

Environmental Character Area Profile for the Minerals Local Plan: 9. Malvern Chase and Commons

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 out in *Planning for a Multifunctional Green Infrastructure Framework in*

¹ Green Infrastructure Guidance – Natural England.

² Green Infrastructure Guidance – Natural England.

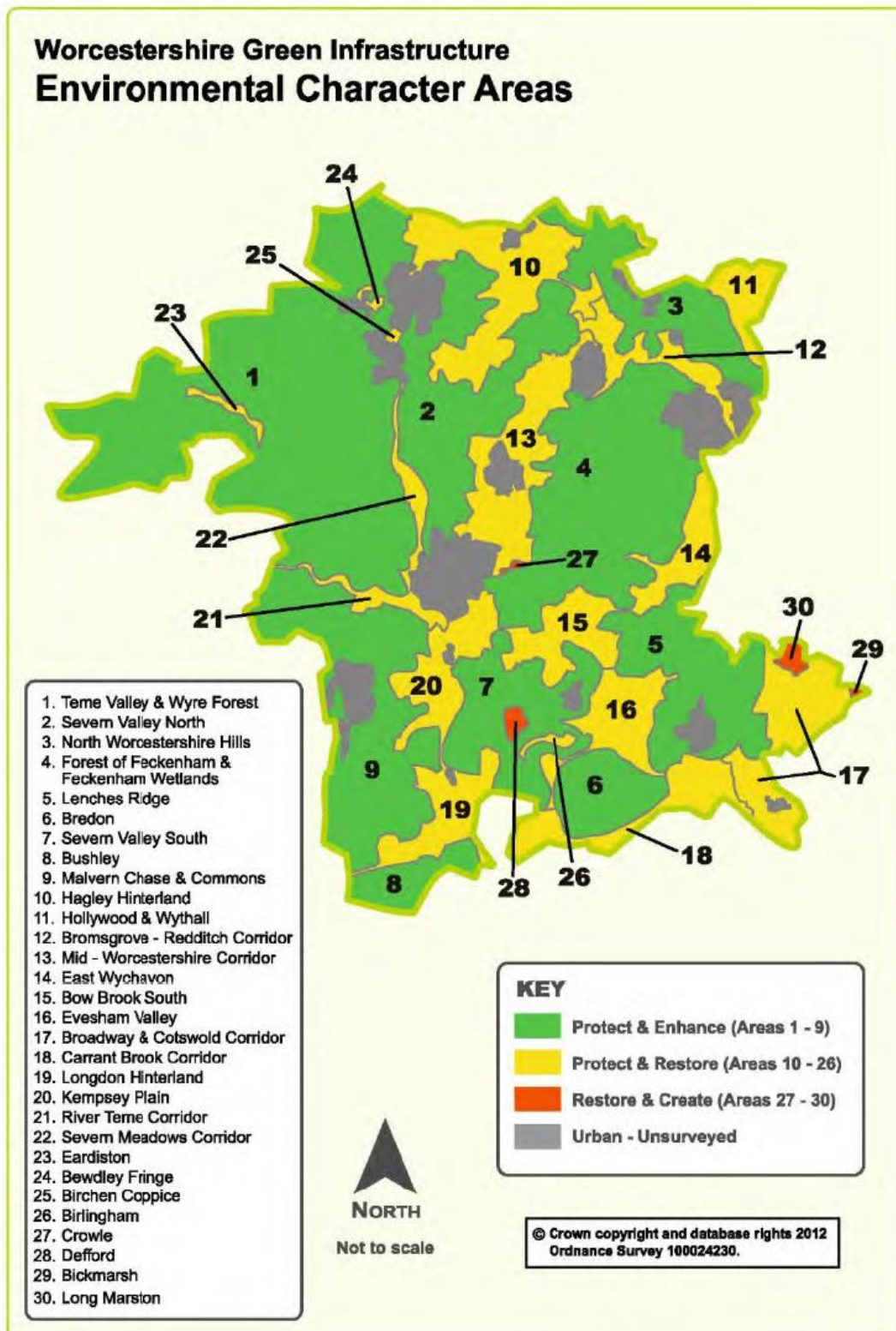
³ Worcestershire County Council (July 2012) *Planning for a Multifunctional Green Infrastructure Framework in Worcestershire: Green Infrastructure Framework 2*

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

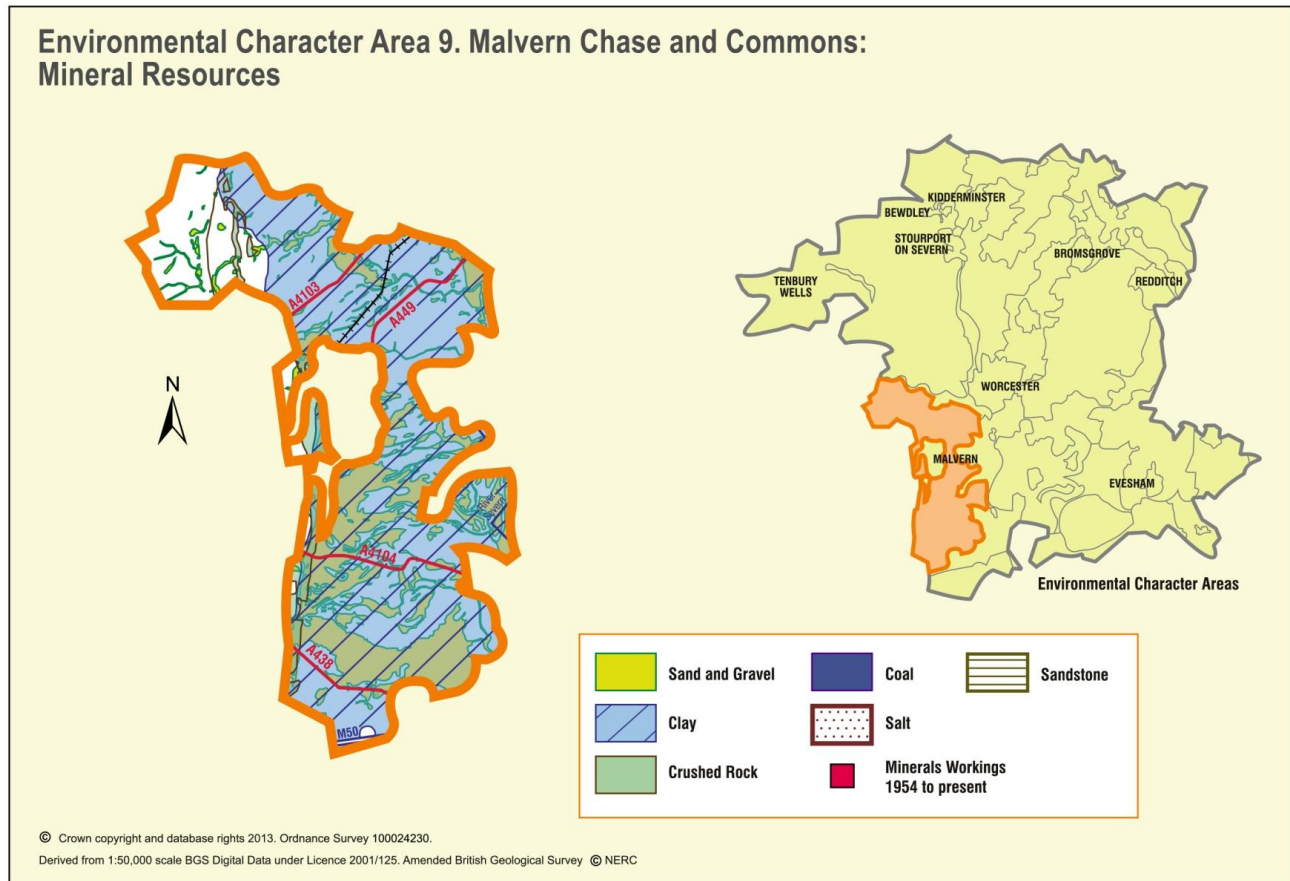
These are illustrated on Figure 1. Environmental Character Areas.

Figure 1. Environmental Character Areas



2. Characteristics and priorities of the Malvern Chase and Commons ECA

Figure 2. Environmental Character Area 9 Malvern Chase and Commons: 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. There may be large volumes of sand and gravel in this ECA. It includes 2nd, 3rd and 4th terrace deposits which vary between 1m and 6m thick but borehole and other data about the extent, nature and quality of the geology is poor. One deposit is designated key and 4 significant. Other large deposits may exist in alluvium near the Severn in the west of the area or at Longdon Marsh to the south, but are unproven.

- 2.3. One respondent to the First Consultation states that there are about 2mt of sand and gravel reserves near Hanley Swan.
- 2.4. The land to the east of the Malvern Hills is covered with poorly sorted glacial gravels but there is no evidence that they are commercially viable.

Hard rock

- 2.5. This ECA also contains potentially very large resources of potential crushed rock resources for aggregate use along the western edge of the county; granite in the Malvern Hills and Silurian Limestone in the Suckley Hills. Both materials were worked extensively in the past but all workings ceased before 1980.

Industrial minerals

Clay

- 2.6. Large Clay resources exist and were worked in quite large brickpits before the C20th

Silica sand

- 2.7. There is no evidence that suitable strata exist.

Building stone

- 2.8. There is considerable evidence in this ECA of building stone production from both granite and limestone strata; many buildings and walls in and around Malvern were constructed from both and abundant resources of both still exist.

Brine

- 2.9. There is no evidence of brine working in this area or that Halite deposits might exist at depth.

Future Growth

- 2.10. 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.

- 2.11. This ECA is a largely rural area within Malvern Hills District. The district anticipates the development of 2,592 homes and 29.76 ha of employment land in the next 14-18 years⁴. The ECA is adjacent to the "main town"⁵ of Malvern which is proposed for balanced growth in the South Worcestershire Development Plan and incorporates the Category 1 village of Welland⁶.
- 2.12. Other areas beyond the boundary of the ECA could also create demand for minerals in this Environmental Character Area. Particularly Worcester City to the east, Tewkesbury and Ashchurch to the south of the ECA which are proposed as strategic or housing allocations in the Gloucester, Cheltenham and Tewkesbury Joint Core Strategy "Developing the Preferred Option" consultation document. These and other areas beyond Worcestershire could create further demand for minerals in this Environmental Character Area.

Green Infrastructure priorities⁷

- 2.13. 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
- 2.14. 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.

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 Main towns are second in the five tier settlement hierarchy set out in the South Worcestershire Development Plan proposed submission document. These towns provide a comprehensive range of local services and employment opportunities for their residents and the rural hinterland. The towns will continue to be the focus of balanced growth in Malvern Hills and Wychavon. A number of urban extensions and smaller infill allocations are proposed along with necessary associated infrastructure. 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 floodplains around Upton upon Severn, new 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 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 Worcestershire County Council (July 2012) *Planning for a Multifunctional Green Infrastructure Framework in Worcestershire: Green Infrastructure Framework 2*

- 2.15. The strategic GI approach for the Malvern Chase and Commons ECA is to *protect and enhance*. The overarching principle identified by the GI partnership to protect and enhance acid and neutral grassland habitats and wooded landscape of orchards, woodlands and scrub.

Biodiversity and landscape

- 2.16. The Malvern Chase and Commons is a large Environmental Character Area, covering the area from the western county boundary on the crest of the Malvern Hills, inland to the Severn Vale and extending from the River Teme corridor in the north to the M50 corridor in the south. Not surprisingly, for such a large area, it encompasses a wide range of local Landscape Character Types, as well as the Malvern Hills Area of Outstanding Natural Beauty (AONB). The northern part of the ECA, north and east of Great Malvern, is generally of a wooded nature and has been identified by the County Landscape Character Assessment as the Landscape Type Principal Timbered Farmlands with Principal Wooded Hills along the ridge of the Suckley Hills. Here the character relies on small scale, agricultural landscapes of irregularly shaped woodlands, winding lanes and frequent wayside dwellings and farmsteads which have been cleared piecemeal from the local woodlands and subsequently enclosed by hedgerows. The most notable characteristic is the densely scattered hedgerow trees, usually oaks which frame filtered views. The high biodiversity value of the area is reflected by the many Sites of Special Scientific Interest (SSSI) and Special Wildlife Sites (SWS), based on their woodland interest.
- 2.17. The western boundary of the ECA is characterised by the High Hills and Slopes Landscape Type of the Malvern Hills where the unenclosed, unsettled landscape of this striking ridge gives wide panoramic views across both Herefordshire and Worcestershire. Historically, the hills would have been an unenclosed expanse of commons and rough grazing where the stocking levels would have been sufficient to keep scrub encroachment at bay, lower levels of stocking today have allowed secondary woodland and scrub encroachment, particularly on the lower slopes. Nevertheless, much of the area is categorised as a SSSI, due to its grassland habitat.
- 2.18. To the south of Great Malvern, the western part of the ECA covers a large area of former common. Some of this remains unenclosed common land but much has now been enclosed and is identified as the Landscape Type Enclosed Commons where the overriding characteristic is the planned enclosure pattern of straight boundaries and roads with wide verges. Castlemorton Common is the largest of the commons that have been protected with SSSI status, but generally all the commons have a high biodiversity interest, based on their valuable grassland habitats. They are the richest botanical area in the county with many rarities, including some of national importance.
- 2.19. To the east of the commons is a band of land which has been identified as Settled Farmlands with Pastoral Land Use. These are small scale landscapes where the heavy, poorly drained soils traditionally discouraged

arable farming and where small fields with prominent hedges and hedgerow trees are still generally grazed. Scattered through this landscape are a number of small SSSIs and SWSs designated for their grassland interest.

- 2.20. To the south east of the ECA is an area of the Landscape Type Wet Pasture Meadows where the heavy soils, in a naturally poorly drained low lying basin, inhibits agriculture. Longdon Marsh is included in the area. Modern agricultural drainage has unfortunately reduced the wetland value of the area but there are still numerous small areas where wetland flora flourish⁸.

GI Priorities:

- 2.21. The landscape priorities identified for the Malvern Chase and Commons ECA are⁹:
- Protect grassland habitats on uplands, commons and verges through appropriate grazing/management regimes.
 - Enhance and protect the planned enclosure pattern and woodland character (discrete blocks) in the Enclosed Commons whilst retaining the unenclosed, unwooded (and unsettled) nature of the uplands and Unenclosed Commons through appropriate grazing/management strategies.
 - Elsewhere in the Timbered and Settled Farmlands and Wet Pasture Meadows, opportunities should be sought to strengthen the patterns of field enclosure and tree cover through the planting of watercourse and hedgerow trees to address density and age structure.
 - Protect permanent pasture/maintain pastoral land use in the Settled Farmlands and Wet Pasture Meadows.
 - Priority to protect, buffer and enhance existing sites to create linked networks of habitat where possible.
 - Protect and enhance grassland habitats (acid and neutral) and the wooded landscape including orchards, woodlands and scrub.
 - Conserve parkland and veteran trees.
 - Maintain traditional field boundaries including hedges, where appropriate to aid habitat connectivity.

Geodiversity

- 2.22. The area of the Malvern Hills in this ECA is a geological SSSI.
- 2.23. Geologically, the Malverns is one of the largest and most important outcrops of Precambrian basement in southern Britain. The excellent exposures have stimulated much original research work, including pioneering petrological and geochemical studies by Rutley and Timms. Interest in the petrography, geochemistry and geophysics of these rocks

⁸ Worcestershire County Council (October 2011) *Landscape Character Assessment: Supplementary Guidance*

⁹ Worcestershire County Council (July 2012) *Planning for a Multifunctional Green Infrastructure Framework in Worcestershire: Green Infrastructure Framework 2*

has flourished throughout this century, particularly with the realisation that the Complex represents the calc-alkaline plutonic roots of an island arc system once active on the southeast flanks of Iapetus.

- 2.24. The site also includes the type locality for the Warren House Volcanics which provide an important stratigraphic link between the basement inliers of the Malverns and Shropshire. The exposure of the Malvern Quartzite of the Lower Cambrian (Comley Series, Non-trilobite Zone) at Gullet Pass Pit has been known since the early years of the nineteenth century. Interdigitating conglomerates and quartzites are seen, and these have figured in discussions on the structure and geological history of the Malvern Hills. The site is of palaeontological importance in yielding five species of inarticulate brachiopod and one hyolithid species, a fauna which can be compared to that of the Lower Comley Sandstone of Shropshire, providing a dateable horizon for the onset of Cambrian sedimentation in the Malvern area.
- 2.25. Gullet Quarry shows a section through the Wych Formation of the early Silurian, here directly overlying Precambrian strata. This unit, of mid-Telychian age, yields fine acritarch microfloras from its shales and conodonts from its limestones. This is the type locality for a number of microfossils. The formation in addition yields a common brachiopod and trace-fossil assemblage. This is a key site in studies of Llandovery rocks in the Malvern area.
- 2.26. There are also 27 local geological sites in this ECA. Twelve of these are associated with historic quarrying activities at: Gullet Quarry, Swinyard Hill Quarry, Broad Down Quarry, Gorse Bank Pit, Dingle Quarry, Earnslaw Quarry, Park Wood Quarries, Scar Quarry, Tank Quarry, Upper Wyche Quarry, Westminster Bank Quarry and Longley Green Quarry. The remaining 15 local geological sites are distributed across the ECA and are found at Castlemorton Common, Highwood Sports Field, Rushy Valley, Wide Valley, Ivy Scar Rock, Bruff Works, Crews Hill Nature Reserve, Knightwick, Leigh Brook, Osebury Rock and five at Suckley.

Historic Environment¹⁰

- 2.27. This large character area contains a diverse landscape, from the dominant Malvern Hills, with its impressive Iron Age Hill Fort, earlier landscape boundaries, and industrial heritage through to the Roman and Medieval ceramic production areas of Interfield and Hanley Swan. Large portions of this character area have an unknown archaeological potential as little fieldwork has been carried out in these areas.
- 2.28. Historic landscape character is derived from areas of regular and piecemeal enclosure of lowland commons and former medieval open-field in the east of the area. To the west, leading up to the higher ground the

¹⁰ 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.

character is more strongly associated with dispersed settlement, earlier enclosure of the land and tracts of ancient woodland.

GI Priorities:

- 2.29. The historic environment priorities identified for the Malvern Chase and Commons ECA are¹¹:
- Protect nationally significant and extensive below ground archaeology associated with the Roman and medieval ceramic industries north and east of Malvern.
 - Enhance upland un-enclosed acid grassland to strengthen Historic Landscape Character and ensure conservation of prehistoric settlement and land boundary features.
 - Protect and enhance common-edge landscapes and field patterns.
 - Enhance and create linkages with wider historic environment green networks (hedgerows, woodland, parkland and common).

Blue Infrastructure

Flooding

- 2.30. 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.
- 2.31. The main cause of flooding in Malvern Hills District 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.
- 2.32. The area of the Severn Internal Drainage Board within the South Worcestershire Joint Core Strategy area is limited to the Longdon Marshes in the south of the Malverns Hills DC area. The main flood risk issue for the Severn IDB is the condition of the Longdon Brook which will affect the IDB drains that drain to it. Only 1 or 2 flooding reports were received in 2007 but these could increase if the Longdon Brook is not maintained. Any development proposals affecting the Longdon Marshes or Longdon Brook will need to be discussed with the Severn IDB to agree strategies for surface water disposal and flood protection.
- 2.33. The River Severn Catchment Flood Management Plan makes this a Policy 2 area where it will "Reduce existing flood risk management actions (accepting that flood risk will increase over time".

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

Water quality

- 2.34. The chemical quality of the Teme fails WFD standards; its ecological quality is moderate. The ecological quality of the minor watercourses around Hanley castle and Brotheridge Green is poor. Groundwater quality in the ECA is good.
- 2.35. Changes to current discharge consents may be necessary at Powick STW for BOD, Ammonium and Phosphorus. None of the consents identified are below those achievable using Best Available Techniques (BAT).
- 2.36. Most of this ECA south of Malvern, with the exception of a small area between Malvern Wells and Castlemorton is categorised as a water body with water company point source pollution pressure. North of Malvern only an area between Alfrick and Leigh Sinton is categorised this way. Most of the ECA south of Knightwick and Collets Green is categorised as a water body with agricultural/rural diffuse pollution pressure.

Water Supply

- 2.37. Catchment Abstraction Management Strategies produced by the Environment Agency show that the surface water and groundwater in the South Worcestershire Development Plan area is either being over-abstracted or there is no water available for further abstractions.

GI Priorities:

- 2.38. The blue infrastructure priorities identified for the Malvern Chase and Commons ECA are¹²:
- Reduce dependence on raised flood defences, as this is unsustainable in the long term, by taking opportunities to restore sustainable natural storage of floodwater on undeveloped floodplains.
 - Make more space for rivers through urban areas via 'blue corridors' (i.e. Restoring access for floodwater onto key strips of floodplain. This requires redevelopment to be limited to flood-compatible land-uses e.g. parkland).
 - Some designated 'aquatic conservation' sites are in unfavourable condition (for example Teme SSSI). Activities that affect these sites must be changed to improve their condition.
 - Ensure that the run-off from all proposed development is minimised. For example, SUDS must be encouraged and targeted within planning approvals.
 - Encourage the retro-fitting of SUDS where surface water flooding is already a problem. Support ecological improvements. Examples of this include Severn & Avon Wetlands Project and Natural England's three fluvial SSSIs. Tackle issues of diffuse pollution in the catchment through the provision of advice to farmers under the England Catchment Sensitive Farming Delivery Initiative.

¹² Worcestershire County Council (July 2012) *Planning for a Multifunctional Green Infrastructure Framework in Worcestershire: Green Infrastructure Framework 2*

Access, informal recreation and tourism

- 2.39. This ECA is in the Malvern Hills District, which has 4,212ha of accessible natural greenspace. This is 7.3% of the total area of the District. There is a good spread of different sizes of accessible natural greenspaces assets across the District and the presence of the Malvern Hills AONB along the western edge of the District means that access to larger assets is good with 84% of households in the Malvern Hills being within 10km of 500ha+ sites and 66% of households being within 5km of 100ha+ sites.
- 2.40. The District has three sub-regional GI assets:
- The Malvern Hills
 - Shrawley Wood
 - Kempsey Common
- Malvern Hills district also enjoys a dense rights of way network, linking a network of small sites and commons which fall outside of the regional assets but combined together offer significant recreational opportunity.
- 2.41. The Malvern Hills sub-regional GI asset is in this ECA. The Worcestershire Way recreation route which runs 31 miles between Bewdley and Malvern also runs through this ECA.
- 2.42. Tourist attractions in this ECA include the Three Counties Showground, The Fold at Bransford, Little Malvern Court, and The Abberley and Malvern Hills Geopark.

GI Priorities:

- 2.43. The access and recreation priorities identified for the Malvern Chase and Commons ECA are¹³:
- 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

- 2.44. Two major roads serve the northern end of the ECA. The A4103 links Worcester in the north east to Hereford in the west, and the A449 linking Worcester to Great Malvern and then on to Ledbury in Herefordshire.

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

- 2.45. Two A-roads serve the southern end of the ECA. The A4104 links Upton upon Severn in the east with Little Malvern where the road joins the A449. The A438 crosses the southern tip of the ECA between Tewkesbury to the south east and Ledbury to the west. Other roads in this Environmental Character Area are more minor.
- 2.46. 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 within the ECA. However, there are steep gradients of 11% on the A449 and 14% on the A4104 at Little Malvern. Local roads may have further restrictions and will need further assessment if they are to be used for accessing mineral resources.

Rail

- 2.47. The Birmingham to Hereford Line crosses through the northern end of this ECA, connecting Worcester and Hereford. Malvern Link and Great Malvern stations are within the urban area of Malvern which this ECA surrounds, and Colwall Station is just outside the western boundary of the ECA.

Water

- 2.48. There are no major watercourses in the ECA, although the River Severn is immediately adjacent to the eastern boundary at Rhydd and Hanley Castle. The River Severn is an operational river navigation, capable of carrying commercial traffic and is navigable up to Stourport on Severn.

GI Priorities:

- 2.49. The GI transport priorities identified for the Malvern Chase and Commons ECA are¹⁴:
- 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:

- 2.50. The LTP 3 transport priorities identified for the Malvern Chase and Commons ECA are:
- **A449/A4440 Malvern-Worcester (M5 J7) interurban corridor maintenance and improvement scheme** - a programme of improvements to transport infrastructure on this route, which is likely to be progressed in the medium term and will include junction enhancements, street furniture decluttering, replacement and enhancement as well as the provision of an off-road walking and cycling route along the A449 between Worcester and Malvern.
 - **Upton-upon-Severn to Malvern cycle route** - this scheme involves the development of a direct off-road walking and cycling

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

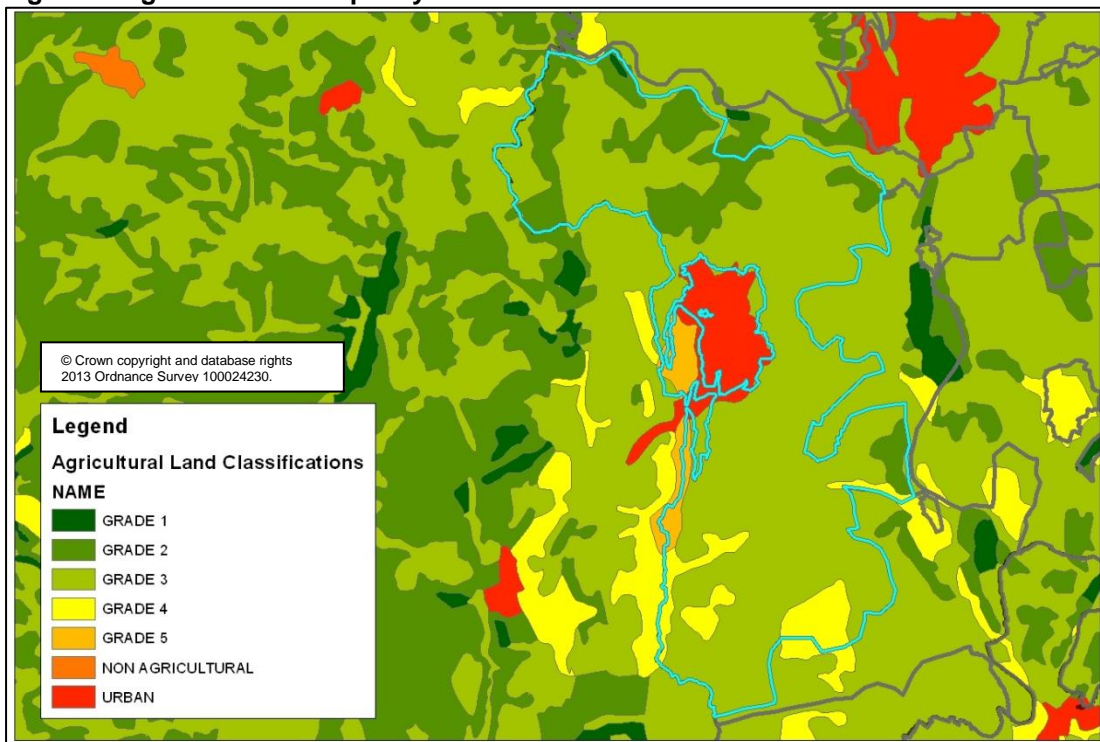
route along former railway line between Upton-upon-Severn and Malvern to link a number of trip attractors and provide a short, attractive route for cyclists and pedestrians between Malvern and Upton-upon-Severn, likely to be progressed in the medium term.

Agriculture/Forestry

2.51. The agricultural land use in this ECA is dominated by pastoral and mixed farming with some rough grazing.

2.52. Agricultural land quality varies across the area, with the majority of the ECA classified as grade 3 land. There are some pockets of higher quality grade 2 land in the north of the ECA, some lower quality grade 4 land in the south, and some grade 5 land along the ridge of the Malvern Hills, as shown in Figure 3.

Figure 3. Agricultural land quality



2.53. 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 western edge and the north western corner of the ECA is an ancient woodland landscape with some of this prioritised for woodland restoration (Figure 5).

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

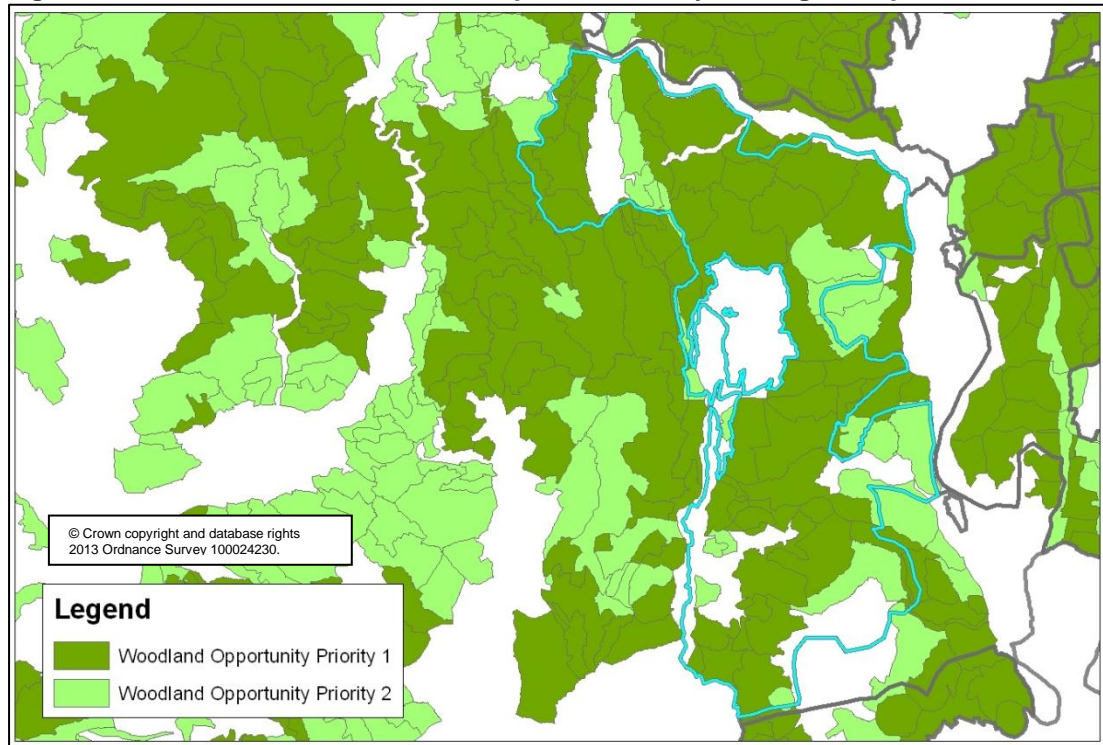
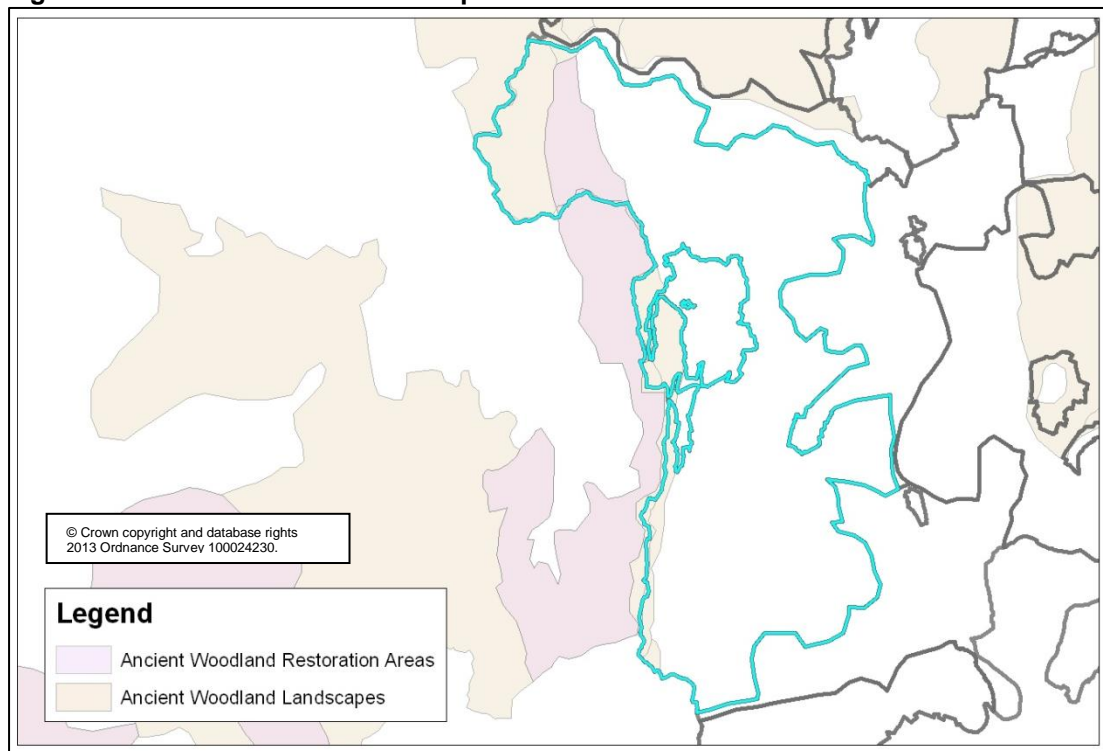


Figure 5. Ancient woodland landscape and restoration



Climate Change

2.54. 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

- 2.55. Green Infrastructure features such as buffering of watercourses provide a way of minimising fluvial flooding. Planned landscaping incorporating flood defences could provide both and short term benefits and sustainable drainage schemes (SUDS) are a mechanism for managing both fluvial and pluvial flood risk.
- 2.56. 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.
- 2.57. The soil types in most of this ECA apart from the western and north-western parts 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.
- 2.58. Very large and important areas of heathland, bracken (and to a lesser extent, conifer woodland) in this ECA are amongst the habitats most at risk from fire as a result of climate change.

Socio-economic considerations

- 3.59. 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.
- 2.60. 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.

- 2.61. 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. The level of childhood obesity is around the national average, at 10% of five year olds and 18% of eleven year olds. In terms of land cover, most of the Worcestershire area has some problems with obesity. In this ECA however the corridor between the A44 and A4103 and area to the south of the Malvern Hills are however amongst the better performing areas in the county in this regard.

- 2.62. 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.

- 2.63. The overarching principles identified by the GI partnership regarding socio-economic matters for this ECA are:
 - Support the tackling of and prevention of obesity, respiratory and heart disease beyond the area between the A44 and A4103
 - Support improvements to household income.