Environmental Character Area Profile for the Minerals Local Plan: 8. Bushley

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 know as blue infrastructure). The GI approach requires thinking about the environment as an integrated system of stepping stones or nodes in a wider network[1].

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 network[2] will need to be considered.

Environmental Character Areas[3] 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.

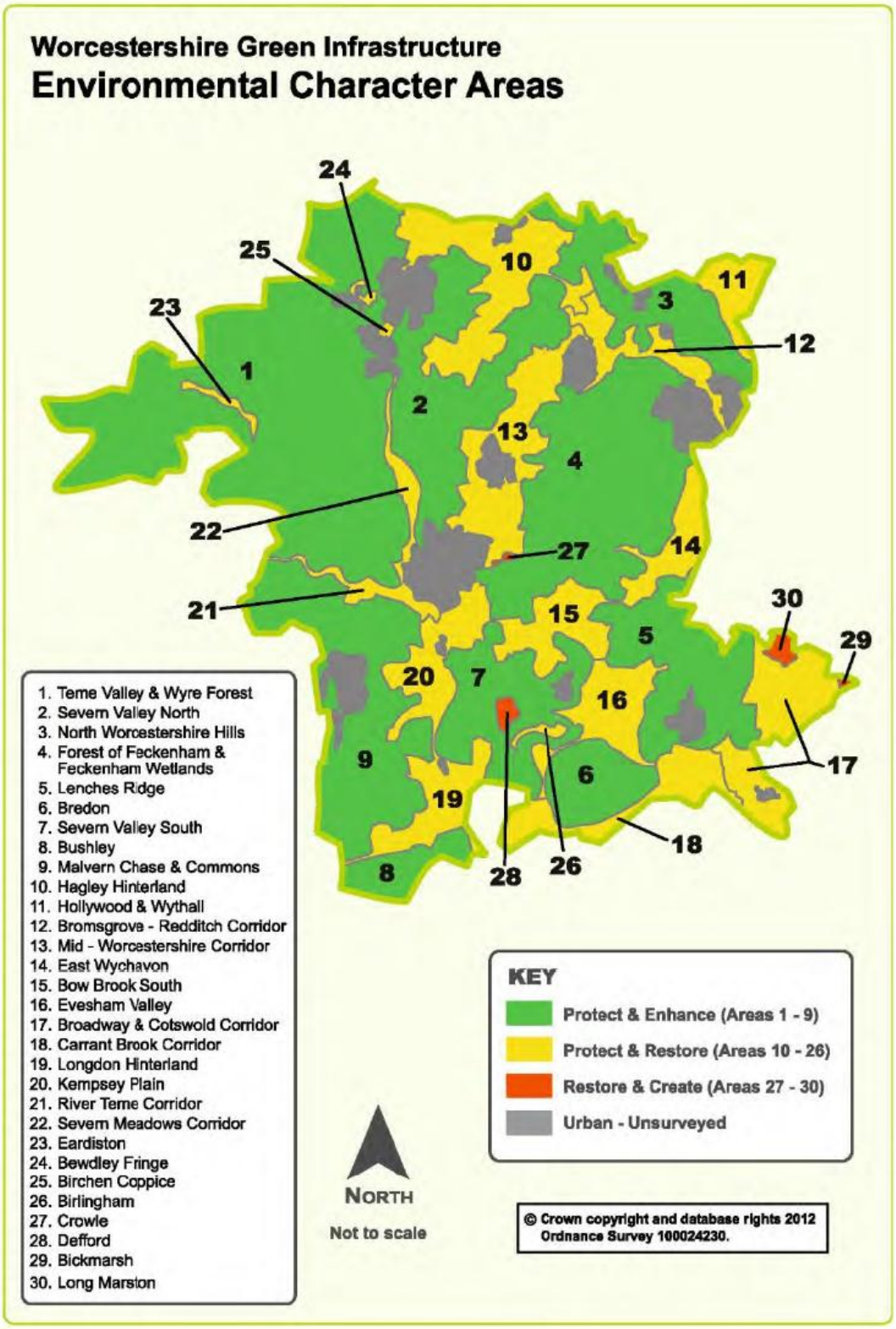
1.10. Profiles for each of the following ECAs are available on our website www.worcestershire.gov.uk/mineralsbackground:

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

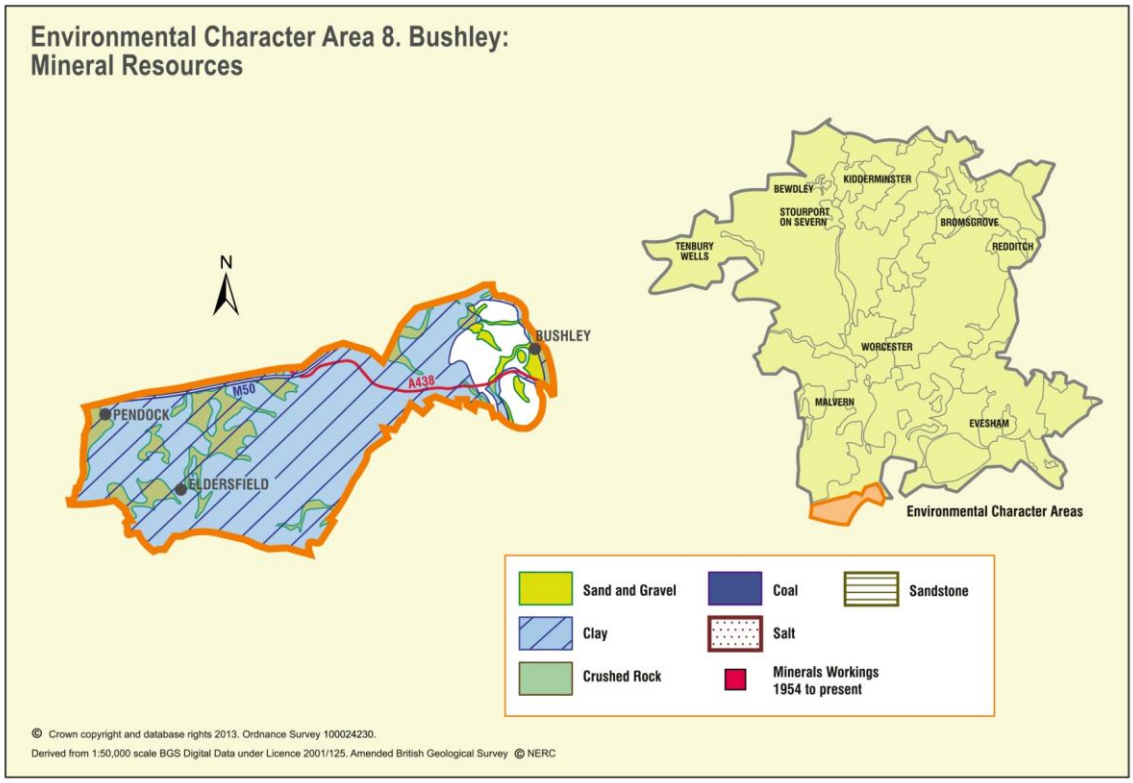
These are illustrated on Figure 1. Environmental Character Areas.

Figure 1. Environmental Character Areas



2. Characteristics and priorities of the Bushley ECA

Figure 2. Environmental Character Area 8. Bushley: 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. Large deposits of sand and gravel may exist in this ECA but information is poor, any deposits appear to be mostly overlain with alluvium and any volumes may be very modest.

Hard rock

2.3. Potential (Arden Sandstone) building stone deposits appear to exist and to have been worked on a small scale immediately north of this ECA.

Industrial minerals

Clay

2.4. There is no evidence of clay working in this ECA.

Silica sand

2.5. There is no evidence that suitable strata exist in this ECA.

Brine

2.6. There is no evidence of brine working in this area but the memoir for Worcester suggests that strong seismic reflections within the Eldersfield Mudstone may be halite beds.

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 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 years[4]. The South Worcestershire Development Plan proposed submission document[5] does not propose development in this ECA.

2.9. Other areas beyond the boundary of the ECA could create demand for minerals in this Environmental Character Area, including 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.

[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] 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.

Green Infrastructure priorities[6]

2.10. 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

2.11. 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.

2.12. The strategic GI approach for the Bushley ECA is to *protect and enhance.* The overarching principle identified by the GI partnership to protect and enhance the irregular field pattern, boundary hedges and orchard habitats.

Landscape and biodiversity

2.13. Bushley ECA is located at the south-western tip of Worcestershire and stretches from Pendock in the west to Bushley in the east.

2.14. The western part, around Pendock and Eldersfield is low lying land which has been identified by the county Landscape Character Assessment as the Landscape Type Settled Farmlands with Pastoral Land Use; a small scale pastoral landscape with prominent hedgerows and hedgerow trees, but without woodland. Centrally located within this Landscape Type are to be found Wet Pasture Meadows, a poorly drained Landscape Type that is characterised by linear tree lines along wet ditches and watercourses. Here, the impacts of agricultural intensification and especially drainage have been considerable. As such, the area offers considerable restoration potential, particularly for wetland habitats such as reedbeds, wet grassland and ponds.

2.15. The eastern part of this ECA is higher land around Bushley and has generally been identified as within the Landscape Type Estate Farmlands where the key characteristics relate to a planned, estate landscape with estate villages, larger geometric fields, plantations and belts of trees and large country houses set in mature grounds and parkland.

2.16. There are a number of SSSI status neutral grasslands present including Burley Dene Meadows, Poolhay Meadows and Avenue Meadows. Corse Lawn and Avenue Meadow Special Wildlife Site is also important grassland extending along the south east boundary of the ECA.

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

GI Priorities:

- The biodiversity priorities identified for the Bushley ECA are[7]:Seek opportunities to re-create or restore wetland habitats in the Wet Pasture Meadows, including sustainable water management systems.
- Protect and enhance tree cover of small estate plantations, tree belts and individual parkland and ornamental trees in the Estate Farmlands and linear tree belts in the Wet Pasture Meadows.
- Protect permanent pasture and maintain pastoral land use in the Settled Farmlands
- Enhance and protect the hedgerow field boundaries. Seek opportunities to address density and age structure in linear tree belts along hedgerows, ditches and watercourses.
- Encourage the re-planting and restoration of distinctive specimen tree planting associated with Estate Farmlands.
- Priority to protect, buffer and enhance existing sites to create linked networks of habitat where possible.
- Protect and enhance networks of neutral grassland and traditional orchards.
- Conserve parkland and veteran trees.
- Maintain traditional field boundaries including hedges to aid habitat connectivity.

Geodiversity

2.17. There are no Local Geological Sites in this ECA.

Historic Environment[8]

2.18. Where clays dominate over the lighter sands and gravels there is greater survival of medieval landscape and settlement earthworks. The area has been under recorded archaeologically; however the area has potential as indicated by the Scheduled remains of Gadbury Camp, a small Iron Age Hillfort and the well preserved medieval landscape.

2.19. Historic landscape character is diverse, derived from the historic development of settlements into unenclosed heath and woodland with later post-medieval piecemeal and planned enclosure.

GI Priorities:

2.20. The historic environment priorities identified for the Bushley ECA are[9]:

- Buffer historic common edge landscapes and parkland character around Eldersfield.

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

[8] 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.

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

- Protect and enhance diverse multi-period historic field patterns and hedgerows associated with enclosure of historic heath and woodland.
- Protect historic water features and buffer key sites, such as moats, fishponds.
- Protect below ground deposits of high palaeoenvironmental potential associated with above ground features pertaining to historic water meadows and irrigation.

GI Priorities:

2.21. The landscape priorities identified for the Bushley ECA are[10]:

- Protect and enhance field boundaries and characteristic enclosure patterns (sub-/irregular); protect and enhance tree cover (small estate plantations, tree belts, parkland and ornamental trees in the Estatelands; hedgerow and watercourse trees in the Settled Farmlands, watercourse treebelts in the Wet Pasture Meadows); protect permanent pasture/maintain pastoral land use in the Settled Farmlands and Pasture Meadows.

Blue Infrastructure

2.22. The river Severn adjoins this ECA at two points; several minor watercourses also drain it. Apart from the risk from the Severn, the main cause of flooding in Malvern Hills is 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, modelling may need to be undertaken to the SWLP SFRA update to determine the level of risk.

Lower Severn Internal Drainage Board

2.23. The area of the Severn Internal Drainage Board within the South Worcestershire area is limited to the Longdon Marshes immediately to the north. One of the un-named watercourses in ECA 8 drains into the Longdon marsh and could potentially be affected by any future mineral workings. The main flood risk issue for the Severn IDB is the condition of the Longdon Brook which will affect the IDB drains that drain into it. 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 management and flood protection.

2.24. The River Severn Catchment Flood Management Plan makes this a Policy 2 area, where it will "Reduce existing flood management actions (accepting that flood risk will increase over time).

Water Quality

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 Plan11 (CFMP), the lower reaches of the

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

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.

2.26. The area's river catchments have moderate ecological status. The River Severn touches the ECA at one point but is directly fed from this ECA; this section has moderate ecological potential and passes the chemical quality assessment under the WFD.

2.27. Groundwater status, both quality and quantity in the ECA is good, but an area to the west is poor in quantity and deteriorating in quality. The EA records water bodies with agricultural diffuse pollution pressure across the greater part of this ECA.

GI Priorities:

2.28. The blue infrastructure priorities identified for the Bushley ECA are[11]:

- 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

2.29. 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.

2.30. 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.

2.31. There are no sub-regional GI assets or tourist attractions in this ECA.

GI Priorities:

2.32. The access and recreation priorities identified for the Bushley ECA are[12]:

- Consider the proximity to and ability to integrate with the rights of way network, recreational way-marked routes and the cycle network;

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

- 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

2.33. The M50 motorway runs across the northern edge of the ECA, with Junction 1 for Tewkesbury outside the ECA to the north east and Junction 2 for Ledbury and Hereford to the west. The A438 crosses the eastern end of the ECA between Tewkesbury to the east and Ledbury to the north west. Other roads in this Environmental Character Area are more minor.

2.34. 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 restrictions on the A438 to the east of the ECA where the road crosses the River Severn, with a maximum gross weight limit of 17t and a width restriction of 9'6" (3m). Local roads may have further restrictions and will need further assessment if they are to be used for accessing mineral resources.

Rail

2.35. There are no network rail lines within the ECA.

Water

2.36. There are no navigable watercourses within the ECA, although the River Severn is near to the eastern boundary. The River Severn is an operational river navigation, capable of carrying commercial traffic and is navigable up to Stourport on Severn.

GI Priorities:

2.37. The GI transport priorities identified for the Bushley ECA are[13]:

- 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.

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

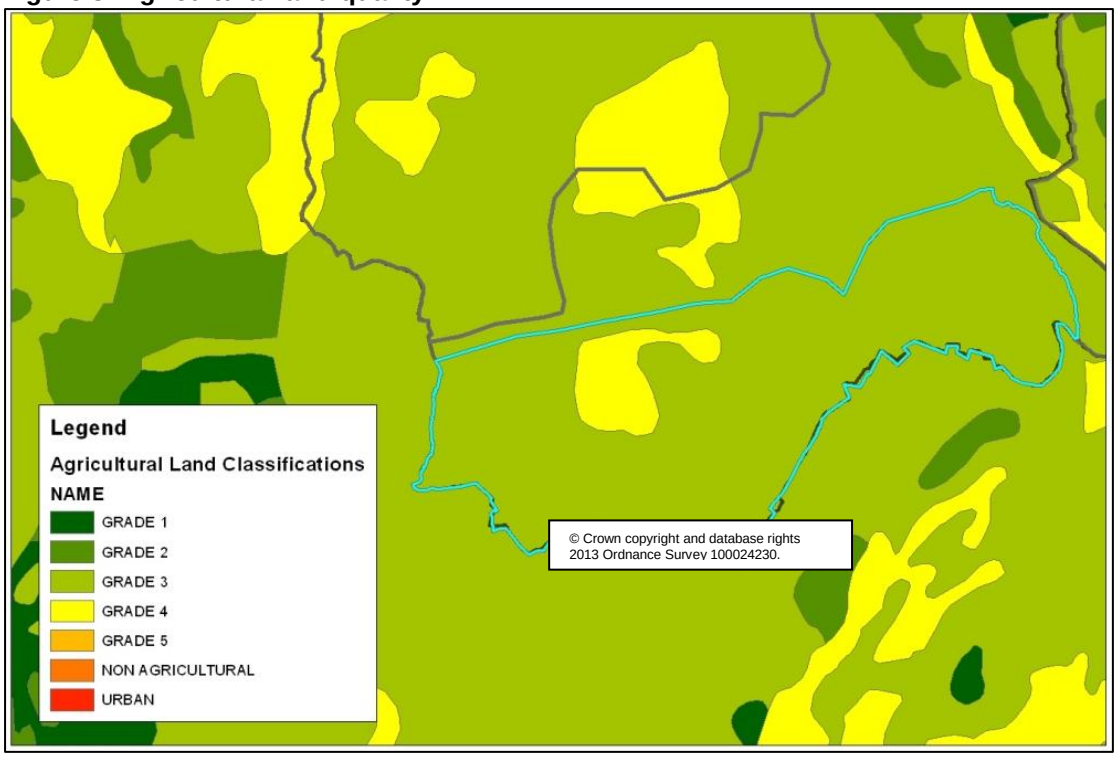
LTP Priorities:

2.38. There are no LTP 3 transport priorities identified for the Bushley ECA.

Agriculture/Forestry

2.39. The agricultural land use in this ECA is dominated by pastoral land in the west of the ECA and mixed farming in the east. Agricultural land quality is dominated by grade 3 land, with a pocket of lower quality grade 4 land, as shown in Figure 3.

Figure 3. Agricultural land quality



2.40. 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). However, they also show that none of the ECA is an ancient woodland landscape and is therefore not prioritised for woodland restoration (Figure 5**Error! Reference source not found.**).

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

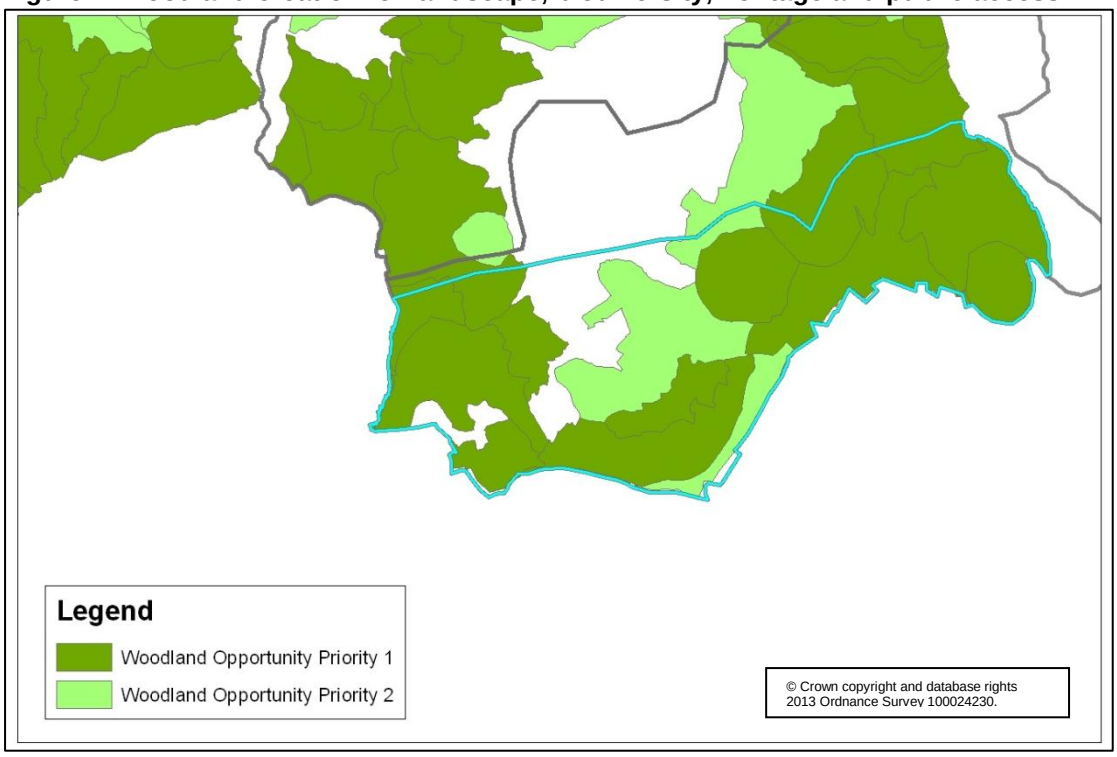
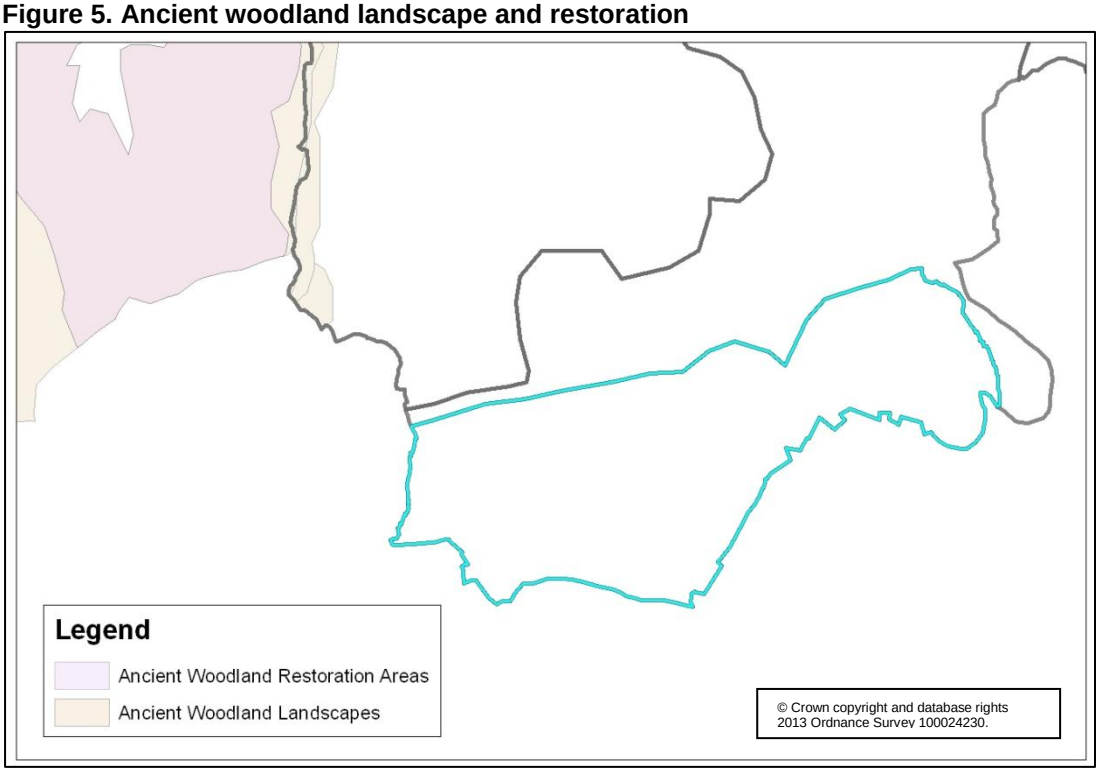


Figure 5. Ancient woodland landscape and restoration



Climate Change

2.41. 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

2.42. 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.

2.43. 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.

2.44. The soil types in 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.

Socio-economic considerations

3.45. 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.

2.46. 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.

2.47. 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.

2.48. 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.

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

- Primary focus on enhancements to support overall health of residents.
- Support for improvements to household income.