain grazing marsh and/or prevent the future creation of wetland habitat.

Opportunities in Weston-super-Mare itself will largely be those that can take place within an urban/suburban setting, such as tree planting, improving the quality of gardens for wildlife, improved urban drainage, and better managing parks for nature.

Gordano Valley

Area	1,640 ha
Summary	Low-lying floodplain grazing marsh and areas of lowland peat that is mostly drained by rhynes (ditches), including a National Nature Reserve and many wet meadows that provide valuable habitat for wading birds, water vole and otter. This area also includes the industrial area of Bristol Port and the eastern part of Portishead.
Key priority habitats present	Coastal and floodplain grazing marsh Lowland Fen/Peat Purple moor-grass and rush pasture
'Crown Jewel' sites	Gordano Valley NNR Clapton Moor (SNCI) Weston Moor SSSI
Notable species	Lapwing, Redshank, Snipe, Woodcock Otter, Water Vole Great Crested Newt Hairy dragonfly, ruddy darter, variable damselfly, grizzled skipper, grayling Cotton grass, marsh pennywort, yellow sedge, lesser butterfly orchid, frog-bit, fen pondweed, greater spearwort, whorled water-milfoil
Potential opportunities for nature recovery	Peatland restoration, and associated creation of wet meadow, reedbeds and carr woodland Creation of wetland and reedbed habitats Creation/restoration of floodplain grazing marsh and wet grassland/meadows Improving management of rhynes and ditches Improving water quality in rivers, streams, rhynes and ditches

Part of National Character Area 106 - Severn and Avon Vales

Sub-areas used to organise priorities for nature recovery:

- 1 – Gordano Valley
- 42 – Avonmouth and Coastal Industrial Areas
- 47 – Lowland peat Gordano Valley and NSLM

Description and current value to nature

The Gordano Valley refers to the low-lying area between the wooded ridges Tickenham between Clevedon and Portishead and between Clevedon and Easton-in-Gordano. Much of the land here is reclaimed and drained by a series of rhynes (ditches), allowing grazing and a small amount of arable farming in the valley, especially in its northeastern half.

The southwestern end of the valley also incorporates a 162ha SSSI, of which 126ha has been designated as a National Nature Reserve (NNR) for its 'incredibly rich and diverse invertebrate fauna',

variety of flowering plants, and populations of rare birds and mammals[5]. The soil at this end of the Gordano Valley is lowland peat.

The Valley is thought to be the most important site in North Somerset for wet meadows, particularly in the southwest of the Valley, which provide valuable habitat for endangered wetland birds, including lapwing, redshank and snipe, mammals including otter and water vole (on the England red list for mammals), and newts. However, as with the North Somerset Levels and Moors, populations of wading birds on the Levels and Moors have declined significantly over the last few decades.

This area also includes Bristol Port, a largely industrial area with some scrubby areas of value to wildlife.

Issues and challenges for nature

Much of the lowland peat is part of the Gordano Valley NNR or managed by Avon Wildlife Trust, and this part of the valley has a raised water level system (RWLS), which protects peaty soils and benefits biodiversity. However, the land between Weston Moor and Clapton Moor is drained and farmed, potentially putting the peaty soils at risk of degradation (their condition is unknown).

As with the North Somerset Levels and Moors, historic drainage will have removed wetland habitats to enable farming in this area, depleting its overall value to wildlife. This is especially pertinent in the northeastern part of the Valley, where most agriculture is taking place.

Many of the rhynes in the area, if they continue to be used for drainage, are in need of restoration and better management to boost their value to nature. The presence of the invasive American mink may be an obstacle to recovering populations of water volve.

The Gordano Valley water level management plan identified water quality as its biggest threat. The M5 motorway runs alongside the valley, and the outfalls from the road are significant sources of pollution from petrochemicals, sediments, nutrients, and vehicle tyres and brakes (which is increasingly being recognised as potentially harmful to freshwater ecosystems[6]). Additionally, one of the feeder springs to the valley has high nutrient levels, which may be attributable to the golf course in Clevedon.

There is also pollution from livestock and arable farming, including widespread use of herbicides in some areas, and diffuse pollution from livestock. Widespread worming of grazing livestock will reduce the value of their dung to insects and, therefore, birds and bats.

The topography of the coast and the 'hold the line' policy in the relevant Shoreline Management Plans (SMPs) for this area should mean that the Valley is not at risk of coastal flooding in the foreseeable future, which it may otherwise have been.

Constraints and opportunities

With correct management of water levels (i.e. a raised water level system or RWLS), the lowland peatland in the southwestern part of the valley, lowland peat offers significant opportunities for carbon sequestration, as well as supporting wet meadow, reed bed and carr woodland habitats. The

[5] https://www.gov.uk/government/publications/avons-national-nature-reserves/avons-national-nature-reserves

[6] https://www.weforum.org/agenda/2022/03/tire-particle-pollution-may-be-harming-freshwater-and-estuary-ecosystems/

existing NNR and nature reserves owned by Avon Wildlife Trust are already under good management for wildlife and have a RWLS, which could be extended to the rest of the peaty soils.

Elsewhere, the low-lying and wet nature of the Gordano Valley means the area is suitable for the creation of wetland and reedbed habitats, as well as floodplain grazing marsh, at a scale that would not be possible in many locations.

Any re-wetting of the landscape and creation of wetland habitats more widely should benefit the plant and invertebrate communities that are largely confined to rhynes and ditches at present by both providing more habitat and improving water quality. This would also sequester carbon and provide a measure of flood management. However, any rewetting would need to be considerate of potential impacts on adjacent land.

There are also mapped opportunities for reconnecting of rivers in the southwestern part of the Gordano Valley to the floodplain, as well as for riparian woodland creation along rivers in this area as mapped by WWNP.

Water quality may be a limiting factor to improving biodiversity in the area, which would need to be addressed through attenuation/settlement facilities at M5 outfall locations, improved farming practices, and targeted action to address any other significant sources of pollution.

Almost all of the farmed part of the Levels and Moors is Grade 3 land and grazed. Restoration of areas of wetland habitat is, therefore, mostly possible without large impacts on food production.

The industrial area of Bristol Port could integrate some additional measures for nature, such as tree planting, and should maintain the scrubby areas of value to wildlife, but measures for nature recovery here will be limited.

Wooded Ridges and Plateaux (North Somerset)

Area	9,153 ha
Summary	A large area of wooded ridges and slopes winding through North Somerset, with many ancient woodlands, open parklands and wood pasture, and roosting sites for the nationally rare greater horseshoe bat.
Key priority habitats present	Ancient Woodland Semi-natural broadleaved woodland Wood pasture
'Crown Jewel' sites	Ashton Court (SSSI) Leigh Woods (SSSI) Kings Wood and Urchin Wood SSSI (including part of North Somerset & Mendip Bats SAC) Priors Wood Weston Big Wood (SSSI)
Notable species	Greater Horseshoe Bat, Lesser Horseshoe Bat, hazel dormouse Wood Warbler, Marsh Tit, Woodcock, Tree pipit Silver-washed Fritillary, Small Pearl-bordered Fritillary, Dark Green Fritillary, grizzled skipper, Western Wood-vase Hoverfly Herb Paris, Purple Gromwell
Potential opportunities for nature recovery	Improving the condition and management of existing woodlands, including opening up rides and glades and thinning canopy where appropriate Allowing natural regeneration of scrub and woodland close to existing woodlands Creating new, well-managed woodlands that connect existing habitat Creating wood pasture and successional habitats Removing invasive woodland species such as Rhodendron Ponticum Hedgerow creation and improved hedgerow management

Part of National Character Area 118 - Bristol, Avon Valleys and Ridges

Sub-areas used to organise priorities for nature recovery:

- 7 – Avon Rolling Valley Farmland
- 8 – Wooded Ridges and Plateau (North Somerset)
- 9 – Woodland Gap (North Somerset)
- 10 – Long Ashton Vale
- 46 – Other built-up Areas (Portishead and Clevedon)

Description and current value to nature

The wooded ridges and plateau in North Somerset has been defined as the area running from Weston Big Wood (between Portishead and Clevedon), across the Tickenham and Failand Ridges to Leigh Woods and Ashton Court, then southwest to Kings Wood and Urchin Wood SSSI near Bristol airport. It

mostly covers wooded ridges and slopes, although it also has been defined to include the valley between Flax Bourton and Long Ashton, and the 'woodland gap' between Redhill and Blagdon. It broadly corresponds to the Woodland GI Corridors '2' and '3' in the North Somerset GI Strategy.

It is the most extensive area of woodland in the area covered by the toolkit, and includes a significant proportion (around a third) of ancient woodland in the area covered by the toolkit. This network of woodland contains several ancient woodlands of ecological importance, including Weston Big Wood, Prior's Wood, Leigh Woods, and Kings Wood and Urchin Wood SSSI, as well as more open parklands and wood pasture at, for example, Tyntesfield and Ashton Court.

The network of woodland (as well as hedgerows, field trees and surrounding pasture) form an important habitat and corridor for the nationally important populations of greater and lesser horseshoe bats that roost in the area. An area of woodland to the northeast of Congresbury is designated as a SAC for its populations of greater and lesser horseshoe bats.

The area is a stronghold for the seriously endangered local dormouse population, especially around Leigh Woods, Kings Wood and Urchin Wood SSSI, and Goblin Combe[7], as well as scarce small pearl-bordered fritillary and dark green fritillary butterflies. Buglife has also mapped parts of Tickenham Ridge as an 'Important Invertebrate Area' (IIA)[8] due to it supporting the critically endangered Western Wood-vase Hoverfly (Myolepta potens), which is associated with mature broadleaved trees[9].

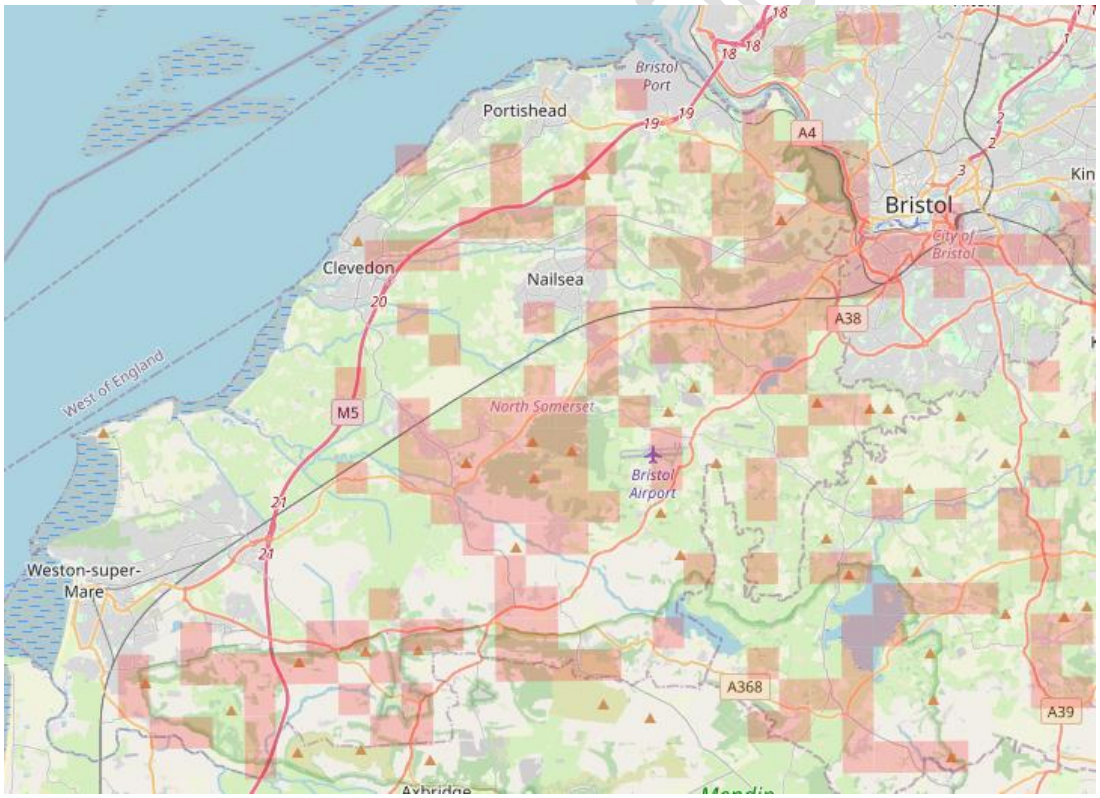

Figure 1 - map of recordings of Lesser Horseshoe bats in North Somerset, demonstrating the importance of the North Somerset Woodland network to this rare species. Source: BRERC Interactive Map, accessed 11/01/2023

[7] North Somerset Council (2021), North Somerset Green Infrastructure Strategy (pg 174)
[8] https://www.buglife.org.uk/our-work/important-invertebrate-areas/
[9] https://cdn.buglife.org.uk/2022/01/Western-woodvase-hoverfly-species-account.FINAL_.pdf

Issues and challenges for nature

As is the case across much of the country, a lack of woodland management is possibly the biggest issue for nature in this area. For example, King's Wood and Urchin Wood SSSI is (as of 2015) in unfavourable condition[10], with only parts of it recovering, failing on a lack of open space, understorey cover, variety of age classes and presence of young trees and saplings.

Compounding this, overpopulation of deer (particularly muntjac deer) can prevent growth of new trees and reduce woodland flora. Records also show the presence of Rhododendron Ponticum and cherry laurel in this area; both of these are problematic invasive species that can be highly damaging to woodland ecology if not managed and eliminated.

Ash dieback is also of concern, with some woodlands in the area made up largely of ash. The extent of tree cover that will be lost is unclear, and the negative impacts of the loss of ash trees may be somewhat offset by the positive impacts from thinning and opening up of woodland.

While there is generally good connectivity in this network of woodland, there are some smaller gaps, and the connectivity with the woodlands on the Mendip Slopes is poor.

Constraints and opportunities

The existing prevalence of woodland offers a good opportunity for improving woodland management where it is not already well-managed; this could significantly improve the area's value to wildlife even without any additional habitat creation. Additionally, there are plenty of opportunities for small areas of new woodland, wood pasture and hedgerow creation/restoration to improve habitat connectivity between existing woodlands.

Existing areas of coniferous woodland could also be managed in a way that improves their value to nature (e.g. through continuous cover regimes). They could also incorporate areas of semi-natural broadleaved woodland to ensure connectivity of woodland habitats.

North Somerset Council has mapped opportunities for improving woodland quality/management and for improving connectivity in their Green Infrastructure Strategy (P172). These include improving the condition of Walton Common SSSI and Gordano Valley SSSI; better connecting the Tyntesfield Plantation and Truckle Wood; and a number of potential woodland corridors that would connect existing areas of ancient woodland.

The West of England Nature Recovery Network (NRN) mapping and North Somerset GI Strategy identify a clear ecological 'gap' between the woodlands on Cleeve Ridge and the wooded slopes of the Mendips, which would make targeted woodland creation, hedgerow creation and restoration etc. here particularly valuable for ecological connectivity.

This could better connect the populations of the greater and lesser Horseshoe bat populations in the Mendip Hills and wooded ridges of North Somerset, as well as better connecting populations of dormice. The North Somerset GI Strategy notes that there is also soil runoff observed in this area during most years, and most of it is also mapped as having opportunities for woodland creation to provide NFM by the Forestry Commission, and so there are opportunities to provide nature-based solutions to water quality and flooding while improving ecological connectivity.

10 https://designatedsites.naturalengland.org.uk/SiteFeatureCondition.aspx?SiteCode=S1005522&SiteName=King%27s%20Wood%20and%20Urchin%20Wood%20SSSI

The best opportunity for connecting these woodlands seems to be to the east of the A38, between Redhill and Blagdon/Rickford, where the gap is 'narrowest', the connectivity of woodland habitats is best, and there is less arable land.

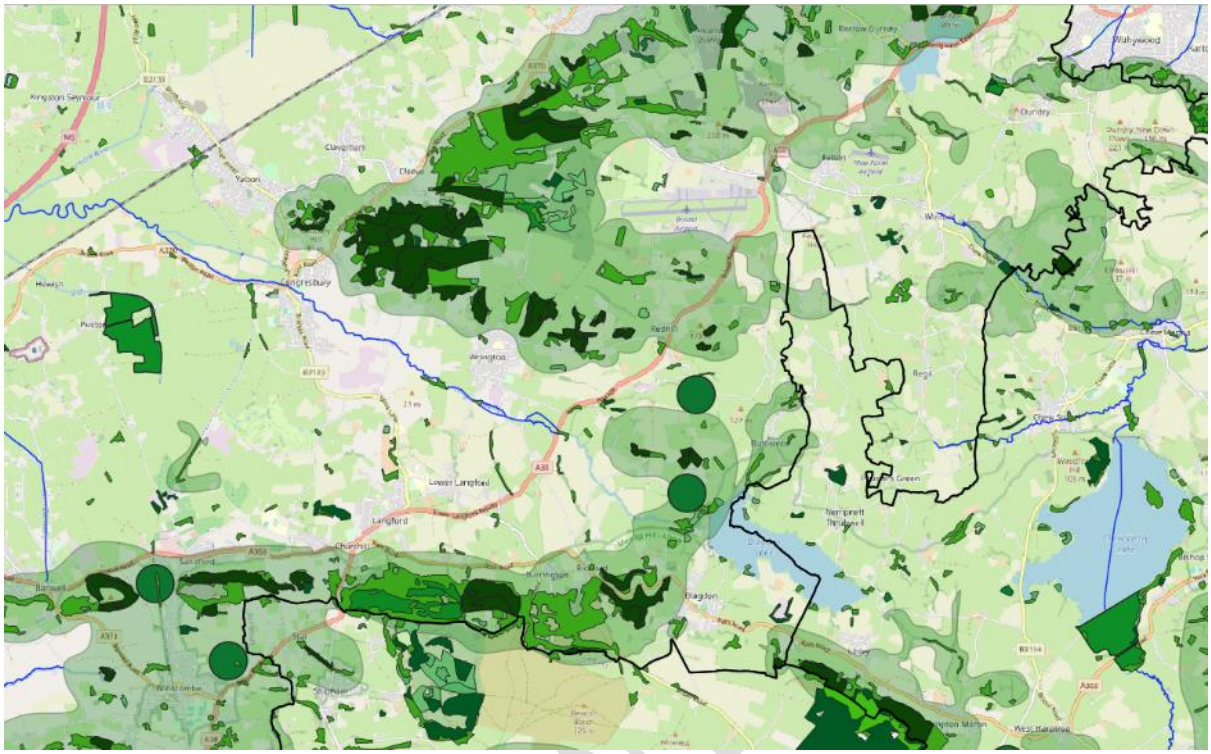

Figure 2 - The 'woodland gap' between the North Somerset wooded ridges and the wooded slopes of the Mendip Hills. Existing woodland is shown in solid green (ancient woodland is dark green); woodland connectivity gaps identified by WENP mapping of the NRN are shown as green circles; and the West of England Strategic Woodland Network is translucent green.

There are also opportunities for riparian woodland expansion and creation along the Land Yeo, which sits in the Valley between the two ridges in this area. This could improve connectivity between existing woodlands, as well as benefit in-river wildlife.

Improving woodland and hedgerow management, and connecting and expanding existing areas of woodland would all benefit the seriously endangered hazel dormouse, as well as the resident species of rare bats, and other threatened woodland species including the fritillary butterflies that are present here.

A fair amount of land in the northern part of this area is owned by National Trust, Avon Wildlife Trust and the Forestry Estate, which provides opportunities for joined up working on nature recovery. A landscape partnership, referred to as 'Bristol and Somerset Downs', is already looking at opportunities within this area.

Most of the land in this area is designated as Grade 3 under the ALC with a scattering of Grade 2; the areas designated as Grade 4 here are largely already woodland. The majority of the land that is used for agriculture is used for grazing, with a significant minority of arable production. This means there should be ample opportunity for connecting areas of woodland through hedgerow creation/restoration, agroforestry and creation of new woodland and wood pasture where appropriate.

The prevalence of invasive species that impact woodland ecology, such as Rhodendron Ponticum, in parts of the landscape could limit opportunities for woodland restoration without effective removal, which can be labour and resource intensive.

The proximity of parts of the area to Bristol Airport means that the potential impact of habitat creation/management on aerodrome safety will need to be considered. For example, anything that increases the number of corvids or gulls within the airport's take-off or approach zones could increase the risk of bird strikes.

Limestone Plateau (North Somerset)

Area	2,103 ha
Summary	A largely flat and open area with a mixture of arable and pastoral farming, and low tree cover. There are few sites here designated for their value to wildlife.
Key priority habitats present	Unimproved calcareous and acid grassland Semi-natural broadleaved woodland
'Crown Jewel' sites	Felton Hill and Common SNCI Barrow and Rock Lane Fields
Notable species	Lesser Horseshoe Bat, Greater Horseshoe Bat,
Potential opportunities for nature recovery	Creation/restoration of calcareous and acid grasslands Creation/restoration of species-rich grasslands, wood pasture and other open habitats, and tall, bushy hedgerows to support foraging horseshoe bats Reducing agricultural pollution from the pleateau to improve water quality in watercourses including the Windford Brook, River Kenn and Land Yeo.

Part of National Character Area 118 - Bristol, Avon Valleys and Ridges

Sub-areas used to organise priorities for nature recovery:

- 12 –Limestone Plateau (North Somerset)

Description and current value to nature

This is an area of open, exposed and relatively flat/gently undulating upland between the wooded ridges of North Somerset and the Chew Valley, with limestone geology.

The land use is a mix of grassland and arable, with almost all of the land in the area classified as Grade 3 and having 'medium' likelihood of being Best and Most Versatile Land for agriculture. There is relatively low tree cover across the area, although there are scattered areas of both semi-natural and plantation woodland, particularly in the northern part of the area. There are also a number of limestone quarries in the north of the area.

Some of the western part of this area forms important foraging habitat for the greater horseshoe bats at Brockley Hall maternity roost, particularly between Bristol airport and Barrow Hill; small areas of woodland and hedgerows are especially important foraging 'highways'.

Other than this, there are few sites in the area designated for their value to wildlife. There are remnant areas of species-grasslands, notably the unimproved calcareous and acid grassland at Felton Common. Other than Felton Common, the only SNCIs in the area are Barrow and Rock Lane Fields, and a few smaller woodlands (Oatfield wood, High Wood, and Hyatt's wood).

Issues and challenges for nature

The main challenges facing nature in this area are those common to the countryside nationally, including intensification of agriculture, pesticide use, the removal or poor management of hedgerows, the loss of marginal areas for wildlife, the loss of field trees, and a lack of woodland management. There is a lack of sizeable habitat managed for nature in this area.

Bristol airport, which is within this area, is a significant source of light pollution, shown to negatively impact insects in particular, as well as noise pollution.

Constraints and opportunities

Where mapping shows the best opportunities to benefit foraging greater horseshoe bats from the Brockley Hall maternity roost, less intensive grazing (including reducing the use of worming medication), tall and bushy hedgerows and field trees would all increase foraging opportunities for bats.

Given the acid limestone soil, there would be opportunities for restoration of unimproved calcareous and acid grassland, ideally building on the existing remnants at e.g. Felton Common.

In the future, quarries that come to the end of their lifespan could be prioritised for nature restoration.

Water on the plateau runs into a number of rivers, including the Winford Brook, River Kenn and Land Yeo. Therefore, action to reduce soil erosion and diffuse phosphorus pollution from farming on the plateau (such as regenerative farming techniques, wildflower buffer strips around fields, the creation of storage ponds and wetland scrapes, etc.) would benefit water quality in these rivers.

The proximity of parts of the area to Bristol Airport means that the potential impact of habitat creation/management on aerodrome safety will need to be considered; for example, anything that increases the number of corvids, gulls, starlings or certain wetland birds could increase the risk of bird strikes.

Countryside in North Somerset

Area	6,939 ha
Summary	A largely flat and open area with a mixture of arable and pastoral farming, and low tree cover. Few sites are designated for their value to wildlife, but pasture, ditches and remaining hedgerows provide important foraging habitat for local populations of rare bats
Key priority habitats present	Orchards Rhynes (ditches) Semi-improved grassland
'Crown Jewel' sites	Brockley Hall SAC (greater horseshoe bat maternity roost) Congresbury Yeo River Kenn
Notable species	Lesser Horseshoe Bat, Greater Horseshoe Bat, Bechstein's Bat
Potential opportunities for nature recovery	Creation/restoration of species-rich grasslands, wood pasture and other open habitats to support foraging horseshoe bats Connecting the 'North Somerset Woodland Network' and the wooded slopes of the Mendips through targeted woodland creation, hedgerow creation/management, establishment of wood pasture etc. Reducing agricultural and urban pollution to improve water quality in rivers and the rhyne/ditch networks on the North Somerset Levels and Moors that they flow into. Renaturalisation (including barrier removal where appropriate) and reconnection to the floodplain of River Kenn, Land Yeo and Congresbury Yeo.

Part of National Character Area 118 - Bristol, Avon Valleys and Ridges

Sub-areas used to organise priorities for nature recovery:

- 4 – Land Yeo and River Kenn floodplain
- 5 – Land Yeo and Kenn Rolling Valley Farmland and Nailsea Farmed Coal measures
- 11 – Colliters Brook Rolling Valley Farmland
- 13 – Congresbury Yeo Floodplain Corridor
- 14 – River Yeo Rolling Valley Farmland
- 46 – Other built-up Areas (Nailsea, Backwell and Yatton)

Description and current value to nature

This area covers the low-lying farmed landscapes of North Somerset that are not part of the Levels and Moors. It is made of up of three non-contiguous areas, separate by the wooded ridges.

This is a largely flat and open area, although, unlike the adjacent Levels and Moors, it is not floodplain (apart from land alongside the River Kenn, Land Yeo and Congresbury Yeo). Most of the area has a mixture of arable and pasture, due to the presence of good quality (grade 1 or 2) agricultural land. The exception is the 'Colliters Brook Rolling Valley Farmland' around Barrow Gurney, which is largely pasture on grade 3 land.

There is low tree cover across the area, with most of it coming from hedgerows and field trees, and the occasional copse or smaller area of woodland.

Much of this area is important foraging habitat for nearby roosting populations of rare bats, particularly greater and lesser Horseshoe bats; hedgerows and ditches are especially important foraging 'highways'. The Brockley Hall maternity roost of greater horseshoe bats is designated as part of the North Somerset and Mendips Bats SAC, and the area of agricultural land surrounding the roost is of particular importance for enabling this population to forage across the landscapes.

Other than this, there are few sites in the area designated for their value to wildlife. The only SNCIs in the area are the 'fields west of Littlewood Lane', the area alongside the River Kenn, and a few small fields close to Nailsea. The Land Yeo and the Congresbury Yeo rivers are the other notable features for their value to nature.

There is a high proportion of the area designated as a GCN Amber Zone, meaning it contains main population centres for GCN and comprises important connecting habitat that aids natural dispersal.

Issues and challenges for nature

As per the developing North Somerset Local Plan 2024-2039, there is likely to be further development close to Nailsea and Backwell in the future, which may lead to loss of habitat that is important for local bat populations. Pollution from Nailsea already impacts water quality, which would be expected to continue in the future without remedial action.

The Congresbury Yeo has a number of river barriers mapped upstream of Congresbury, including the Congresbury Weir, which will present a barrier to fish passage up the river, including to the critically endangered European eel. It is also classed by EA as a Heavily Modified Water Body (HMWB)[11], meaning it does not have the drivers to support restoration of natural processes the same way that other rivers do, particularly downstream of Congresbury.

Although it is rated as having 'moderate' ecological status, it does have high levels of phosphate due to a combination of poor nutrient management in agriculture, point source sewage discharges, and industrial discharges.

The Land Yeo is also heavily modified in sections, including barriers such as weirs and culverts, and re-sectioned and straightened channels. It also suffers from a lack of riparian vegetation and buffer zones, alongside trampling and poaching of the riverbank in numerous locations by livestock. The river is rated as having moderate ecological status up to Yearling Ditch, and poor status beyond that.

Constraints and opportunities

Mapping by North Somerset Council has identified the land that is most important for foraging bats and the best opportunities for habitat creation further improve foraging opportunities, and particularly those in the maternity roost at Brockley Hall. Much of this land is to the south of Nailsea and to the west/northwest of King's Wood and Urchin Wood SSSI, where grassland restoration, hedgerow restoration and creation, and small areas of woodland creation where appropriate would support.

There are good opportunities mapped for both riparian woodland creation and floodplain woodland creation along the River Kenn and Land Yeo, which would provide ecological corridors for foraging

[11] https://environment.data.gov.uk/catchment-planning/WaterBody/GB109052021640

bats (among many other species), improve in-river ecology, and provide flood management. There are also mapped opportunities for floodplain reconnection for both of these rivers, and potentially opportunities for further reedbed /wetland creation in the upper reaches of the Congresbury Yeo to support water quality improvements.

The upper reaches of the Congresbury Yeo catchment are also mapped as having good opportunities for 'Wider Catchment' woodland creation through the Forestry Commission's EWCO data.

A walkover report of the Land Yeo by Bristol Avon Rivers Trust identified numerous opportunities to improve the ecological status of the river, chief of which are fencing of the river to prevent livestock poaching/trampling, increasing buffer zones, and tree planting alongside the river.

Watercress Farm, owned by the Belmont Estate and located in this area, is changing its land management to use extensive grazing of cattle, ponies and pigs to create a more dynamic, naturalised ecology, alongside renaturalisation of part of the Land Yeo and reconnection to the floodplain to 'rewet' the landscape.

The rivers in this area flow into protected rhyne/ditch networks in the North Somerset Levels and Moors, and so catchment-wide efforts to reduce agricultural pollution into watercourses would have benefits both for local rivers and the North Somerset Levels and Moors.

The removal of river barriers or installation of fish/eel passes upstream of Congresbury would better open up the Congresbury Yeo to fish passage (including for European eel) and help to re-naturalise flow, but any barrier removal would need to consider impacts on flooding and drainage. Potential flooding and its impacts on e.g. the A370 would need to be considered when evaluating the feasibility of barrier removal.

As mentioned above, much of the land in this area is well-suited for agriculture, with much of it being classified as Best and Most Versatile Land, or Grade 1 / Grade 2 ALC. This will likely restrict opportunities for large-scale nature recovery in this area.

There will, of course, be opportunities to making farming techniques more nature-friendly (e.g. reducing pesticide use through integrated pest management, use of cover crops), improving the value of hedgerows and other field boundaries for wildlife, providing wildflower strips, and potentially agroforestry.

The proximity of parts of the area to Bristol Airport means that the potential impact of habitat creation/management on aerodrome safety will need to be considered; for example, anything that increases the number of corvids, gulls, starlings or certain wetland birds could increase the risk of bird strikes.

Additionally, any future development near Nailsea would reduce land available for habitat creation but could lead to opportunities to deliver off-site biodiversity net gain in strategic locations.

Avon River and Gorge

Area	1,769ha
Summary	River, which is tidal in its lower reaches, and floodplain with rare fish, invertebrates and a population of beavers. The river provides a wildlife corridor but is heavily modified by humans near urban centres. Also includes the unique Avon Gorge that hosts several endemic and rare trees and wildflowers
Key priority habitats present	River Mudflats Floodplain grazing marsh and wetlands Semi-natural broadleaved woodland
'Crown Jewel' sites	Avon Gorge River Avon Bathampton Meadow (Avon Wildlife Trust site) Conham River Park, Eastwood Farm and Avon Valley Woodland
Notable species	Peregrine falcon Eurasian beaver, Otter European eel, Atlantic Salmon, sea trout Silky wave moth, scarce chaser dragonfly Lodden Pondweed Bristol onion, Bristol rock cress, true service tree, whitebeam (various species)
Potential opportunities for nature recovery	Easement of river barriers in the Avon Restoration and creation of riparian habitat alongside the Avon Creation of floodplain grazing marsh, floodplain woodland or other floodplain habitat such as wetlands Continued protection of endemic species in the Avon Gorge

Part of National Character Area 118 - Bristol, Avon Valleys and Ridges

Sub-areas used to organise priorities for nature recovery:

- 43 – Avon River and Gorge

Description and current value to nature

The River Avon flows through the centre of the area covered by the toolkit, from Freshford in the south east, through Bath and Bristol, and meeting the Severn Estuary at Avonmouth.

The River hosts, amongst much other wildlife, the migratory Atlantic salmon, the critically endangered European eel, otters, beavers, and a strong population of the nationally rare scarce chaser dragonfly. The route of the River is an important corridor for a broader range of wildlife, including mammals, invertebrates and birds, linking up important habitats adjacent to the river such as Bathampton Meadows, Conham River Park and Leigh Woods.

The Avon is tidal up to Hanham Lock, and (especially downstream from Central Bristol) the exposed mudflats at low tide provide valuable habitat for wading birds such as redshank and lapwing and numerous species of gulls.

The Avon Gorge is a truly unique feature for wildlife, as well as for geology and landscape. For starters, there are two endemic (only found in the Gorge) species of whitebeam; the largest population of true service tree in Britain; a number of nationally rare plants such as Bristol Onion, Bristol rock cress, and Honewort; and the famous peregrine falcons nesting in the sides of the cliffs.

Issues and challenges for nature

The River Avon has moderate ecological status, but suffers from high levels of nutrient pollution from industry, agriculture, sewage misconnections and discharges from wastewater treatment work, which can lead to algal blooms and a loss of wildlife. During heavy rainfall, combined sewer outflows can further increase nutrient pollution and reduce water quality.

New pollutants such as pharmaceuticals, forever chemicals and microplastics are now present in the river and can have far ranging impacts on biodiversity. Climate change and warmer weather presents new challenges for fish and other species, bringing an increased likelihood of algal blooms and a need for riparian shade to keep rivers cool.

However, it is worth noting that some sources of pollution, including from industry and some particularly harmful pesticides, will have significantly decreased in the 20th Century, to the benefit of many species: the recovery from the brink of extinction of the UK's otter population, which suffered a catastrophic decline in the mid-20th Century due to the widespread use of organochlorine pesticides, attests to this[12].

The Avon contains numerous fish barriers, particularly near Bathwick and through Bristol city centre, which present a challenge to migratory fish such as eel and salmon, as well as affecting the wider river ecology. Heavy modification of the River Avon, particularly in Bristol and Bath, also alters flow conditions and presents a further barrier to some wildlife.

The invasive and fast-spreading Himalayan Balsam is present along stretches of the River Avon, which, as well as outcompeting native species, can lead to erosion of river banks when it dies back over winter.

Recreational pressure is also increasing along some parts of the River Avon, from e.g. rowers, walkers, kayakers and boat users, which is more of an issue for some species than others.

Constraints and opportunities

As the Bristol Avon flows through two large urban centres (Bristol and Bath), there will be practical limits to how re-naturalised the river could become locally. Similarly, many of the larger barriers present in the River Avon (such as Pulteney Weir in Bath) would be very expensive and disruptive to remove, and may have impacts on flooding in urban areas; other solutions to provide easement for fish passage would be the most practical solution in many cases.

Improving water quality in the River Avon will be dependent on reducing pollution and run-off across the whole catchment; on the flip side, measures to improve water quality in tributaries of the Avon

[12] Jefferie D.J, et al. (2008) The changing otter population of Britain 1700-1989. Biol. J. Linn, 38: 61-69.

will improve water quality in the Avon as well. Investment from water companies in improved wastewater treatment would also help to reduce pollution load within the river.

There are some mapped opportunities to reconnect the river to the floodplain, for example near Somerdale and upstream of Bath, though many of these are already used for living or recreational space, and the feasibility of these will be dependent on impacts on local communities. However, future rises in river levels may make increase the necessity of enabling flooding of the floodplain in strategic locations). Creation of floodplain woodland or other floodplain habitat is also a possibility between Keynsham and Bath, and upstream of Bath.

Where it does not already exist, restoration and creation of riparian habitat (including riparian woodland) would enhance the Avon's role as an ecological corridor, as well as benefitting river ecology and providing protection against the heating effects of climate change.

The presence of beavers (largely) upstream of Bath could help to improve river ecology by restoring natural processes to the river, although they would likely be able to make a greater difference to the smaller tributaries of the Avon.

It would be difficult and probably not desirable to prevent recreational use of the river; education and mitigation measures would be more productive interventions to reduce the impact of recreation on wildlife.

Severn Estuary

Area	3,753 ha
Summary	An estuary with the second-highest tidal range in the world and one of the largest intertidal habits in the UK, internationally recognised for its value to wading birds and wildfowl, and with the most diverse range of fish species in the country
Key priority habitats present	Mudflats Saltmarsh Coastal sand dunes Marine
'Crown Jewel' sites	Severn Estuary SSSI
Notable species	Bewick's swan, white-fronted goose, shelduck, gadwall, dunlin, redshank, curlew European eel, Atlantic Salmon, sea trout
Potential opportunities for nature recovery	Restoration and creation of intertidal saltmarsh habitat and mudflats Managed realignment of coastal flood defences to create new intertidal habitat where consistent with flood defence policy

Sub-areas used to organise priorities for nature recovery:

- 45 – Severn Estuary
- 48 – Sand Point

Description and current value to nature

The Severn Estuary is a globally important site for nature, which is reflected in its designation as a Ramsar site – a wetland site considered to be of international importance. With the second-highest tidal range in the world, it provides one of the largest intertidal habitats in the UK (including mudfalats and saltmarsh) and is of particular importance to wading birds and wildfowl, hosting internationally important populations of Bewick's swan, white-fronted goose, shelduck, gadwall, dunlin and redshank.

There are also seven species of migratory fish that pass through the estuary and into local rivers, including sea lamprey, significant numbers of Atlantic salmon and the critically endangered European eel, whose migration route takes it from the Caribbean to our rivers. All in all, the estuary has the most diverse range of fish species[13] and is one of the most important fish nursery sites in the country.[14]

A large proportion of the Estuary's Eastern shoreline is within the area covered by the toolkit (from Weston Super Mare to the border with Gloucestershire), meaning the area covered by the toolkit has a crucial role to play in conserving and enhancing the Severn Estuary for nature. The primary inter-tidal habitats are mudflats and saltmarshes, which are crucial feeding grounds for numerous species of wading birds as well as being significant carbon stores; there are also some areas of marine cliff, and a small area of coastal sand dunes in North Somerset at Uphill (naturally formed) and Sand Point (artificially formed).

Issues and challenges for nature

Much of the coastline has a 'hold the line' flood defence policy in order to protect homes and infrastructure, meaning that the existing shoreline will be maintained using flood defences. Where this is the case, sea level rise is likely to lead to 'coastal squeeze ', whereby inter-tidal habitat is lost due to squeezing between a rising low-tide and flood defences.

There have been repeated proposals for a tidal barrage across the Severn Estuary at various locations, from between Aust and Chepstow all the way to between Ifracombe and the Gower. While this is still very much a proposal and would likely not be constructed in the foreseeable future, such a barrage would have significant impacts on the ecosystem of the Severn Estuary, for example by reducing the inter-tidal area available for wading birds to feed on, although there could be some positive impacts on marine life by reducing turbidity of the water. The extent and magnitude of these impacts would be dependent on location and design, and are uncertain.

Despite these pressures, the abundance of many fish species in the Estuary increased between the 1970s and 1990s, due largely to improvements in water quality and the reduction in presence of heavy metals, and the estuary's species diversity was increasing by around one species every two years a decade ago[15].

[13] Evaluation of the conservation requirements of rarer British marine fishes. Nature Conservancy Council Report No. 1228. (Potts and Swaby, 1991)
[14] The biology and conservation of the fish assemblage of the Severn Estuary (cSAC). Report Number CCW/SEW/08/1. © Countryside Council for Wales (Bird, 2008)
[15] Fish and macro-crustacean communities and their dynamics in the Severn Estuary (Henderson and Bird, 2010)

Constraints and opportunities

Wetland and saltmarsh habitats play an important role in sequestering carbon[16], and emerging research indicates that creation of saltmarsh habitat in the Severn Estuary would sequester a particularly large amount of carbon due to the turbidity of the estuary. This provides opportunities for restoration and creation of intertidal saltmarsh habitat that could be funded through carbon sequestration.

As climate change induces sea level rise, some land close to the coast may become more difficult or uneconomical to protect, especially where it is unpopulated. This may mean managed retreat, enabling the creation of coastal wetland and saltmarsh habitat, is the most viable option in certain locations. In other areas, the need to maintain flood defences will restrict any opportunities for the creation of new saltmarsh or inter-tidal habitat, and may lead to loss of habitat due to coastal squeeze (see above).

The area around the mouth of the River Avon, in particular, is heavily developed, meaning it would not be suitable for restoration of saltmarsh or wetland habitats. This is also true for, e.g., towns such as Portishead, Clevedon and Weston-super-Mare.

Although it is outside of the area covered by the toolkit, the water intake system at Hinkley Point C nuclear power station could have detrimental impact on fish populations in the Estuary.[17] This could have knock-on impacts on the numbers of migratory fish able to reach the Bristol Avon catchment.

[16] https://features.wwt.org.uk/blue-carbon/
[17] https://www.wwt.org.uk/news-and-stories/blog/giant-plughole-threat-to-sea-life-in-uks-largest-estuary

Mendip Hills

Area	4,753 ha
Summary	The northern part of the Mendip Hills AONB, a range of Limestone Hills on the border with Somerset, containing a good mix of ancient woodland, scrub and grassland habitats. A stronghold for many scarce species including the greater horseshoe bat and fritillary butterflies.
Key priority habitats present	Ancient Woodland Acid Grassland Calcareous Grassland Limestone Heath Semi-natural broadleaved woodland
'Crown Jewel' sites	Burrington Combe (SSSI) Dolebury Warren (SSSI) Part of North Somerset & Mendip Bats SAC Hellenge Hill to Loxton Wood Complex (SNCI)
Notable species	Greater horseshoe bat, lesser horseshoe Bat, hazel dormouse Silver-washed fritillary, small pearl-bordered fritillary, dark green fritillary, Duke of Burgundy, grizzled skipper Adder Dartford warbler, marsh tit, nightjar, tree pipit Purple Gromwell
Potential opportunities for nature recovery	Improving the condition and management of existing woodlands on the Northern Slopes, including opening up rides and glades and thinning canopy where appropriate Allowing natural regeneration of scrub and woodland close to existing semi-natural woodlands on the Northern Slopes Connecting existing woodlands on the Northern Slopes through targeted creation of new woodlands, hedgerow creation/management, and other habitat creation Creating and restoring large areas of dynamic mosaic habitats, and open habitats including species-rich grassland

Part of National Character Area 141 – Mendip Hills

Sub-areas used to organise priorities for nature recovery:

- 15 – Mendips north-facing slopes
- 16 – Lox Yeo Valley and Winscombe Vale
- 51 – Bleadon Hill
- 46 – Other built-up Areas (Winscombe)

Description and current value to nature

The Mendip Hills are a range of limestone hills running along Region's borders with Somerset, from Weston-super-Mare in the West to the Frome Valley in the East. The Hills are part of the Mendip Hills Area of Outstanding Natural Beauty (AONB), which also includes the Chew Valley Lake.

There is a significant amount of calcareous grassland in the Mendip Hills, the area of which has declined significant across England, as well as mosaic habitats. The Northern Slopes that are in the area covered by the toolkit are more wooded, and include important areas of ancient woodland. There are also extensive areas of calcareous grasslands, lowland meadows and even lowland fens both on the slopes and the valleys and vales.

This mixture of valuable habitats support rare and threatened species such as greater horseshoe bat (part of the North Somerset & Mendip Bats SAC falls within this area), Dartford warbler, nightjar, hazel dormouse, Duke of Burgundy butterfly, and purple gromwell. The concentration of designated sites (SSSIs and SNCIs) in this area, as shown in the map below, attest to its value for wildlife. Dolebury Warren, managed by Avon Wildlife Trust and home to an array of wildflowers and butterflies, and Burrington Combe, which has a diverse flora and hosts bat populations in several of its caves, are the two largest SSSIs in the area.

More detailed information on the Mendip Hills can be found in the Mendip Hills Nature Recovery Plan.

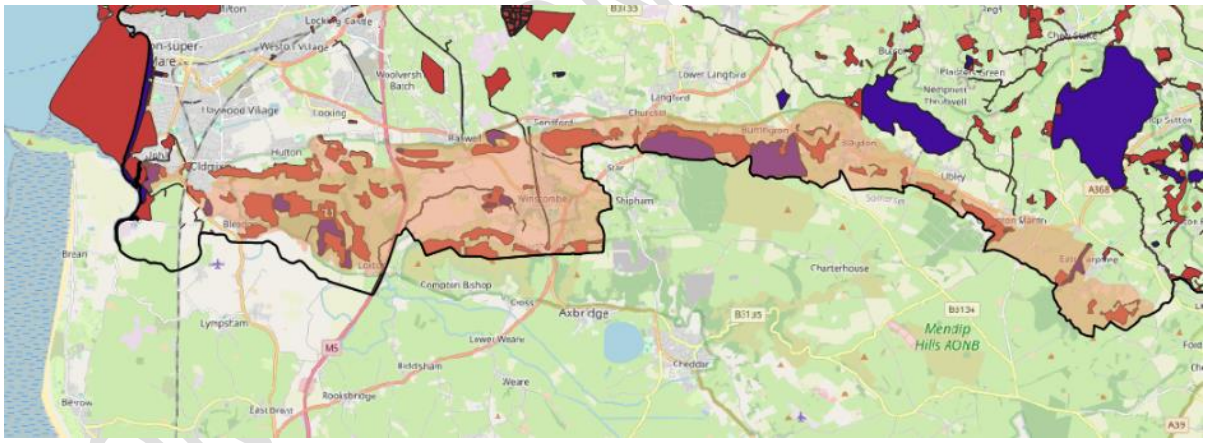

Figure 3 - the concentration of SSSIs (purple) and SNCIs (red) in the Mendip Hills (orange shade) attest to its value for wildlife.

Issues and challenges for nature

The challenges facing nature in the Mendip Hills primarily reflect those experienced nationwide: removal of hedgerows, loss and undermanagement of unimproved grassland sites, and waterway pollution, though less severe than elsewhere in the area covered by the toolkit, have all contributed to nature's decline. Burrington Combe, in particular, is suffering from scrub encroachment, and a lack of woodland management in some woodlands has also decreased their value to wildlife.

The M5 runs through the Mendip Hills between Banwell and Hutton, presenting a barrier to wildlife movement and acting as a source of roadside and noise pollution. There is a planned bypass at

Banwell, which could provide an additional source of disturbance and light pollution, especially to nearby horseshoe bat populations.

Recreational pressure due to high visitor numbers may also be an issue on the northern slopes, and there is some concern over disturbance of bat species through the recreational use of caves.

There has been some planting of conifers in inappropriate locations, including within broadleaved woodland and on the plateau, though most of this is just over the border in Somerset. There is also a significant amount of ash in the woodlands here, meaning ash dieback is of concern.

As in many locations, pheasant releases take place here, which can be damaging when done close to protected sites. Pheasants may also predate adders and negatively affect other wildlife locally, although the evidence on this is not clear[18].

The Lox Yeo river is in moderate ecological condition, thought its invertebrate community and physico-chemical quality are both rated as 'high'. There are, however, flood risk and water quality issues from surface runoff into Burrington Combe from Black Down.

Constraints and opportunities

The location of this area within the Mendip Hills AONB offers opportunities to contribute towards the Mendip Hills Nature Recovery Plan, and potentially access to additional funding for nature recovery. It also means this area is one of the best opportunities for developing ecological connectivity with the wider landscape outside of the area covered by the toolkit.

The prevalence of semi-natural habitat in the Mendip Hills offers significant scope for connecting and expanding existing habitat, and for improving the condition of core sites. This could include a mixture of woodland, grassland and mosaic habitats, depending on the exact location, as the nature of the soil and geology in parts of this area is favourable to restoration of calcareous grassland habitats.

One of the most impactful actions for nature recovery here would be to ensure that existing woodlands are in good management. In some woodlands, sensitive removal of invasive non-native laurel, in particular, and holm oak is also necessary.

Areas of coniferous woodland could also be managed in a way that improves their value to nature (e.g. through continuous cover regimes) and incorporate areas of semi-natural broadleaved woodland to ensure connectivity of woodland habitats. Traditional orchards could also be protected and expanded, which would benefit wildlife as well as local food production.

There are a number of opportunities mapped through the West of England NRN and the North Somerset GI Strategy to improve woodland and grassland connectivity along the slopes, including: linking ancient woodlands at Banwell Wood and around Sandford Quarry; and connecting small fragmented woodlands between two areas of ancient woodland (Chelvey Wood and Bourton Combe).

There are also good opportunities for riparian woodland creation and floodplain woodland creation along and next to the Lox Yeo, which would help improve ecological connectivity in the area as well as improving in-river ecology and reducing flooding. Pond creation in waterlogged areas of fields would also benefit nature as well as slowing the flow of water.

[18] https://www.whatthesciencesays.org/are-released-pheasants-driving-adders-to-extinction/

Reducing light pollution from street lights, roads and residential use would benefit species such as bats and invertebrates, in particular, as well as promoting the dark skies that are characteristic of the Mendip Hills.

These opportunities would all benefit the rare and threatened species in this area, as outlined above.

There are few significant constraints to the creation and restoration of habitats at scale here; for instance, much of the area on the northern slopes of the Mendip Hills is mapped as suitable for woodland creation, which would be true for other habitats, although care is needed not to plant woodland on valuable grassland sites. Any development around Weston-super-Mare and Banwell could disturb wildlife in the Mendip Hills through e.g. light pollution.

The nature of the topology and soil mean that large parts of the area are not highly productive agriculturally (being designated as Grade 4 or even 5 agricultural land), although there are also areas of Grade 1 and 2 land (the most productive). The vast majority of the agricultural land use is for grazing, event on some of the most productive land (possibly due to topology), which offers opportunities for reversion to semi-natural habitats or more extensive grazing.

The designation of the Mendip Hills as an AONB does mean that habitat creation would need to be mindful of potential effects on the landscape. However, one would expect the key actions for nature recovery (e.g. restoration and creation of grassland and mosaic habitats) to enhance landscape quality. Ensuring consistency with the Mendip Hills AONB Nature Recovery Plan would avoid any potential conflicts in any case.

Dundry Hill and Slopes

Area	1,517 ha
Summary	A small area of slopes to the south of Bristol that includes a good mix of thick hedgerows, scrub, small areas of woodland and species-rich grassland.
Key habitats present	Semi-improved grassland Thick hedgerows and scrub Semi-natural broadleaved woodland
'Crown Jewel' sites	Dundry Down (SNCI) East Dundry Slopes (SNCI) South Sundry Slopes (SNCI)
Notable species	Tree pipit
Potential opportunities for nature recovery	Creation/restoration of species-rich grasslands, scrub and dynamic mosaic habitats, in particular on steep slopes Natural flood management interventions to slow the flow of water on steep slopes Improving the condition and management of existing woodlands, including opening up rides and glades and thinning canopy where appropriate Hedgerow creation and restoration

Part of National Character Area 118 - Bristol, Avon Valleys and Ridges

Sub-areas used to organise priorities for nature recovery:

- 21 – Dundry Hills

Description and current value to nature

Dundry Hill is the visually prominent hill and slopes to the South of Bristol, between Barrow in the west and towards Whitchurch in the east. Arable farming is concentrated on the flatter plateaus, with the steeper slopes restricting agriculture to grazing. It is, therefore, a predominately pastoral landscape in the west of the area and a mix of grazing and arable in the east, with fields bordered largely by hedgerows. Many of these hedgerows are well-managed and have a high value for nature.

The area contains a good concentration of sites designated as SNCIs for their value to nature, especially in the South and West of the Dundry Hills. These include Dundry Down and adjacent land, Maes Knoll and Hawkfield Brook, and Whistley Wood. The East Dundry Slopes next to Bristol, Dundry Down, and South Dundry Down are especially notable for their species-rich grassland, hedgerows and scrubby areas.

There is also a scattering of small-to-medium areas of woodland, which is mostly within or close to the aforementioned SNCIs, creating a mosaic of woodland and grassland within the landscape.

The headwaters of the River Malago and Pigeonhouse Stream are on the northern slopes of the Dundry Hills, while the southern slopes host the sources of a number of tributaries that flow into the Chew catchment, including into the Winford Brook.

The geology and soil type (shallow lime-rich soils over chalk or limestone) in much of this area enables the creation of calcareous habitats, including calcareous grassland.

Being so close to many deprived communities in the South of Bristol, this area offers a great opportunity for increasing engagement with nature and improving people's health and wellbeing through access to nature.

Issues and challenges for nature

The North Dundry Slopes, in particular, face recreational pressure and occasional problems associated with anti-social behaviour and fly-tipping. There is also the risk of further habitat loss due to creation of new horse paddocks and associated overgrazing.

In some parts of the area, intensification of farming and poor management of hedgerows has led to habitat loss. As in many areas, ash dieback will likely lead to the loss of many ash trees in the Dundry Hills; the impact of this will be dependent on the extent of loss.

Constraints and opportunities

The steep, grazed slopes in parts of this area that are not already nature-rich are well-suited to habitat restoration or more extensive grazing, due to relative difficulties in farming them; most of the steep slopes are designated as Grade 4 agricultural land and are largely grazed, while the less-steep plateaus is Grade 3.

There are good opportunities for using natural flood management interventions (e.g. cross-contour planting, buffer strips, wetland scrapes and leaky dams) in this area to reduce flood risk, particularly on the steep slopes such as East Dundry Slopes, as well as for riparian woodland creation (as mapped through WWNP). A recent 'Opportunities Report' for the South Bristol rivers (including the Malago and Pigeonhouse) produced by BART identified good opportunities for tree planting and in-stream leaky dams to provide NFM on the northern slopes.

Interventions to reduce soil erosion and run-off will be particularly effective on the steep slopes, benefitting water quality in the River Malago and its tributaries to the north, and tributaries of the river Chew to the south. Less intensive grazing and reversion of arable fields on the steep slopes would help in this regard.

The West of England NRN mapping has identified an opportunity to improve grassland connectivity between Dundry Slopes and Dundry Down. The geology and soil type (shallow lime-rich soils over limestone, and lime-rich soils) in parts of this area also enables the creation of calcareous habitats, including calcareous grassland.

The proximity of the Dundry Slopes to deprived urban communities in South Bristol means that there are good opportunities for improving people's access to and engagement with nature-rich spaces on their doorstep.

Chew Valley

Area	10,396 ha
Summary	A rural landscape centred on the River Chew. The upper catchment is an open, agricultural landscape with a good amount of species-rich grassland, occasional copses, hedgerows and field trees. It also includes two large lakes designated for their value to wildlife, one of which is an internationally important site for wintering and migrating waterfowl. The lower reaches of the catchment narrows, with steeper, undulating and more wooded sides, and many tributaries. This results in an area with relatively high woodland cover north east of Stanton Drew.
Key habitats present	Freshwater Lakes Reedbeds Lowland meadows Traditional orchards Semi-natural broadleaved woodland
'Crown Jewel' sites	Chew Valley Lake (SSSI, SPA) Blagdon Lake (SSSI) Folly Farm (partly SSSI, SNCI) Lords Wood River Chew
Notable species	Shoveler, gadwall, teal, reed warbler, cattle egret, osprey European eel, Atlantic salmon, otter, sea/brown trout, white-clawed crayfish Greater Horseshoe Bat, Lesser Horseshoe Bat, hazel dormouse Silver-washed fritillary, white admiral, purple hairstreak, ruddy darter, migrant hawker, wainscot moths
Potential opportunities for nature recovery	Renaturalisation of River Chew and removal/easing of barriers to fish passage Creation and appropriate management of riparian habitat along the River Chew and its tributaries Reducing soil erosion and diffuse phosphorus pollution throughout the catchment to improve water quality in the Chew and its tributaries Improved woodland management in the lower catchment Creation of new woodlands and successional/mosaic habitat in the lower catchment that connect and buffer existing woodlands Creating and restoring species-rich grassland and dynamic mosaic habitats in the upper catchment Hedgerow creation and restoration

Part of National Character Area 118 - Bristol, Avon Valleys and Ridges

Sub-areas used to organise priorities for nature recovery:

- 17 – Upper Chew and Yeo Valleys

- 18 – Mid-Chew Valley
- 19 – River Chew Floodplain
- 20 – Lower Chew Valley

Description and current value to nature

The Chew Valley covers the catchment draining to the River Chew, including Chew Valley Lake and Blagdon Lake in the upper catchment, to the edge of Keynsham in the lower catchment.

Chew Valley Lake is a 486 ha artificially created reservoir in the Chew Valley, which feeds into the River Chew at its northern end. The Lake is owned and managed by Bristol Water. It is fringed by reedbeds, woodlands, grasslands and hedges. The number of swifts, swallows and martins feeding over the lake in the summer months attests to its value for invertebrates such as dragonflies.

The entire lake is designated as a Special Protection Area due to its importance for wintering and migrating waterfowl, including internationally important populations of shoveler and gadwall. It also has important populations of fish (some commercial) and freshwater invertebrates. The reedbeds are a vital and rare habitat for species such as reed warbler, reed bunting and sedge warbler.

Blagdon Lake, which is a few kilometres to the west of Chew Valley Lake, is also designated as a SSSI due to the variety of habitats and species present. It is less than half the size of the Chew, at 213 hectares, but like the Chew a variety of water birds use the lake, and the varied wooded surroundings and wildflower meadows are also notable.

The upper catchment (the area between the two lakes and surrounding the Chew Valley Lake, particularly to its east and south) also has a good amount of species-rich grassland, scattered woodland, copses, hedgerows and field trees. Folly Farm, a nature reserve owned by Avon Wildlife Trust and less than 2km from Chew Valley Lake, is a particularly nature-rich mix of ancient woodland, scrub and species-rich grassland.

The lower reaches of the valley, around Pensford and Compton Dando, are quite wooded on steeper valley sides and in tributary valleys, with areas of woodland designated as SNCIs including Lord's Wood, Pensford Complex and Wooscombe Complex. Both white admiral and purple hairstreak butterflies have been recorded in this area recently, which are both locally scarce and indicators of good-quality woodland. The new Great Avon Wood being created in a small valley near Pensford will enhance this area for nature.

Further upstream, from Pensford to Chew Magna and Windford, the continuing river corridor of the Chew forms an area of particular ecological interest. There is also a cluster of designated sites, grasslands and woodland around Littleton, including Spring Farm and Bitham's Wood and Meadows. The River Chew itself is of particular note for its variety of fish, including its migratory populations of Atlantic salmon, sea/ brown trout and European eel , as well as numerous coarse fish species such as dace and roach.

There is quite a high proportion of this area designated as a GCN Amber Zone, meaning it contains main population centres for GCN and comprises important connecting habitat that aids natural dispersal.

Issues and challenges for nature

The River Chew is generally of a moderate-good ecological status. Barriers to fish passage and phosphate levels (due to a combination of diffuse agricultural pollution and sewage discharges) are

the primary reasons for not achieving good status overall. The exception to this is the uppermost part of the Chew (from Chew Valley Lake to source), which is in poor ecological condition due to barriers to fish passage. Winford Brook is also in poor ecological condition due a poor hydrological regime and the presence of in-river barriers.

The two reservoirs also present a barrier to migration of certain fish species, notably eels. This has been recognised by Bristol Water and there are plans to install an elver pass in the Chew Valley Lake to enable upstream migration of elvers.

There is also a threat to what remains of the local white-clawed crayfish population from invasive non-native American signal crayfish.

In recent years, Chew Valley Lake has experienced increasing numbers of algal blooms[19], likely reflecting pollution entering the lake from agricultural sources, which will be detrimental to the ecology of the lake. Blagdon Lake is also susceptible to eutrophication, partly owing to the hardness of the water that fills it. In the future, drought is likely to become more frequent locally, which may mean that low water levels in the Lakes become more common during the summer, affecting their ecology and increasing the likelihood of eutrophication and algal blooms.

Poor hedgerow management, including flailing of hedgerows and a loss of hedgerow trees, and removal of some hedgerows has decreased the catchment's value to biodiversity in some areas, especially north-east of Chew Valley Lake around Stanton Drew.

The opening up of an all-weather trail around the Chew Valley Lake provides an important recreational resource for local residents, improving opportunities to engage with nature, but may bring about further recreational pressure on wildlife.

Constraints and opportunities

The River Chew has the potential to be a brilliant river for wildlife, with it already being rated 'high' or 'good' on many elements of water quality[20]. Reducing agricultural run-off and point-source pollution across the catchment, removing river barriers, and renaturalising parts of the watercourse would be needed to achieve this. There are a high number of river barriers on the River Chew and some of its tributaries, as mapped in the water layers of the WENP NRN, which means that barrier removal would need to be sequentially targeted to be most effective.

There are good opportunities across the Catchment to reduce soil erosion and diffuse phosphorus pollution, which could involve creation of storage ponds and wetland scrapes, wildflower buffer strips, restoration of riparian habitat etc.

There are also good opportunities for natural flood management interventions (e.g. ponds and scrapes, leaky dams, tree planting) in the lower Chew catchment to provide natural flood management and to 'slow the flow' of water; BART has already been working with landholders and farmers in this area on such interventions, which could be built upon.

As mentioned above, the installation of elver and fish passes in the Chew Valley Lake would improve access to the upper reaches of the Chew to migratory fish.

There is good scope for strengthening the network of woodland in the lower Chew catchment through improving woodland management, connecting existing woodlands, and creating mosaic

[19] Bristol Water Draft Water Resources Management Plan (full technical document), 2022
[20] https://environment.data.gov.uk/catchment-planning/WaterBody/GB109053021852

habitats. This would also enhance natural flood management and potentially help improve water quality. As mentioned, the lower reaches of the valley, around Pensford and Compton Dando, are quite wooded already, and the creation of the 40+ hectare Great Avon Wood will enhance this network of woodland.

Improved hedgerow management and the restoration of lost hedgerows would help to restore biodiversity here and improve ecological connectivity. This would benefit any foraging bats, the small population of hazel dormouse, and farmland birds.

The EA's Working With Natural Processes (WWNP) mapping identifies opportunities throughout the catchment for riparian woodland creation or enhancement. It also shows opportunities for floodplain woodland creation along the River Chew and in a broader area upstream from Chew Valley Lake, where woodland creation is compatible with the landscape sensitivities of the Mendip HIlls AONB. Both of these could also contribute to improving the ecology of waterbodies across the catchment.

The majority of land in the upper part of the catchment is grazed and most of it is of moderate agricultural quality, and so there are good opportunities here for habitat expansion and restoration that would enhance the existing network of habitats. The largest exception to this is the area of good quality land north/northeast of the Chew Valley Lake, much of which is grazed.

Given the existence of scattered species-rich grasslands in the upper catchment area, there are particularly good opportunities for restoration of grasslands and mosaic habitats to strengthen the grassland ecological network for pollinators and grassland species. The West of England NRN mapping identifies three particularly good opportunities for improving grassland connectivity close to Chew Valley Lake.

There is also a unique landscape of oak trees, hedgerows, and mixed farming (largely pasture) to the southeast of Chew Valley Lake (on floodplain either side of the River Chew at North Widcombe), which includes smaller areas of woodland and some good-quality grassland.

To the east of this area are steep slopes that rise up to a ridge line at Hinton Blewett; these have low productivity (Grade 4 under the ALC) with small fields, tall overgrown hedgerows and a mix of scrub and grassland where agriculture is marginal. There are good opportunities here to focus on hedgerow management for nature, restoring grasslands, and creating mosaic habitats.

The geology and soil type (shallow lime-rich soils over limestone) in parts of this area also enables the creation of calcareous habitats, including calcareous grassland.

The proximity of the western part of this area to Bristol Airport means that the potential impact of habitat creation/management on aerodrome safety will need to be considered; for example, anything that increases the number of corvids, gulls, starlings or certain wetland birds could increase the risk of bird strikes.

Cam and Wellow Valleys

Area	8,535 ha
Summary	A rural landscape covering the Cam and Wellow valeys in the southeastern portion of Bath and North East Somerset. The river valleys themselves are steeply sided and are where most of the designated sites for nature are concentrated.
Key habitats present	Calcareous grasslands Semi-natural broadleaved woodland
'Crown Jewel' sites	Highbury Hill and Greyfield Wood Cam Brook Cleave's Wood SNCI Friary Wood North-West Hinton Complex Wellow Brook
Notable species	Lesser Horseshoe Bat, Greater Horseshoe Bat Silver-washed fritillary
Potential opportunities for nature recovery	Renaturalisation of the Cam Brook and removal/easing of barriers to fish passage Creation and appropriate management of riparian habitat along the Cam and Wellow Reducing soil erosion and diffuse phosphorus pollution in the Cam and Wellow catchments to improve water quality in the Cam and Wellow Brooks and their tributaries Creating and restoring species-rich grassland and dynamic mosaic habitats in a corridor along the Cam valley

Part of National Character Area 107 - Cotswolds and Part of National Character Area 118 - Bristol, Avon Valleys and Ridges

Sub-areas used to organise priorities for nature recovery:

- 22 – Upper Cam and Wellow
- 23 – Cam Enclosed Valleys
- 24 – Peasedown St John Ridge
- 25 – Wellow Valley
- 26 – Wellow Plateaux and fringes

Description and current value to nature

The Cam and Wellow Valleys are two wide and steep river valleys surrounded by limestone plateaus and ridges. The valleys, given their relatively steep nature, are less intensively managed than much of the countryside. Their value to nature comes from a mix of grasslands, small areas of woodland, some ancient, and the areas of farmland with better managed hedgerows and field trees.

The Cam Valley and the part of the area bordering on the Bathscape (i.e. the lower reaches of the brooks) has a greater concentration of species-rich grasslands, ancient woodland, and sites designated as SNCIs. The rivers themselves are valuable habitats for migrating and spawning fish, despite the presence of river barriers, and provide ecological corridors through the landscape.

Issues and challenges for nature

As is the case in other rural areas, many hedgerows and woodlands suffer from a lack of or poor management. Overgrazing and intensification of farming will have led to a loss of meadows and species-rich grasslands, and scrubby areas, in line with most of the country.

There has been a rise in the farming of maize in the area as well, which is intensive in its use of pesticides and can lead to significant soil erosion, especially on slopes.[21] This is particularly prevalent in the upper parts of the Cam and Wellow catchments.

Apart from the uppermost part of the Wellow (upstream from the confluence with Snail Brook), the ecological status of the Cam and Wellow Brooks is rated 'poor'. This is chiefly due to agricultural pollution in the upper reaches of their catchments (the EA has identified that this is caused by 'poor livestock management'[22]) alongside point source sewage discharge, with detrimental effects on in-river ecology. The brooks also have a number of barriers to river passage, preventing upstream migration fish including eels and Atlantic salmon.

Constraints and opportunities

The Cam Valley, due to the river, its topology and existing areas of grassland habitat, provides a natural focus for improving ecological connectivity between the protected landscapes of the Mendip Hills and the Cotswolds, as recognised by the Limestone Link concept. The Cam Valley is also part of the B-Lines network and the Strategic Grassland Network under the West of England NRN, underlining this potential. The West of England NRN mapping has identified a number of opportunities to improve grassland connectivity within the Cam Valley.

Bristol Avon Rivers Trust (BART) were funded to engage landholders and farmers along the Cam Valley with this concept in early 2023, providing a foundation to build upon. BART has also mapped opportunities for the removal of in-river barriers in the Cam Brook.

There are opportunities to reduce diffuse pollution in the Cam and Wellow sub-catchments through improvements in agricultural management, creation of on-farm storage ponds and wetland scrapes, and buffer strips. This would improve the value of the rivers to wildlife, as well as creating additional habitats. There are also opportunities for restoration and creation of riparian habitat, including woodland, along the Cam and Wellow, which would further help restore these rivers and strengthen ecological corridors.

However, modelling indicates that the largest contribution to high phosphorus levels in the Cam Brook is from the wastewater treatment works located near Paulton. Therefore, to get the waterbody to good ecological status, it may be necessary to upgrade these treatment works to remove and recycle a greater amount of phosphorus (which would also improve the retention of this limited resource that is important for agriculture).

[21] https://ahdb.org.uk/knowledge-library/where-to-grow-maize
[22] https://environment.data.gov.uk/catchment-planning/WaterBody/GB109053022290

The Cam Valley is also an EA priority area for natural flood management, with particularly good opportunities mapped for woodland creation to provide NFM in the upper parts of the catchment and on the slopes of the valley.

Additionally, the presence of a growing beaver population in the River Avon suggests it may not be too long until they find their way to the Cam and Wellow Brooks. This could offer a natural solution to improving river ecology, reconnecting the rivers to the floodplains, and 'slowing the flow' of water, though any potential conflicts and negative impacts on land use adjacent to the rivers would need to be proactively managed.

Finally, Somer Valley Rediscovered is a partnership project led by B&NES Council, which aims to improve biodiversity and people's access to and connection with nature in the Somer Valley (which overlaps with the upper parts of the Cam and Wellow Valleys). It has already received funding to improve 34 ha of green space for nature in and around Midsomer Norton, and offers opportunities to bring further funding into the area and engage local communities with nature recovery.

The majority of the land in this area is of moderate quality for agriculture. Most of the area is designated as having a medium-low likelihood of Best and Most Versatile (BMV) Land for agriculture, with some land between Paulton and Farrington Gurney identified as high likelihood of BMV. Under the ALC, most land is designated as Grade 3.

Limestone Plateaux and Brook Valleys (B&NES)

Area	3,905 ha
Summary	The undulating plateau from Newton St Loe to Hinton Blewitt, which is a rural landscape with a large amount of arable farming. Designated sites for nature are concentrated along the steep valleys of the Newton Brook.
Key habitats present	Calcareous grasslands Semi-natural broadleaved woodland
'Crown Jewel' sites	Newton Brook Priston Wood Folly Wood
Notable species	Lesser Horseshoe Bat, Greater Horseshoe Bat
Potential opportunities for nature recovery	Creation of new, well-managed woodlands and wood pasture on the 'undulating plateau' between Newton St Loe and Hinton Blewitt Regenerative and/or wildlife-friendly farming practices Hedgerow creation, restoration and management

Part of National Character Area 107 - Cotswolds and Part of National Character Area 118 - Bristol, Avon Valleys and Ridges

Sub-areas used to organise priorities for nature recovery:

- 27 –Limestone Plateaux and Brook Valley (B&NES)

Description and current value to nature

This area covers the undulating plateau and brook valleys between Newton St Loe and Hinton Blewit. As a whole, the area is rural in character. There is a large amount of arable farming as well as grazing, and scattered areas of woodland.

The land use is largely a mix of arable and pasture, with a few areas of woodland and a smattering of sites designated as SNCIs, including Highbury Hill and Greyfield Wood, and Severcombe Fields. Some parts of the landscape benefit from tall, thick hedgerows and field trees, though this is far from universal.

Most sites designated for their value to nature are located along the steep Newton Brook and its tributary.

Issues and challenges for nature

As is the case in other rural areas, many hedgerows and woodlands suffer from a lack of or poor management. Overgrazing and intensification of farming will have led to a loss of meadows and species-rich grasslands, and scrubby areas, in line with most of the country.

There has been a rise in the farming of maize in the area as well, which is intensive in its use of pesticides and can lead to significant soil erosion, especially on slopes.[21] This is particularly prevalent in the area on the edge of and just outside of the Duchy of Cornwall estate.

The Newton Brook, which is partly in the 'Bathscape' area, would have good or even high ecological status if it were not for high phosphate levels, which is thought to be from diffuse agricultural pollution and point source sewage discharges.

Constraints and opportunities

Generally, as a rural and well-farmed area, improvements in the management of hedgerows alongside restoration of previously removed hedgerows, field trees, agroforestry, restoration of species-rich grassland where it has been improved, on-farm wildflower strips etc. would all enhance the value of the broader countryside for wildlife.

There are mapped opportunities for woodland creation scattered across this area, and West of England NRN mapping has identified a handful of woodland connectivity opportunities. Most of this area could suitable for larger-scale woodland creation where land use allows and where there are no conflicts with other habitat types.

The vast majority of the land in this area is of moderate quality for agriculture: most of the area is designated as Grade 3 under the ALC and of having a medium-low likelihood of Best and Most Versatile (BMV) Land for agriculture.

The concentration of arable farming on the plateau to the west of Bath means that this area may be less suitable for large-scale interventions to enhance nature. Even so, there is plenty of pasture here and the land is generally of moderate agricultural quality. There are also good opportunities for woodland creation due to lower landscape sensitivity, as well as hedgerow habitat improvements.

Reducing phosphate levels in the Newton Brook would bring its ecological status to high, making it potentially a great river for wildlife. This could be achieved through improved agricultural management and addressing sewage discharges, although exact causes of agricultural pollution would need to be identified.

Bath and its Environs, including St Catherine's Valley

Area	10,035 ha
Summary	The landscape surrounding the city of Bath, most of which is designated as 'The City of Bath World Heritage Site' and known as the 'Bathscape'; this LNRS area also included the upper reaches of the St Catherines Valley which falls outside the Bathscape boundary but has a similar landscape character. This is an intricate landscape of enclosed, steep sided and complex limestone valleys and intervening ridges and small areas of plateau. The area has high cover of generally small-scale woodland and relatively large amounts of species-rich grassland and scrub, making it a stronghold for many species of bats, including the greater horseshoe, and a range of invertebrates.
Key habitats present	Ancient Woodland Brooks and streams Calcareous grassland Lowland meadows Semi-natural broadleaved woodland
'Crown Jewel' sites	Brown's Folly (SSSI) Monkswood Valley SSSI St Catherine's Valley SSSI Bath & Bradford on Avon Bat Sites SAC
Notable species	Greater Horseshoe Bat, Lesser Horseshoe Bat, Bechstein's Bat Marsh Tit, Swift Marsh fritillary, silver-washed fritillary, small blue, grizzled skipper Bath Asparagus
Potential opportunities for nature recovery	Ensuring the correct management of existing protected sites including SNCIs Creating and restoring dynamic mosaic habitats and open habitats including species-rich grassland, with extensive grazing systems Improving the condition and management of existing woodlands, including opening up rides and glades and thinning canopy where appropriate Hedgerow creation and management Installation of swift bricks, nest-hole bricks, and bird and bat boxes in the city of Bath Improve management of private gardens and other privately managed areas for nature in Bath, including reducing the area of hard/impermeable sufaces Increase tree canopy cover and green streets in Bath Increase the area of parks public green spaces managed for nature in Bath

Part of National Character Area 107 - Cotswolds

Sub-areas used to organise priorities for nature recovery:

- 29 – Bathscape Enclosed Valleys
- 30 – City of Bath
- 49 – Bathscape limestone plateaux
- 50 – Bathscape Eroded Plateaux and Valleys

Description and current value to nature

Most of this area is the 'Bathscape', consistent with the boundary of the City of Bath World Heritage Site setting and covering 10,100ha (including the city itself). It is a varied landscape, dominated by enclosed valleys interspersed by ridges and small areas of plateau, that includes woodlands, unimproved grassland, scrub, riverside meadows and canals.

The land is rural in nature outside of the city, with beef and sheep farming the most common land use. The landscape is also important as an accessible and nature-rich surrounding for residents and visitors of Bath, and much of the area is within the Cotswolds AONB.

The area also includes some of the land between the Bathscape and the A420, which continues the hilly and varied nature of the Bathscape.

5% of the Bathscape area is mapped as UK Priority Grassland, a habitat that has declined drastically across England; a population of the marsh fritillary butterfly has recently been found in the area, demonstrating the Bathscape's value for grassland species.

A further 15% of the area is wooded, with around a third of this woodland characterised as ancient woodland, supporting the once locally abundant but now nationally rare Bath asparagus plant, among many other species.

There is a large concentration of SNCIs in this area (over 20% of the area is designated as an SNCI), including sites such as St Catherine's Valley (see below), Brown's Folly (a notable ancient woodland), Bathampton Down (species-rich calcareous grassland) and Woodlands, Horsecombe Vale (species-rich calcareous grassland) and Priory Wood.

15 of the UK's 18 bat species are present in the area, including the rare greater and lesser horseshoe bats. These are concentrated largely to the south and east of Bath, roosting in local caves and using thick hedgerows for hunting and commuting. Part of the Bath & Bradford on Avon Bat Sites SAC falls within this area due to the hibernation sites associated with 15% of the UK greater horseshoe bat population, as well as the presence of Bechstein's bat.

Another important site for nature in this area is St Catherine's Valley, which is in the northern part of the Bathscape. It includes 156ha of SSSI and many other SNCI-designated grasslands. The steep sided valley maintains a good amount of woodland, hedgerows and species-rich grassland, offering a rich mosaic for wildlife.

The city itself is an urban setting, but does include plenty of green spaces, horseshoe bat roosts, nesting peregrine falcons and swifts, and the important river corridor.

Issues and challenges for nature

As a landscape that includes and surrounds the city of Bath, development (although this is likely to be small-scale, given the protection afforded by the landscape), disturbance, and overgrazing by horses are some of the ongoing challenges to nature. Additionally, while the steep slopes in the area have played a role in agricultural deterring intensification during the 20th century, they also mean that some wildlife-rich sites are more difficult to manage and have become neglected.

Of particular concern is the status of priority grassland in the Bathscape, with aerial photography and anecdotal evidence suggesting much of it is reverting to scrub. Continuing lack of management will likely lead to further decline in grassland species.

Over 15% of the project area is woodland, and a recent report demonstrated that '37% of this woodland has no record of active management and a further 12% has no record of recent management'. Many of these woodlands are small (<3ha in size), which has made accessing grants for management difficult for their owners.

Poor hedgerow management is also a concern in some areas, where short cropping and removal of hedgerows will reduce their value to wildlife, including bats.

St Catherine's Brook and Lam Brook are generally of good ecological status, with the St Catherine's Brook only failing to reach good due to groundwater abstraction. The By Brook, however, only meets moderate ecological status due to barriers to fish passage, diffuse pollution from agriculture, and water industry sewage discharge.

Constraints and opportunities

The city of Bath is doubly designated as a UNESCO World Heritage Site (WHS)[23] (city of Bath WHS and Great Spas of Europe WHS), and the 'City of Bath WHS Setting' surrounds the World Heritage Site itself and the Bathscape boundary follows its outer edge. The WHS Setting is described and its importance in relation to the outstanding Universal values of the site is set out in the City of Bath World Heritage Setting Supplementary Planning Document.

This means that actions to restore nature within the Bathscape, in particular, should be sympathetic to the historic landscape. This includes aspects relating to historic land-uses, such as quarrrying for Bath Stone and remnant flood plain grazing meadows alongside the river Avon at Bathampton Meadows, cultural influences, historic buildings, and historically important views and viewpoints.

The geology and soil type (shallow lime-rich soils over limestone) in much of this area enables the creation of calcareous habitats, including calcareous (limestone) grassland.

The majority of the area in agricultural production is used for grazing, with some smaller areas of arable farming closer to A420 (i.e. nearer Marshfield and Cold Ashton). The topography of much of the landscape means that intensive farming is not feasible, with many sloping areas designated as Grade 4 ALC because of this; most of the rest of the landscape is Grade 3.

As much of the landscape is already a mixture of woodland, low-intensity grazing and wood pasture, improved management of woodland, grassland and mosaic habitats, rather than any significant changes to the landscape, would present the greatest opportunity in this area. The Bathscape Scheme has already been working towards this aim, providing a strong foundation to build upon.

[23] https://whc.unesco.org/en/list/428/

There are three grassland connectivity opportunities in this area, mapped through the West of England NRN, where grassland creation would boost the connectivity of the grassland network, as well as one woodland connectivity opportunity.

The Lam Brook, St Catherine's Brook, Newton Brook and By Brook all have mapped opportunities for riparian habitat creation and enhancement, including riparian woodland.

Targeted removal or installations of measures for fish passage on the river barriers in the St Catherine's Brook, By Brook, Lam Brook and Corston Brook would better open up these brooks to wildlife and could help to renaturalise them, benefitting the wider river ecology.

Any development around the city of Bath could mean less land available for nature recovery in the future, although good-quality development could contribute towards enhancing ecological connectivity.

Cotswolds Plateau

Area	7,637 ha
Summary	A flat and open plateau of largely arable farming in the Cotswolds AONB, with the exception of Badminton Deer Park in the very northeast
Key habitats present	Ancient Woodland Parkland / Wood Pasture Semi-natural broadleaved woodland
'Crown Jewel' sites	Badminton Deer Park Swangrove (SNCI) Upton Coombe SSSI and Hennel Bottom (SNCI)
Notable species	Corn bunting, grey partridge
Potential opportunities for nature recovery	Regenerative and/or wildlife-friendly farming practices Arable reversion to extensively grazed mosaics Buffering the parkland and wood pasture on Badminton estate with woodland and mosaic habitats Hedgerow creation, restoration and management

Part of National Character Area 107 - Cotswolds

Sub-areas used to organise priorities for nature recovery:

- 33 – Cotswolds Plateau

Description and current value to nature

This refers to the part of the Cotswolds AONB that is not included in the Cotswolds Scarp or 'Bath and its Environs'. The majority of land here is in arable production, and the M4 runs through the middle of the landscape.

The Badminton Plateau, which is the northern part of this area, is an open and exposed landscape, with large arable fields surrounded by stone walls, clipped hedgerows and some fencing. There are few mature trees, copses, and areas of broadleaved woodland. Badminton deer park, in the northeast of this area, contains an area of wood pasture and a smaller area of woodland.

The southern part of this area is part of the Marshfield Plateau. Again, this is largely an open arable landscape, though it is more gently undulating, with one or two more steep sided valleys that have a greater amount of calcareous grassland and small copses.

The area is most valuable for farmland birds such as corn bunting and grey partridge, as might be expected in an arable landscape. Species data from BRERC suggests that this is the biggest stronghold for these species in the area covered by the toolkit.

There is also a smattering of sites designated as SNCIs, with a handful in the far south of the landscape (closer to St Catherine's Valley) and in the north. The largest is an area of ancient woodland to the north of Badminton Deer Park.

The area lies over a limestone aquifer, which provides groundwater to nearby rivers and is sensitive to over-abstraction due to its geological nature.

Issues and challenges for nature

Intensive arable farming, while of course important for food production, generally offers less space for wildlife overall. The lack of tree and hedgerow (see below) cover in this area, including field trees and copses, further reduces the habitat and food available for many species.

The presence of stone walls rather than hedgerows as common field boundaries will further reduce the shelter and food available for wildlife in the area, although they do provide some refuge for invertebrates and reptiles, and are considered valuable for landscape purposes.

The presence of the M4 cutting through the landscape also presents a barrier to wildlife, as well as a source of both noise and chemical pollution.

The sensitivity of the limestone aquifer to over-abstraction puts rivers dependent on this source of groundwater at risk of low flows during times of drought, with resulting impacts on river ecology.

Constraints and opportunities

The prevalence of arable farming on the Plateau means that the area may be important for food production, although it is unclear how much of the crops produced here are used for animal feed rather than human consumption. The shallow soil here also means that a high amount of input is required for crop production. Therefore, there may be some opportunities for conversion to extensive grazing where arable farming is currently unproductive.

Otherwise, where arable farming continues, the best opportunities will be to make farming techniques more nature-friendly (e.g. reducing pesticide use through integrated pest management, use of cover crops), improving the value of hedgerows and other field boundaries for wildlife, providing wildflower strips, and potentially agroforestry.

The shallow soils on the plateau are particularly prone to erosion; measures such as cover crops, undersowing of crops to reduce bare soil exposure and low/no tillage techniques would help to reduce this risk. Fortunately, the flat nature of the plateau means that soil erosion is less likely to

impact water quality. Additionally, measures to reduce soil compaction could help to slow the flow of water, as would reducing the consumption of water on-farm.

There are two woodland connectivity opportunities in this area, mapped through the West of England NRN, where woodland creation would boost the connectivity of the woodland network between Dodington Estate and Badminton Estate (Forest of Avon Plan, Section 5.14). Given the agricultural nature of the landscape and the landscape character in the Cotswolds AONB, the creation of small woodland/copses or hedgerow creation/restoration could help to fill these 'gaps'.

The Badminton Estate's woodland and wood pasture offers an opportunity to enhance and expand existing woodland habitats in the area. Targeted hedgerow restoration/creation, for example, could better connected the Badminton Estate with the woodlands on the Cotswolds Scarp.

It should be noted that the geology and soil type (shallow lime-rich soils over limestone) in most of this area enables the creation of calcareous habitats, including calcareous grassland.

Cotswolds Scarp

Area	3,476 ha
Summary	A narrow, steeply-sloped corridor running between the Bathscape and the Gloucestershire border. It retains much of its semi-natural character due to its topography, and offers good opportunities for landscape-scale ecological connectivity
Key habitats present	Ancient Woodland Calcareous grassland Semi-natural broadleaved woodland
'Crown Jewel' sites	Upton Combe SSSI and Hennel Bottom (SNCI) Dyrham Park (SNCI) Hawkesbury Knoll, Broad Hill and Birch Hill, Chalkley and Walk Woods SNCIs
Notable species	Barbastelle bat, Bechstein`s bat, hazel dormouse Marsh Tit Herb Paris
Potential opportunities for nature recovery	Creating and restoring dynamic mosaic habitats and open habitats including species-rich grassland, with extensive grazing systems Improving the condition and management of existing woodlands, including opening up rides and glades and thinning canopy where appropriate Creating areas of new, well-managed woodlands to connect existing woodlands along the scarp Measures to address the severance of ecological connectivity caused by the M4

Part of National Character Area 107 - Cotswolds

Sub-areas used to organise priorities for nature recovery:

- 32 – Cotswolds Scarp

Description and current value to nature

The Cotswolds Scarp Nature Improvement Area is a roughly 80-mile corridor running between Bath in the south to Mickleton, Gloucestershire in the north. In the area covered by the toolkit, the Scarp runs between the Bathscape and Lower Woods.

Retaining much of its semi-natural character due in part to its topography, which is characterised by steep slopes, the Scarp includes areas of ancient woodlands (80 hectares), wood pasture, scrub and scattered areas of unimproved limestone grassland. Much of the woodland is internationally important beech woodland[24]. Thick hedgerows and scattered trees provide additional value to wildlife.

There is a good concentration of SNCIs along the scarp, including Dyrham Park and Wood, Dodington Wood, Toghill, Broad Hill, Hawkesbury Knoll, as well as a SSSI at Upton Combe. However, the current condition of most of these sites is unknown, although Dyrham Park is managed by the National Trust and so can expect to be well managed for nature.

Issues and challenges for nature

Although the nature of the Scarp means that it retains much of its semi-natural habitats, there are parts of the Scarp that are more intensively managed for agriculture, with less value for wildlife, especially where hedgerows give way to fencing. Some of these 'gaps' in the ecological network are quite large, especially between Dyrham Park and Dodington Park.

The M4 is also between Dyrham Park and Dodington Park, bisecting the Scarp and presenting a barrier to the movement of mammals and amphibians especially.

In many instances, there is poor management of the hedgerows that do remain, affecting the connectivity of the Scarp for species such as bats and dormice. There is also a lack of woodland management outside major historic parks and estates, as well as a paucity of replacement field and hedgerow trees.

Constraints and opportunities

Part of the value of the Cotswolds Scarp to nature is in its location and the opportunities for ecological connectivity that this brings. It connects the Bathscape and St Catherines Valley (see above) with Lower Woods (see below), and continues to the northern edge of the Cotswolds, offering an opportunity for landscape-scale ecological connections.

[24] National Character Area 107 Cotswolds: Analysis

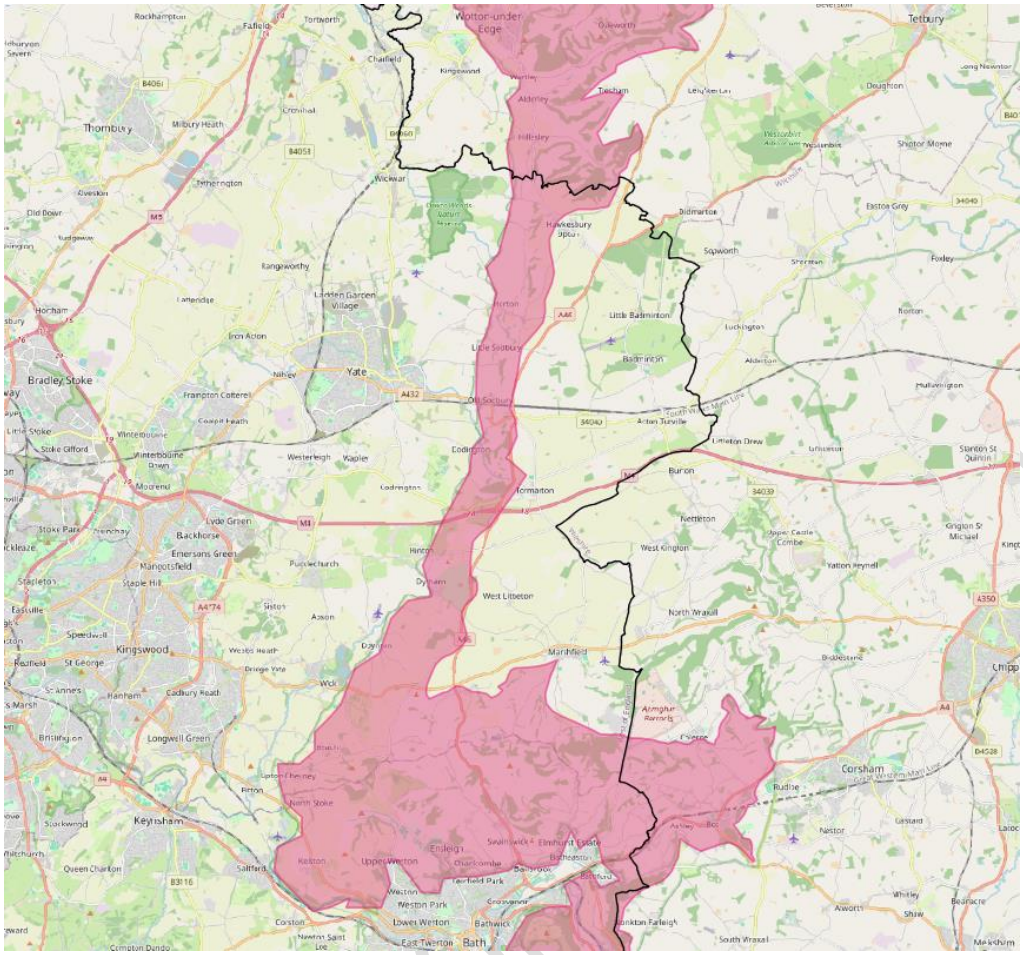

Figure 4 - The location of the Cotswolds Scarp Nature Improvement Area (in pink) shows the potential for an ecological corridor between the landscape surrounding Bath, and Lower Woods and the scarp continuing into Gloucestershire.

The topology of the Scarp means the productivity of the land is limited, and there is little arable production. Much of the land is improved grassland, which means that reducing intensity of grazing or reverting land to semi-natural habitat would not impact the most productive land.

Sustainably managing existing areas of woodland, particularly ancient woodland and the important beech woodlands, and connecting them through woodland expansion, new woodland copses and hedgerow restoration/expansion would all help to improve the ecological connectivity of the wooded scarp. Any woodland creation would need to be mindful of landscape character, due to the AONB designation.

Parts of the area defined as the Scarp (the eastern part of it, specifically) have the geology and soil type (shallow lime-rich soils over limestone) that enables the creation of calcareous habitats, including calcareous grassland. Restoration of limestone grassland and unimproved pasture would be beneficial for biodiversity, as would the creation of scrub and field margins in hard to graze areas.

Figure 5 - A vision of nature recovery on the Cotswolds Scarp. Source: Cotswolds Nature Recovery Plan.

The presence of SNCIs along the Scarp, including at Dyrham Park, owned by the National Trust, offers building blocks for an ecological corridor between Lower Woods and the Bathscape / St Catherine's Valley. The Scarp also maps closely to a 'B-Line', further highlight its potential role as an ecological corridor.

There are a handful of grassland and woodland connectivity opportunities mapped in or on the boundary of this area, where habitat creation would be particularly beneficial in improving the connectivity of the grassland and woodland networks.

Restoration of semi-natural habitats and catchment interventions could reduce sediment run-off into streams and phosphorus pollution, especially on slopes (which is much of the Scarp).

A notable constraint is that the narrow and linear nature of the scarp means that there may be pinch points for ecological connectivity. This means that if one part of the scarp were relatively inhospitable to wildlife, the functionality of the Scarp as an ecological corridor may be compromised.

The Scarp is identified as a Green Infrastructure Corridor (Corridor E) in the South Gloucestershire GI Strategy, which are intended to be used to protect and enhance existing assets and connect and extend the green infrastructure and Nature Recovery Network.

Wickwar Ridge and Vale

Area	3,082 ha
Summary	An area centred on one of the largest ancient woodlands in the South West, and also covering a number of wildflower meadows, commons and mosaic habitats.
Key habitats present	Ancient Woodland Lowland meadows Semi-natural broadleaved woodland
'Crown Jewel' sites	Lower Woods (SSSI) Bishop's Hill Wood SSSI Hawkesbury Common Sodbury Common
Notable species	Hazel dormouse Silver-washed Fritillary, White admiral, Purple hairstreak Marsh Tit, Woodcock Herb-paris, Greater butterfly orchid, Violet helleborine, Wild service tree
Potential opportunities for nature recovery	The restoration of natural processes in Lower Woods to improve its condition for wildlife and create more 'edge' or successional habitat Restoration of appropriate grazing regimes on the commons surrounding Lower Woods Buffering Lower Woods with more woodland and mosaic habitats Creation, restoration and good management of hedgerows Renaturalisation of the Little Avon river and creation of riparian habitat

Part of National Character Area 118 - Bristol, Avon Valleys and Ridges

Sub-areas used to organise priorities for nature recovery:

- 34 – Wickwar Ridge and Vale
- 35 – Little Avon Corridor

Description and current value to nature

At over 300ha, Lower Woods is one of the largest ancient woodlands in the South West, supporting populations of rare woodland plants, butterflies, and birds, as well as the seriously endangered hazel dormouse. Much of the site is designated as a SSSI, making it the largest terrestrial SSSI in the area covered by the toolkit and reflecting its importance locally.

Lower Woods also contains important areas of standing deadwood, and woodland rides and glades. Traditionally, Lower Woods was coppiced, with local people using the wood for firewood and charcoal. Although this practice was largely lost to history here, it is now being revived (see below).

The surrounding area includes a number of SNCIs and SSSIs, designated for their wildflower meadows, ancient woodland and/or mosaic habitats, such as Bishop's Hill Wood SSSI, Hawkesbury Meadow SSSI and Hawesbury Common, and Sodbury Common to the South.

Lower Woods stands on the border between South Gloucestershire and Gloucestershire, and is close to the woodlands of the Cotswolds Scarp. It is, therefore, an important site for woodland connectivity in the area covered by the toolkit and in the wider landscape beyond.

The Little Avon River also flows through this area and is designated as an SNCI. Although it has poor ecological status (see below), the habitat and structure of the river itself is of good quality.

Most of this area outside of Lower Woods is designated as a GCN Amber Zone, meaning it contains main population centres for GCN and comprises important connecting habitat that aids natural dispersal.

Issues and challenges for nature

Like many woodland sites, planting of non-native trees and a lack of woodland management in the 20th Century reduced the value of Lower Woods to nature. In particular, the abandonment of coppicing has meant that species such as nightingale have been lost from the site.

Gloucestershire Wildlife Trust, who manage the reserve, have reintroduced traditional coppicing, open areas and grazing at the site to help restore the woodland to its former glory, but work remains to be done.

As in many woodlands in the South West of England, ash dieback has presented an additional challenge to management of Lower Woods. It remains to be seen what the long-term impact of loss of ash trees in Lower Woods will mean for wildlife here, as the negative impacts of the loss of ash trees could be partly offset by positive impacts from thinning and opening up of woodland.

Many of the surrounding commons and meadows are suffering from undergrazing, which has decreased the value of these grassland habitats for nature.

Additionally, the Little Avon River that flows through this area has poor ecological status due to diffuse sources of agricultural pollution, primarily from poor livestock management and point source water industry sewage discharge.

Constraints and opportunities

The size of Lower Woods (over 300 ha) and the presence of surrounding meadows, woodland and wood pasture offers an opportunity to create a large area of good-quality mosaic habitat. Connecting Lower Woods with Sodbury Common, to the South, would further increase the size of a contiguous area of semi-natural habitat. Additionally, ensuring good connectivity to the Cotswolds Scarp to the east would connect this area to the wider ecological network. This would benefit species such as the hazel dormouse, which may otherwise be isolated and at risk of disappearing from the area.

The restoration of natural processes in Lower Woods could be an option to improve its value to biodiversity, opening up more 'edge' habitats in the woodland, and restoration of grazing cattle to the surrounding commons could help restore grassland habitats by tackling undergrazing. Lower Woods is managed by Gloucestershire Wildlife Trust, who are best placed to make any decisions on its management.

The West of England NRN mapping identifies a specific opportunity for connecting grassland networks between Sodbury Common and the meadows to the east of Lower Woods (this is also part of a B-Line, as mapped by Buglife), as well as an opportunity to better connect Lower Woods to the Cotswolds Scarp. These opportunities are also reflected in recommendations in the Forest of Avon Plan (section 5.18) to better connect Lower Woods to the Cotswolds Scarp and to woodlands to the north of Yate.

The Little Avon is currently rated as being in poor ecological health due to pollution, although the habitat and structure of the river itself is of good quality. Catchment interventions to reduce soil erosion and phosphorus pollution alongside ensuring that livestock are not able to poach the river could, therefore, improve the Little Avon's ecological value.

There are also good opportunities for riparian woodland creation or enhancement alongside the rivers and streams in this area, which would help improve connectivity between Lower Woods and surrounding areas, as well as benefitting the ecology of the rivers and streams themselves.

All of this area is mapped as having a low likelihood of Best and Most Versatile Land for agriculture, and is designated as Grade 3 or 4 under the ALC. Most of the land that is not already managed for nature is mapped as being grazed, with some areas of arable farming(. The restoration of semi-natural habitat would, therefore, be feasible without impacting on the most productive land.

The relatively small size of fields in the area also offers good opportunities for well-managed hedgerows to connect nature-rich sites .

Peri-urban Bristol

Area	6,344 ha
Summary	A mixed urban fridge and rural landscape on the edge of Bristol that includes the River Frome, a corridor for nature and people running out of Bristol
Key habitats present	Lowland dry acid grassland Semi-natural broadleaved woodland
'Crown Jewel' sites	River Frome and Oldbury Court Estate (SNCI) Stockwood Open Space (SNCI) Wooscombe Complex (SNCI)
Notable species	Otter
Potential opportunities for nature recovery	Restoration of well-managed grazing regimes on the commons to the east of Bristol Increasing access to nature-rich spaces for nearby communities Provision of allotments and agroecological farming Creation of a riparian habitat corridor along the river Frome Hedgerow creation and management

Part of National Character Area 118 - Bristol, Avon Valleys and Ridges

Sub-areas used to organise priorities for nature recovery:

- 36 – River Frome Floodplain Corridor
- 37 – Peri-urban Bristol

Description and current value to nature

This area has been defined to align with GI Areas 17 and 20 in the West of England JGIS, and takes in a mixed urban fridge and rural landscape on the edge of Bristol.

The Frome Valley runs through this area, taking in Stoke Park in the south and continuing to Frampton Cotterell in the north. Stoke Park is designated as an SNCI due to the value of its mix of grassland and wetland and the River Frome forms a corridor for nature moving north, including areas of ancient woodland alongside it.

A small area in Stoke Gifford, between Bristol Parkway and the A4174, is categorised as a 'red' risk zone for GCN, meaning it has a key population of GCN, which is important on a regional, national or international scale. Additionally, a high proportion of the northern part of this area (north of the M4) is designated as a GCN Amber Zone, meaning it contains main population centres for GCN and comprises important connecting habitat that aids natural dispersal.

The area around Winterbourne Down, Coalpit Heath and Lyde Green is a mixed landscape of towns, villages and agriculture, with a scattering of woodland and a few SNCIs.

The area around Keynsham and Stockwood has a few SNCIs of moderate size, including open spaces accessible to people and areas of woodland. The edges of this area maintain a more rural feel, with a mixture of arable farming and pasture, and some thicker, taller hedgerows.

The rest of this area takes in the eastern flank of Bristol, between Lyde Green and Bitton / Longwell Green. Although on the very edge of Greater Bristol, this area is largely countryside, with a mix of pasture, some arable farming, woodland, commons, and grassland.

There are a fair number of sites designated as SNCIs to the east of Bristol, mostly designated for their species-rich grassland. Siston Common and the adjoining land is the largest of these, and connects via Warmley Brook to Rodway Hill, which is the second largest SNCI here. There also seems to be a good concentration of thicker, taller hedgerows and scattered trees in this part of the area, helping connect core wildlife sites.

Issues and challenges for nature

As per the sites currently proposed in the emerging preferred strategy for the South Gloucestershire Local Plan, and the B&NES Local Plan options consultation, there is the possibility of future development in this area. This could place pressure on nature through, for example, habitat loss and recreational pressure on designated sites including the large areas of commons to the east of Bristol.

The part of the River Frome within this area has a significant number of river barriers that present a barrier to fish passage, largely weirs that were previously used for industrial purposes. Additionally, the weir in Keynsham Memorial Park is the largest barrier on the River Chew.

There is also quite a lot of transport infrastructure in this area, including the M32, the M4, the A4 and the Bristol ring road, all of which present barriers to wildlife and are sources of pollution.

Constraints and opportunities

Much of the area is designated as having a low likelihood of Best and Most Versatile Land for agriculture, and is designated as Grade 3 or 4 under the ALC. However, there is a strip of land running north/northeast from Frenchay towards Iron Action that is high-quality agricultural land, known as the 'Blue Finger', which should be prioritised for food growing. Given its proximity to Bristol, this area could offer good opportunities for 'agroecological' food growing involving local communities.

The River Frome Reconnected project is working in the northern part of this area to 'manage flood risk on the Bristol Frome as well as improving biodiversity and connecting local communities to the river. There are good opportunities mapped for wetland creation to provide natural flood management here, as well as some good opportunities for catchment interventions to reduce phosphorus pollution and sediment run-off from diffuse sources. For more information on opportunities identified through RFR, see the River Frome Reconnected Catchment Plan.

Additionally, the 'Common Connections' project is working in this area to restore and join up local green spaces, rivers and ponds across 87 sites covering 375 hectares, including sites such as Siston Common, where grazing will be reintroduced. Actions such as improved grassland management for nature, orchard creation, tree planting, hedgerow restoration and creation, and pond creation should support nature recovery in this area, and provide a good foundation to build on moving forward.

Commons Connection will provide an opportunity to bridge three grassland connectivity opportunities identified to the East of Bristol by West of England NRN mapping; the area covered by Commons Connection is mapped as being part of the 'Strategic Grassland Network' under the NRN. There is also an opportunity to improve connectivity of both woodland and grassland networks identified to the south of Stockwood.

Finally, the proximity of this area to north and east Bristol, as well as Keynsham and Yate, means it provides significant opportunities to improve people's access to and engagement with nature, which is well-demonstrated by the Common Connections project.

The Waterspace Connected project, focused on the River Avon between Bath and Bristol, provides similar opportunities, and is looking at the possibility of a 45-hectare nature park next to the Somerdale development in Keynsham.

As noted in the 'issues and challenges' section, there is the possibility of future development in this area, which could limit opportunities for nature recovery to those that can be accommodated in suburban and peri-urban areas. However, well-designed development could contribute towards ecological connectivity.

The presence of the M4 and M32 in the area, as well as busy A-roads including the A4, is also a source of ecological severance and pollution.

Countryside in South Gloucestershire

Area	11,736 ha
Summary	A large swathe of countryside that is largely a mixture of pasture and arable farming outside of towns, including most of the catchment of the River Frome, with a handful of sites that are recognised for their value to nature
Key habitats present	Semi-natural broadleaved woodland Semi-improved grassland
'Crown Jewel' sites	River Frome Tortworth Estate Harris' Wood (SNCI) Wick's Valley Nature Reserve
Notable species	Hazel dormouse Bechstein's Bat *White-clawed crayfish?*
Potential opportunities for nature recovery	Creation of a riparian habitat corridor along the river Frome Remove or ease barriers to fish passage along the river Frome Restoration of wetland habitats in the floodplain Creation of scrapes, wetlands, and ponds throughout the farmed landscape to benefit wildlife and provide flood management Hedgerow creation and management

Part of National Character Area 118 - Bristol, Avon Valleys and Ridges

Sub-areas used to organise priorities for nature recovery:

- 36 – River Frome Floodplain Corridor
- 37 – Frome Catchment Shallow Vales
- 46 – Other built-up Areas (Yate)

Description and current value to nature

This refers to a large stretch of peri-urban and rural landscape in South Gloucestershire, bordered by the Cotswolds Scarp to the east, Greater Bristol to the south, the Lower Severn Vales to the west, and Gloucestershire to the north. It does not include the Wickwar Ridge and Vale.

A large part of the area, particularly to the north and east of Yate, is formed of a largely rural, open landscape with a mix of pasture and arable fields. There is little woodland in the area (as defined by areas of woodland more than 0.5ha in size), although there are smaller copses, well-managed hedgerows and field trees throughout the landscape, which form the majority of tree cover. There is a relative paucity of sites designated as SNCIs (although there are a handful of very small SSSIs). The Tortworth Estate and Harris' Wood, in the very north of this area, are notable sites of value to wildlife.

To the South of Yate, between Bristol to the West and the Cotswolds Scarp to the East, the landscape is more of a mixture between pasture and arable farming. Again, woodland cover is quite low, but non-woodland trees and hedgerows and found throughout the area. There is a smattering of sites designated as SNCIs for the value to nature, including the Wick Golden Valley Nature Reserve.

There is a high proportion of the area designated as a GCN Amber Zone, meaning it contains main population centres for GCN and comprises important connecting habitat that aids natural dispersal; this is particularly the case in the area between the Shirehampton to Tytherington Ridges, Lower Woods and Yate.

Issues and challenges for nature

The main challenges facing nature in this area are those common to the countryside nationally. This includes intensification of agriculture, pesticide use, the removal or poor management of hedgerows, the loss of marginal areas for wildlife, the loss of field trees, and a lack of woodland management. There is a lack of sizeable areas managed for nature locally.

As per the sites currently proposed in the emerging preferred strategy for the South Gloucestershire Local Plan, further development could place additional pressure on nature through urbanisation, recreational pressure and urban pollution. The increasing presence of horse grazing near urban areas has also likely been detrimental to nature through habitat loss.

Both the M4 and M5 pass through parts of this area, presenting a barrier to the movement of wildlife and a source of pollution; the A420 and A432 are also a less severe version of the same problem.

Sub-catchments in the middle of this area (Laddon Brook, Bradley Brook and Hortham Brook) suffer from poor ecological status due to heavy modification of river channels, the presence of barriers to fish passage, and land drainage; as well as due to diffuse sources of pollution, largely from agriculture but also from transport drainage.

Constraints and opportunities

The land in this area is quite mixed in terms of its quality for agriculture. The areas of most likely Best and Most Versatile Land are in the West of this area, between Frampton Cotterell and Torthworth. Much of the 'centre' (north and south of Yate) is mapped as having the lowest likelihood of BMV, with more moderate quality land south of Pucklechurch.

The EA has mapped the Frome catchment as a high priority area for NFM and there are good opportunities across the catchment for wider woodland creation to manage flood risk. There are also very good opportunities in the upper reaches of the Bristol Frome sub-catchment (to the northwest of Yate) for 'flood risk mitigation using land-based approaches'. This includes the potential for wetland creation to hold water and release it more slowly (this is due to the nature of the geology/soil here, which has a naturally high water table) and floodplain woodland creation.

The River Frome Reconnected (RFR) project is working in the central part of this area to 'manage flood risk on the Bristol Frome as well as improving biodiversity and connecting local communities to the river', building on these opportunities for flood risk mitigation.

The River Frome and its tributaries also offer good opportunities for riparian habitat enhancement and creation, and there are proposals for a nature reserve along the River Frome. For more information on opportunities identified through RFR, see the River Frome Reconnected Catchment Plan.

A number of natural flood management interventions are already being scoped out or delivered through RFR, including a constructed wetland within the Laddon Brook catchment, upstream NFM 'quick wins' and highway flooding interventions; and options for fish passes are being identified for a number of river barriers.

As part of River Frome Reconnected, there is also a long-term project to create a new publicly accessible river reserve adjacent to the River Frome.

There are good opportunities in the southern and eastern part of this area (i.e. south and east of Yate) for catchment interventions that would reduce soil erosion and diffuse phosphorus pollution.

There are six opportunities to improve grassland connectivity in the northern part of this area (to the west and northwest of Lower Woods) mapped through the West of England NRN. The three just to the west of Lower Woods could help connect isolated grassland habitats to the more extensive network around Lower Woods. The three in the north of the area (near Charfield), would connect a few isolated grasslands to each other, but would likely be more difficult to achieve given the distances involved and would provide less of an obvious benefit to the wider grassland network.

There are two other grassland connectivity opportunities mapped here, to the south of Sodbury Common and just north of Upton Cheney, as well as two opportunities to connect woodland networks close to Yate.

There is a small part of this area, around Wick, where geology and soil type (shallow lime-rich soils over limestone) enables the creation of calcareous habitats, including calcareous grassland.

Shirehampton to Tytherington Ridges

Area	9,297 ha
Summary	A ridge rising up from the Lower Severn Vales that runs between Bristol and the Gloucestershire border. It is a mixed arable and pastoral landscape punctuated by areas of woodland and copses, and a concentration of woodland in its southern reaches
Key habitats present	Ancient woodland Semi-natural broadleaved woodland
'Crown Jewel' sites	Blaise Castle Estate Berwick Wood Blackhorse Wood
Notable species	Hazel dormouse Silver-washed fritillary Marsh Tit
Potential opportunities for nature recovery	Improving the condition and management of existing woodlands, including opening up rides and glades and thinning canopy where appropriate Creating new, well-managed woodlands that connect existing woodland along the ridges Creating wood pasture and dynamic mosaic habitats in and around the Tortworth Estate Hedgerow creation and improved hedgerow management

Part of National Character Area 118 - Bristol, Avon Valleys and Ridges

Sub-areas used to organise priorities for nature recovery:

- 35 – Little Avon Corridor
- 39 –Ridges and Parkland Vale (South Gloucestershire)
- 40 – North West Bristol Woodlands
- 46 – Other built-up Areas (Thornbury)

Description and current value to nature

This area covers a ridge rising up from the Lower Severn Vales and bordered by the M5 to the east. This is a varied landscape with a mix of arable and pastoral farming, punctuated by smaller areas of woodland and copses, including wooded scarps, scattered areas of calcareous and neutral grassland, and various streams and watercourses.

There is a notable concentration of woodland in the southern part of this sub-area, near Cribbs Causeway. Some of this woodland is ancient and designated as SNCIs, such as Berwick Wood, Blackhorse Wood and Hay Wood. Otherwise, some medium-size sites designated for their local importance to nature are scattered throughout the area.

Much of the area is designated as a GCN Amber Zone, meaning it contains main population centres for GCN and comprises important connecting habitat that aids natural dispersal.

Issues and challenges for nature

The M5 runs along the eastern edge of this area, the A38 runs through its centre, and the M4 bisects it from southeast to northwest. All of these roads are barriers to the movement of wildlife, as well as a likely significant source of chemical, noise and light pollution.

The mapping of ecological networks by WENP suggests that most of the woodland north of the M4 in this area is isolated and poorly connected. A lack of management of woodland and hedgerows is likely to exacerbate the problem.

Pressure from development and urbanisation along the A38 corridor, as well as increasing horse grazing at settlement fringes and along A38, has potentially led to a loss of habitat in the past.

There is the potential for further development here, as per the sites currently proposed in the emerging preferred strategy for the South Gloucestershire Local Plan. If not well-designed, developments could contribute to further ecological fragmentation. The large new development at Filton Aerodrome may increase recreational pressure on the woodlands in the south of this area.

There are areas of poor water quality adjacent to the M5, including Hortham Brook and Laddon Brook, due to agricultural pollution. Pollution from the M5 will likely exacerbate pressures on the water environment here.

Constraints and opportunities

The West of England NRN mapping (see Figure 6) has identified a number of opportunities to improve the connectivity of the fragmented woodland network north of the M4. This could be achieved through, for example, targeted creation of small woodlands and copses, agroforestry, and hedgerow creation and restoration, as identified in the Forest of Avon Plan (Section 5.15). In many of these areas, there are also opportunities for riparian woodland creation that could improve ecological connectivity and improve in-river ecology.

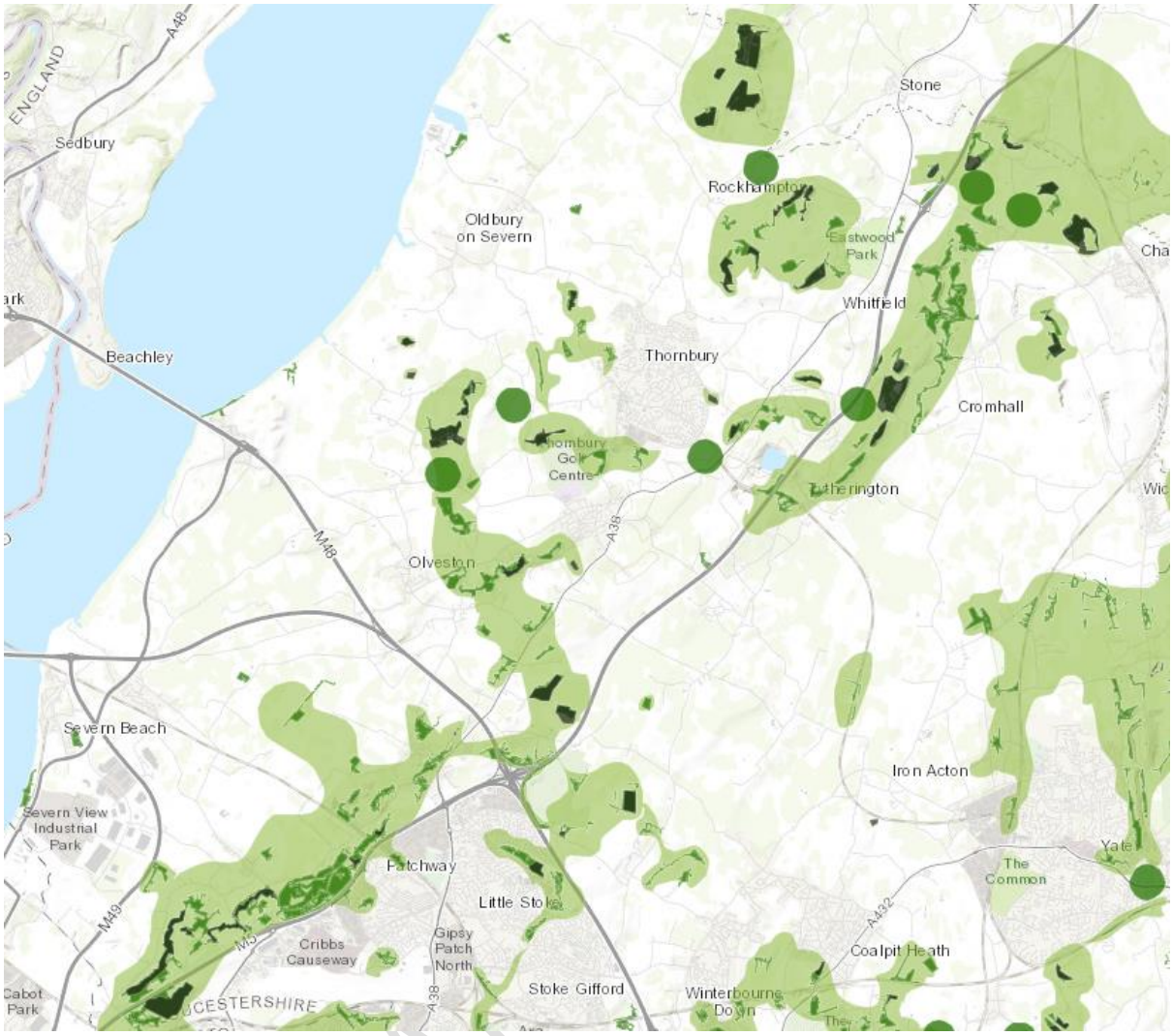

Figure 6 – The woodland network and gaps along the Shirehampton to Tytherington Ridges. Existing woodland is shown in solid green (ancient woodland is dark green); woodland connectivity gaps identified by WENP mapping of the NRN are shown as green circles; and the West of England Strategic Woodland Network is translucent green.

There is a notable concentration of woodland between Tytherington and Tortworth that hosts a population of dormouse (and is mapped as being part of the Strategic Woodland Network in the NRN). This would benefit from improved connectivity through, for example, woodland creation, creation and better management of hedgerows, and establishment of field trees.

South of the M4, the concentration of woodlands provides opportunities for improving woodland management where it is not already well-managed, to boost the area's value to wildlife. In some of these woodlands, such as in Blaise Castle Estate, this could involve removal of invasive species such as rhododendron Ponticum and cherry laurel.

The land in this area is of largely moderate-good quality for agriculture, with the best quality land surrounding Thornbury. As such, there is a relatively high (for this part of the country) proportion of arable farming on this ridge, particularly between the M5 and Thornbury.

North of the M4, the amount of land in arable production and the relatively good quality of agricultural land, together with the relative paucity of semi-natural habitats, may make large-scale nature recovery less feasible away from the more wooded ridge.

However, as a more rural and well-farmed area, improvements in the management of hedgerows alongside restoration of previously removed hedgerows, field trees, agroforestry, restoration of species-rich grassland where it has been improved, on-farm wildflower strips etc. would all enhance the value of the broader countryside for wildlife.

Additionally, measures to reduce agricultural run-off and other sources of pollution (including from road outfalls on the A38, M4 and M5) would help to improve water quality in the various sub-catchments that water from this area runs in to.

For certain species (e.g. mammals), ecological connectivity would be limited by the M5, M4 and A38, which may need rectifying before habitat creation delivers benefits for ecological connectivity.

Any development that took place here could remove areas as opportunities for habitat creation/restoration in the future, although well-designed developments can contribute positively to ecological connectivity.

However, this proximity to population centres also means there could be good opportunities for improving people's access to nature. Alongside public spaces such as Blaise Castle Estate, the presence of sites such as Wild Place and The Wave, which have a focus on sustainability and engagement with nature, could assist with bring people closer to nature on their doorstep.

Much of this area is identified as a Green Infrastructure Corridor (Corridor B) in the South Gloucestershire GI Strategy, with the strategic woodland network highlighted as being of importance to this GI Corridor.

Lower Severn Vale Levels

Area	7,772 ha
Summary	A low-lying, open floodplain that is largely pastoral apart from the industrialised area near Avonmouth. A mosaic of watercourses and rhynes drain much of the land, with areas of saltmarsh, wetland and reedbeds providing valuable wildlife sites
Key habitats present	Coastal and floodplain grazing marsh Reedbeds Traditional orchards
'Crown Jewel' sites	Littleton Brick Pits Pilning Wetlands Silt lagoons at Oldbury Power Station
Notable species	Lapwing, Redshank, Snipe, Curlew, Woodcock, Reed warbler, reed bunting Otter, water vole Great-crested newt Hairy dragonfly, water scorpion Common stonewort
Potential opportunities for nature recovery	Creation of wetland and reedbed habitats Creation/restoration of floodplain grazing marsh and wet meadows Saltmarsh creation/restoration Modification of barriers in rhynes and ditches to allow passage for eels and other fish Improving management of rhynes and ditches Improving water quality in rivers, streams, rhynes and ditches Establishment/restoration of traditional orchards

Part of National Character Area 106 - Severn and Avon Vales

Sub-areas used to organise priorities for nature recovery:

- 41 – Lower Severn and Avon Vale
- 42 – Avonmouth and Coastal industrial areas

Description and current value to nature

The Lower Severn Vale Levels refers to the low-lying, open floodplain between the Severn Estuary coast and the ridge running from Shirehampton to Hill, close to the border with Gloucestershire. This area is part of the wider Severn Vale Levels, which continues north into Gloucestershire.

The South of the area, around Avonmouth, is heavily industrialised, giving way to a largely rural and agricultural area in the North, with the majority of the lang being grazed. A network of watercourses and rhynes drain land for agriculture in the rural part of the landscape.

Tree cover in this area is sparse, with just over one hectare is designated as ancient woodland. Scattered orchards and copses provide most of the tree cover . However, a strong hedgerow network provides connectivity for species such as bats.

The area's value to nature comes from the saltmarsh, scattered orchards, reedbeds, grassland and the many watercourses. The scattered traditional orchards, which have steeply declined across England in the past century, and remaining species-rich grassland provide valuable habitat for a variety of invertebrates and birds.

Much of the area is designated as a GCN Amber Zone, meaning it contains main population centres for GCN and comprises important connecting habitat that aids natural dispersal.

Areas of saltmarsh, wetland and reedbeds are particularly noteworthy. Due to their proximity to the Severn Estuary, many of the wetlands and saltmarsh habitats providing high tide roosts and feeding sites for the wading birds and wildfowl that feed on the Severn Estuary[25], while reedbeds provide a unique habitat for birds such as reed bunting and reed warbler. The Pilning Wetlands, Littleton Brick Pits, and the silt lagoons at Oldbury Power Station are good examples of these habitats in the Lower Severn Vale Levels.

Before drainage, the land would have likely been wetland and marshy habitat, such as 'reed swamps', with a greater overall value to biodiversity but little use for agricultural purposes. However, the many watercourses that criss-cross the landscape support a diverse range of species including aquatic macroinvertebrates, fish, and water vole.

Issues and challenges for nature

In the south of the Levels, pressure from industrial development is a notable challenge for nature. The area between Avonmouth and Severn Beach hosts an economically important industrial zone, which has removed a large area of what was previously wetland habitat and places pressure on surrounding wildlife due to e.g. light pollution.

Additionally, man-made flood defences, such as sea walls, put further pressure on coastal habitats by preventing flooding of grasslands and significantly reducing the area of wetland habitat. Recreational pressure (especially in the southern part of the landscape) can disturb feeding and roosting birds, and fly grazing of animals (usually horses) is especially prevalent in the Avonmouth/Severnside area, which can have a dramatic impact on biodiversity.

The Shoreline Management Plans (SMPs) for this area defines a 'hold the line' policy (apart from a small section where no active intervention is required). This means that coastal squeeze is likely to reduce the area of inter-tidal habitat in the future as sea-levels rise and flood defences are maintained.

The rhyne and ditch network suffers from some water pollution (all the watercourses and features are of moderate ecological status in this area), reducing its value to wildlife. Poor management of ditches (e.g. fencing off) further reduces their value to biodiversity in some areas. Additionally, barriers used for maintaining water levels prevent passage of eels and other fish through the ditch network.

[25] High tide roosts are recognised by the RSPB and Natural England as being critically important for the conservation of water birds, providing areas for 'loafing' and energy conservation at periods of high tide along the Estuary.

The road network in the southern part of the levels, which is crisscrossed by a series of motorways, presents a barrier to wildlife, especially mammals and amphibians, and is an additional source of pollution from road runoff.

Further north, in the more rural part of the Levels, the majority of the traditional orchards that once populated the landscape have been lost, reflecting the fate of traditional orchards across England. Given the value of traditional orchards to a range of wildlife, this will have had a detrimental effect on nature.

As is the case in many rural areas, overgrazing, intensification, removal and undermanagement of some hedgerows, and the loss of on-farm ponds has reduced the value of the agricultural landscape to wildlife. There has also been an increase in horse grazing in recent years, further reducing the amount of land that may have been of value to nature.

Further back in history, drainage for agricultural purposes would have removed wetland and marshy habitat that would have been of higher value to nature overall.

Opportunities and constraints

The Shoreline Management Plan policy of 'holding the line' to protect coastal communities and assets from flooding means that opportunities for saltmarsh creation/restoration across the Lower Severn Vale Levels is likely to be limited.

However, if there are any opportunities to do so, managed coastal realignment could help to create new intertidal and saline habitats, including saltmarsh. This would benefit nature, provide natural flood management, and potentially sequester significant amounts of carbon.

Similar to the North Somerset Levels and Moors, its low-lying and wet nature means the area is suitable for the creation of wetland habitats, as well as floodplain grazing marsh, at a scale that would not be possible in many locations. Creation of wetland habitats could also provide high levels of flood mitigation in this coastal area.

Restoration of farmland ponds, scrapes and other water storage would benefit biodiversity as well as helping to maintain water within the landscape.

Any re-wetting of the landscape and creation of wetland habitats should benefit the plant and invertebrate communities that are largely confined to rhynes and ditches, as well as a variety of other species, by both providing more habitat and improving water quality. This would also sequester carbon and provide a measure of flood management. However, any rewetting would need to be considerate of potential impacts on adjacent land.

Where drainage is maintained, which will likely be on most of the land, better management of the rhynes and ditches would increase their value to biodiversity, and modifying barriers to allow fish passage would upon up the ditch network to eels and other fishes in the Severn Estuary.

Although the area is generally not suitable for woodland creation, there are opportunities for riparian woodland creation/enhancement, including increasing the presence of native willow pollards next to watercourses.

The restoration and establishment of traditional orchards would be of value for both nature and heritage in this area, for instance by conserving the genetic diversity of orchard fruit varieties. Restoration and appropriate managing of hedgerows will also benefit wildlife, providing ecological corridors across the landscape, and would benefit landscape character.

The majority of this area is grazed as pasture and is mapped as having a low likelihood of Best and Most Versatile Land. Restoration of areas of wetland habitat is, therefore, mostly possible without removing the most productive agricultural land.

The heavily developed/industrialised nature of the area between the M49 and the coast means that opportunities for nature recovery may be limited there. Conversely, the relatively less developed area north of the M48 could present larger-scale opportunities for nature recovery, including at-scale wetland creation and/or saltmarsh restoration in appropriate locations.

Most of the area north of Chittening and Hallen is mapped as a South Gloucestershire Strategic GI Corridor (Corridor A), due to the strategic wetland network here.

Bristol and surrounding Suburbs

Area	12,340 ha
Summary	A largely urban and suburban area with scattered areas of larger semi-natural spaces
Key habitats present	Parkland Semi-natural broadleaved woodland
'Crown Jewel' sites	Clifton and Durdham Downs Manor Wood Western Slopes
Notable species	Hedgehog Swift
Potential opportunities for nature recovery	Improve management of private gardens and other privately managed areas for nature, including reducing the area of hard/impermeable surfaces Increase tree canopy cover and green streets Increase the area of parks public green spaces managed for nature Installation of Sustainable Urban Drainage Systems Installation of swift bricks, nest-hole bricks, and bird and bat boxes

Part of National Character Area 118 - Bristol, Avon Valleys and Ridges

Sub-areas used to organise priorities for nature recovery:

- 44 – Bristol and surrounding Suburbs

Description and current value to nature

In this context, Greater Bristol refers to the built-up area that forms the city of Bristol. This is largely within Bristol City Council, but a significant minority falls within South Gloucestershire.

This is a largely urban and suburban area, with scattered areas of larger semi-natural spaces. Its value to wildlife comes largely from the mix of gardens, small open green spaces, street trees and hedges,

incidental habitat, and the larger green and blue spaces such as Blaise Castle, Clifton Downs and Western Slopes.

There are a number of sites designated as SNCIs for their local wildlife value in this area, including Clifton and Durdham Downs, the lower part of the River Frome corridor, Conham Valley River Park, Western Slopes and Manor Wood. Part of the Avon Gorge SSSI is found on the western side of the Downs, designated for its exceptional number of nationally rare plants.

There is also an area around the Ashton Brook and Colliters Brook close to Long Ashton Park and Ride that is in the flood zone and is prone to flooding, where wetland birds such as snipe are often spotted.

Issues and challenges for nature

As would be expected for a densely populated area, the biggest threat to nature here has been from urbanisation. This has led to the loss of most of the semi-natural habitat that would have originally been present, as well as increased recreational pressure on remaining sites.

With urbanisation comes pollution of various forms and from various sources, including light pollution, noise pollution and chemical pollution. Light pollution is particularly severe in Bristol and has been shown to negatively impact insects, in particular. The preponderance of infrastructure such as roads and drains are a further source of danger for wildlife.

Additionally, the increasing tendency for gardens to be paved over or replaced with artificial surfaces for ease of maintenance is reducing the extent of what can be an important mosaic habitat for wildlife[26]. Paving with impermeable surfaces also contributes to flooding and in the case of artificial lawns, an additional source of pollution.

Research from Butterfly Conservation has shown that butterflies have declined by 69% over a 20-year period in urban areas, compared to a 45% decline for butterflies in rural areas, demonstrating the pressure faced by wildlife in urban areas.

Constraints and opportunities

Opportunities for nature recovery will largely be those that can take place within an urban/suburban setting. This could include increasing tree canopy cover through street trees, improving the quality of gardens for wildlife, and better managing parks for nature.

Reducing and softening barriers to the movement of wildlife, such as roads and hard boundaries, would also benefit nature. This could include creating urban 'hedgehog highways', using wildlife kerbs to reduce the loss of amphibians to drains and gullies, and prioritising connecting existing open spaces.

There are some areas of semi-natural habitat, as outlined above, which could be further enhanced for nature. As these will all be important green/blue spaces for local communities, recreational infrastructure and pressures will likely be the limiting factor for opportunities for nature recovery.

[26] A London survey found that the capital is losing about 3,000ha of greenery a year from its domestic gardens, which is the equivalent of two-and-a-half Hyde Parks. We can expect similar changes to have taken place in Bristol and other urban areas.

The area in the flood zone close to Long Ashton Park and Ride offers good opportunities for wetland creation, given it is already prone to flooding. This would also provide an opportunity to bring nature close to local communities.

This area does present the greatest opportunity to bring nature into people's everyday experience, with resulting benefits to people's health and wellbeing. The concentration of gardens also offers an opportunity to improve urban biodiversity while benefitting people's wellbeing.

Nature-based solutions also offer opportunities to tackle issues such as urban pollution and heat stress while benefitting nature. For example, street trees and vegetation can improve air quality, reduce heating, provide shade and improve the aesthetic of urban areas; and sustainable urban drainage systems (SuDS) can help reduce flood risk and mop up pollutants. Greening streets can also support businesses and the local economy by reducing staff sickness, increasing staff retention, and increasing patronage.

There are also a large number of active community groups, charities and 'friends of' groups helping to look after parks, green spaces and rivers in the area, which can provide resource and local expertise to create and manage spaces for nature, as well as enabling people to engage with their local environment.