

Environmental Character Area Profile for the Minerals Local Plan: 7. Severn Valley South

1. Introduction

- 1.1. Minerals development usually takes place on previously undeveloped land and can therefore result in permanent change to the natural environment and green spaces in Worcestershire. The impacts of both the working and the restoration of mineral sites need to be considered in detail in the development of the Worcestershire Minerals Local Plan (the MLP).
- 1.2. The Council will take a 'green infrastructure' (GI) approach to considering these impacts. The GI approach is a different way of thinking about the green spaces in Worcestershire. It moves beyond solely considering the environmental benefits of green spaces and integrates the consideration of economic, health and social benefits in the planning and management of green spaces. Rather than considering each green space in isolation it looks at the ways in which individual sites and corridors of green space collectively form the distinctive character of Worcestershire that attracts both visitors and business to the County.
- 1.3. The components of GI include biodiversity, landscape, historic environment, access and recreation and water (also known as blue infrastructure). The GI approach requires thinking about the environment as an integrated system of stepping stones or nodes in a wider network¹.

Green infrastructure and mineral workings and restoration

- 1.4. There is significant potential for mineral workings to destroy existing networks of green infrastructure if the nature and character of these networks is not taken into account. However there is also significant potential to contribute positively to green infrastructure through the restoration of mineral workings.
- 1.5. The GI approach extends beyond thinking about designated sites of biodiversity or historic interest. This means that the impact of a mineral working on the wider environment and the integrated system of stepping stones or nodes in a wider network² will need to be considered.

Environmental Character Areas³ and the Minerals Local Plan

- 1.6. The Worcestershire Green Infrastructure Partnership has undertaken an analysis of the landscape character, biodiversity and the historic environment of Worcestershire to identify 30 distinct GI Environmental Character Areas (ECAs). Details about how these were developed is set

¹ Green Infrastructure Guidance – Natural England.

² Green Infrastructure Guidance – Natural England.

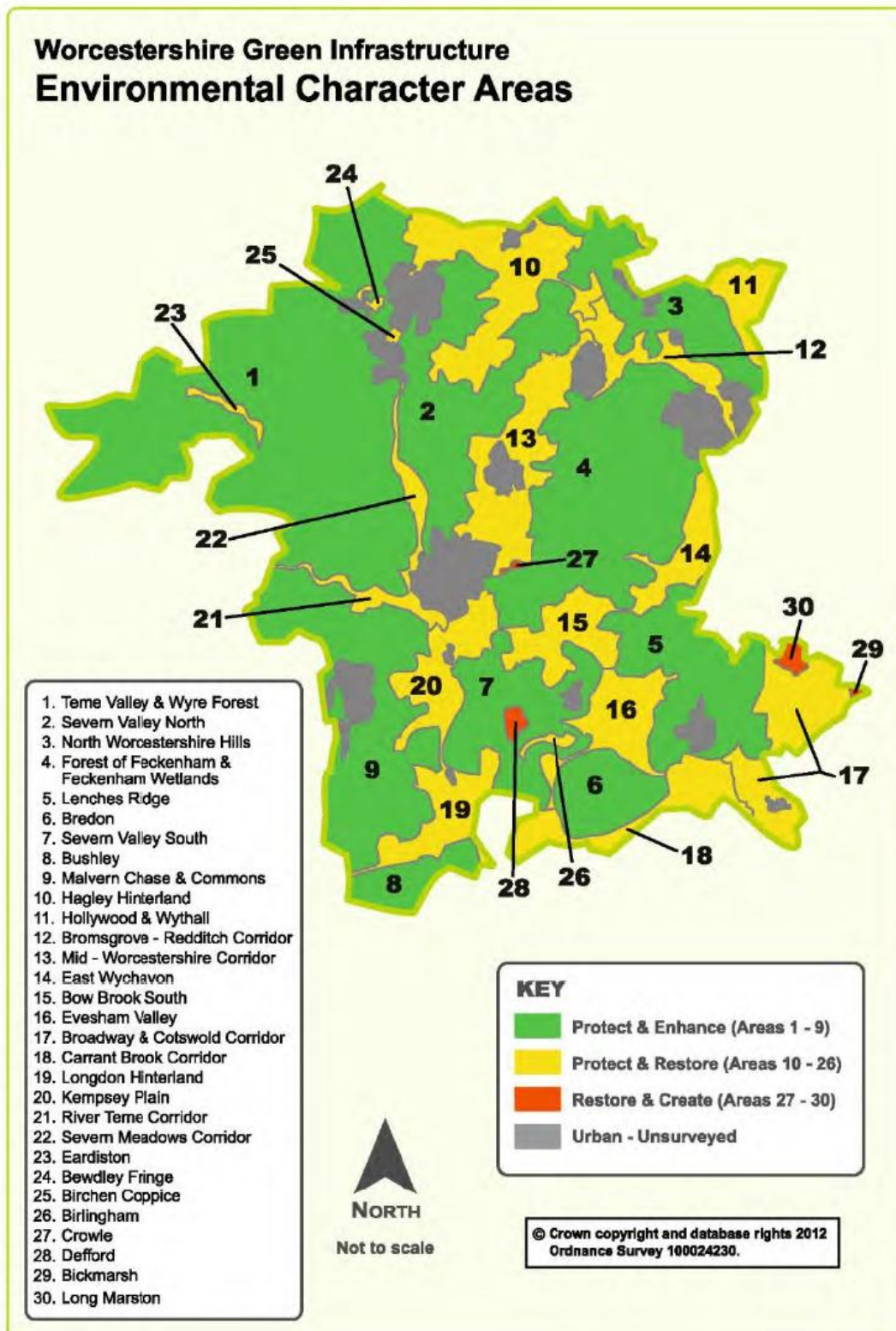
³ Worcestershire County Council (July 2012) *Planning for a Multifunctional Green Infrastructure Framework in Worcestershire: Green Infrastructure Framework 2*

out in *Planning for a Multifunctional Green Infrastructure Framework in Worcestershire: Green Infrastructure Framework 2 (2012)* available at www.worcestershire.gov.uk/GI

- 1.7. These underlie the distinctive character of Worcestershire and it is the Council's intention that the unique characteristics of each area will drive the restoration strategy for the Minerals Local Plan.
- 1.8. This is one of 30 profile documents which set out the characteristics and priorities for the each ECA. It sets out the mineral resources in the ECA and the GI priorities identified by the Worcestershire GI Partnership. These priorities are structured around biodiversity, historic environment, landscape character, water environment (also known as blue infrastructure) access and recreation and transport. The document is also supplemented by other locally relevant information as appropriate.
- 1.9. This information will be used to develop the spatial strategy and restoration priorities for each ECA.
- 1.10. Profiles for each of the following ECAs are available on our website www.worcestershire.gov.uk/mineralsbackground:
- 1.11. The Environmental Character Areas are:
 1. Teme Valley & Wyre Forest
 2. Severn Valley North
 3. North Worcestershire Hills
 4. Forest of Feckenham & Feckenham Wetlands
 5. Lenches Ridge
 6. Bredon
 7. Severn Valley South
 8. Bushley
 9. Malvern Chase and Commons
 10. Hagley Hinterland
 11. Hollywood & Wythall
 12. Bromsgrove – Redditch Corridor
 13. Mid-Worcestershire Corridor
 14. East Wychavon
 15. Bow Brook South
 16. Evesham Valley
 17. Broadway & Cotswold Corridor
 18. Carrant Brook Corridor
 19. Longdon Hinterland
 20. Kempsey Plain
 21. River Teme Corridor
 22. Severn Meadows Corridor
 23. Eardiston
 24. Bewdley Fringe
 25. Birchen Coppice
 26. Birlingham
 27. Crowle
 28. Defford
 29. Bickmarsh
 30. Long Marston

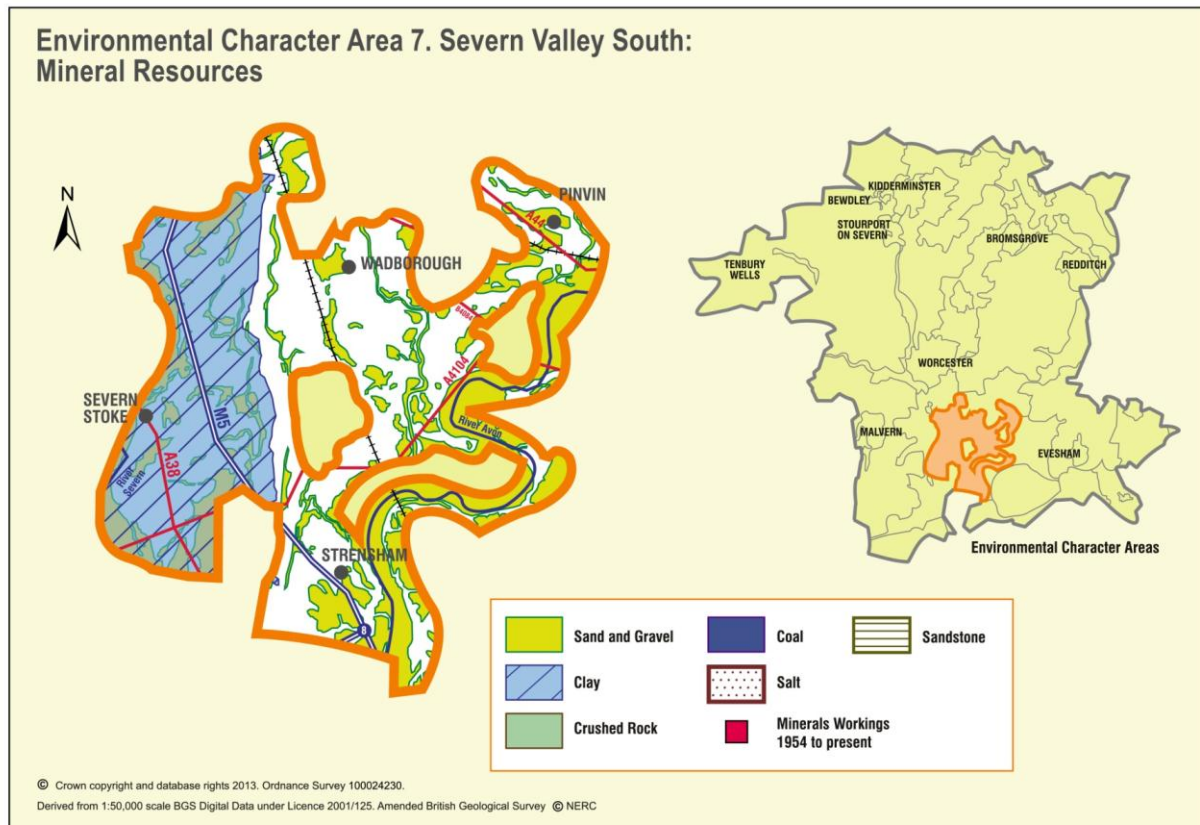
These are illustrated on Figure 1. Environmental Character Areas.

Figure 1. Environmental Character Areas



2. Characteristics and priorities of the Severn Valley South ECA 7

Figure 2. Environmental Character Area Severn Valley South: Mineral Resources



Mineral Resources

Aggregates

2.1. Details about the aggregate resources in this ECA are given in the background report "Analysis of Mineral Resources in Worcestershire" available on www.worcestershire.gov.uk/mineralsbackground. The following is therefore only a simple summary.

Sand and gravel

2.2. ECA 7 contains 18 deposits of sand and gravel, comprising at least 583 Ha of 1st, 2nd, 3rd, 4th and 5th Severn and Avon terrace deposits, the resource is generally located along the course of the river Severn and close to the motorway. 10.7m³ of material can be estimated from 15 of the deposits. 3 deposits are categorised as "Key" and 6 "Significant".

Hard rock

2.3. There is no evidence of suitable strata in this ECA.

Industrial minerals

Clay

- 2.4. There are large areas of Mercia Mudstone in this ECA but no evidence of significant working.

Silica sand

- 2.5. There is no evidence of suitable strata in this ECA.

Brine

- 2.6. The OS 1:10,000 map shows a Salt Spring and Salt Bath Covert 1km SE of Croome Court. The memoir for Worcester suggests that the halite deposits may be present at depth to the east of the Smite-Pirton-Tewkesbury fault system.

Future Growth

- 2.7. The key driver for mineral extraction is to provide the raw materials required for the economy to function properly and for homes and infrastructure to be built. Minerals are unevenly distributed. Some of the minerals that we need are not found in Worcestershire and will need to be imported from outside the County. Many minerals are expensive to transport, particularly aggregates as they are a relatively low value and bulky material, and they are likely to be used close to their source, meaning that some local mineral extraction will be needed to support local growth in housing and the associated infrastructure that is required, or to provide raw materials for local industry. On average, about 80 per cent of mineral products are used within 30 miles of the quarry.
- 2.8. This ECA is a largely rural area primarily within Wychavon District but with the western side of the ECA in Malvern Hills District. Wychavon District anticipates the development of 5,807 homes, 18.5 ha of employment land and a new neighbourhood centre and Malvern Hills District anticipates 2,592 homes and 29.76 ha of employment land in the next 14-18 years⁴.
- 2.9. The ECA incorporates the "other town" of Upton upon Severn⁵, the Category 2 village of Pinvin and Category 3 village of Defford which are proposed for some development in the South Worcestershire Development Plan proposed submission document⁶ and surrounds the "other town" of Pershore⁷.

⁴ Information gathered by Worcestershire County Council in early 2013. This gives a good indication of the likely levels of development which can be expected, but for the latest figures please refer to the relevant City, District or Borough Council.

⁵ Other towns are third in the five tier settlement hierarchy set out in the South Worcestershire Development Plan proposed submission document. They are less than a third of the size of the Main Towns, but provide a range of services and employment opportunities and act as local service centres. Due to the extent of floodplain around Upton upon Severn, development will be limited.

⁶ Category 1, 2 and 3 villages are fourth in the five tier settlement hierarchy set out in the South Worcestershire Development Plan proposed submission document. Their role is predominately aimed at meeting locally identified housing and employment needs. They are

2.10. These and other areas beyond the boundary of the ECA could create demand for minerals in this Environmental Character Area. Particularly Worcester City to the north of the ECA is proposed for 6,525 homes and 74ha employment land in the South Worcestershire Development Plan proposed submission document⁸ and the main towns⁹ of Malvern to the west and Evesham to the east. Tewkesbury and Ashchurch to the south of the ECA are proposed as strategic or housing allocations in the Gloucester, Cheltenham and Tewkesbury Joint Core Strategy "Developing the Preferred Option" consultation document and could also create some demand for minerals in this ECA.

Green Infrastructure priorities¹⁰

2.11. All Environmental Character Areas (ECA's) have been placed into one of three categories based on their overall score for Green Infrastructure. These are:

1. Protect and enhance
2. Protect and restore
3. Restore and create

2.12. The category is based an assessment of the ECAs landscape character, biodiversity and the historic environment characteristics. These characteristics were each attributed a score, with biodiversity being given a greater weighting than landscape and the historic environment, each of which were given equal but lower weightings.

2.13. The strategic GI approach for the Severn Valley South ECA is to *protect and enhance*. The overarching principle identified by the GI partnership is to protect and enhance the Severn Valley floodplain and its functionality.

therefore suited to accommodate market and affordable housing needs alongside limited employment for local needs. The scale of allocated development is significantly less than that for the urban areas and is aimed at helping to address housing needs and support local services.

⁷ Other towns are third in the five tier settlement hierarchy set out in the South Worcestershire Development Plan proposed submission document. They are less than a third of the size of the Main Towns, but provide a range of services and employment opportunities and act as local service centres. Pershore is relatively large and has available suitable land, therefore an urban extension is proposed for it.

⁸ Category 1, 2 and 3 villages are fourth in the five tier settlement hierarchy set out in the South Worcestershire Development Plan proposed submission document. Their role is predominately aimed at meeting locally identified housing and employment needs. They are therefore suited to accommodate market and affordable housing needs alongside limited employment for local needs. The scale of allocated development is significantly less than that for the urban areas and is aimed at helping to address housing needs and support local services.

⁹ Main towns are second in the five tier settlement hierarchy set out in the South Worcestershire Development Plan proposed submission document. They provide a comprehensive range of local services and employment opportunities. The towns will continue to be the focus of balanced growth in Malvern Hills and Wychavon, with urban extensions and smaller infill allocations along with necessary associated infrastructure.

¹⁰ Worcestershire County Council (July 2012) *Planning for a Multifunctional Green Infrastructure Framework in Worcestershire: Green Infrastructure Framework 2*

Biodiversity and landscape

- 2.14. The Severn Valley South Environmental Character Area encompasses a broad variety of valuable but highly fragmented semi-natural habitats as well as broad areas of intensively managed agricultural land.
- 2.15. This ECA, to the south-east of Worcester, lies between the Rivers Severn and Avon, in the low-lying land around Pershore. The two river corridors are characterised by open riverine landscapes described by the county Landscape Character Assessment (LCA) as the Landscape Type Riverside Meadows. These are seasonally flooded landscapes of permanent grassland with lines of willows and alders, often pollarded, along the river banks and wet ditches. These areas are of vital importance in the retention and enhancement of a functioning floodplain along the rivers in order to protect communities downstream from flood events. Traditionally, these riparian landscapes would have included functioning flood plain meadows (or hams), the remnants of which have a high biodiversity value. The ECA holds a significant portion of Worcestershire's River Terrace and Alluvial Fenland environments; the terraces, banks and floodplain of the Avon hold wetland resources (such as BAP wet woodland and flood meadows) which are important in their county context. The value and fragmented nature of these habitats mean the area has been prioritised by the Wetlands West Partnership for wetland restoration delivery, as well as the Worcestershire Biodiversity Partnership who have identified the Severn and Avon Vales as a Biodiversity Delivery Area, capable of delivering significant proportions of the county's BAP targets.
- 2.16. Elsewhere, the landscape of this ECA is dominated by Wooded Estatelands to the east and Estate Farmlands to the west. This separation reflects the more ancient character of the eastern part where the Wooded Estatelands are characterised by large blocks of ancient woodland and the western part where the Estate Farmlands are characterised by small geometric plantations associated with country houses. Ornamental tree planting and veteran trees associated with the designed landscape of parks such as Croome and Pirton are also very noticeable here. These landscapes are one of the most intensively cultivated areas in Worcestershire; semi-natural habitats are restricted and fragmented by diffuse urban development and cultivated land.
- 2.17. There are also two substantial areas of Unenclosed Commons at Defford and Kempsey where the unenclosed and unwooded nature of the landscape is gradually changing as management declines and areas are allowed to scrub over.

GI Priorities:

- 2.18. The biodiversity and landscape priorities identified for the Severn Valley South ECA are¹¹:
- Links should be made with existing site management, in order to achieve site expansion, buffer and link the key priorities including

¹¹ Worcestershire County Council (July 2012) *Planning for a Multifunctional Green Infrastructure Framework in Worcestershire: Green Infrastructure Framework 2*

wet grassland, wet woodland, reedbed and functional flood plain habitats and sites. In the case of the River Severn corridor the link is already in place but augmentation of this in the floodplain will be critical for a number of GI aspirations, in conjunction with enhancements to the blue infrastructure.

- Protect and enhance neutral grassland networks.
- Protect veteran trees.
- Enhance and protect the woodland character according to the guidelines for each Landscape Type (predominantly hedgerow and streamside trees in the Settled/Timbered Farmlands and the Meadows Landscape Types; small geometric plantations and tree belts in the Estate Farmlands).
- Enhance the pattern and composition of hedgerows through management and replanting.
- Seek opportunities to retain and encourage pastoral land use in the Meadows landscapes. NB This ECA also contains localised patches of Unenclosed Commons which is a (largely) unsettled, unenclosed and unwooded Landscape Type; here opportunities should be sought to retain rough grazing land use and management regimens which support unwooded and unenclosed character.

Geodiversity

- 2.19. There are no Geological Sites of Special Scientific Interest or Local Geological Sites in this ECA.

Historic Environment¹²

- 2.20. This area is archaeologically varied, with the sands and gravels of the River Avon to the east providing a strong focus for prehistoric and Romano British and early medieval occupation and activity. The broader meanders of the river are likely to have left a series of palaeochannels sealed beneath later alluvial deposits, and these have a high potential for the preservation of significant palaeoenvironmental remains. The second Avon Terrace is important for the identification and recovery of Palaeolithic artefacts and associated environmental remains, and is seen as a key research objective for the region.
- 2.21. The River Severn forms the southwest boundary to this character area and here broad alluvial deposits are known to seal palaeochannels and earlier land surfaces.
- 2.22. Away from the gravel terraces relic medieval and post medieval landscapes contain moated sites, settlement, field system and parklands.

¹² Historic Environment and Archaeology Service, Worcestershire County Council and Cotswold Archaeology (R Jackson and H Dalwood et al) (November 2007) "*Archaeology and aggregates in Worcestershire: A resource assessment and research agenda*" Supported by English Heritage through the Aggregates Levy Sustainability Fund.

- 2.23. The historic parkland at Croome and the influence of the wider Estate landscape is still evident across much of the western part of the area. Further west and north the historic landscape character is more diverse with mixed period field systems and a higher density of dispersed, irregular-shaped ancient woodlands.

GI Priorities:

- 2.24. The historic environment priorities identified for the Severn Valley South ECA are¹³:
- Protect extensive below ground prehistoric and Romano-British settlement on river terraces and sensitive prehistoric ritual sites in alluvial clays adjacent to the Severn and other watercourses.
 - Protect sensitive below ground palaeoenvironmental deposits contained in palaeochannels adjacent to the Severn.
 - Protect and enhance historic parkland character associated with the more extensive historic Croome estate lands.

Blue Infrastructure

Flooding

- 2.25. The geology can have an effect on the runoff, and the flooding, within a catchment as a result of the permeability of the strata. The geology within South Worcestershire is variable. According to the River Severn Catchment Flood Management Plan (CFMP), the lower reaches of the River Severn flow over Non Aquifer Triassic Mercia Mudstone Group strata and Jurassic Lower Lias Clays. The drift gravels at this point allow groundwater to flow from the drift deposits to the river and vice versa, only the western edge of this ECA is likely to be affected in this way. Impermeable clays and mudstones dominate the Warwickshire Avon sub-catchment, in which far and away the greater part of this ECA lies. Groundwater flooding is not considered to be a major issue in the South Worcestershire Joint Core Strategy area.
- 2.26. The main cause of flooding in the Malvern Hills part of this ECA is from local watercourses and surface water sewers. In particular, rapid response catchments are of concern, and as many of the watercourses at risk are less than 3km² in area there are no flood risk maps covering these areas. Where proposed allocation sites are located in such catchments, further assessment may be needed to determine the level of risk. The Hatfield Brook in Kempsey causes flooding. Short duration intense storms causing flash or rapid response flooding in smaller watercourses are a particular problem.
- 2.27. Upton upon Severn is flooded from a combination of the River Severn and surface water flooding from sewers and overland flow.

¹³ Worcestershire County Council (July 2012) *Planning for a Multifunctional Green Infrastructure Framework in Worcestershire: Green Infrastructure Framework 2*

- 2.28. During an extreme flood extent the town can become cut off as a result of the River Severn flooding. This is caused more from a flood flow route to the west of the town rather than from significant flows from within this ECA.
- 2.29. In the Wychavon part of this ECA the principal flood risk is from the River Avon in Pershore. For the villages in south Worcestershire the main causes of flooding are the smaller watercourses and surface water flooding from sewers and overland flow. Wychavon LPA considers that Pinvin is not defended to a satisfactory standard.
- 2.30. Groundwater flooding is not considered to be a major issue in the South Worcestershire Joint Core Strategy area.

Water Quality

- 2.31. The Severn, Bow Brook and the Avon are of moderate ecological quality. The Severn and Bow Brook pass WFD chemical standards but the Avon would fail them. Most of the ECA, apart from a relatively narrow corridor south of Pirton, is categorised as having water company point source pollution and under agricultural/rural diffuse pollution pressure. Groundwater quality is good.

Water Supply

- 2.32. No water is available from either the Severn or the Avon. The Bow Brook is over abstracted.

GI Priorities:

- 2.33. The blue infrastructure priorities identified for the Severn Valley South ECA are¹⁴:
- Reduce dependence on raised flood defences, as this is not sustainable in the long term, by taking opportunities to restore sustainable natural storage of floodwater on undeveloped floodplains.
 - Seek opportunities to improve watercourses where it would benefit fisheries (especially salmon).

Access, informal recreation and tourism

- 2.34. This ECA is in Wychavon District. Only 3.6% of the Wychavon District is accessible natural greenspace, this is the lowest proportion across all districts in Worcestershire. As a whole accessibility to greenspace is poor with only 20% of households in Wychavon are within 5km of 100ha+sites and 2% of households within 10km of 500ha+sites.
- 2.35. There are no sub-regional recreation assets in this ECA, however the River Severn runs through the ECA, forming a significant GI asset. The Severn Way also runs through this ECA.

¹⁴ Worcestershire County Council (July 2012) *Planning for a Multifunctional Green Infrastructure Framework in Worcestershire: Green Infrastructure Framework 2*

- 2.36. There are deficiencies in opportunities for access and recreation across the Vale of Evesham, with the Rights of Way network being less dense than in any other area of the County. There is also a lack of sites such as Country Parks, picnic places and Registered Commons. Few nature reserves exist although there are a number of smaller community sites such as Village Greens and Millennium Greens.
- 2.37. Provision is required at both a strategic and neighbourhood level. At a neighbourhood or local scale there is scope for towns and villages to address natural greenspace needs within the rural communities. This should be a requirement of development and other options should be explored for existing communities such as stewardship agreements.
- 2.38. Tourist attractions in the ECA include Croome National Trust property and landscape park.

GI Priorities:

- 2.39. The access and recreation priorities identified for the Severn Valley South ECA are¹⁵:
- Consider the proximity to and ability to integrate with the rights of way network, recreational way-marked routes and the cycle network;
 - Accommodate associated facilities necessary for the use and enjoyment of the site in a manner that is appropriate and able to integrate with the landscape character, wildlife and cultural interests.
 - Act as a greenway from town into the countryside and utilise existing canal, former railway lines, river corridors and wherever possible link with public transport routes.
 - Adopt minimum quality standards, (commensurate with its location and scale) that sites and routes should be expected to achieve will be those from the Green Flag Award Programme, and the Country Parks Accreditation Scheme, as appropriate.

Transport

Road

- 2.40. The M5 runs north-south through the western half of the ECA and Junction 8 for the M50 is within the ECA. The A38 runs through the west of the ECA, connecting Worcester to the north with Upton upon Severn and Tewkesbury to the south.
- 2.41. The A44 crosses the north eastern end of the ECA and the A4104 meets it at Pinvin crossroads which suffer from peaktime congestion. The A4104 then crosses the ECA to link Pershore with Upton upon Severn and Little Malvern to the west. Other roads in this Environmental Character Area are more minor.

¹⁵ Worcestershire County Council (July 2012) *Planning for a Multifunctional Green Infrastructure Framework in Worcestershire: Green Infrastructure Framework 2*

- 2.42. The Worcestershire Advisory Lorry Route Map does not show any low bridges which would restrict the movement of vehicles over 16'3" (4.95m) on the lorry route network. Local roads may have further restrictions and will need further assessment if they are to be used for accessing mineral resources.

Rail

- 2.43. The Cotswold Line crosses through the north eastern corner of this ECA, connecting Worcester and Evesham, and Pershore Station is within the ECA. The Birmingham-Bristol line also crosses the centre of the ECA and the intersection of these lines near Norton is in the northern tip of the ECA.

Water

- 2.44. The River Severn crosses the western boundary of the ECA, joining Worcester upstream in the north to Upton upon Severn and Tewkesbury downstream in the south. It is an operational river navigation, capable of carrying commercial traffic and is navigable up to Stourport on Severn.
- 2.45. The River Avon flows through Wyre Piddle, Pershore, Pensham and Eckington along the eastern edge of the ECA, joining Tewkesbury downstream, to Evesham, Bidford-on-Avon and Stratford-upon-Avon upstream in the east. It is an operational river navigation, capable of carrying commercial traffic and is navigable for 45 miles from Tewkesbury to Stratford on Avon.

GI Priorities:

- 2.46. The GI transport priorities identified for the Severn Valley South ECA are¹⁶:
- Opportunities should be sought to protect, enhance and create green infrastructure that promotes sustainable movement by walking and cycling, reducing the need to travel by car by providing pleasant environments that promote sustainable transport as a means to minimise the impact of transport on the natural environment and mitigate the impacts of climate change.

LTP Priorities:

- 2.47. The LTP 3 transport priorities identified for the Severn Valley South ECA are:
- **A44 Worcester-Pershore-Evesham interurban corridor maintenance and improvement scheme** - a programme of improvements to transport infrastructure on this route, which is likely to be progressed in the short term and will include junction enhancements, street furniture decluttering, replacement and enhancement.
 - **Pershore Racecourse Road to Pershore Station link** - A proposed scheme to enable through traffic between Racecourse Road and Pershore Railway Station, improving accessibility to the Station for passenger transport operations, which is likely to be progressed in the short term.

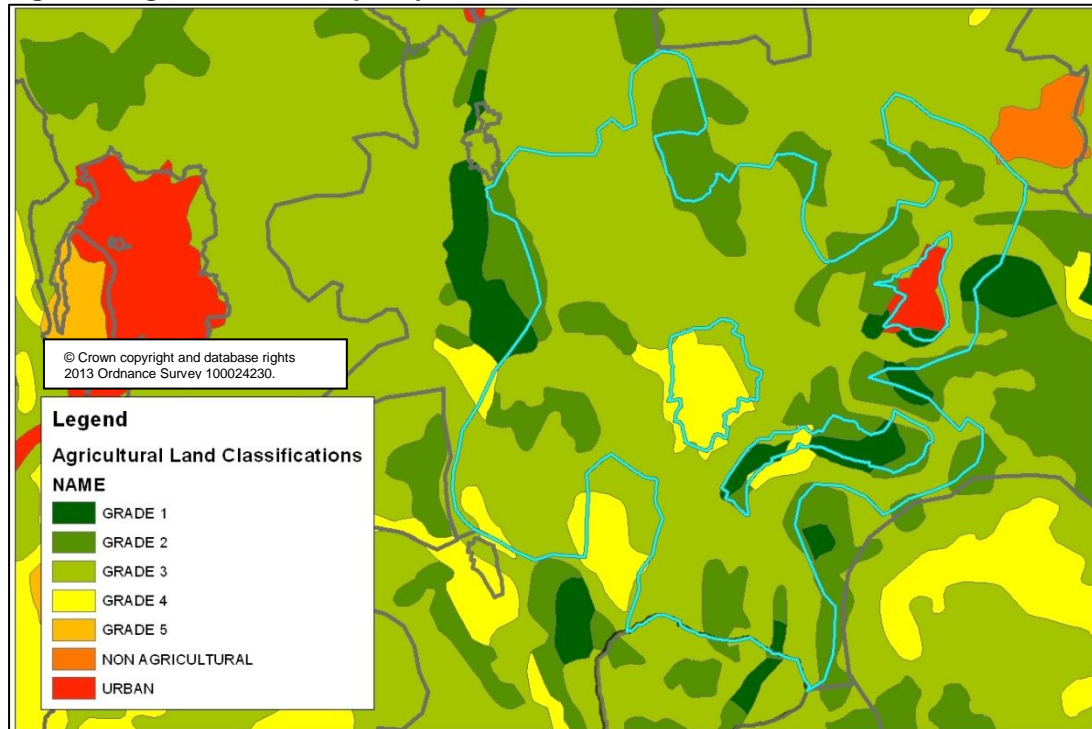
¹⁶ Worcestershire County Council (July 2012) *Planning for a Multifunctional Green Infrastructure Framework in Worcestershire: Green Infrastructure Framework 2*

- **Upton upon Severn town centre public realm enhancement scheme** – this scheme which is likely to be progressed in the medium term includes decluttering of unnecessary street furniture, drainage improvements and cleaning and repainting of Upton Bridge.
- **Pershore Station Enhancement Scheme** – a scheme to improve the passenger facilities and information at Pershore Station which is likely to be progressed in the medium term and would include the provision of new passenger shelters, passenger information, secure cycle and motorcycle parking and car parking enhancements.
- **Upton-upon-Severn to Malvern cycle route** - this scheme involves the development of a direct off-road walking and cycling route along former railway line between Upton-upon-Severn and Malvern to link a number of trip attractors and provide a short, attractive route for cyclists and pedestrians between Malvern and Upton-upon- Severn, likely to be progressed in the medium term.
- **Worcester to Evesham rail line dualling scheme** - A proposed scheme to reinstate dual track between Worcester and Evesham, to further increase capacity on the Cotswold Line route. Dependent on the rail industry to progress this in the long term.
- **Upton-upon-Severn to Uckinghall walk/cycle bridge and connecting links** - this scheme would involve the development of a walking and cycling link between Upton-upon-Severn and Tewkesbury, a new walking and cycling bridge over the River Severn to the south of Upton, making use of the former rail line alignment. However this scheme is only likely to be progressed in the long term if developments are approved in the local area that would be likely to benefit from the scheme, or provide funding (via developer contributions) to enable progression.
- **Pershore Keytec link road** - A scheme to develop a link road between Wyre Road and Abbey View Road near the Keytec Industrial Estate which would require significant earthworks and the installation of a bridge over the Cotswold Line railway. This is only likely to be progressed in the long term if a suitable business case can be justified and significant private sector funding is provided.

Agriculture/Forestry

- 2.48. The agricultural land use in this ECA is dominated by cash crops along the River Avon and mixed farming across the centre of the ECA. There is some pastoral or rough grazing in the west of the ECA.
- 2.49. Agricultural land quality varies across the area, with the majority of the ECA classified as grade 2 or 3 land. There are some pockets of higher quality grade 1 land and some lower quality grade 4 land, as shown in Figure 3.

Figure 3. Agricultural land quality



2.50. The forestry commission's woodland opportunity maps show that much of this ECA is listed as priority 1 or 2 for woodland creation which could benefit landscape character, biodiversity, cultural heritage and/or public access (Figure 4). They also show that the centre of the ECA is an ancient woodland landscape but this is not prioritised for woodland restoration (Figure 5 **Error! Reference source not found.**).

Figure 4. Woodland creation for landscape, biodiversity, heritage and public access

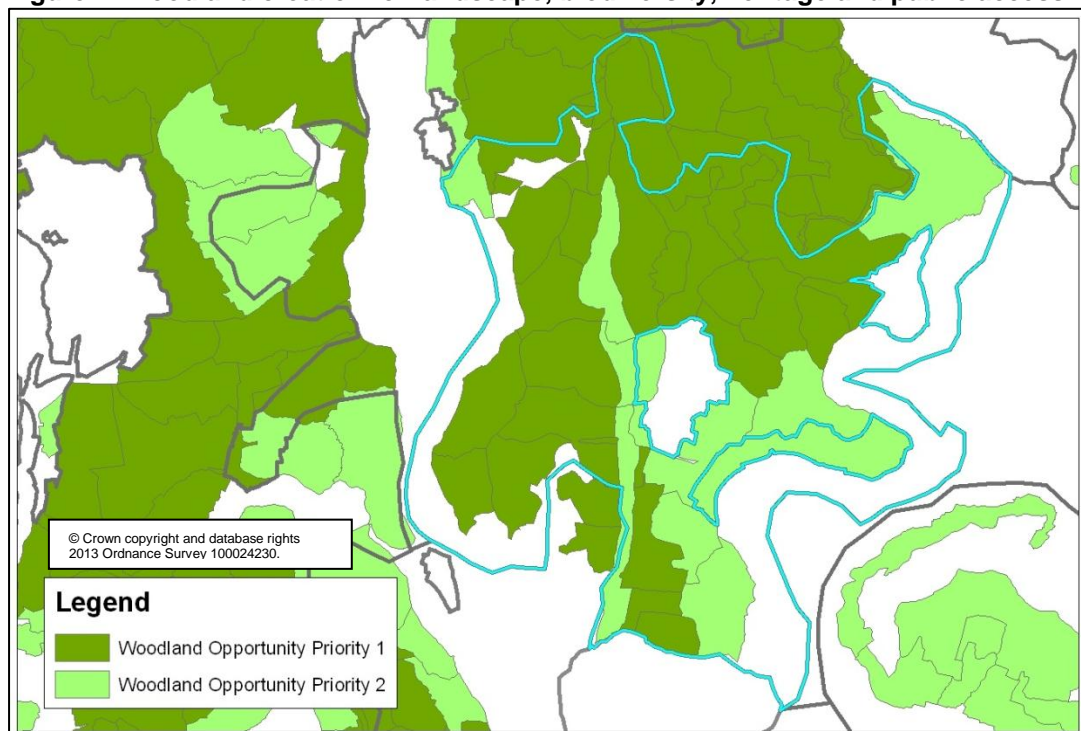
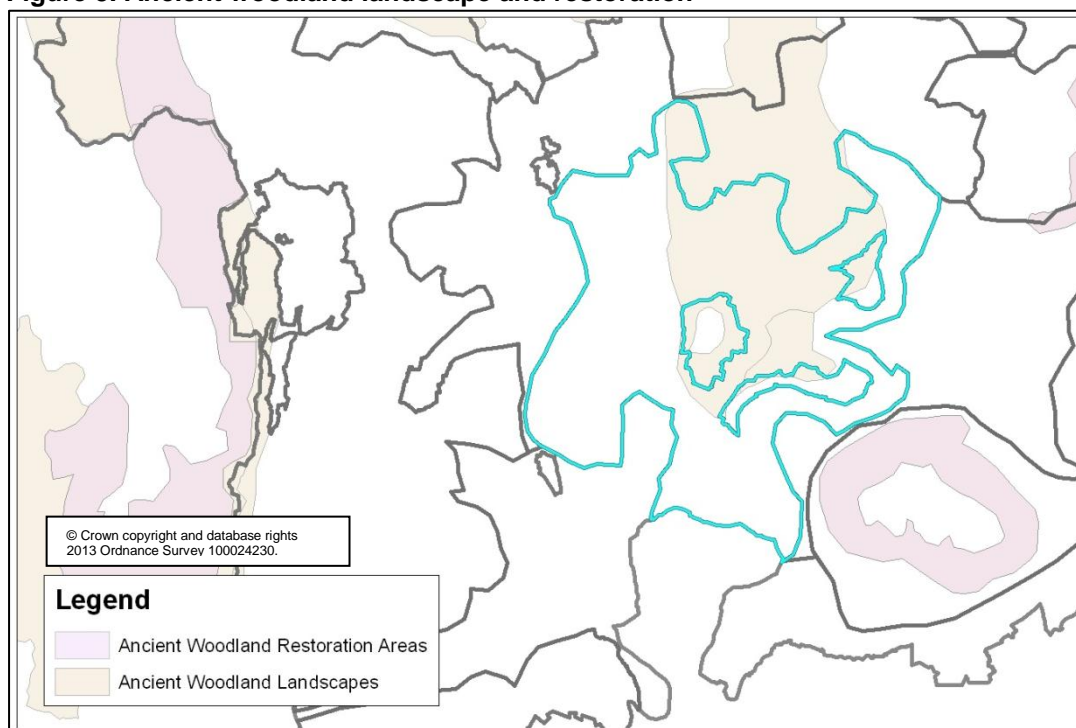


Figure 5. Ancient woodland landscape and restoration



Climate Change

2.51. Some effects of climate change will be similar across the whole county and many of the issues which can be addressed are likely to be common to all ECAs, such as:

- Improving air quality
- Providing flood risk management solutions
- Preventing water and soils pollution as a result of climate change related extreme weather conditions
- Promoting energy efficient and low carbon solutions
- Contributing to renewable energy production

Opportunities and issues

2.52. Green Infrastructure features such as buffering of watercourses provide a way of minimising fluvial flooding. Planned landscaping incorporating flood defences could provide both short term benefits and sustainable drainage schemes (SUDS) are a mechanism for managing both fluvial and pluvial flood risk.

2.53. Agricultural and horticultural businesses could face damaging water shortages in the coming decades as a result of climate change. In many parts of Worcestershire, water resources are under severe pressure. The majority of catchments in which horticultural production is concentrated have been defined by the Environment Agency as being either over-licensed and/or over-abstracted. Well executed water storage facilities could not only provide water supply for the business in the dry periods but a wide range of green infrastructure benefits such as biodiversity or

landscape and opportunities for increased physical activity and exposure to nature.

- 2.54. The soil types in much of this ECA are inherently at risk of subsidence and heave. It is possible that changes in weather patterns as a result of climate change may worsen these tendencies.
- 2.55. Locally significant areas of heathland, bracken and conifer woodland in this ECA are amongst the habitats most at risk from fire as a result of climate change.

Socio-economic considerations

3.56. The analysis of the socio-economic situation in Worcestershire in this strategy considers the economy and health & well-being at a high level. It is not intended to draw a full picture of the economy or health and well-being in the county, instead it focuses only on the indicators which are of most relevance to green infrastructure:

- **Economy:** unemployment, household income and deprivation levels.
- **Health and well-being:** health deprivation, heart diseases, obesity, mental health problems and respiratory conditions.
- **Access to sites for informal recreation:** considers links between informal recreation opportunities and mental and physical well-being.

2.57. There is thought to be a link between green infrastructure and some aspects of health. The issues of obesity, respiratory conditions, mental health, heart disease and health deprivation have been considered in this context.

26% (120,000) of the Worcestershire's adult population is obese and another 40% is overweight. The adult obesity levels in Worcestershire are higher than the national average. Most of the Worcestershire area has some problems with obesity. Parts of this ECA are however amongst the better performing areas in the county in this respect.

2.58. Obesity and respiratory problems in this county generally follow the same geographical pattern. Mental health problems, by contrast, tend to be found in the and around major settlements. Although mortality rates from cardiovascular diseases are significantly lower than the national rate, patterns of heart diseases are more dispersed than the other health indicators assessed and poor performance is found across the county. Contrary to other health indicators, heart diseases are least prevalent in some of the urban areas.

2.59. The overarching principles identified by the GI partnership regarding socio-economic matters for this ECA are:

- Increase economic wealth and address health inequalities

- Economic enhancements including employment creation, household income improvements and overall economic deprivation reduction in areas beyond the M5 corridor.
- Health improvements for heart diseases, respiratory diseases and obesity.
- Address overall health deprivation.