

Worcester Green Infrastructure Strategy (Re002)

Worcestershire County Council
December 2007

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Table of Contents

1	Introduction and Overview	4
	1.1 Terms of Reference	4
	1.2 Document Structure	4
	1.3 Definition of Green Infrastructure.....	4
2	Policy Review	8
	2.1 Introduction	8
	2.2 National Policy	8
	2.3 West Midlands Regional Policy	11
	2.4 Local Policy.....	17
3	Baseline Context	24
	3.1 Introduction	24
	3.2 Landscape Character	25
	3.3 Historic Environment.....	34
	3.4 Biodiversity.....	36
	3.5 Woodland.....	42
	3.6 Recreation & Tourism	45
	3.7 Natural Processes and Environmental Systems	48
	3.8 Structural Greenspace.....	51
	3.9 Access and Movement	52
4	Impacts and Constraints	56
	4.1 Introduction	56
	4.2 Landscape Character	56
	4.3 Historic Environment.....	57
	4.4 Biodiversity.....	57
	4.5 Woodland.....	57
	4.6 Recreation and Tourism	58
	4.7 Natural Processes and Environmental Systems	58
	4.8 Structural Greenspace.....	58
	4.9 Access and Movement	59
5	Protection and Improvement	63
	5.1 Introduction	63
	5.2 Landscape Character	63
	5.3 Historic Environment.....	64
	5.4 Biodiversity.....	64
	5.5 Woodland.....	65
	5.6 Recreation and Tourism	65
	5.7 Natural Processes and Environmental Systems	65
	5.8 Structural Greenspace.....	66
	5.9 Access and Movement	66
6	A Green Infrastructure for Worcester	69
	6.1 Introduction	69
	6.2 Long-term Vision.....	69
	6.3 Green Infrastructure Principles	69
	6.4 Strategic Green Infrastructure Framework	71
7	Next Steps	78
	7.1 Further Study	78
	7.2 Proposed Delivery Mechanisms	78

APPENDIX 1 – STUDY EXTENT

APPENDIX 2 – LANDSCAPE DESIGNATION UNITS

APPENDIX 3 – LDU ECOLOGICAL PROFILES

APPENDIX 4 – APPROACH AND METHODOLOGY

Introduction and Overview

1 Introduction and Overview

1.1

Terms of Reference

The West Midlands Regional Spatial Strategy¹, adopted in 2004, identified Worcester as a Sub-Regional focus for balanced growth. This has subsequently led to Worcester being designated as a New Growth Point by the Department for Communities and Local Government.

A condition of this designation was the preparation of a green infrastructure strategy to ensure that green infrastructure is properly taken account of in the subsequent planning and delivery of Worcester's strategic growth.

This strategy has been commissioned by Worcestershire County Council in response to this requirement.

The aims of this document are as follows:

- To provide a long-term vision for the creation of a network of green spaces and natural elements that will intersperse and connect Worcester, particularly as a result of its strategic growth, with the surrounding countryside and settlements.
- To inform the production of a Joint Core Strategy for South Worcestershire.²
- To catalyse and focus resources for further detailed study.
- To provide a context by which the consideration of green infrastructure may be requested within scoping requests for new development.

This document represents a strategic-level desktop study, analysing existing data and developing it into a long-term vision for green infrastructure in and around Worcester.

The area covered by this strategy roughly comprises the City of Worcester and a 6 kilometre radius, extending into the districts of Malvern Hills to the west and Wychavon to the east. The approximate extent of the study area is shown on Figure A1 at Appendix 1.

1.2

Document Structure

This strategy is structured as follows:

- Section 2: Policy Review
- Section 3: Baseline Context
- Section 4: Impacts and Constraints
- Section 5: Protection and Improvement
- Section 6: A Green Infrastructure Strategy for Worcester
- Section 7: Next Steps

1.3

Definition of Green Infrastructure

The concept of green infrastructure is relatively new, having developed in the USA and been initially adopted in the UK during the planning stage of the Thames Gateway Growth Area.

Green infrastructure comprises networks of multi-functional open space, at all scales. Its fundamental principles are therefore the multi-functionality of open space resources, to enable them to maximise public benefit, and the connectivity of these resources into functional networks to ensure that the overall value of the network is greater than the sum of its component parts.

Green infrastructure encompasses all open space elements within rural and urban landscapes. Examples include:

- Woodland
- Watercourses
- Playing fields

¹ Regional Planning Guidance for the West Midlands (RPG11): Office of the Deputy Prime Minister, 2004

² South Worcestershire comprises the City of Worcester and the Districts of Malvern Hills and Wychavon.

- Nature reserves
- Cemeteries
- Footpaths
- Hedgerows
- Amenity landscaping

Green infrastructure is recognised for its improvement of the “liveability” of areas; improving their attractiveness to residents, employees, visitors and investors and promoting physical and mental well-being through its use and enjoyment.

A more comprehensive definition of green infrastructure within the West Midlands is provided by “Green Infrastructure: A Prospectus for the West Midlands Region”.³

³ West Midlands Regional Assembly, 2007

Policy Review

2 Policy Review

2.1 Introduction

In this section the national, regional and local policy relating to green infrastructure has been reviewed and is presented with the twin aims of establishing the existing policy context under which the future planning and delivery of Worcester's green infrastructure will occur and justifying the consideration of green infrastructure within the South Worcester Joint Core Strategy.

It should be noted that the existing local policy has been covered in less detail than the national and regional policy, given that it is in the process of being superseded by the South Worcestershire Local Development Framework.

2.2 National Policy

Department for Communities and Local Government (DCLG): Planning Policy

The DCLG, formerly the Office of the Deputy Prime Minister (ODPM) has been created with a remit to promote community cohesion and equality, as well as responsibility for housing, urban regeneration, planning and local government. It is responsible for national policies on different aspects of planning and the rules that govern the operation of the system, including the suite of Planning Policy Guidance (PPG) notes and Planning Policy Statements (PPS) that provide national planning policy for the UK.

While the term "green infrastructure" was not in wide use when the Planning Policy Guidance notes and some Planning Policy Statements were produced, a number of subjects are covered by these documents that now fall within the definition of green infrastructure.

Policy relevant to green infrastructure is present within the following documents:

- PPS1: Delivering sustainable development
- PPS3: Housing
- PPS7: Sustainable Development in Rural Areas
- PPS9: Biodiversity and geological conservation
- PPG13: Transport
- PPG15: Planning and the historic environment
- PPG16: Archaeology and planning
- PPG17: Planning for open space, sport and recreation
- PPG21: Tourism

The most notable extracts from the above documents are presented in the following paragraphs:

In PPS1 the effective protection of the environment and the prudent use of natural resources are listed as two of the Government's four aims for sustainable development. It also states that planning should facilitate and promote sustainable development by

"...protecting and enhancing the natural and historic environment, the quality and character of the countryside, and existing communities."

PPS3, which recently replaced PPG3, recognises the fundamental value of good design to the development of high quality new housing and creation of sustainable communities.

It sets out a number of considerations when assessing design quality, which include the extent to which new development:

- *Provides, or enables good access to, community and green and open amenity and recreational space (including play space) as well as private outdoor space such as residential gardens, patios and balconies.*
- *Creates, or enhances, a distinctive character that relates well to the surroundings and supports a sense of local pride and civic identity.*

- *Provides for the retention or re-establishment of the biodiversity within residential environments.*

It places particular value on the value of green space to families, recognising that it will be:

“...important to ensure that the needs of children are taken into account and that there is a good provision of recreational areas, including private gardens, play areas and informal play space. These should be well-designed, safe, secure and stimulating areas with safe pedestrian access.”

With regard to the efficient use of land in housing growth, PPS3 recommends that Local Authorities take the current and future level and capacity of green and open space into account when developing housing density policies.

PPS9 lists the Government’s objectives for planning in relation to biodiversity, which includes the conservation and enhancement of biodiversity and geodiversity and the achievement of rural renewal and urban renaissance by enhancing biodiversity in green spaces among developments and ensuring that developments take account of the role and value of biodiversity. The document also recognises the importance of networks of natural habitats to

“...link sites of biodiversity importance and provide routes or stepping stones for the migration, dispersal and genetic exchange of species in the wider environment.”

It also states that these networks should be strengthened by and integrated into development as a wider strategy for the protection and extension of open space and access routes.

In discussing the wider historic landscape of England, PPG15 identifies the link between the historic environment and biodiversity, stating that the historic environment is a

“...crucial and defining aspect of biodiversity, to the enhancement of which the Government is committed.”

It also reinforces the network aspect of green infrastructure, stating that the historic landscape, to varying degrees and in different ways, is

“...an archaeological and historic artefact, the product of complex historical processes and past land-use.”

PPG 16 also links green infrastructure to archaeology, making reference to the ability of landscaping and open spaces to protect important remains that occur within development sites.

Office of the Deputy Prime Minister (ODPM): Urban White Paper

In November 2000 the ODPM published the Urban White Paper, describing how the government means to help urban communities realise their full potential. Since the publication of this document the ODPM has published several follow-up documents to take forward this vision.

“Living Places – Cleaner, Safer, Greener”,⁴ published in 2002, sets out how the Government is working to achieve an improvement in public open spaces.

It outlines the need for local environments to be greener and healthier through

“...a good balance of parks, play areas and green spaces and imaginative use of tree planting.”

Under the summary of Government objectives for urban parks and green spaces, it is stated that:

“Good parks and green spaces make neighbourhoods, towns and cities more attractive and appealing.” and that they “...bring many benefits that make places more liveable and sustainable and enrich the quality of peoples’ lives and communities.”

It confirms peoples’ desire for city farms and community gardens, wildlife areas and woodlands, allotments and tree-lined streets, as well as parks, sports grounds and play areas to address their social, educational and physical needs and changing lifestyles.

In affirmation of the importance of green infrastructure to the overall development agenda, it recommends that action is needed at the national and local level to give parks and green space services equal status to other services.

⁴ Living Places – Cleaner, Safer, Greener (ODPM, 2002)

Office of the Deputy Prime Minister (ODPM): Rural White Paper

The Rural White Paper⁵, published by ODPM in 2000, also supports the principles of green infrastructure. Objective 4 of the Government's Rural Policy Objectives is the better management and improved recreation potential of land on the rural/urban fringe.

Under Section 11.3: Recreation for All the Rural White Paper identifies the countryside around towns as an important recreational resource for city dwellers and states the Government's aim to improve its amenity value. Country Parks are identified as being a particularly important asset, providing a "gateway" between town and country. Within this section Paragraph 11.3.3 also recommends green transport corridors to, from and within disadvantaged areas.

CABE Space: Manifesto for Better Public Spaces

The Commission for Architecture and the Built Environment is an Executive Non-Departmental Public Body, funded by the Department for Culture, Media and Sport and the DCLG. It promotes a higher quality of life for people and communities across England, with particular concern for those living in deprived areas.

With regard to the general benefits of green infrastructure, the "Manifesto for Better Public Spaces",⁶ published by CABE Space, and discussions⁷ with CABE revealed their support for a well-designed network of urban green spaces that meet a variety of objectives such as biodiversity, community development and recreation towards the overall aim of improving the quality of life in urban areas.

CABE Space: Does Money Grow on Trees?

In 2005 CABE published "Does Money Grow on Trees?",⁸ a study into the economic potential of parks and green spaces in and around urban areas.

This identified that green spaces:

"...define our communities" and "...enhance our quality of life and give local neighbourhoods the identity that helps engender a sense of belonging."

It also states that:

"...for residents and visitors alike the provision of free, open access for a range of activities promotes healthier living in a psychologically beneficial environment".

The study cautions against low green space provision, stating that:

"A poor quality physical environment not only saps the self-esteem of local residents but can have a wider impact on undermining the confidence of others to commit to the area, be they prospective residents, businesses, developers or the local authority".

Relevant policy is reviewed in the document and in this context it states that:

"...the contribution of parks and green spaces is likely to be central to the success or failure of new developments, both in the regeneration of deprived areas and in the creation of new residential and mixed use environments".

In economic terms the study supports the green infrastructure concept of a multi-functional network, suggesting that from data analysis it appears that this contributes to spreading property value uplift over a wider area in comparison to isolated features. It also challenges the conventional developer view that land given over to open space represents a cost in the context of the whole development, suggesting that development income forgone could be partially or completely offset by overall uplifts in property value.

HMSO: UK Biodiversity Action Plan

In 1994 the UK government published "Biodiversity: The UK Action Plan". This landmark document was prepared as the UK's response to the Convention on Biological Diversity signed at the Earth Summit in Rio in 1992.

⁵ Rural White Paper (ODPM, 2000)

⁶ Manifesto for Better Public Spaces (CABE Space, 2004)

⁷ Verbal communication

⁸ Does Money Grow on Trees? (CABE Space, 2005)

The Plan describes the UK's biological resources and commits a detailed plan for the protection of these resources. It currently contains 577 priority Species Action Plans, 49 priority Habitat Action Plans and 162 Local Biodiversity Action Plans with targeted actions.

The overall delivery of the Plan is administered by the UK Biodiversity Partnership⁹, which is currently reviewing the lists of habitats and species and which has recently published the results of this study¹⁰, which recommends that the number of priority species be increased to 1149 and the number of priority habitats to 65 based on the assessment criteria of international importance, rapid decline and high risk. The report also recommends in the exclusion of 123 current priority species from the list.

2.3

West Midlands Regional Policy

West Midlands Regional Assembly (WMRA): West Midlands Regional Concordat

In July 2006 WMRA published the third edition of the West Midlands Regional Concordat¹¹, which is a framework for partnership working between regional organisations and for the integration of regional strategies prepared by a wide-ranging partnership of regional organisations.

It presents a joint aspiration for the region organisations to work together to create

“...an economically successful, outward looking, healthy and adaptable Region, rich in culture and environment, where all people, working together, are able to meet their aspirations and needs without prejudicing the quality of life of future generations.”

The Concordat affirms the region's commitment to the UK's pillars of sustainable development, including living within environmental limits and achieving a sustainable economy.

It lists a number of regional strategic priorities distilled from the various regional strategies, which includes

“Securing and developing the Region's environment and culture – as assets supporting our quality of life, economic and social aspirations and acting as key components in regeneration.”

Government Office for the West Midlands (GOWM): West Midlands Regional Spatial Strategy (RSS11)

In June 2004 GOWM published the Regional Spatial Strategy for the West Midlands (RSS11), which also incorporates the Regional Transport Strategy. At the time of the launch it was entitled “Regional Planning Guidance for the West Midlands” and it subsequently became the statutory Regional Spatial Strategy following the commencement of the Planning and Compulsory Purchase Act 2004.

RSS11 is a broad development strategy to guide the preparation of local development and transport plans, inform the preparation of other regional strategies and provide a planning and land use framework for the development of the region.

RSS11 re-affirms the Vision presented in the West Midlands Regional Concordat (see paragraph 2.3.2 above) and recognises that the Vision looks forward to a region which is recognised for its distinctive, high quality natural and built environment.

It recognises Worcester as a sub-regional focus for new development and identifies the need for new investment to enable the city to support the wider regeneration and meet the needs of surrounding rural areas, including building upon the city's historic heritage and high quality environment, which are seen as traditional strengths.

Paragraph 3.14 of RSS11 states 10 strategic objectives for the Region, one of which is:

“To ensure the quality of the environment is conserved and enhanced across all parts of the region.”

⁹ The UK Biodiversity Partnership comprises a wide range of individuals from public and private sector backgrounds who are interested in the UK's wildlife and natural history.

¹⁰ Report on the Species and Habitat Review: Report to the UK Biodiversity Partnership (Biodiversity Reporting and Information Group, 2007)

¹¹ West Midlands Regional Concordat: Third Edition (West Midlands Regional Assembly, 2006)

Chapter 7 of RSS11 relates to economic prosperity. It recognises that improving factors such as environmental quality and access to leisure facilities will enhance the attractiveness of the region to inward investment.

Policy PA1 (Prosperity for All) states that local authorities and regional agencies should:

“Ensure that the environmental and cultural assets are maintained and enhanced to help attract and develop business activity.”

The Policy also states that development should respect the natural environment, built environment and historic heritage.

Policy PA6 (Portfolio of Employment Land) reinforces this point, stating that:

“...in all cases land allocations should take account of the need to protect and enhance the Region’s natural, built and historic environment.”

Chapter 8 of RSS11 relates to the quality of the region’s environment. It states that:

“Conserving the quality of the environment and the prudent use of natural resources are key elements in the achievement of sustainable development and the implementation of the Spatial Strategy and Regional vision. To fulfil this role requires losses of environmental quality to be minimised and a planned approach to securing higher environmental quality outcomes.”

The chapter recognises the value of the region’s environment, confirming the underlying philosophy to be:

“...whilst in some instances the environment may act as a constraint on certain types of development, overall it should be regarded as a major asset to the Region supporting wider economic and social aspirations and acting as a key component in regeneration.”

The following policies within Chapter 8 relate to matters concerning green infrastructure:

- *QE1: Conserving and enhancing the environment*
- *QE2: Restoring degraded areas and managing and creating high quality new environments*
- *QE4: Greenery, urban greenspace and public spaces*
- *QE5: Protection and enhancement of the historic environment*
- *QE6: The conservation, enhancement and restoration of the region’s landscape*
- *QE7: Protecting, managing and enhancing the region’s biodiversity and nature conservation resources*
- *QE8: Forestry and woodlands*
- *QE9: The water environment*

Chapter 8 places particular importance on urban greenspace, identifying that:

“Access to quality greenspace can contribute greatly to the region’s urban renaissance, improving the quality of life in urban areas by providing opportunities for sport and recreation and improving biodiversity.”

The critical importance of investment in the long-term management is also recognised, as follows:

“The longer-term management and maintenance of landscaping and public spaces generally, should be addressed at the outset when new developments are being implemented, for example by negotiating commuted sums.”

Chapter 8 recognises the important contribution that tree planting can make to health, recreation and regeneration and recommends that it be particularly encouraged in urban and urban fringe areas. It states that development plans should encourage increases in tree cover and prevent the loss of woodland and that priority should be given to expanding and linking small and fragmented semi-natural woodlands using native species.

Chapter 9 of RSS11 covers transport and accessibility and places particular value on walking and cycling as the most sustainable means of travel and a significant contributor to the general health of the population. It recognises the contribution of walking and cycling to reducing traffic congestion and associated pollution and noise, but also the potential for accidents and need to improve the environment for these modes.

Policy T3 (Walking and cycling) identifies several opportunities for walking and cycling to be delivered through development plans and transport plans, such as developing greenways, the National Cycle Network and ensuring that new developments and infrastructure proposals improve walking and cycle access.

Advantage West Midlands: West Midlands Economic Strategy

In 2004 Advantage West Midlands, the Regional Development Agency for the West Midlands, published “Delivering Advantage: The West Midlands Economic Strategy and Action Plan 2004 – 2010.”

It states the economic Vision for 2010 for the West Midlands to be as follows:

“The West Midlands is recognised as a World Class region in which to invest, work, learn, visit and live and the most successful in creating wealth to benefit all of its people.”

It predicts that by 2010, tourism will be recognised as one of the region’s main economic drivers and it predicts that the basis for this offer will be a high quality environment with an exciting range of visitor activities and opportunities for informal recreation.

It also predicts that the region’s rich geographical diversity will give it unique strengths and that it will be recognised for its outstanding quality of life and opportunities.

The Strategy identifies a number of key challenges that must be overcome to achieve the Vision, one of which is the environment. It states that:

“A high quality environment is vital for tourism development, inward investment and overall quality of life; and our challenge is to work together to utilise available opportunities to ensure that economic development enhances, and is in turn enhanced by, the environment.”

The Strategy is underpinned by three principles, the first of which is:

“A commitment to sustainable development to ensure that the Strategy contributes to long-term improvements in the quality of life in the region.”

The Strategy is structured into 5 pillars, which are as follows:

- *Pillar 1: Developing a diverse and dynamic business base*
- *Pillar 2: Promoting a learning and skilful region*
- *Pillar 3: Creating the conditions for growth*
- *Pillar 4: Regenerating communities*
- *Pillar 5: A powerful voice for the region*

Pillar 1 calls for businesses to recognise that the quality of the environment needs to be managed and improved as a substantial asset for the region’s economy.

Pillar 3 calls for an improvement to transport through measures which include encouraging greater use of public transport, cycling and walking across the region.

It also identifies that there is a fundamental role for a high quality environment to support the region’s economy and deliver the Vision. The natural environment is recognised as a key component of quality of life in the West Midlands.

Pillar 4 recognises that successful, sustainable local economies and communities need an environment (real and perceived) that is attractive, safe and offers high quality social and cultural infrastructure.

It establishes several priorities for action, one of which is:

“Promotion of environmental awareness and improvement; enhancement of cultural opportunities; and maintaining and developing green spaces to provide better living conditions and improve perceptions of local areas.”

Sustainability West Midlands: West Midlands Regional Sustainable Development Framework

In July 2006 Sustainability West Midlands published “A Sustainable Framework for the West Midlands: Regional Sustainable Development Framework Version Two.” The purpose of this document is to help all strategies, policies and plans to contribute to a sustainable future for the West Midlands.

It identifies several issues that will need to be overcome to achieve sustainable development in the region, including the following:

- The need to improve links between rural and urban communities through the provision of local produce, sustainable fuel sources and opportunities for recreation.
- The region's position as a national transport hub leading to problems of congestion, poor air quality and streets that are unsafe for walking and cycling.

The Framework commits to the Regional Concordat's Vision for the region and supports the central aim of RSS11 to deliver urban and rural renaissance whilst protecting and enhancing the quality of the environment.

The Framework then sets out a range of Sustainable Development Objectives for the region, many of which relate to green infrastructure, under the following headings:

- Sustainable consumption and production (Objectives 1.4 and 1.8)
- Climate change and energy (Objectives 2.2 and 2.5)
- Natural resource protection and environmental enhancement (all Objectives)
- Sustainable Communities (Objectives 4.4 and 4.5)

The Framework concludes with a number of useful case studies illustrating a wide range of sustainable development initiatives that are currently active in the region.

West Midlands Biodiversity Partnership: Regional Biodiversity Strategy for the West Midlands

In 2005 the West Midlands Biodiversity Partnership published "Restoring the Region's Wildlife: Regional Biodiversity Strategy for the West Midlands." The aim of this strategy is to focus attention on the most urgent priorities for biodiversity, and to harness effort to meet and overcome the challenges to achieve the Biodiversity Partnership's aim of restoring the region's wildlife.

The Strategy recognises that the region's plants and animals have suffered major losses in recent decades and sets out the following key challenges for the region:

- Maintaining and improving the conditions of habitats, species and ecosystems
- Developing an area based approach to restoring wildlife
- Monitoring the condition of habitats, species and ecosystems
- Re-connecting and integrating action for biodiversity with other environmental, social and economic activity
- Coping with the impacts of climate change

Under Challenge One the Strategy supports the network concept of green infrastructure by recognising the need to

"...make sure that the wider countryside, suburbs and towns contain the networks and features needed to support and connect functioning ecosystems."

This is further supported by Challenge Two, which recognises the need for an holistic approach to wildlife restoration by

"...taking a landscape-scale approach to biodiversity conservation; that is, working in particular areas to enhance habitats, species and the ecosystems within which they interact, paying particular regard to how they connect together, how they sit within the landscape and how they link to social and economic concerns."

The Strategy establishes the significant importance of biodiversity to the region, stating that it is

"...important to the West Midlands because of the contribution it makes to the quality of life of people who live and work in, and visitors to, the Region. It also plays a vital role in underpinning some of our most important economic sectors, such as tourism."

The Strategy goes on to state that biodiversity is critically important to people's health and welfare, but that people are increasingly disconnected from nature and generally do not recognise this link.

Under the heading of "The Natural Economy" the Strategy recognises that as well as providing employment the quality of the environment is

"...a significant factor for businesses in deciding where to locate."

It cites a study¹² into the personal factors influencing executives' choice of cities for relocation, which put quality of life at the top of the list. It also notes that the attractiveness of the environment is one of the top ten reasons for inward investors choosing a site.

Under the heading of "Tourism and Recreation" the Strategy states that:

"We must ensure that this component remains competitive by taking action to maintain and enhance the landscapes, habitats and ecosystems concerned, whilst linking them to local and regional history and economic activity."

The Strategy also contains two essays on aspects of biodiversity. The second of these, "Our Water and Wetlands", calls for rivers to be reconnected with their floodplains where this is possible. It states that this will not only restore and improve wetland ecosystems and functions, but will also bring direct economic and social benefits.

The majority of the second half of the Strategy comprises a summary of the links between biodiversity and the following sectors:

- Agriculture
- Water and Wetlands
- Forestry and Woodlands
- Towns, Cities and Development
- Business
- Tourism
- Recreation and Access
- Health
- Transport

While many of the above relate to green infrastructure, the following are of particular relevance to this strategy:

The section entitled "Towns, Cities and Development" recognises the role of towns and cities in wildlife conservation, in particular through transport routes, suburban areas and greenspace networks. It also highlights the value of the urban fringe in providing both ecological and recreational links between the countryside and urban greenspaces.

It recognises that this sector can further improve biodiversity by ensuring that new development records and supports biodiversity, managing urban greenspace for multiple functions including wildlife, incorporating sustainable drainage systems into new developments and protecting linkages between rural areas of biodiversity value and urban areas via the urban fringe.

The section entitled "Business" recognises that businesses often have land around properties which can become low-maintenance pleasant places for workers if managed for wildlife. It also recognises that well planned developments can create new and enhance existing nature conservation sites.

The section entitled "Health" recognises that people's use of natural places, including urban greenspaces, can contribute to a healthy lifestyle, improve patient recovery times, improve mental well-being and reduce tension and stress. It recognises in particular the value of the British Trust for Conservation Volunteers' Green Gyms initiative, which has been shown to improve fitness and mental well-being amongst participants while benefiting biodiversity through the work undertaken.

The Strategy concludes with a section on delivery, which recognises that:

"Restoring wildlife at a landscape scale requires putting into place linkages between important habitats and species populations, helping to create more robust ecosystems resilient to the impacts of contemporary intensive land uses as well as the effects of climate change."

Forestry Commission: West Midlands Regional Forestry Framework

In October 2004 the Forestry Commission published "Growing Our Future: The West Midlands Regional Forestry Framework" with the aim of inspiring and guiding those involved in the management of trees, woodland and forests in the region to secure the sustainable development of this resource.

¹² The Environmental Economy of the West Midlands (Environment Agency and Advantage West Midlands, 2001)

It states the vision for woodland and forestry in the region to be:

“...to create a viable and inclusive woodland and forestry sector that maximises sustainable development through delivery of economic, environmental, cultural and social benefits to the people of the region.”

The Framework sets out a list of actions that the West Midlands woodland and forestry sector will have to earn a reputation for to achieve this vision. These include:

- *Using trees and woodlands to unify and enhance both urban and rural landscapes and to help create a sense of place at a landscape scale.*
- *Using wood for energy.*
- *Using woodlands and forestry to foster social inclusion and cohesion and education for all, and to promote good health and quality of life.*
- *Conserving hedges, fruit orchards, parkland, leafy public spaces and veteran trees.*
- *Using trees and woodlands to enhance transport corridors.*
- *Making use of woodlands for tourism, local recreation and other non timber products.*
- *Using trees to help manage flood risk, floodwater and alleviate weather extremes.*
- *Protecting and enhancing ancient woodlands.*

The main body of the Framework comprises an action plan, which is presented using the following 11 strategic themes:

- Woodland Cover
- The Woodland and Forest Industry
- Wood Energy
- Recycling
- Recreation and Tourism
- Health and Wellbeing
- Education, Learning and Skills
- Fostering Social Inclusion
- Enhancing Biodiversity
- Natural and Cultural Environmental Benefits
- Supporting the Regeneration of the West Midlands

For each strategic theme the Framework describes the current situation and establishes a set of aims, objectives and actions. A case study is also presented for each theme.

Much of the material presented in the action plan is directly relevant to green infrastructure and in particular Objectives WC1, WC4, WC5, WC6, RT3, RT4, HW1, HW2, ELS1, EB2, EB3, EB5 and NCEB6.

West Midlands Regional Assembly: West Midlands Regional Housing Strategy

In June 2005 West Midlands Regional Assembly published the West Midlands Regional Housing Strategy with a number of core aims (consistent with and supportive of the vision of the West Midlands Regional Spatial Strategy), which includes:

“To achieve sustainable access to minimise environmental resource consumption and traffic and improve the quality of the environment.”

The Framework further commits to this aim by stating that one of the purposes of the Strategy is to be environmentally engaged, recognising that:

“Improvement in the quality of the residential environment is crucial to the wellbeing of neighbourhoods and the creation of successful places.”

Chapter 7 of the Strategy relates to sustainable communities. It recognises the importance of informal open spaces and children’s play areas and advocates the incorporation of such spaces in both new developments and areas of re-development. It also recognises the positive impact of open spaces on residents’ health and well-being and their potential to improve community cohesion by acting as a community resource for events.

Paragraph 7.24 of this chapter directly refers to green infrastructure, as follows:

“The development of area based approaches is also a means for strengthening connections between neighbourhoods, their local environments and cultural heritage. This includes the provision of green infrastructure, including safe, accessible open spaces for informal/formal recreation and rich in biodiversity, thus supporting semi-natural habitats and ecosystems.”

Chapter 7 also presents the following policies (Nos. 7.3, 7.6 and 7.7) which relate to green infrastructure:

- *To promote residential development and improvements to the housing stock which protect and enhance the quality of the natural and built environment; and which maintains and enhances biodiversity in urban as well as rural areas.*
- *To promote development and improvements to the housing stock which support healthy lifestyles, which reduce the need to travel and encourage the use of more sustainable forms of transport for example by ensuring that journeys on foot are safe, easy and attractive as well as practicable.*
- *To advocate incorporating land within housing development for community services where appropriate, such as open space and recreation facilities, in the interests of creating sustainable, well managed and properly resourced communities.*

The Strategy also connects green infrastructure to health within Chapter 7, through Policy 7.20, which states:

“Housing should promote positive health, in particular by enabling and encouraging people to walk and cycle as part of their normal daily routine, and providing good access to open space.”

West Midlands Regional Assembly: Regional Green Infrastructure Prospectus

In 2007 West Midlands Regional Assembly published “Green Infrastructure: A Prospectus for the West Midlands Region” with the following five aims:

- To ensure politicians, policy-developers and decision-makers throughout the West Midlands are aware of the vital roles of green infrastructure.
- To advocate greater investment in, and improved management of, the region’s existing green infrastructure.
- To ensure green infrastructure is appreciated as an essential element of delivering sustainable communities, underpinning growth and regeneration.
- To promote a robust and systematic approach to green infrastructure assessment, planning and investment by local, sub-regional and regional planning authorities.
- To ensure green infrastructure is proactively planned from the earliest stages of strategic plan preparation through to concept and design stages of all future development in the region.

The Prospectus goes on to recommend the value of green infrastructure and its contribution to the sustainable development of the region in terms of economic, social and environmental benefits.

The Prospectus states the regional vision for green infrastructure to be as follows:

“In the next two decades, we will plan, deliver and manage green infrastructure to create a high quality environment which makes the West Midlands vibrant, prosperous and sustainable.”

The Prospectus continues with a proposal as to how green infrastructure policy will fit into the existing spatial planning system and presents a number of good practice case studies of the successful delivery of green infrastructure, including the National Forest and Black Country Urban Park.

It concludes with an indication of spatial priorities for green infrastructure improvement and sets out a number of key challenges for the future, which include awareness raising, embedding green infrastructure into regional plans, policy and investment programmes, and ensuring that sufficient funding is provided not only for the creation of green infrastructure but also for its long-term management.

2.4

Local Policy

Worcestershire County Council: Worcestershire County Structure Plan 1996 – 2011

The Worcestershire County Structure Plan, adopted in 2001, provides a strategic policy framework for development and land-use planning in the county. It is currently due to be superseded by the South Worcestershire Joint Core Strategy in 2010.

The Plan sets out a vision for Worcestershire whose main theme is to sustainably enhance the quality of life within the county.

The vision is presented through four aspects, one of which is for a county that is environmentally conscious and another where its residents are healthy and safe. Within these

sections the vision acknowledges the importance of the county's diverse environmental characteristics and features and states its aim for a good, pollution-free and stimulating environment.

The Plan then sets out 17 objectives for the plan period, which include:

- *Encourage and promote land use activities which will lead to an improvement in the quality of air, water and land.*
- *Protect from damaging development and land use activity, and enhance, biodiversity and diverse and important environmental, landscape, townscape and historic features and characteristics.*
- *Ensure the integration of development into the landscape in order to protect and enhance essential landscape characteristics and features.*
- *Protect and expand amenity areas and open spaces, and access to them, in both town and country.*
- *Facilitate the strengthening and diversification of the economic base of the region and of Worcestershire by the provision of a mixed portfolio of development locations and sites and by the enhancement and management of an attractive county environment.*
- *Support the enhancement, development and integration of, and access to, a range of recreational facilities both within and around settlements.*

The Plan then sets out a suite of development and land use policies for the county, under a variety of headings. A strong environmental protection and enhancement theme runs through these policies and the following policy areas contain the following policies which relate to green infrastructure:

- A Sustainable Development Framework: Policy SD.2 (Care for the Environment)
- Conservation of Town and Country: Policies CTC.1 (Landscape Character), CTC.2 (Skylines and Hill Features), CTC.5 (Trees, Woodlands and Hedgerows), CTC.6 (Green Open Spaces and Corridors), CTC.7 (Agricultural Land), CTC.8 (Flood Risk and Surface Water Drainage), CTC.11 (Sites of National Wildlife Importance), CTC.12 (Sites of Regional or Local Wildlife Importance), CTC.13 (Protection of Species), CTC.14 (Features in the Landscape of Nature Conservation Importance), CTC.15 (Biodiversity Action Plan), CTC.16 (Archaeological Sites of National Importance), CTC.17 (Archaeological Sites of Regional or Local Importance), CTC.18 (Enhancement and Management of Archaeological Sites), CTC.19 (Areas and Features of Historic and Architectural Significance) and CTC.20 (Conservation Areas).
- Transport: Policies T.1 (Location of Development), T.2 (Resources) and T.10 (Cycling and Walking).
- Recreation, Sport and Tourism: Policies RST.1 (Criteria for the Development of Recreation and Sports Facilities), RST.2 (Location of Informal Countryside Recreation Developments), RST.3 (Public Rights of Way), RST.4 (Recreational Walking Routes), RST.5 (Recreational Cycling Routes), RST.6 (Horse Riding Routes), RST.8 (Recreation in Areas Under Visitor Pressure), RST.9 (Waterways and Open Water Areas), RST.10 (Outdoor Sports in the Countryside), RST.11 (Major Sports Facilities), RST.12 (Recreational Provision in Settlements), RST.13 (Golf Courses) and RST.14 (Tourism Development).
- Minerals: Policy M.4 (Restoration and Aftercare)

Worcester City Council: City of Worcester Local Plan 1996 – 2011

The City of Worcester Local Plan, adopted in October 2004, is a comprehensive document to guide development in the City of Worcester to 2011. It is due to be superseded by the South Worcestershire Local Development Framework in 2010.

The Plan commits to the aim for Worcester agreed by the City Council in 1995, which is:

“Working together with our community we aim to create and sustain an environment across the City of Worcester which stimulates prosperity and a good quality of life for all.”

In order to achieve this aim the Plan sets out 17 objectives under the headings of environment, prosperity, access for all, health and safety and opportunity. Five of these relate to green infrastructure, namely to:

- *Encourage and promote land use activities which will lead to an improvement in the quality of soil, air, water and land.*

- *Protect and enhance open spaces and access to them, local biodiversity, landscape, townscape, historic environment (including conservation areas, historic buildings, archaeological areas, and sites of historic parks and gardens) and their setting.*
- *Encourage and promote modal change and increased walking and cycling.*
- *Plan for attractive and safe neighbourhoods where shops, schools, open spaces and other community facilities are easily accessible to all.*
- *Protect, enhance and develop new and existing recreational, cultural and community facilities with improved access to them and the wider countryside.*

Chapter 3 of the Plan covers the natural environment. It recognises that Worcester's natural topography has resulted in some areas not being developed, such as the flood plain of the River Severn and steep hilly parts, and that these areas retain considerable wildlife interest.

The Plan aims to sustain and enhance Worcester's open spaces by:

- *Providing a positive context for the protection and enhancement of open space.*
- *Promoting environmental protection, biodiversity and enhancement of wildlife habitats.*
- *Enhancing the amenity feature of the Worcester and Birmingham Canal, River Severn and protecting the flood plain of the River Severn and its tributaries.*
- *Encouraging new urban landscape design of a high standard, which is appropriate in character and commensurate with historic land form and ecological features.*
- *Enabling access to such spaces to be within walking/cycling distance of every home.*

Paragraphs 3.36 – 3.43 of the Plan refer to a City Council initiative called the Green Network, a continuous interlinked network of open space throughout the city and into the surrounding countryside which represents valuable work towards the establishment of a green infrastructure framework for the city.

It recognises that there has been an historic loss of open space within the city and that those assets that remain and the benefits they confer to the city's residents are in need of protection from further development pressure. The aims of the Green Network are as follows:

- *Give protection to sites of ecological interest and encourage their enhancement.*
- *Provide a supply of open space to meet the increasing needs of informal and formal recreation.*
- *Provide easily accessible open space to all residents of the city.*
- *Introduce a visual variety and relief in the built up area.*
- *Sustain landscape character and local distinctiveness.*
- *Enable pedestrian/cycle and wildlife movements between different parts of the city, and to and from the open countryside.*

It is envisaged that the Green Network will comprise all designated sites, as well as green corridors (including the River Severn and railway lines), green links (lesser linkages such as hedgerows and footpaths/cycleways) and other open spaces.

Chapter 3 recognises the value of footpaths and bridleways to the natural environment and notes that new developments in St Peter the Great and Warndon contain a high level of access provision. The Plan places particular value on the provision of links between the urban area and open countryside, in particular via long distance routes along the major watercourses. It also emphasised the protection of bridleways and recommends the cooperation with adjoining authorities to establish strong connections.

The value of proper long-term management of the Green Network is emphasised within the Plan and to ensure this occurs the City Council will prepare a management strategy covering better use, management, access, wildlife corridors, education and recreation.

Chapter 3 recognises the M5 Protection Corridor as a vital area of green space separating the city from the M5. It notes that the character of this area is dominated by woodland, hedges and agricultural land and advocates a presumption against further building within this area, with the exception of a reserved site for Worcester City Football Club.

It also acknowledges the presence of the Green Belt to the north of Worcester, established in 1992 with the aim of preventing the coalescence of Worcester and Droitwich and protecting the setting and character of the historic city.

The River Severn is recognised in Chapter 3 as being fundamental to the character of Worcester and a valuable recreation and sporting resource. The Worcester and Birmingham

Canal is also recognised as being of value and therefore the sides of both of these have been designated Conservation Areas.

At Paragraph 3.92 the Plan also supports a movement away from the culverting of watercourses towards open channels to provide open space corridors for biodiversity, informal recreation and visual amenity. This includes realising opportunities to re-open existing culverts to open channels in redevelopment sites.

Chapter 5 of the Plan relates to transport, and cycling and walking is recognised within this chapter as an important element of efforts to reduce congestion, pollution and climate change, and to improve health and fitness.

A number of challenges are identified, however, in the encouragement of cycling, including road safety and secure cycle storage at workplaces.

To address these challenges the following measures are identified within the Plan:

- *The provision of a comprehensive, safe, direct and convenient cycleway network throughout the city.*
- *The signing of cycleways.*
- *Cycle priority and safe cycle crossings on major roads.*
- *Cycle parking and storage facilities at places of enjoyment and other public buildings (secure and well designed).*
- *Cycle parking facilities at the entry points to pedestrianised streets, and in district/neighbourhood shopping centres.*
- *Changing facilities and shower facilities at places of employment.*
- *Increased road safety education for cyclists (and motorists).*
- *Improved highway maintenance standards, especially at the carriageway edge.*

Chapter 5 promotes the integration of new developments into existing cycleway networks, as follows:

“Where planning applications are received on land adjacent to, or in close proximity to the cycleway network to be of use to employees or visitors of a development, then developers will be expected to provide either the appropriate cycleway section or connection to an existing part of the network, including signing.”

With regard to walking, the Plan recognises the current challenges facing those seeking to get around on foot, as follows:

“Pedestrians have faced an ever deteriorating environment with the increasing levels of traffic pollution and congestion. In modern developments the concern for safety, in both housing and commercial layouts, can result in tortuous routes for pedestrians.”

To remedy this, the Plan advocates a more balanced approach, with safe, well-lit open and convenient routes with good surfaces promote secure pedestrian access. It states that routes should be convivial, connected, conspicuous, comfortable and clean.

With regard to policy, the following policies within the plan cover issues related to green infrastructure:

- Natural Environment: Policies NE1 (Sites of International Importance for Nature Conservation), NE2 (Sites of National Importance for Nature Conservation), NE3 (Sites of Regional or Local Importance for Nature Conservation), NE4 (Nature Conservation – Green Spaces), NE5 (Landscape Protection), NE6 (Species Protection), NE7 (Landscaping Scheme), NE8 (Design of Buildings), NE9 (The Green Network), NE11 (M5 Protection Corridor), NE12 (Green Belt Area), NE13 (Development within the Green Belt), NE19 (Private Moorings Ancillary to Dwellings – River Severn and NE20 (Safeguarding Watercourses).
- Built Environment: Policies BE2 (Character and Appearance of the City), BE6 (Open Areas in Conservation Areas), BE13 (Landscape in Conservation Areas), BE21 (Development within Archaeologically Sensitive Areas – Design Principles), BE24 (Protection of Nationally and Internationally Important Archaeological Sites) and BE26 (Historic Landscapes and Features).
- Transportation: Policies TR1 (Footpath/Cycleway Network), TR2 (Footpath/Cycleway – Private Development) and TR8 (Pedestrian Access in Development).

Worcestershire Biodiversity Partnership: Worcestershire Biodiversity Action Plan

In 1999 the Biodiversity Action Plan for Worcestershire Partnership published the Biodiversity Action Plan for Worcestershire, a strategic document that outlines how the most urgent priorities for wildlife conservation can be promoted in Worcestershire.

Further details on the content of this document are given in Section 3.4.

Baseline Context

3 Baseline Context

3.1

Introduction

The following section summarises existing strategic-level baseline information relating to the green infrastructure of Worcester and the surrounding area, i.e. at city, district and county scale. Regional-level data will also be considered as appropriate to provide a wider context to local data.

The collected baseline information represents a significant body of existing work and while it is recognised that all of this information is linked and contributes to the whole environmental context of Worcester, for the purposes of this Strategy it has been divided into 8 strategic themes for ease of analysis. This approach was chosen because it has been proven to be successful in the analysis of green infrastructure in the Milton Keynes and South Midlands Growth Area.¹³

The following themes were agreed with Worcester City Council and represent the range of environmental aspects that fall under the banner of green infrastructure:

- Landscape Character
- Historic Environment
- Biodiversity
- Woodland
- Recreation and Tourism
- Natural Processes and Environmental Systems
- Structural Greenspace
- Access and Movement

Each strategic theme is covered in its own section below. These sections comprise a general description of the character of this theme for the study area, with reference made to existing information. Three key features of each theme are then identified which demonstrate particular sites, designations or initiatives of value to illustrate the theme.

Each section concludes with a series of plans representing the baseline assets of the theme geographically to provide a spatial context.

¹³ A good existing example of this approach is presented within “Investing in the Environment: Northamptonshire’s Environmental Character and Green Infrastructure Suite” (River Nene Regional Park, 2006)

3.2

Landscape Character

Introduction

This theme covers the landscape and visual aspects of Worcester's green infrastructure, influenced by the physical form of the landscape and the effect of subsequent human activity upon it. Landscape character strongly influences the public's perception and enjoyment of green spaces as destinations and also as settings to new and existing settlements and movement routes.

Key Data Sources

- Natural England
- Worcestershire County Council
- Ordnance Survey

Joint Character Area

In 1996 the former Countryside Commission (now part of Natural England) published The Character of England map. This map divides England into 159 Joint Character Areas (JCAs), based on a combination of landscape and biodiversity character, and is accompanied by 8 regional documents describing the JCAs in each region. As a sub-regional scale assessment it provides a useful broad landscape context for Worcester and the study area, but should not be used to define the specific character of the study area.

This map places the study area within the Severn and Avon Vales JCA (as shown on Figure 1.1 at the end of this section), which is defined by the following key characteristics:

- A diverse range of flat and gently undulating landscapes, united by broad river valley character.
- Riverside landscapes with little woodland, often very open.
- A variety of land uses from small pasture fields and commons in the west to intensive agriculture in the east.
- Distinct and contrasting vales: Evesham, Berkeley, Gloucester, Leadon, Avon.
- Many ancient market towns and large villages along the rivers.
- Nucleated villages with timber frame and brick buildings.
- Prominent views of hills – such as the Cotswolds, Bredon and the Malverns – at the edges of the Character Area.

The rivers within this JCA are described as unifying features in what is a large and complex area. The land cover of the JCA is described as being mostly of mixed arable and pasture use, with the presence of arable land to the south of the study area and the general absence of hedgerow trees giving a very open character.

Woodland is described as being very localised within the JCA, however large oak and ash dominated ancient woodlands and the remains of parks may be found on the high ground between the Severn and Avon, south-east of Worcester and north-east of the Malvern Hills.

The JCA description also examines historic, cultural and settlement influences on the landscape. It notes that within the rural landscape, the intensification of agriculture has been less significant than elsewhere, but that the loss of trees to Dutch Elm disease has had a significant effect. It also notes that the M5 and other significant roads around Worcester, Gloucester, Cheltenham and Evesham are very prominent and tend to govern first impressions of these settlements.

Landscape Character Assessment: Introduction

In 1999 Worcestershire County Council produced a draft Landscape Character Assessment for Worcestershire entitled "Shaping the new Worcestershire" as Supplementary Planning Guidance to the County Structure Plan. While this document has not to date been formally adopted by the County Council, it is being used by the Council as the standard document to assess development proposals against landscape character.

The Assessment uses three area units to describe the landscape of Worcestershire. At the broadest level area Regional Character Areas, which relate to the Joint Character Area described above.

At an intermediate level are the Landscape Character Types, which are areas that are visually different from one another, as defined by dominant key elements such as topography or settlement pattern. Occasionally the Character Types are sub-divided into sub-sets to reflect landscapes which contain common key characteristic elements but which also possess additional identities which distinguish them within the Character Type.

At the finest level of detail are the Land Description Units, based on the framework of Landscape Character Types. Land Designation Units are representations of the Character Type in a specific location.

The locations of these Landscape Types and Land Designation Units are shown on Figure 1.2. This geographical information was not available as a digital map, therefore Figure 1.2 is a reproduction of an image that is shown in context with the study area boundary to provide a geographical context to the descriptions below.

The following sections describe the study area in terms of these three levels of landscape characterisation.

Landscape Character Area: Regional Character Area

The Assessment places the study area within the “Mid-Worcestershire Forest” Regional Character Area.

This area is generally described as a broad rolling plain stretching from the Malvern and Abberley Hills in the west to the Lenches and the Ridgeway along the county border in the east.

It is observed that there are significant differences in the pattern of land use and settlement across the area, reflecting the historic forest character of the central and northern parts of this area as opposed to the historic open agricultural character of the south.

This Regional Character Area forms part of a much larger complex of historic Royal Forests across the West Midlands and this association is recognised as being a very relevant element of the cultural heritage and landscape of Worcestershire. The vast number of small remnant coppices and hedgerow trees give the area a well-timbered appearance, despite much of the historic woodland having been cleared.

The Mid-Worcestershire Forest is a conglomeration of the following five historic forest areas, all of which encompass part of the study area:

- Malvern Chase
- Ombersley Forest
- Horewell Forest
- Feckenham Forest
- West Worcestershire Woods

The approximate boundaries of the historic forest areas, interpreted from the descriptive text of the Landscape Character Assessment, are shown as Figure 4.1 (see Section 4).

Malvern Chase

Malvern Chase occupies the area bordered by the Malvern Hills to the west, the River Teme to the north, the River Severn to the east and the Worcestershire/Gloucestershire county boundary to the south.

Historically the character of this forest area comprised woodland, open lawns and commons with occasional areas of open fields around scattered settlements.

The forest area was rapidly cleared during the 17th Century and nowadays the landscape is better described as a broad plain with very little remaining ancient woodland but a relatively high concentration of commons, particularly in the vicinity of the Malvern Hills.

The majority of the remaining woodland within this forest area occurs at the northern end, in the form of scattered ancient semi-natural woods and moderately species rich hedges. The woods principally comprise oak standards over old coppice with moderately rich ground flora.

Ombersley Forest

Ombersley Forest occupies a relatively small part of the northern end of the study area, forming a diamond shaped area from Worcester to Kidderminster with the River Severn forming its western edge.

A moderate element of woodland remains to the west of the forest area where it falls within the study area (in particular Knight's Grove – an area of ancient semi-natural woodland and replanted ancient woodland), the eastern part being dominated by Droitwich and its associated saltworks along the River Salwarpe.

It is noted that the woodland within this area contains a characteristically high proportion of the nationally uncommon small-leaved lime.

The Droitwich Canal, which runs parallel to the River Salwarpe, is also a characteristic feature of this area, as is Westwood Great Pool located to the west of Droitwich.

Horewell Forest

Horewell Forest occupies the south-eastern part of the study area, to the south of Worcester and east of the River Severn. Beyond the study area, it extends eastwards to the River Avon and southwards to the confluence of the Rivers Severn and Avon.

The dominant land use within this forest area is mixed farming, with woodland reduced to scattered fragments in the part that falls within the study area. Larger areas of remaining woodland are present to the south east of the study area, around Drakes Broughton and Defford.

Several landscaped parks and ornamental estatelands are present within this forest area, the most notable being Croome Court to the immediate south of the study area. It is also noted that a historic deer park was held by the Prior of Worcester at Kempsey.

Hedgerow trees, principally oak, are a significant characterising element of this forest area, as are relic commons.

Feckenham Forest

Feckenham Forest occupies a large area of land to the east of the study area and was historically the largest forest of the Worcestershire complex.

The general character of this area is that of irregular fields with hedges rich in woody species and clusters of linear settlement associated with old commons.

A number of large remaining woodlands associated with the forest area survive at the eastern end of the study area, clustered around Himbleton, including Trench Wood and Bow Wood. These were all historically managed as hazel coppice with oak standards, however some have since been planted with commercial conifers. Of particular note are the woods formerly managed by the Harris Brush Company, which were managed to produce brush handles from coppice stems and which are known for their woodland flora.

West Worcestershire Woods

Whilst not occupying the area of a former Royal Forest, the West Worcestershire Woods forest area occupies the western part of the study area, to the north of Malvern Chase (the boundary being the River Teme) and extends northwards beyond the boundary of the study area to the Wyre Forest plateau. Important features of this forest area are ancient woodland, hedges and the River Severn. Worcester is also included within this forest area.

The forest area is described as being heavily wooded, however significant areas of historic open field are also present. A notable historic land use within this area is wood pasture, for which the area was known in Anglo-Saxon times.

Several former medieval deer parks fall within the study area, at Hallow, Grimley, Wick Episcopi and Holt.

Important ancient woods falling within the study area are Monkwood and Ockeridge Wood. These were historically managed as mixed coppice with oak standards, however in recent history they were acquired by the Harris Brush Company and planted with beech, sycamore and other species for brush handle production. Remnants of the original semi-natural woodland

within these woods include ancient ditch and bank boundaries and the presence of small-leaved lime and wild service.

These woods hold a significant recognised ecological interest in the form of diverse woodland flora, butterfly and dormouse populations.

Shrawley Wood, located to the north of the study area, forms part of this complex and is also of significant value as the largest stand of small-leaved lime in Britain. It is also recognised for its associated insect and fungal populations and immigrant bird interest arising from its management as rotational coppice.

The hedgerows which characterise this forest area are also of significant interest, containing a range of remnant woodland species including small- and large-leaved lime and wild service, indicating their former presence in the cleared wildwood and they possess a rich flora where agricultural practices do not impact upon it.

Landscape Character Assessment: Landscape Types and Land Designation Units

The study area contains six Landscape Types as identified by the Assessment and each Type is further divided into place-specific Land Designation Units. The spatial occurrence of these Types and Units is indicated on Figure 1.2 at the end of this section, which is reproduced courtesy of Worcestershire County Council.

The Landscape Types within the study area are as follows:

- Timbered Farmlands
- Wooded Estatelands
- Settled Farmlands
- Estate Farmlands
- Unenclosed Commons
- Riverside Meadows
- Wet Pasture Meadows

Timbered Farmlands

Timbered Farmlands is the most commonly occurring Landscape Type within the study area and is well-distributed throughout, although it is noted that these landscapes cease to occur to the south of the study area. It is a small to medium scale wooded agricultural landscape characterised by filtered views through densely scattered hedgerow trees, which are predominantly oak. The pattern of the landscape is organic and it contains a number of irregularly-shaped woods of ancient character.

Identified issues with this Landscape Type are the conservation loss of its scale and structure as well as its ageing population of hedgerow oaks, which are not being adequately replenished. The overall strategy in the Assessment is therefore one of conservation and restoration, which is reflected in the following guidelines:

- Maintain the tree cover character of hedgerow oaks, and enhance the age structure of the hedgerow oak population
- Conserve all ancient woodland sites and restock with locally occurring native species
- Seek to bring about coalescence of fragmented relic ancient woodlands
- Encourage the planting of new woodlands, reflecting the scale, shape and composition of the existing ancient woodland character, favouring oak as the major species
- Conserve and restore tree cover along watercourses and stream lines
- Seek opportunities to enhance tree cover along highways and other non-farmed locations
- Conserve and restore the pattern and composition of the hedgerow structure through appropriate management and replanting
- Conserve the organic pattern and character of the lane networks
- Maintain the historic dispersed settlement pattern

The study area contains the following Land Description Units¹⁴ which may be attributed to the Timbered Farmlands Landscape Type:

- Guarlford Timbered Farmlands (LDU 34)

¹⁴ Full descriptions of all Land Description Units within the Study Area are reproduced at Appendix 2.

- Madresfield and Clevelode Timbered Farmlands (LDUs 35.1 & 35.2)
- Bransford – Old Hills Timbered Farmlands (LDUs 40.1 – 40.3)
- Brockamin Timbered Farmlands (LDU 44)
- Hallow Timbered Farmlands (LDU 54)
- Kenswick and Broadwas Timbered Farmlands (LDUs 55.1 & 55.2)
- Crown East Timbered Farmlands (LDU 56)
- Rushwick Timbered Farmlands (LDU 57)
- Stoulton and Drakes Broughton Timbered Farmlands (LDUs 80.1 & 80.2)
- Goosehill Green Timbered Farmlands (LDU 99.5)
- Spetchley and Bredicot Timbered Farmlands (LDUs 107.1 & 107.2)
- Hindlip Timbered Farmlands (LDU 111)
- Hanbury and Westwood Timbered Farmlands (LDUs 118.1 & 118.2)
- Elmley Bridge and Hadley Timbered Farmlands (LDU 119.3)
- Ombersley Timbered Farmlands (LDU 20)

Wooded Estatelands

Wooded Estatelands occur to the east, south-east and north-west of Worcester, as indicated on Figure 1.2. They are large scale, wooded agricultural landscapes characterised by a semi-regular pattern of large, hedged fields, wooded streamlines, large country houses with associated parks and an abundance of large, irregularly-shaped ancient woodland blocks. Woodland is a critical element of the character of these landscapes, comprising 30-40% of land cover.

Issues identified with this Landscape Type include hedgerow loss and deterioration (leading to woodland isolation), coniferisation of ancient woodland and reduction of parkland area through conversion to arable cropping.

The overall strategy for Wooded Estatelands in the Assessment is therefore one of conservation with elements of enhancement and restoration, expressed through the following landscape guidelines:

- Conserve all ancient woodland sites and restock with locally occurring native species
- Promote new large scale woodland planting
- New woodland planting should be of native broadleaved species, favouring oak as the dominant species and should relate to the scale and spatial pattern of the Landscape Type
- Conserve and restore the hedgerow pattern, with particular attention given to primary hedgerows
- Seek to ensure hedgerow linkage to all woodland blocks, for visual cohesion and wildlife benefit
- Conserve and restore parkland
- Conserve the integrity of estate villages

The study area contains the following Land Description Units which may be attributed to the Wooded Estatelands Landscape Type:

- Ockeridge Estatelands (LDU 47.1)
- Witley Wooded Estatelands (LDU 48.1)
- Wadborough Wooded Estatelands (LDU 78)
- Kimbolton and Crowle Wooded Estatelands (LDUs 105.1 & 105.2)

Settled Farmlands

Settled Farmlands occur to the north and south of Worcester, as indicated on Figure 1.2. Three distinct sub-sets have been identified within this Landscape Type (described individually below) and all of these occur within the study area.

Settled Farmlands may be broadly described as small to medium scale landscapes that have developed from extensive areas of former open field. Tree cover in this Landscape Type is limited, comprising riparian strips, thinly-scattered hedgerow trees and clusters of trees around dwellings. Settlement patterns are dispersed, comprising dispersed farmsteads and hamlets.

Principal Settled Farmlands occur to the south-east of Worcester. These are small to medium scale agricultural landscapes characterised by mixed farming and an irregular pattern of hedged fields over rolling lowland with occasional steep-sided hills and escarpments.

Settled Farmlands with Cropping Land Use occur both north and south of Worcester, clustered around the River Severn. They differ from Principal Settled Farmlands in that their land use is predominantly arable and horticultural influenced by their sandy, brown soils and this has led to a slightly larger scale than the former.

Settled Farmlands with Pastoral Land Use occur to the north and east of Worcester, towards Droitwich. Their poorer, gleyed soils have led to pastoral land use and this has in turn influenced a smaller scale landscape defined by a prominent pattern of hedged fields.

Issues affecting this Landscape Type area the loss of the essential scale of these landscapes arising from modern farming practices and the loss of current nature conservation interest associated with areas of small scale permanent pasture. Development is also seen as a risk as its nucleated structure would dilute the current dispersed settlement pattern of these landscapes.

The recommended strategy for Settled Farmlands in the Assessment is therefore to conserve and enhance the small-scale, hedged character of this landscape and this is expressed through the following landscape guidelines:

- Conserve and enhance the pattern of hedgerows
- Retain the integrity of the dispersed pattern of settlement
- Conserve and enhance tree cover along watercourses
- Enhance patterns of tree cover associated with settlement
- Seek opportunities to conserve all remaining areas of permanent pasture
- Seek to maintain the distinctive land use prominence and associated differences in scale in sub-type areas
- Seek to maintain a balance of arable and pastoral uses in the type area

The study area contains the following Land Description Units which may be attributed to the Settled Farmlands Landscape Type:

- Principal Settled Farmlands
 - Holt Principal Settled Farmlands (LDU 52)¹⁵
 - Grimley Principal Settled Farmlands (LDU 53)¹⁶
 - Norton and Kempsey Principal Settled Farmlands (LDUs 62.1 & 62.2)
- Settled Farmlands with Pastoral Land Use
 - Timberton and Newland Settled Farmlands (LDUs 109.1 – 109.3)
 - Martin Hussingtree and Fernhill Heath Settled Farmlands (LDUs 112.1 & 112.2)
- Settled Farmlands with Cropping Land Use
 - Powick Settled Farmlands (LDU 41)
 - Croome Settled Farmlands (LDU 64)
 - Kerswell Green and Clifton Settled Farmlands (LDUs 65.1 & 65.2)
 - Claines Settled Farmlands (LDU 113)
 - Holt Fleet – Torton Settled Farmlands (LDUs 122.1 & 122.2)

Estate Farmlands

Estate Farmlands occupy a small area of land within the study area to the north of Worcester. These are ordered agricultural landscapes that are characterised by a sub-regular pattern of medium to large sized fields, small geometric plantations and groups of ornamental trees associated with large country houses. It is noted that these landscapes are generally of low nature conservation value. The topography of these landscapes is rolling lowland with occasional steep-sided hills and escarpments.

Issues associated with this Landscape Type are the loss of hedgerows and former parkland plantings to increasingly dominant arable land use.

¹⁵ Shown incorrectly on plan associated with Assessment (reproduced as Figure 1.3) as Settled Farmlands with Cropping Land Use

¹⁶ Shown incorrectly on plan associated with Assessment (reproduced as Figure 1.3) as Settled Farmlands with Cropping Land Use

The recommended strategy for Estate Farmlands in the Assessment is therefore one of restoration and conservation of the landscapes' distinctive estate characteristics and this is expressed through the following landscape guidelines:

- Enhance tree cover through further planting of small scale plantations and tree belts
- Conserve the pattern of hedged fields, with priority given to primary hedge lines
- Conserve and restore parkland and the tree cover associated with large ornamental grounds
- Conserve and enhance tree cover along watercourses
- Promote the development of wide field margins for wildlife benefit
- Conserve the integrity of estate villages

The study area contains the following Land Description Unit which may be attributed to the Settled Farmlands Landscape Type:

- Ombersley Park Estate Farmlands (LDU 121)

Unenclosed Commons

Unenclosed Commons occupy a small portion of the southern part of the study area to the east of Kempsey, as shown on Figure 1.2. These highly varied landscapes have the common characteristics of a lack of enclosure and rough grazing land use. Tree cover within these areas is restricted to clusters around the clusters of wayside dwellings occurring on the perimeters of commons. It is noted that these landscapes are often of high nature conservation value on account of their unimproved status and that they are highly valued for their sense of wilderness.

Issues associated with Unenclosed Commons include inappropriate management in a municipal fashion and the demise of the exercising of commoners' rights leading to reversion to scrub. The need is identified for long-term sustainable management initiatives.

The recommended management strategy for Unenclosed Commons is therefore one of conservation and restoration, expressed in the Assessment through the following landscape guidelines:

- Conserve and enhance the visual distinctiveness of open common areas
- Conserve and enhance the spatial pattern, scale and specific character of wayside dwellings associated with commons
- Recognising that each common will have a different historical profile, seek to define management objectives to integrate wildlife benefit, current recreational interests and other uses, together with the historical interest
- Seek to avoid municipal/tidy approaches to management

The study area contains the following Land Description Unit which may be attributed to the Unenclosed Commons Landscape Type:

- Kempsey Unenclosed Common (LDU 63)

Riverside Meadows

Riverside Meadows occur throughout the study area, following the corridors of the Rivers Severn, Teme and Salwarpe as indicated on Figure 1.2. They are described as linear riverine landscapes on flat, generally well-defined alluvial floodplains with meandering river channels. The land use is predominantly pastoral and the land was historically used for seasonal grazing influenced by annual flooding. The historic cycles of flooding have also led to the presence of species and habitats tolerant of waterlogging. Tree cover within these landscapes is limited to scattered trees, principally alder and pollarded willow on riversides and within hedge lines, however this low-level cover is still identified within the Assessment as a notable feature of these landscapes.

Identified issues with this Landscape Type include the encroachment of arable land uses and the loss of nature conservation interest resulting from the abandonment of traditional seasonal grazing and haymaking practices. The nature conservation interest has been further impacted by the modification of the watercourses and the visual unity of these linear landscapes has been reduced by the construction of new highways on causeways across the flood plains.

The recommended management strategy for Riverside Meadows is therefore one of restoration and conservation, expressed in the Assessment through the following landscape guidelines:

- Seek to retain the unity of the linear form of these landscapes
- Conserve all existing areas of permanent pasture
- Seek opportunities to encourage the conversion of arable land back to pasture
- Conserve and enhance continuous tree cover along hedge lines, ditches and watercourses
- Conserve existing wetland habitats and seek opportunities for further wetland habitat creation
- Avoid building or road construction works
- Avoid further drainage of waterside meadows
- Explore opportunities to return to patterns and processes of natural flooding cycles where feasible

The study area contains the following Land Description Units which may be attributed to the Riverside Meadows Landscape Type:

- Pixham Riverside Meadows (LDU 33.5)
- Powick Ham Riverside Meadows (LDU 33.6)
- Powick Bridge Riverside Meadows (LDU 33.7)
- Kempsey Upper Ham Riverside Meadows (LDU 33.8)
- Severn Stoke Riverside Meadows (LDU 33.9)
- River Teme Upper Wick – Lulsley Riverside Meadows (LDU 42)
- Leigh Brook Riverside Meadows (LDU 43)
- River Severn Ombersley – Worcester Riverside Meadows (LDU 51)
- Salwarpe Riverside Meadows (LDU 114)

Wet Pasture Meadows

Wet Pasture Meadows occur in the eastern part of the study area, as indicated on Figure 1.2. They are described as flat, low-lying and largely uninhabited landscapes associated with poorly draining basins. Their principal land use is permanent pasture with patches of wet grassland and they occur within a regular pattern of hedged fields and ditches. The lines of these field boundaries are reinforced in the landscape by the presence of lines of alder and willow, with willow being historically pollarded. The reedbeds and wetland habitats associated with these landscapes, are of recognised wildlife interest.

The issues associated with these landscapes are the modernisation of agricultural practices, in particular land drainage and conversion to arable farming, and the decline of the historic practice of willow pollarding. The recommended management strategy for Wet Pasture Meadows is therefore one of conservation and restoration, expressed in the Assessment through the following landscape guidelines:

- Conserve all permanent pasture
- Conserve and restore linear tree cover along watercourses, ditches and hedgelines
- Seek opportunities to encourage the conversion of arable land back to pasture
- Encourage the retention and appropriate management of existing wetland habitats
- Encourage the creation of new wetland habitats
- Discourage activities likely to increase the drainage or lower the water table of these areas
- Discourage any building or construction works in these landscapes

The study area contains the following Land Description Units which may be attributed to the Wet Pasture Meadows Landscape Type:

- Tibberton Wet Pasture Meadows (LDU 108)
- Hanbury Wet Pasture Meadows (LDU 110)

A New Look at the Landscapes of Worcestershire

The findings of the Assessment have more recently been published by Worcestershire County Council in 2004 in a document entitled “A new look at the Landscapes of Worcestershire.” This document broadly describes the geological, topographical, soils, tree cover, settlement and land use character of Worcestershire and then outlines each Landscape Type providing a description and bulleted summary of their primary and secondary characteristics.

Key features

Diverse local landscape, ranging from floodplain to wooded higher ground

As identified above, the landscape surrounding Worcester is very diverse, ranging from the linear, unsettled, riverine landscapes of the Rivers Severn, Teme and Salwarpe to the medium-scale agricultural landscapes to the north and south of Worcester relating to the river corridors and the more wooded landscapes to the east and west that reflect the area’s former Royal Forests. This diversity gives visual interest to the city and surrounding settlements and highways and it is important that this is maintained.

Worcester’s historic skyline

Worcester has a very distinctive skyline and this is no better demonstrated than in its use within the website logo of Worcester City Council, in which the towers of Worcester Cathedral and St Andrews Spire can be clearly seen. The value of the City’s skyline is also recognised within the City of Worcester Local Plan and its protection is secured within Local Plan policy BE2.

Adjacent Malvern Hills and Bredon Hill Areas of Outstanding Natural Beauty

While these nationally designated areas do not occur within the study area, engagement with local stakeholders¹⁷ has indicated that they are of key importance to the wider setting of the City and study area and that views of both sets of hills are obtainable within Worcester.

Thematic plans

See Figures 1.1 & 1.2 overleaf.

¹⁷ Comments made during presentation of interim findings to South Worcestershire Joint Advisory Panel on 13th July 2007

3.3

Historic Environment***Introduction***

This theme covers the contribution of the historic environment to Worcester's green infrastructure. The historic environment influences landscape character and provides significant areas of multi-functional open space such as parkland, gardens and battlefields, while the provision of green infrastructure can protect below ground archaeology and the settings of historic features from the pressures of development.

Key Data Sources

- MAGIC
- Worcestershire County Council
- Natural England

Worcestershire Historic Environment Assessment – Scoping Report

In May 2007 Worcestershire County Council Historic Environment and Archaeology Service published a scoping report for the historic environmental assessment of Worcester growth points.

This report provides a useful baseline description of the historic context of Worcester and the wider study area (the report also focuses on a 6km radius around Worcester's administrative boundary). It summarises the known assets within the study area to be as follows:

	Worcester Administrative District	6km study zone bounding Worcester Administrative Boundary	Total
Scheduled Monuments	23	22	45
Listed Buildings	701	399	1100
Other Historic Buildings	121	758	879
Non-nationally designated archaeological monuments of national, regional or local significance	911	972	1883
Historic parks and gardens (registered and non-registered)	20	50	70
Registered battlefields	0.5	0.5	1
World War II defence sites	509	217	726
Other archaeological find spots	109	130	239
Archaeological activities	1401	455	1856
Total	3795.5	3003.5	6799

Source: Worcestershire County Council Historic Environment and Archaeology Service

The report cautions against the use of this data, however, in that current designation information is by no means representative of the complete picture and is often representational of patterns of development and infrastructure, where investigation has been required. It also notes that the Registered Battlefield of Worcester significantly under-represents the actual area of battle.

The report describes the assets within the study area as being diverse in both period and scale, and dates human activity within the study area back to the Palaeolithic Era. It notes that settlement within Worcester began during the Iron Age and Roman periods, and that the historic core of the city and medieval suburbs grew through successive phases of both planned and unplanned growth during the middle to late Anglo-Saxon period and the medieval period. The city reached its full form by around 1250 and remained relatively static until after 1800, when it was again subject to residential and industrial growth.

It also notes that the archaeology within the study area can range from surface scatters to stratified sites up to 6m deep in the centre of Worcester.

The JCA description for the Severn and Avon Vales also describes historic and cultural influences. It identifies a particularly strong Roman influence in the area and makes reference to Worcester as a major industrial centre, producing iron.

Key features

Worcester Cathedral and Historic Centre

The historic centre of Worcester, with the Cathedral at its centre and encompassing the flood plain of the River Severn is a key area of multifunctional green space, offering historical and archaeological interest, tourist facilities (including River Severn boat trips), open play space and walking opportunities for health, leisure and sustainable movement. As the dominant feature of Worcester's skyline, the cathedral is immediately identifiable as the heart of the City and a prominent reminder of Worcester's rich and varied history.

Registered Battlefield: Battle of Worcester with Powick Bridge

Worcester Battlefield is a site of national historical importance, being the place where first and last encounters of the English Civil War occurred. It is also a large area of open space to the south of the City, currently in agricultural use, where seasonal flooding prevents development taking place and which holds significant potential for public access and interpretation.

River floodplains/gravel terraces and associated archaeology

Extensive evidence has been found in the wider Severn and Avon Vales that Mesolithic hunter gatherers were probably working the gravel terraces from around 9000 BC. The seasonal flooding of the River Severn has prevented development from taking place within the floodplain and this is likely to have left the below ground archaeology largely intact compared to the developed parts of Worcester, where excavation for successive foundations is likely to have disturbed remains. It is therefore likely that a significant body of undiscovered finds area present within the flood plain and projects are currently underway to assess the significance of this archaeology.

Thematic plan

See Figure 2.1 overleaf.

3.4

Biodiversity

Introduction

The support and protection of biodiversity is a critical function of green infrastructure and almost all forms of green infrastructure have the potential to contribute to the conservation of biodiversity, from providing specific habitat types for rare specialist species to providing wildlife with the means of moving around the landscape between, for example, feeding and breeding areas.

Key Data Sources

- Natural England
- Worcestershire County Council
- Worcestershire Wildlife Trust

Natural Area

In conjunction with the landscape assessment of the Joint Character Areas outlined in Section 3.2, the former English Nature (now part of Natural England) established a set of Natural Areas (NAs) that are keyed to the JCA boundaries and which relate to the biodiversity of these areas. These again provide a broad sub-regional context to the biodiversity character of the study area.

Again, the study area falls within the Severn and Avon Vales NA, which is generally described as a low-lying undulating plain through which the Rivers Seven and Warwickshire Avon and their many tributaries flow. The document describing the Natural Area notes that much of the floodplain still floods regularly in winter and that this has led to a high level of conservation interest. The document describes the overall area as not being heavily wooded, although notes that there is a concentration of woodland in the northern part of the NA between Worcester, Stourport and Redditch.

The urban areas within the NA, including Worcester, are described as supporting a wildlife interest that is locally important and which contributes to the quality of the urban environment.

The document then outlines the main issues facing biodiversity within the NA and sets out a number of objectives to protect features that are important or extensive within the NA, which include

- Prevent loss or degradation of ancient woodland and where appropriate restore or enhance the resource.
- Prevent loss or degradation of semi-natural grassland and where appropriate restore, expand or enhance the resource.
- Prevent deterioration of wetland habitats and where appropriate reverse past degradation and re-create wetland habitats within areas of high water table or subject to winter flooding.
- Prevent further loss or degradation of other habitats of wildlife value which contribute to the character of the Natural Area and where appropriate restore, enhance or expand them.

Landscapes for Living Project

“Landscapes for Living” is a project led by the West Midlands Biodiversity Partnership (WMBP) in response to a requirement in the West Midlands Biodiversity Strategy for an area-based approach to restoring wildlife in the region. Its aim is to develop a 50-year biodiversity vision and opportunity map for the region, to help the transition of habitat and species conservation from the traditional site-scale approach to more effective landscape-scale working.

In August 2007 WMBP published “Landscapes for Living: Technical Report”, the results of a study undertaken by consultants to develop the vision and opportunity map and to undertake a process of public consultation to ensure local support for the results. Future work envisaged within the project includes further study to develop sub-regional opportunity maps and to formulate delivery strategies.

The report divides the West Midlands into three zones based on the biodiversity value of individual Land Designation Units (see Section 3.2), with Zone 1 of highest biodiversity value containing the greatest proportion of priority habitats and ecological networks, Zone 2 of moderate biodiversity value containing significant quantities of priority habitats and Zone 3 of

low biodiversity value, possessing reduced and dispersed habitats with high levels of isolation within a matrix of other land uses. Strategic river corridors and their floodplains were considered separately, as connecting networks between rural and urban landscapes.

The biodiversity opportunity map places the majority of the study area within Zone 3, with small areas at its northern and eastern extremities within Zone 2. The proposed vision for Zone 2 areas is to restore extensive multi-functional areas of habitat, linking and buffering the areas of greatest value, while the vision for Zone 3 areas is for the ecological improvement and “greening” of highly modified landscapes, protecting remaining features of value and the identification of areas suitable for multi-functional habitat creation.

With regard to the strategic river corridors across the region, the report promotes the enhancement, re-connection and restoration of habitats to aid the delivery of green infrastructure. The report also covers the region’s cities and towns, promoting the enhancement, creation and celebration of ecologically rich urban landscapes.

Worcestershire Biodiversity Action Plan

The Plan includes 19 specific Habitat Action Plans for a broad range of habitats, as follows:

- Arable
- Traditional Orchards
- Ancient/Species-Rich Hedgerows
- Scrub
- Woodland
- Lowland Wood Pasture and Veteran Trees
- Wet Woodland
- Reedbeds
- Fen and Marsh
- Lowland Wet Grassland
- Lowland Hay Meadows and Neutral Pastures
- Lowland Calcareous Grasslands
- Lowland Dry Acid Grassland
- Lowland Heathland
- Road Verges
- Urban (Villages, Towns and Cities)
- Canals
- Open Water (Ponds and Lakes)
- Rivers and Streams

20 Species Action Plans have also been prepared for priority species (17 animals and 3 plants), as follows:

- European otter
- Dormouse
- Bats (all species)
- Water vole
- Marsh warbler
- Nightingale
- Shad – Twaite and Allis
- Adder
- Slow worm
- Great Crested Newt
- White-clawed crayfish
- High brown fritillary
- Brown hairstreak butterfly
- Club-tailed dragonfly
- Stag beetle
- Violet click beetle
- Hornet robberfly
- Black poplar
- True service tree
- Early gentian

The structure of the plans is broadly similar, with the current status of each habitat or species outlined, followed by current factors affecting the habitat or species, current action being undertaken, action plan objectives and proposed targets, and a summary of proposed actions with lead delivery agencies identified.

Designated Features

The City of Worcester and surrounding study area contains the following numbers of internationally, nationally and locally designated sites of conservation interest, the distribution of which is shown on Figure 3.1:

Designation	Total
Special Area of Conservation (EU)	1
Site of Special Scientific Interest (UK)	22
Local Nature Reserve (UK)	13
Special Wildlife Site (Local)	102

The Special Area of Conservation is Lyppard Grange Ponds, located to the east of the Worcester urban area. It has been designated on account of its breeding population of great crested newts (a European Protected Species), which is the largest in Worcester and one of the largest in the UK.

Notable Sites of Special Scientific Interest within the study area include the entire length of the River Teme, designated on account of its interest as a representative, near-natural and biologically-rich river type associated with sandstone and mudstone, Monk's Wood, a replanted ancient woodland (planted with alder by the Harris Brush Co), designated on account of the invertebrate populations associated with its open structure and Northwick Marsh, an open area of species-rich marsh designated on account of its scarcity within Worcestershire and its associated botanical and ornithological interest.

Worcestershire Habitat Inventory

Worcestershire Habitat Inventory is an ongoing project which seeks to map habitats and land use at a local scale, updated on an iterative basis, to inform strategic decision making and enable ongoing monitoring of habitats. Approximately 17,500ha (61%) of the study area has currently been mapped under the project and the results are shown as Figure 3.2.

The most commonly represented habitat type within the mapped part of the study area is grassland, accounting for 9093ha or 52% of the total area. Within this group the most common grassland type was "Grassland probably improved", which accounted for approximately half of the grassland area and second was "Grassland possibly unimproved or semi-improved", which accounted for another third of the grassland area. These figures (combined with the "Improved grassland" area of 892ha or around 10%) indicate that the vast majority of grassland has been modified by modern agriculture with only 556.27ha or 6% confirmed unimproved.

Arable land is the second most common habitat type, covering 7000ha or 40% of the total recorded area. Almost all of this land is recorded as "Arable and horticulture", covering 6873ha or 98% of the total arable area.

The third most dominant habitat is woodland, covering 1055ha or 6% of the total recorded area. "Broadleaved woodland" was the most common woodland type, representing 595ha or 56% of the total woodland area. It is encouraging to note that coniferous woodland, which is generally regarded as the least ecologically valuable woodland type, only represented 13.63ha or around 1% of the total woodland area.

The remaining habitat groups together represent around 3% of the total recorded area and are as follows:

- Urban areas (170ha)
- Fruit trees (154ha)
- Open water (90ha)
- Other vegetation (32ha)
- Wetland habitats (20ha)
- Linear features (19ha)
- Tall herbaceous vegetation (2ha)
- Rock exposures (0.2ha)

The above results indicate that the study area contains a broad representation of habitat types, but that semi-natural habitats are limited in area and mixed farming is the dominant land use.

A positive observance, however, is that the vast majority of woodland present is broadleaved, which is generally considered to hold greater habitat value than coniferous woodland, principally due to the lack of year-round shading permitting the establishment of ground flora and understorey shrubs, which in turn support populations of birds and invertebrates.

Protected Species

The Worcestershire Biological Records Centre is a facility which receives, holds and issues biological information for the county

Within the study area, 22 protected species have been recorded as being present in a total of 832 records, as follows:

Animals

- Slow worm (*Anguis fragilis*) – 66 records
- High brown fritillary (*Argynnis adippe*) – 1 record
- Water vole (*Arvicola terrestris*) – 8 records
- Freshwater crayfish (*Austropotamobius pallipes*) – 5 records
- Marsh fritillary (*Eurodryas aurinia*) – 10 records
- Viviparous lizard (*Lacerta vivipara*) – 3 records
- Wood white (*Leptidea sinapis*) – 14 records
- Otter (*Lutra lutra*) – 20 records
- Badger (*Meles meles*) – 256 records
- Common dormouse (*Muscardinus avellanarius*) – 3 records
- Daubenton's bat (*Myotis daubentonii*) – 6 records
- Natterer's bat (*Myotis nattereri*) – 2 records
- Grass snake (*Natrix natrix*) – 38 records
- Noctule (*Nyctalus noctula*) – 15 records
- Pipistrelle (*Pipistrellus pipistrellus*) – 50 records
- 45KHz Pipistrelle (*Pipistrellus pipistrellus* 45kHz) – 34 records
- 55KHz Pipistrelle (*Pipistrellus pipistrellus* 55kHz) – 7 records
- Brown long-eared bat (*Plecotus auritus*) – 18 records
- Lesser horseshoe bat (*Rhinolophus hipposideros*) – 5 records
- Great crested newt (*Triturus cristatus*) – 250 records
- Common viper (*Vipera berus*) – 1 record

Plants

- Wild hyacinth or bluebell (*Hyacinthoides non-scripta*) – 20 records

The distribution of these records is shown on Figure 3.3. This figure shows that Worcester city itself contains a moderate level of ecological interest, particularly in the form of great crested newt on the eastern side of the City, several species of bat along the River Severn and slow worms throughout.

While this data is a useful resource indicating the presence, location and relative abundance of protected species, it should be borne in mind that the accuracy of the data is limited by the skills of the surveyors and that the abundance data may be skewed by the locations in which survey has taken place.

Worcestershire LDU Ecological Profiles

As described in Section 3.2, the Worcestershire Landscape Character Assessment divided the study area into 73 Land Designation Units.

Ecological profiles have been prepared for each of these units, which score their biodiversity, abundance, network and range characteristics and identify those impacts which currently threaten each unit's biodiversity value.

The primary habitats within each unit (e.g. orchards, hedgerows, grassland, etc) are also described in terms of their character, abundance and condition.

These profiles have been reproduced in full at Appendix 3. The geographical locations of these units are shown on the image reproduced as Figure 1.2.

Worcestershire Grassland Inventory

Worcestershire Grassland Inventory is a series of maps held by Worcestershire Biological Records Centre recording the locations of sites of particular grassland interest (unimproved and some semi-improved grassland) within the county. A record is held for each site, based on a survey undertaken in the mid-1990s, which describes the grassland and classifies it under the National Vegetation Classification.

Worcestershire has been identified as being of high grassland interest as a county, possessing 20% of England's Neutral Grasslands, however it has been observed that very little unimproved or semi-improved grassland remains around Worcester due to the expansion of arable farming.¹⁸

The Grassland Inventory sites that fall within the study area are shown on Figure 3.1, however it has been commented that this data is no longer up-to-date and that re-surveying needs to take place in line with the Worcestershire Habitat Inventory to provide an adequate tool.¹⁹

Key features

Lyppard Grange Ponds SAC

Lyppard Grange Ponds are two field ponds located within the open space provision of a recent residential development, constructed in 1989. Prior to this they were part of a formal garden and orchard associated with Lyppard Grange Farm. Annual newt surveys have been undertaken on the ponds since 1987 and these have consistently recorded a breeding population which is the largest in the county and one of the largest in the UK. Populations of smooth newt and grass snake have also been recorded within the site, as well as a range of aquatic invertebrates including the nationally rare scavenger water beetle *Hydrochus elongatus*.

River Teme SSSI

The River Teme is an attractive river with a natural character which flows from Cilfaesty Hill, Powys to its confluence with the River Severn south of Worcester. The river's variation with its underlying geology has led to a natural variation in its nutrient status and this, combined with its high water quality has led to the river supporting significant plant, fish and otter populations. Breeding bird populations are also associated with the river's banks, rocky sections and shingle bars.

Monk Wood SSSI

Monk Wood is an area of mixed broadleaved replanted ancient woodland, part of which is owned and managed by Worcestershire Nature Conservation Trust and The British Butterfly Conservation Society. The historic coppice management of Monks Wood for the production of brush handles has given the wood a largely open structure with cycles of light and shade and this has in turn resulted in the development of a rich invertebrate fauna, supported by the site's rich woodland flora, especially along ride edges. This invertebrate community includes thirty species of butterfly (including the country's largest population of the wood white *Leptidea sinapsis* and over one hundred beetles. The ecological value of the wood is further enhanced

¹⁸ Worcestershire Wildlife Trust, personal communication.

¹⁹ Worcestershire Wildlife Trust, personal communication.

by two unimproved ridge and furrow meadows and a pond at its southern end and the adjacent Monkwood Green permanent rough pasture SSSI.

Thematic plans

See Figures 3.1 – 3.3 overleaf.

3.5

Woodland

Introduction

Woodland is a highly multi-functional resource and often forms the core of green infrastructure frameworks and it is for this reason that it has been considered separately. It is recognised as being of significant habitat value with ancient semi-natural woodland recognised as the UK's richest habitat and it strongly influences the character of the landscapes in which it occurs. Woodland is a popular leisure and recreation resource, able to comfortably support a high density of visitors and can provide significant tourist interest through mountain biking facilities, visitor centres, woodland accommodation or sculpture trails. It can provide significant hydrological benefits, slowing down peak storm flows within catchments to reduce flood risk.

Key Data Sources

- Forestry Commission
- MAGIC
- Worcestershire County Council
- Worcester City Council

Woodland Character and Distribution

Worcester and the surrounding study area is located within a mosaic of historic Royal Forests and wooded areas, as identified in Section 3.2, and as such have a long woodland tradition. This is particularly evidenced in the Wooded Estatelands to the east and north-west of Worcester and to a lesser extent in the Timbered Farmlands that occur to the west, east and north of Worcester with their remnant woodland areas and hedgerow trees.

The forest areas identified within the study area from the draft Worcestershire Landscape Assessment (see Section 3.2) are as follows:

- Feckenham Forest
- Ombersley Forest
- Horewell Forest
- Malvern Chase
- West Worcestershire Woods

Figure 4.1 at the end of this section is a sketch plan of the approximate locations of these forests, based on the descriptions given within the draft Worcestershire Landscape Character Assessment. Descriptions of these forest areas are given in Section 3.2.

The majority of the woods within the study area have been historically managed as coppice with standards, often comprising hazel coppice with oak standards. The cycles of light and shade associated with this silvicultural system have in turn led to the establishment of rich woodland flora and associated wildlife communities.

The study area contains a total of 1,754ha of woodland, which is divided as follows:

- Ancient semi-natural woodland 383ha
- Ancient replanted woodland 342ha
- Other woodland 1,029ha

The geographical distribution of these woodland types is shown on Figure 4.2 at the end of this section.

Ancient semi-natural woodland is the most valuable and irreplaceable form of woodland, having been continuously wooded since 1600AD with relatively little disturbance. This results in significant biodiversity interest as some species such as invertebrates and lichen are almost entirely dependent upon the habitat conditions that have developed over hundreds if not thousands of years. Ancient semi-natural woodland is frequently of high archaeological value because of the lack of disturbance which protects features that have often been destroyed elsewhere by other forms of land management.

Ancient replanted woodland is land which has been continuously wooded since 1600AD, but which has been subject to clearance and replanting during this period. It still retains an element of value in remaining trees, ground flora and soils, however, and as such is also regarded as irreplaceable.

Figure 4.2 shows the distribution and type of woodland within the study area. It shows that to the west of Worcester is a highly fragmented ancient woodland landscape, while ancient woods to the north and east tend to be larger but more isolated. Significant areas of ancient woodland area present to the north west of Worcester in the Monks Wood/Ockeridge Wood complex and to the east of Worcester in the Himbleton woods complex (comprising, amongst others, Trench Wood, Bow Wood and Goosehill Wood).

With regard to woodland access, only partial existing data is available on the accessibility of woodland within the study area, however it has been identified from Worcestershire County Council and Ordnance Survey that Nunnery Wood, Perry Wood, Warndon Wood, Tolladine Wood, Monk Wood, Trench Wood and Old Hills provide public access and many more are crossed by public Rights of Way.

Woodland Opportunities Map

The Regional Forestry Framework for the West Midlands was launched in October 2004. One of the principal outputs of this strategy was the production of a Woodland Opportunities Map (WOM) for the region. The WOM comprises six maps: two priority maps and four theme maps (broad regional landscape, biodiversity, cultural heritage and access themes).

The two priority maps show “broad brush” regional priorities for the targeting of woodland creation and the preservation of ancient woodland landscapes. These regional priority areas are shown on Figure 4.3.

As Figure 4.3 shows, the eastern and western parts of the study area fall within an identified ancient woodland landscape, defined as areas where ancient semi-natural woodland is greater than or equal to 3% of the land area and where the maintenance and expansion of ancient semi-natural woodland is the highest priority. It is likely therefore that targeted regional funds will be available from the Forestry Commission to achieve this objective.

A large portion of the study area also falls within the “Priority 1 woodland creation” area, which is defined as areas where the highest preference for woodland creation exists with the fewest sensitivities, tying in with the “Wooded Estate/land” and “Timbered Farmlands” Landscape Types. Again, this is likely to result in targeted regional funds or a reduction in grant criteria being available from the Forestry Commission to achieve an increase in woodland area.

Key features

Nunnery Wood

Nunnery Wood is an area of ancient semi-natural woodland, which forms the core of Worcester Woods Country Park. Being located within the boundaries of the City, it is easily accessible (a bus is provided from the City Centre) and is very popular with local communities. Nunnery Wood is predominantly oak woodland and this reflects its historic composition, with some oak trees over 500 years old. Also present are wild service, aspen, hazel, crab apple, pear and yew trees. Coppicing was the traditional management practice within the wood and this was resumed by Worcestershire County Council in the 1980s. The wood’s historic management as coppice has allowed the development of a rich ancient woodland flora and its array of spring flowers, including wood anemone and bluebell, is well known and promoted. Public access is provided via a waymarked trail and other accessible rides and a visitor centre with café is located on its eastern boundary.

Harris Brush Plantations

In the mid 20th Century, several woods within the study area were clearfelled and replanted with a mixture of Italian alder, sycamore and beech by the Harris Brush Company. These include Monk Wood, Trench Wood and Goosehill Wood. The purpose of this exercise was to provide coppice stems for brush handles, although it is recorded that these plantings were largely unsuccessful and that the woods reverted to native scrub mainly comprising ash, field maple and birch²⁰. The management of these plantations for coppice and subsequent scrub reversion has resulted in the development of high value woodland habitats for birds and invertebrates. Trench Wood and Monk Wood are also open for public access, providing attractive natural recreation resources and opportunities for healthy living.

Royal Forests

²⁰ Worcester Biodiversity Partnership, 2007

As identified above, the study area is a mosaic of historic Royal Hunting Forests and these have strongly influenced the character of the landscape. This has resulted in the presence of a number of clusters of ancient woodland in the study area, most notably at Himbleton and Wichford, which may indicate the presence of historic bailiwicks, or areas under the jurisdiction of a bailiff.

Thematic plans

See Figures 4.1 – 4.3 overleaf.

3.6

Recreation & Tourism

Introduction

Green infrastructure resources provide a wide range of recreation and tourism functions, from neighbourhood scale sports pitches and play areas to features serving wider catchments such as primary municipal parks, country parks, watersports centres, racecourses and equestrian centres. Green infrastructure offers opportunities for healthy living, which can contribute to government targets in the reduction of obesity and ill health and it is recognised that recreation in green spaces contributes to mental well-being. Recreation and tourism also has the potential to generate much-needed revenue income to maintain green infrastructure resources through, for example, entry fees, cycle hire, events or café profits.

Key Data Sources

- Worcestershire County Council
- Worcester City Council
- Ordnance Survey

Tourism

The presence of the Rivers Severn and Teme and attractive countryside around Worcester, as well as its accessibility and its rich history, combine to make Worcester an attractive tourist destination.

The green infrastructure of Worcester and the wider study area offers a wide range of tourist facilities which are well advertised by local and county level tourist agencies. These include:

- Worcester River Cruises
- Pitchcroft Boating Station
- Spetchley Park & Gardens
- Worcester Racecourse
- Bransford Game Fisheries
- Guinness Park Equestrian Centre
- Worcester Woods Country Park
- Campsites and caravan parks

The study area also contains an area of Abberley and Malvern Hills Geopark. This European designated area (spanning 1,250 square kilometres of Herefordshire, Gloucestershire, Shropshire and Worcestershire) was created with the aim of promoting sustainable tourism of the geological heritage of this area to achieve sustainable development.

The Geopark is currently at an early stage, but has applied for funding for a “Geopark Way” encompassing the entire area and several site-based trails at specific sites, including Tank Quarry at Great Malvern.

The study area also contains a significant recreation provision, with golf courses, a country park, equestrian centres, playing pitches, accessible woodland, nature reserves, tennis courts, picnic sites, parks and bowling greens.

Recreation - Worcester City Open Space Needs Assessment

In July 2006 Worcester City Council published an Open Spaces, Indoor Sports and Community Recreation Assessment. The report examined the following recreation typologies, of which all but the first two fall under the banner of green infrastructure:

- Indoor sports facilities
- Community recreation facilities
- Parks and gardens
- Natural/semi-natural open space
- Outdoor sports facilities
- Green corridors
- Amenity greenspace
- Provision for young people/play areas
- Allotments
- Cemeteries/churchyards

The above typologies were assessed against a set of quality and provision criteria.

The quality assessment found that current facilities relevant to this study ranged from average to excellent (on a sliding scale from very poor to excellent), as shown in the following table:

Typology	Quality Score
Parks and gardens	Average
Natural/semi-natural open space (including green corridors)	Average
Outdoor sports facilities	Good - Very Good
Amenity greenspace	Good
Provision for young people/play areas	Average
Allotments	Average
Cemeteries/churchyards	Excellent

The provision assessment measured the provision of current facilities relevant to this study against a recommended standard per 1000 population. Its findings are presented in the following table:

Typology	Current provision per 1000 population (ha)	Recommended standard per 1000 population (ha)	Surplus/deficit per 1000 population (ha)
Parks and gardens	0.61	0.61	0
Natural/semi-natural open space (including green corridors)	1.58	2.00	-0.42
Outdoor sports facilities	1.27	1.80	-0.53
Amenity greenspace	0.57	0.50	+0.07
Provision for young people/play areas	0.39	0.60	-0.21
Allotments	0.40	0.40	0
Cemeteries/churchyards	N/A	N/A	N/A

The assessment found that there are existing deficiencies in the provision of natural/semi-natural open space, outdoor sports facilities and provision for young people/play areas. The report did not assess the provision for cemeteries and churchyards because these facilities are not created with the intention of providing informal or passive recreation.

Key features

Worcester Woods Country Park

Worcester Woods Country Park is a large area of open space on the eastern side of the City, comprising Nunnery Wood ancient woodland, Hornhill Meadows Local Nature Reserve and an events field. It is well publicised and well used within the City and facilities to improve visitor experience include waymarked woodland and meadow trails, a countryside centre with shop and café, children's play area, picnic area, guided walks and activities and orienteering.

Spetchley Park Gardens

Spetchley Park Gardens is a nationally popular Victorian garden spanning 30 acres, set within the context of a deer park with red and fallow deer. It is privately owned and open to the public between April and September inclusive. The gardens contain a number of attractive formal features that provide colour and interest for the whole open season, including a magnolia-fringed horse pool, rose lawn and “melon yard” with olives and pineapple-scented flowers. A café is provided and while a children’s play area is not present, adventure play is encouraged within the gardens.

River Severn

Running through the centre of Worcester, the River Severn has a range of recreational and tourist facilities within its attractive setting. These include riverside walks (incorporating the long-distance Severn Way), an adjacent sports ground, Worcestershire County Cricket Ground, river cruises, fishing and the nationally popular Worcester Racecourse.

Thematic plan

See Figure 5.1 overleaf.

3.7 Natural Processes and Environmental Systems

Introduction

Environmental systems and the natural processes that drive them are the critical functions that must be taken account of to ensure the “liveability” of new developments and their wider landscapes. Green infrastructure has the potential to assist new strategic development in harmonising with these processes and in doing so, using them to the benefit of both the built and natural environment.

Key Data Sources

- Department for Communities and Local Government
- HM Government
- Forestry Commission
- CIRIA
- Worcestershire County Council
- Aerial photography

Climate Change

Climate change is believed to be the greatest long-term challenge facing the world today. In the UK, the anticipated effects of climate change include more extreme weather events, increased flooding and permanent changes to the natural environment²¹.

It is widely accepted that the emission of greenhouse gases, in particular carbon dioxide, from human activity is the principal contributor to climate change. In response to this the government has committed to a strategy to combat climate change through a range of measures from global to local scale to reduce net greenhouse gas emissions²².

Green infrastructure has the potential to contribute to this strategy both directly through the sequestering of atmospheric carbon dioxide by growing trees and other vegetation and also indirectly through a number of means, including the following:

- Provision of attractive sustainable movement options such as walking and cycling that offer viable alternatives to the use of the private car for local movement.
- Provision of biomass as a substitute fuel for energy generation, replacing fossil fuels.
- Provision of biomass as a substitute fuel for domestic and industrial heat generation, replacing fossil fuels.

The use of biomass fuels such as short rotation coppice, *Miscanthus* grass, woodland management residues and sawmill residues is growing rapidly on a national scale, encouraged by national and regional policy²³, and this agenda is being led in the West Midlands by Bioenergy West Midlands²⁴, an organisation established to assist in the development of a dedicated regional bioenergy supply chain. The use of biomass fuels can greatly assist the management of green infrastructure by providing a source of revenue for low grade material which can, for example, fund ongoing woodland management and improvement.

Two examples of installations within Worcester currently using biomass to provide heat are Worcestershire County Hall and Defra’s Worcester site canteen, which use a combined 650 tonnes of biomass each year, reducing carbon dioxide emissions by 555 tonnes each year.

Flood Risk

Hydrology is an important natural process in the context of the study area, having influenced historic patterns of settlement and land use that have led to its current character. In particular, the River Severn’s seasonal flooding has resulted in the retention of an undeveloped corridor of open space through Worcester which delivers multiple benefits.

The risk of flooding is a critical consideration in the planning of strategic growth, especially given current pressures for land on which development can take place. In response to this, the South Worcestershire Joint Advisory Panel has commissioned a detailed hydrological study in

²¹ Consultation on Planning Policy Statement: Planning and Climate Change (DCLG, 2006).

²² Climate Change: The UK Programme 2006 (HM Government, 2006)

²³ E.g. “A Woodfuel Strategy for England” (Forestry Commission, 2007).

²⁴ Component partners are Advantage West Midlands, Harper Adams University College, Defra, and the Government Office for the West Midlands.

parallel with this Strategy and this document should be consulted for detailed information regarding the study area's hydrological characteristics, however the main river catchments and 1:100 year flood zones associated with the rivers within the study area are shown on Figure 6.1 at the end of this section.

The retention of flood plains as areas not suitable for development presents strong opportunities for green infrastructure, as the linear nature of these features can act as natural linkages between urban areas and the surrounding countryside. Habitats associated with flood plains are also frequently of high value, for example wet woodland, wet grassland and reedbeds, which are all Biodiversity Action Plan priority habitats.

Drainage

All built-up areas require drainage to remove surface water and this has traditionally been undertaken using underground pipe systems designed to convey rainwater to attenuation features before discharging it to watercourses. Recently, these solutions have been criticised for not being sustainable, because of their potential to cause flooding through rapid conveyance of storm water to watercourses and to cause pollution through pollutants from urban areas being washed into rivers or groundwater²⁵.

The recommended solution to these issues is the use of Sustainable Urban Drainage Systems (SUDS). These systems use a variety of natural processes to reduce flood risk associated with development, including permeable surfaces and infiltration trenches to return rainfall directly to groundwater while filtering out pollutants and open swales and ponds to store stormwater, trap pollutants, reduce flow rates and encourage evapotranspiration.

These systems have high potential to contribute to site-level green infrastructure frameworks as they have the potential to provide a range of beneficial functions, as wildlife habitats, recreation resources and attractive features. In particular the linear swales can form valuable green corridors through urban areas, supporting priority habitats such as wet grassland and reedbeds.

Urban Trees

Worcester is a well treed city, with a study of aerial photographs revealing an abundance of street and garden trees within suburban areas and along the corridors of the River Severn and Worcester to Birmingham Canal, however the main retail areas of the City Centre possess a relatively density of mature trees compared to the rest of the City.

Trees provide a variety of benefits to urban areas and this is now recognised at a national policy level²⁶. In terms of natural processes, these benefits include the moderation of the urban microclimate, through shading buildings in summer and reducing wind speed and allowing sunlight (deciduous trees only) to penetrate in winter, which can save as much as 10% of a building's annual energy consumption. Urban trees are also recognised for their value in intercepting rainfall to reduce urban run-off and can be valuable in filtering air pollution and screening unsightly urban components such as sewage treatment works and electricity sub-stations.

Key features

River Severn Floodplain

As identified above, the River Severn floodplain provides a strong green corridor through the centre of Worcester. This corridor delivers multiple and diverse benefits to the City, including an attractive linear riverside meadows landscape, wildlife habitat, recreation space, walking opportunities and water-based activities such as rowing and leisure boating.

Worcester's Urban Trees

As identified above, Worcester is a well treed City, especially in its residential suburbs. This mature tree stock delivers considerable value to the City in enhancing the appearance of residential areas and transport corridors, sequestering carbon dioxide, intercepting rainfall, providing shade or shelter and providing opportunities for children to engage in adventure play.

²⁵ Sustainable Urban Drainage Systems: Design Manual for England and Wales (CIRIA, 2000)

²⁶ "A Strategy for England's Trees, Woods and Forests" (Defra, 2007), pp 16-18

Worcestershire Wood Fuel Project

The Worcestershire Wood Fuel Project, led by Worcestershire County Council, was established following the publication of the County's Environmental Action Plan in 1996.

The aims of the project were as follows:

- Reduce the Council's carbon dioxide emissions
- Improve the prospects for agriculture in the area
- Create economic opportunities in the County by establishing a biomass energy network
- Stimulate a local biomass market by leading by example

The project achieved these aims by the installation of a 700kW wood fuelled boiler in Worcestershire's County Hall in 2002, with heat supplied under contract by Econergy, which supplied, installed, owns and operated the boiler. The boiler consumes between 500 and 600 tonnes of biomass fuel per year, delivering around 1.3 million kilowatt hours of heat.

Over 90% of the boiler's fuel is sourced within Worcestershire, principally from sawmill residues but also including 200 tonnes of fuel sourced from woodland managed by Worcestershire Wildlife Trust, providing valuable revenue income for ongoing habitat management and improvement.

The use of the boiler contributes to action against climate change by reducing the Council's overall carbon dioxide emissions by 250 tonnes per year, at a cost that competes with other conventional fuels.

Thematic plan

See Figure 6.1 overleaf.

3.8

Structural Greenspace

Introduction

Structural greenspace refers to areas of open space that form the core of local-level open space networks and deliver multi-functional value in a local context. Examples include incidental open space, transport corridors, private parkland and farmland managed under Countryside Stewardship or Environmental Stewardship schemes.

Key Data Sources

- Worcester City Council
- MAGIC

Description

Worcester City contains a significant amount of greenspace, principally due to restrictions on development by the floodplains of the Rivers Severn and Teme and more recently the planning controls associated with the Green Belt between Worcester and Droitwich Spa and the M5 protection corridor. A number of woodland areas have also been retained within development, including Nunnery Wood and Perry Wood, and a number of golf courses also provide valuable urban greenspace.

Worcester City Council has been proactive in identifying Worcester's "Green Network" within the City's Local Plan (see Paragraphs 2.4.11 – 2.4.13). This network of key green spaces and linkages along features such as railway lines, road verges and the Worcester and Birmingham Canal forms a strong green infrastructure framework for the City, which can be expanded into and enhanced by new developments, creating stronger links with the surrounding countryside.

The wider study area also contains a significant amount of publicly-accessible structural greenspace, especially to the south of the City where the Open Access Common Land surrounding Powick, Callow End and Kempsey provides large areas of multi-functional greenspace delivering landscape, ecological and recreational benefits, and to the east in the form of Spetchley Park.

Well-managed farmland also provides tangible benefits as structural greenspace, delivering ecological and landscape benefits through, for example, the retention of field trees, ponds and well-managed hedgerows. A useful indicator of these areas of farmland is those that are managed under the current Environmental Stewardship Scheme or the previous Countryside Stewardship Scheme, which is now closed. Under these schemes, farmers are offered grant payments to undertake a range of environmentally beneficial measures and Figure 7.1 shows that a large amount of the farmland within the study area is entered into either scheme or both, and that this land is relatively evenly distributed, with only the land around Stoulton showing a marked deficiency.

Key features

Green Network

The inclusion of a network of open space within Worcester's Local Plan is of significant benefit to the strategic planning of green infrastructure, as it provides an urban framework within which key nodes and linkages (and deficits) can be identified and addressed.

M5 Protection Corridor

The corridor of open space between the eastern boundary of Worcester and the M5 is of critical importance in maintaining an attractive setting to the City, separating it from potential adverse noise and pollution effects of the motorway. It also holds significant informal recreational value, containing Warndon Wood and several public footpaths. Warndon Wood has also been designated a Local Nature Reserve and Special Wildlife Site and the surrounding pasture land use is also likely to possess moderate ecological value.

Parks & Gardens

Worcester contains a number of municipal parks and gardens, including Cripplegate, Gheluvelt, Fort Royal, Riverside, St Andrews and Brickfields Parks. These contain a wide range of facilities including surfaced paths, play areas, formal and semi-formal gardens, sports facilities and a children's paddling pool (Gheluvelt Park).

Thematic plan

See Figure 7.1 overleaf.

3.9

Access and Movement

Introduction

Green infrastructure offers significant opportunities to provide sustainable movement, by walking, cycling and horse riding and the benefits of these modes of transport are particularly recognised within urban areas for the reduction of traffic congestion and air pollution, in addition to the reduction in carbon dioxide emissions.

Within urban areas walking and cycling have the most benefit for short journeys such as between residential areas and retail or employment areas and can be combined with public transport where facilities exist. It is also noted that access to greenspace has been shown to be conducive to mental wellbeing²⁷ and this can provide significant incentives to walk along attractive green routes to workplaces compared to car journeys on congested roads.

Key Data Sources

- Worcestershire County Council
- Sustrans
- MAGIC

Description

Worcestershire contains almost 5,000km of footpaths and bridleways, of which 758km of footpaths and 87km of bridleways pass through the study area. The study area also contains four long-distance routes, namely the Worcestershire Way, Severn Way, Wychavon Way and Monarch's Way and a combination of national and local cycle routes. The towpaths of the River Severn and Worcester and Birmingham Canal also offer sustainable access opportunities around Worcester City and into the surrounding countryside.

It is also noted that there is a proposed national cycle route between Worcester City and Great Malvern and the Malvern Hills and, if delivered, this will offer a significant opportunity for sustainable tourism within the area.

Key features

Rivers & canals

The Rivers Severn and Salwarpe and the Worcester to Birmingham Canal and Droitwich canal, offer existing opportunities for access and movement via riverside footpaths and canal towpaths. In particular, the stretch of the Worcester to Birmingham Canal passing through the City forms part of the Sustrans National Cycle Network. While there are a number of public footpaths that loosely follow the route of the River Teme, there is no specific path along its entire length as with the other watercourses.

Cycleways, footpaths & bridleways

The study area is well-served by public footpaths and bridleways and Figure 1.8 shows that there are few areas that are not served by these routes. Worcester and Droitwich are also connected by the Sustrans National Cycle Route and proposals are in place for a similar link between Worcester and Great Malvern following the route of the A449. The eastern side of the City (presumably recent developments) is well-served by a local signed traffic-free cycleway network, however there appears to be a deficit of routes connecting these neighbourhoods with the City Centre.

Open Access Common Land

Several areas of Open Access Common Land are present to the south of the study area, at Powick Hams, Old Hills, Kempsey and Stonehall, as shown on Figure 8.1. This land is of considerable value to the residents of Worcester, as it allows people to roam freely in countryside where access is normally restricted to set routes and to experience the relative wildness of historic grazed commons.

Thematic plan

See Figure 8.1 overleaf.

²⁷ CABE Space, 2005: "Does Money Grow on Trees?"

Impacts and Constraints

4 Impacts and Constraints

4.1 Introduction

This Chapter outlines the potential impacts that might arise from the strategic growth of Worcester on each strategic theme if sufficient avoidance and/or mitigation measures are not appropriately implemented, as well as potential constraints to the improvement of each strategic theme. Measures to avoid these impacts and opportunities that may be realised to improve each theme's value are then identified in Chapter 5.

4.2 Landscape Character

Impacts

- Conversion of land in rural areas and on rural/urban fringe to urban character.
- Effect of the design of new developments on vernacular building character.
- Dissolution of historic field patterns.
- Disruption of views into and out of the City, especially over the City's historic skyline.
- Effect of the design of new developments on the external appearance of the City.
- Effect of infill development on the urban character of the City (including urban greenspace).
- Effect of potential development within the green corridor between the eastern edge of the City and the M5.
- Development, including infrastructure development, on the floodplain disrupting views along these linear landscapes.
- Loss of the landscape framework through fragmentation of hedgerow and green corridor networks and tree cover in the rural as well as urban locations leading to adverse impacts on scale and visual cohesion.
- Loss of connectivity through development of ring roads and other infrastructure that terminates or obstructs the physical and visual effectiveness of networks.
- Introduction of landscaping that is inappropriate to landscape character in order to buffer the visual impacts of new development, for example belts of woodland planting for screening purposes in unwooded landscapes.
- Loss or reduced viability of sensitive land management practices due to pressures for multifunctional use of land and such impacts as disturbance, vandalism, dogs, trespass, theft, etc.
- Sanitisation of the landscape due to health and safety issues relating to the use of land for public access, e.g. the removal of trees liable to drop branches.
- Loss of mature oak trees within the landscape that characterise much of the landscape to the east and west of the City.
- Loss of tranquillity.
- Loss of tree cover in close proximity to new development on account of recent alarmist propaganda related to insurance liabilities.
- Loss of sensitive landscape attributes, i.e. those that are very vulnerable and difficult to replace.
- Fragmentation of wider landscape patterns, i.e. the extent of a particular landscape type becoming broken up by areas of development within it. This is particularly applicable to the small to medium scale landscapes identified in Section 3.2, for example Settled Farmlands.

Constraints

- Lack of available land (brownfield and infill) within the existing urban area, as well as planning protection measures for existing urban greenspace leading to the need to develop on the rural/urban fringe or create new settlements in rural areas.
- Financial costs associated with building in styles influenced by the vernacular (e.g. the choice of materials, density or detailing), as well as resource availability and associated environmental impacts (e.g. importing building stone from overseas).
- Presence of the M5 as the dominant landscape feature to the east of the City, in addition to other significant routes such as the southern bypass.

- Limited landscaping options to reduce impacts of new developments, for example public expectations to screen new road-building with woodland planting in areas where woodland is inappropriate to landscape character such as Settled Farmlands or Riverside Meadows.
- Lack of commitment to ongoing maintenance cost, particularly in the long term, of restored or reintroduced landscape features, for example willow pollards.
- Limited viability of introducing or restoring characteristic landscape elements which no longer have a function in the landscape, for example organic field patterns.
- Lack of awareness and understanding of landscape character and associated aspects such as landscape sensitivity.
- Lack of consideration of landscape (and biodiversity) at initial the initial planning stages of development schemes.

4.3

Historic Environment

Impacts

- Direct destruction of archaeological or historic features to permit development.
- Indirect impacts on historic features, for example inappropriate development within their settings or disruption of historic landscapes.
- Disturbance of historic boundaries and/or settlement patterns, for example the removal of parish boundary hedges.
- Increased population resulting in increased visitor pressure on vulnerable historic and archaeological features of interest.
- Impact of increased water demand on water dependent historic and archaeological features.

Constraints

- Lack of comprehensive archaeological information constraining the ability of the historic environment to fully inform the strategic growth of the City.
- The irreplaceable nature of all historic and archaeological features.

4.4

Biodiversity

Impacts

- Direct destruction of habitats to facilitate development.
- Reduction of habitat value by adverse effects arising from adjacent or nearby development, for example noise and light pollution affecting bat foraging and bird nesting habit, informal recreation (including dogs) disturbing sensitive species or domestic cat predation reducing the populations of wild birds.
- Severing of existing wildlife corridors and/or habitat linkages with new development or infrastructure, leading to habitat fragmentation.
- Loss, contraction or fragmentation of species ranges (for example badger foraging territory) arising from the direct development of habitat, or construction of linear infrastructure through habitats.
- Lack of appreciation of the biodiversity value of brownfield sites and allocation for development under “broad brush” national policy.
- Increase in “tidy” approaches to the management of potential habitats such as road verges.
- Introduction and subsequent spread of non-native invasive species.

Constraints

- Lack of adequate funding for habitat creation, conservation, improvement and ongoing management.
- Lack of awareness among planners and developers of habitat location, value, condition, connectivity and management requirements.
- Lack of detailed biodiversity data within the urban area of Worcester.

4.5

Woodland

Impacts

- Clearance of woodland and associated semi-natural habitats to facilitate development.
- Degradation of woodland resulting from adjacent development, for example construction within root zones, fly tipping over garden boundaries and migration of invasive garden plants.
- Degradation of woodland arising from nearby development, for example through excessive visitor pressure, vandalism, introduction of non-native species or unauthorised mountain bike or motorbike access.

- Severance of woodland from wider landscape unit through envelopment or severance of key linkages.
- Sanitisation of woodland and trees to comply with health and safety guidance in publicly-accessible areas, in particular the risk of loss of veteran trees and other ancient woodland remnants.

Constraints

- Depressed woodland products markets reducing funds available for woodland management.
- Public aversion to woodland operations arising from lack of awareness of the need for active woodland management.
- Damage to young trees by pests including deer, grey squirrels and rabbits.
- Unwillingness of landowners to convert land to woodland due to the reduced flexibility associated with woodland and the general assumption that woodland will remain in perpetuity.
- No economic return for non-timber outputs provided by woodland, for example landscape improvement, biodiversity storage or informal recreation.

4.6 Recreation and Tourism

Impacts

- Increased population demand on existing facilities, especially natural and semi-natural open space, outdoor sports facilities and provision for young people and play areas, where existing deficiencies have already been identified (see Paragraph 3.6.9).
- Increased visitor pressure on sensitive facilities, such as publicly-accessible ancient woodland.
- Destruction of existing open space facilities to permit infill development.

Constraints

- Lack of available space within Worcester City to accommodate additional provision.
- Availability of revenue funding for long-term maintenance and replacement of new recreation facilities.
- Competition with other cities and regions for tourism income.

4.7 Natural Processes and Environmental Systems

Impacts

- Reduction of natural flood storage capacity resulting from new development or infrastructure within the floodplain.
- Replacement of agricultural and other open land with impermeable surfaces leading to increased run-off and higher peak storm water flows.
- Replacement of "green" land uses with development, resulting in higher carbon dioxide emissions per hectare during construction and operation.
- Replacement of vegetation with "hard" surfaces, leading to urban heat island effects and the associated need for carbon-intensive cooling systems.
- Increased carbon dioxide emissions from conventional domestic and industrial heating systems.
- Increased carbon dioxide emissions from traffic associated with new development.

Constraints

- Shortage of available land for development influencing development within floodplains.
- Unwillingness of local authorities and water companies to adopt Sustainable Urban Drainage systems (SUDS), which return rainfall to groundwater near to source and reduce run-off rates. This is due to the annual maintenance requirements of SUDS features, for example regular vegetation cutting, and health and safety issues associated with open swales for both maintenance contractors and local children.
- Unwillingness of developers to install biomass heating systems (including district heating) due to existing negative perceptions and lack of awareness.
- Recent tendency by local authorities nationwide to remove (and not replace) street trees as a result of litigation fears associated with tree safety.
- Over-sensitivity of insurance companies resulting in the loss of street trees when dealing with subsidence claims.

4.8 Structural Greenspace

Impacts

- Pressure of infill development on existing urban greenspace.
- Development of key greenspace on the rural-urban fringe, for example farmland managed under an agri-environment scheme.
- Development on the rural-urban fringe (including transport infrastructure) severing linkages between the existing Green Network and the surrounding countryside.

Constraints

- Unwillingness among developers to retain areas of urban greenspace above and beyond minimum national and local standards due to the need to forgo profit to achieve this.
- High land values and general lack of land availability within growth locations.
- Difficulty in sourcing revenue funding for the long-term management of informal urban greenspace against conflicting uses for funds.

4.9**Access and Movement****Impacts**

- Reduction of attractiveness of public footpaths and bridleways as a result of them passing through developed areas rather than open countryside.
- Disruption to Public Rights of Way during the construction phase of new development.
- Diversion of Public Rights of Way onto longer or less accessible routes to accommodate new development.
- Increased pressure on the existing footpath and cycleway network arising from a significant rise in the City's population.

Constraints

- Financial costs associated with creating and managing sustainable movement routes through urban areas.
- Requirement for security features on urban routes, such as lighting and CCTV.
- People's natural tendency to use the private car as the default mode of transport.
- Weather constraints to sustainable movement, especially to workplaces.

Protection and Improvement

5 Protection and Improvement

5.1 Introduction

This Chapter suggests a number of measures for the protection of the features of value within each strategic theme from the impacts of strategic growth and identifies opportunities arising from the strategic growth of the City that could be realised for the improvement of the value each theme.

5.2 Landscape Character

Protection

- Adopting a strategic approach to growth, ensuring that locations for development (residential, industrial, commercial and infrastructure) are suitably located and informed by local landscape character assessment.
- Ensure that all new development is appropriate and takes account of local character where possible, for example in the selection of soft landscaping type (e.g. woodland, parkland, open water or grassland) and species used.
- Liaison with developers to ensure that the layouts of new developments interact sensitively with important historic boundaries.
- Prevent the inappropriate interruption of Worcester's historic skyline or key views in and out of the City.
- Ensure that developments on the rural-urban fringe interact with and respond to the character of the surrounding countryside and present an attractive edge to the City while accounting for potential future requirements for further urban expansion.
- Ensure that any permitted infill development reflects the character of its surroundings. In exceptional circumstances where this character has been heavily degraded or is no longer appropriate and there is an identified desire for modernisation, development should be of high quality, distinctive and challenging new design.
- Ensure that only appropriate development occurs within the corridor of greenspace between Worcester and the M5, such as new playing fields, cemeteries and appropriate extensions to existing buildings.
- Ensure that elements that have the potential to cause visual intrusion such as road signs, road markings, petrol station forecourt paraphernalia, etc are kept to minimum.
- Ensure that all historic parks and gardens and other designed landscapes of value are properly protected, together with associated concepts such as key view points.
- Ensure that the scale of retail outlets reflects the scale of residential development to prevent imbalances, particularly on the edge of the city where large retail facilities may be desirable.
- Take full account of night blight impacts caused by excessive light in the night sky.
- Seek to perpetuate boundary types and patterns associated with the respective landscape character of the area, for example encourage hedged boundaries to development rather than wooden fencing where appropriate to the landscape character of the area, to encourage visual cohesion, rather than division.
- Ensure development respects and effectively safeguards all existing landscape features of value, particularly existing tree cover and other vegetation.
- Ensure the setting, scale and context of existing properties with regard to their surrounding gardens or grounds is fully appreciated, taken into account and protected when applications to develop in gardens are considered.

Improvement

- Use of high quality new development with associated infrastructure (including green infrastructure) to improve the landscape character of the study area, in particular the relationship between rural and urban areas.
- Use of high quality landscape planting to address the current dominance of the road network to the south and east of the City. This planting should reflect local landscape character in terms of its vegetation type, species selection, planting pattern and scale.

- Use of developer contributions to restore and maintain historic parks and gardens and other designed landscapes and features of value.
- Use of developer contributions to maintain and restore the urban tree canopy, notably the perpetuation of street trees.
- Consideration of local landscape character at the initial design stages of development schemes.

5.3

Historic Environment

Protection

- All development should respond positively to existing historic features, through integration, protection and enhancement within development design. The need to create the “history of tomorrow” through distinctive new design should also be recognised.
- Ensure that existing historic boundaries, land use patterns and environmental character are respected within development design.
- Use of historic land characterisation to inform strategic growth.
- Requirement for proposed development to be subject to archaeological assessment prior to planning permission, including field evaluation where appropriate.

Improvement

- Implementation of a detailed historic characterisation study, as recommended in the scoping report produced by Worcestershire County Council, and use of the results of this study to inform strategic growth.
- Protection and improvement of the historic environment through the creation of new green infrastructure associated with the City’s growth, for example the establishment of managed grassland with interpretation over known below ground archaeology.
- Use of developer contributions to improve the interpretation of the historic environment, particularly when development incorporates historic features.
- Use of new green infrastructure to allow the public greater access to historic features for the purposes of education and awareness raising.
- Use of green infrastructure associated with new development to restore hedgerow trees to the landscape in appropriate areas.

5.4

Biodiversity

Protection

- Ensure that developers take reasonable action to minimise adverse effects of development upon existing habitats or species.
- Ensure that all development results in no net loss of ancient woodland, semi-natural grassland and wetland habitats.
- Use of buffer zones to protect designated features.
- Designation of features of biodiversity interest, in particular priority Biodiversity Action Plan habitats that are under threat of development, as Special Wildlife Sites to ensure their recognition and consideration within development proposals.
- Recognition of the equal value of habitats and habitat linkages when planning strategic growth areas and the protection of key linkages within these areas, as well as designated habitats.
- Requirement of adequate crossings where highway infrastructure crosses wildlife corridors and/or habitat linkages, such as badger tunnels and green bridges.
- Ensure that the biodiversity value of brownfield sites is appreciated by developers, planners and local communities.
- Ensure that the biodiversity value of gardens and orchards is fully appreciated by developers and planners.

Improvement

- Encouragement of developers to deliver net biodiversity gain as part of strategic growth through positive partnership working.
- Ensure appropriate habitat creation through development landscaping and open space creation.
- Use of native and locally appropriate species wherever possible in development landscaping.
- Use of developer contributions (e.g. Section 106 Agreements or planning gain tariffs) or perpetual owner/occupier contributions to secure improvement and ongoing management of habitats within and adjacent to new developments.

- Use of “pooled” developer contributions where appropriate to attract additional funding to secure habitat creation, restoration, linkage, improvement and ongoing management at a landscape scale.

5.5

Woodland

Protection

- Ensure greater protection of ancient woodland from clearance and development.
- Ensure that new development takes account of existing native and locally appropriate woodland in its design.
- Use of buffer zones to protect woodland habitats.
- Avoid inappropriate development in areas with high woodland concentrations.

Improvement

- Use of appropriate development landscaping, especially in areas with existing high woodland concentrations, to create new native woodland to buffer and link existing woodland areas.
- Use of appropriate development landscaping to create new native woodland within the Forestry Commission’s Priority 1 woodland creation area (as shown on the woodland thematic plan, Figure 4.3).
- Use of dowries sourced from developers or perpetual owner/occupier contributions to secure the ongoing management of woodland within and adjacent to new developments.
- Involvement of existing and new communities in woodland creation and management.
- Use of pooled developer contributions to improve the identified ancient woodland landscape to the east of the City (see thematic plan), for example by strengthening linkages between Nunnery Wood and Perry Wood and encouraging tree planting within the ancient woodland landscape area where this is compliant with local landscape character.

5.6

Recreation and Tourism

Protection

- Ensure that new development occurs with adequate open space facilities to cater for the needs of the new population.
- Ensure that new development does not adversely affect Worcester’s attractiveness as a tourist destination.
- Protect existing facilities from infill development.
- Ensure that new recreational facilities are fully accessible to new and existing populations, in line with local standards.

Improvement

- Creation of additional open space provision within new developments, funded by developer contributions, to address existing shortfalls identified in the Worcester City Open Spaces, Indoor Sports and Community Recreation Assessment (see Paragraph 3.6.6).
- Creation of new “green” tourist facilities or improvement of provision within existing facilities.

5.7

Natural Processes and Environmental Systems

Protection

- Prevent further construction, except essential infrastructure, on the floodplain.
- Ensure that development does not affect a site’s baseline hydrological characteristics.
- Ensure that there is no net tree or woodland loss across development sites.
- Use of Tree Preservation Orders to protect existing trees of value.
- Ensure that new housing achieves at least a “one star” rating under the Code for Sustainable Homes²⁸.
- Ensure that new developments are laid out in a way that encourages non-vehicular movement, e.g. between residential areas and local centres and schools.

Improvement

- Positive engagement between local authorities, developers and Severn Trent Water to encourage the use of Sustainable Urban Drainage systems (SUDS) in all viable new development sites.
- Encouragement of the restoration of inappropriate land uses on the River Severn flood plain to more appropriate land uses.

²⁸ Code for Sustainable Homes: A step-change in sustainable home building practice (Department for Communities and Local Government, 2006)

- Encouragement of developers to build new housing that achieves at least a “three star” rating under the Code for Sustainable Homes.
- Promotion of significant urban tree planting within new developments and within existing urban areas, to realise the benefits of natural insulation and shading, reduction of air pollution and carbon sequestration.
- Promotion of the use of green roofs within new developments to intercept rainfall and insulate buildings against annual temperature fluctuations.
- Planting of additional street trees within Worcester City Centre.
- Inclusion of new woodland in developments at the design stage, where appropriate to the local landscape character, to increase carbon sequestration and provide local biomass fuel crops.
- Use of biomass heating in all new public buildings and encouragement of developers to explore district heating opportunities in new residential developments and biomass heating systems in new industrial and commercial developments, using the Worcestershire Wood Fuel Project as a viable local example of best practice.

5.8

Structural Greenspace

Protection

- Prevent infill development within the identified Green Network.
- Ensure that Green Network linkages with the surrounding countryside, for example along footpath and bridleway corridors or SUSTRANS routes, are maintained within development layouts.
- Prevent development within registered Open Access areas.

Improvement

- Secure significant areas of multi-functional greenspace between development areas.
- Achieve greater rural-urban integration using well-designed informal open space on the urban fringe.
- Ensure that new development improves linkages between the existing Green Network and surrounding countryside.
- Positive liaison with landowners to encourage greater multi-functionality in agricultural land on the rural-urban fringe, especially in relation to public access.
- Better design of verges associated with new transport infrastructure to deliver biodiversity and sustainable access benefits.

5.9

Access and Movement

Protection

- Ensure that new development respects existing Public Rights of Way, in particular their condition and appearance.
- Ensure that new development does not adversely affect the routes and public enjoyment of existing Public Rights of Way.

Improvement

- Use of new development, both within and outside the existing City, to augment and enhance the existing Public Rights of Way network and to provide sustainable means for movement between homes and destinations such as workplaces, schools and retail areas.
- Requirement for all new homes to be provided with cycle storage facilities.
- Requirement for all new workplaces to have dry cycle storage facilities and changing rooms with showers.
- Provision of cycle hire stations on key routes (for example between Worcester and Great Malvern) and a subsidised “cycle doctor” service within the town centre, using existing businesses if possible.
- Better waymarking of main routes between residential areas and the City Centre and promotion through leaflets and local authority websites.
- Installation of security features such as low landscaping, lighting and CCTV on urban routes.
- Education of the City’s population on the benefits of using sustainable transport over the private car.

A Green Infrastructure for Worcester

6 A Green Infrastructure for Worcester

6.1 Introduction

This section provides the information required to inform the South Worcestershire Joint Core Strategy from a green infrastructure perspective.

Section 6.2 provides a long-term vision which broadly states how green infrastructure should be addressed over the next 20-50 years as Worcester experiences its strategic growth.

Section 6.3 provides a set of specific principles for each of the strategic themes used in Chapter 3, drawing on the completed assessment and providing priority actions that can be expressed and delivered through local policy.

Section 6.4 shows the physical context for the recommendations of this study. It draws on both the baseline thematic plans and subsequent assessment to provide an overall physical framework of nodes and linkages (both existing and aspirational) that can be used to inform the strategic growth of the City and direct future investment, in conjunction with the long-term vision and principles.

6.2 Long-term Vision

Green infrastructure is critical to the success of sustainable development and should be considered equal to all other forms of infrastructure. It should recognise and build on existing resources to establish a high quality, multi-functional resource that underpins Worcester's desirability as a place to live, work and visit. New green infrastructure should be of the highest quality, with robust mechanisms established for its long-term management to ensure ongoing delivery of public benefit.

6.3 Green Infrastructure Principles

Landscape Character

- All new development should respect the existing character of Worcester and the surrounding countryside as defined in the Worcestershire Landscape Character Assessment, in particular the City's historic skyline.
- All development proposals, including landscaping schemes, should be informed by analysis of the condition of the existing landscape character and the associated green infrastructure of the areas concerned, and should seek to improve the condition of these areas wherever feasible through appropriate landscape gain.
- All development on Worcester's urban fringe should maintain and where possible improve the City's visual interaction with the surrounding countryside, presenting attractive, open and welcoming views into the City across a well-managed transition zone as opposed to "closed" views of the rear of properties and large highway infrastructure.

Historic Environment

- Development should respect Worcester's historic environment and should integrate existing historic features to ensure their protection and, where appropriate, their enhancement and their physical and intellectual accessibility.
- Development should make use of the advance planting of appropriate screening vegetation, which can deliver multiple benefits, to protect the settings of historic features.
- All development areas should be subject to archaeological field investigation and recording, to avoid accidental destruction of below ground archaeology and to contribute to the greater understanding of Worcester's historic character. This understanding should then be communicated to the new residents of those areas by interpretation and characterisation, for example through themed outdoor sculpture.

Biodiversity

- The strategic growth of Worcester must achieve net biodiversity gain and, wherever possible, should not cause the loss of irreplaceable semi-natural habitats such as; ancient woodland, mature, over mature and veteran trees, ancient hedgerows, semi-natural grassland and wetland habitats.

- Development should identify and respect existing wildlife corridors within development sites and should maintain or improve them through their retention within site-level green infrastructure frameworks.
- New landscaping should reflect local species and habitats unless there are over-riding reasons for a different approach, and should contribute to local and national Biodiversity Action Plan targets.

Woodland

- The strategic growth of Worcester should not cause any further loss of ancient woodland and where appropriate should contribute to its management, expansion, buffering and linkage.
- Development should seek to retain all existing woodland and woodland linkages within development sites and should maintain and where possible improve its overall condition, on-site linkage and connection to the surrounding landscape.
- Existing and new communities, especially children and young people, should be involved in the creation and management of woodland arising from Worcester's strategic growth.

Recreation and Tourism

- The strategic growth of Worcester should not only provide sufficient open space facilities to cater for the step change in population, in line with local standards, but should also provide additional recreational space to address existing shortfalls.
- Investment should be made in those open space typologies that have been identified as being of "average" quality to improve their condition and robustness against a step change in demand.
- Opportunities should be realised from the strategic growth of Worcester to create new tourist facilities such as country parks and equestrian centres, and to improve the tourist provision associated with existing features of interest, such as Worcester Battlefield.

Natural Processes and Environmental Systems

- No new development should take place within the identified 1:100 year floodplain and all new developments should incorporate Sustainable Urban Drainage systems where feasible, with adoption processes agreed at the outset.
- All new development should achieve at least a "one star" rating under the Code for Sustainable Homes.
- Existing trees should be retained where safety permits and significant urban tree planting of suitable species in strategic locations should be undertaken in new developments and existing urban areas to deliver the identified benefits.

Structural Greenspace

- No development should take place within the identified Green Network and linkages should be maintained between the Green Network and surrounding countryside.
- No development should take place on registered Open Access land unless the public benefit derived from the development exceeds that of the land's open access provision and no suitable alternative locations can be found.
- New areas of informal open space created as a result of Worcester's strategic growth, as well as existing areas, should deliver multiple benefits, for example informal public recreation, biodiversity enhancement and storm water attenuation.

Access and Movement

- New development should respect existing Public Rights of Way, providing suitable, safe and accessible routes of an attractive, "green" character.
- High quality, clearly signed walking and cycling routes between all new developments and the City Centre should be established and promoted.
- All forms of new development should incorporate appropriate features to support and encourage non-motorised forms of transport.

6.4

Strategic Green Infrastructure Framework

See Figure 9.1 overleaf.

Hierarchy

The Strategic Green Infrastructure Framework Plan shows the current physical network of green infrastructure within the study area and aspirational future elements of this network. It is divided into nodes and linkages, and these in turn are divided into major and minor classifications.

Green Infrastructure Nodes

The major nodes represent those existing features within the study area that deliver a high level of value over a broad range of functions. The major nodes, with justification for their selection, are as follows:

Worcester Historic Centre

The historic centre of Worcester, centred around the cathedral and encompassing the cathedral grounds, surrounding parks and the River Severn, holds much of the identity of Worcester through its representation of the City's historic environment. It is the City's tourist hub and a key recreation resource with facilities such as River trips, attractive formal parkland, sports fields and Worcestershire County Cricket Ground. Several key sustainable movement routes also connect to this node, notably the Severn and Monarch's Ways and a Sustrans National Cycle Route.

Worcester Battlefield

The area to the south of Worcester, at the confluence of the Rivers Severn and Teme, was the site of both the first and last encounters of the English Civil War. The latter encounter, the Battle of Worcester with Powick Bridge, marked the end of the war and an important event in British history and this is recognised in the site's status as a Registered Battlefield.

Public access to the battlefield is provided by the Monarch's Way footpath and there is a large area of Open Access Land to the south of the River Teme, encompassing Powick Bridge.

A number of opportunities exist to improve this node, including the conversion of the land use from mixed farming to pastoral, to better reflect its Landscape Character Type of Riverside Meadows and to better protect below-ground archaeology, and the designation of the balance of the battlefield as Open Access Land to enable the public to explore this historically important place, with appropriate interpretation.

Worcester Woods Country Park

Worcester Woods Country Park consists of a combination of ancient semi-natural woodland (Nunnery Wood), a grassland Local Nature Reserve (Hornhill Meadows) and an events field of mown grass. It is a key recreational resource for Worcester as well as a site of considerable ecological interest, supporting populations of bats, badgers and ancient woodland flora including wood anemone and bluebell.

Public facilities include a play area and waymarked woodland and meadow trails, as well as a visitor centre which includes a shop, café and education and interpretation facilities.

Monk Wood

Monk Wood is an area of replanted ancient woodland containing a nationally renowned butterfly population. This has arisen from the wood's former coppice management by the Harris Brush Company and subsequent resumption of this activity by Worcestershire Nature Conservation Trust and The British Butterfly Conservation Society, its current occupiers.

In association with nearby Ockeridge Wood, Monk Wood is also representative of the West Worcestershire Woodlands Regional Character Area and Wooded Estatelands Landscape Character Type into which it falls, being an area of irregularly-shaped ancient woodland.

Monk Wood is open to the public with a picnic site provided and the Monkswood Green rough pasture SSSI to the south of the wood is an area of Open Access Land.

The wood is also of local heritage interest, as one of the local woodlands cleared and planted with pale-timbered species by the Harris Brush Company in the mid 20th Century.

Spetchley Park

Spetchley Park is a nationally renowned Registered Park and Garden that is privately owned, but open to the public. Its late Victorian Gardens are of significant interest to tourists, as is the historic deer park. The southern part of the park is also registered as ancient semi-natural woodland, however in reality it is more representative of wood pasture, which reflects the history of its area, indeed the name “Worcester” is derived from the Anglo-Saxon word for wood pasture²⁹.

Himbleton Woods Complex

The cluster of ancient woods around Himbleton, including Trench Wood, Goosehill Wood and Bow Wood represent remaining fragments of the historic Feckenham Forest.

Trench Wood is of particular value as a green infrastructure node within this complex. It was partially cleared and replanted by the Harris Brush Company in the mid 20th Century and is now a Site of Special Scientific Interest, designated on account of its woodland flora (including herb Paris and bluebell) and nationally scarce moth and butterfly populations. It is also known for its bird populations including a breeding population of nightingale and a range of summer visiting warblers. It is part managed as a Local Nature Reserve by Worcestershire Nature Conservation Trust and is open for public access with a well-established ride network and car park.

Other woods designated as SSSIs within this complex are Rabbit Wood and Grafton Wood, which are areas of ancient semi natural woodland.

Minor Nodes

The minor nodes on the Plan represent those features which currently hold a recognisable level of value, but do not necessarily deliver the level of value and/or multi-functionality of the major nodes. These include ancient woods, Local Nature Reserves, playing fields, registered parkland and Open Access land.

Green Infrastructure Corridors

The existing major green infrastructure corridors on the Plan are connecting features within the landscape that provide the means of the sustainable movement of wildlife and people and which hold a significant level of inherent value in themselves as habitats, destinations or linear landscapes. In the case of Worcester and the surrounding study area, it is the principal watercourses which provide the greatest level of connectivity. The existing major corridors, with justification for their selection, are as follows:

River Severn

The River Severn is a highly valuable link running north-south through the study area. It bisects the City of Worcester, bringing valuable greenspace into the heart of the City and providing an open, visual corridor along which the attractive historic City Centre can be viewed. The River itself is also of historic value, with its corridor being associated with human activity since prehistoric times.

The character of the river is of a meandering, wide channel, passing through predominantly pastoral mixed farmland, in keeping with its “Riverside Meadows” landscape type. An identified issue is the crossing of this linear landscape by highway infrastructure to the south of the City. This also occurs within the City Centre, although this is remediated to a certain extent by the more ornamental design of the bridges.

Public access is provided along the entire length of the river within the study area (and beyond) via the Severn Way long distance footpath and this route has been improved within the Worcester urban area to permit year-round access. The River Severn is also a popular tourist destination, offering riverside walks through attractive parks, river cruises, angling, rowing and mooring. Adjacent tourist facilities within the river corridor also include Worcester Cathedral and Racecourse and Worcestershire County Cricket Ground.

The River Severn itself is of ecological interest, having been locally designated as a Special Wildlife Site on account of its rich (if limited in abundance) aquatic flora and fish population. Otters are also recorded as having re-colonised the river from the north. Tree cover is present along much of the length of the river and provides a valuable wildlife corridor.

²⁹ Worcestershire County Council, 1999

Worcester to Birmingham Canal

The Worcester to Birmingham Canal originates at a confluence with the River Severn to the south of Worcester City Centre and follows a general north-easterly course to Birmingham, passing under the M5 at the northern end of Worcester and to the east of Droitwich.

Accessible along its entire length via the towpath, the canal offers a means of sustainable access for walking and cycling between Worcester and the surrounding countryside and associated features to the north—west, including Trench Wood and Hanbury Hall. The canal also connects with the Wychavon Way, which provides linkage to Droitwich and the countryside to the east. Other recreational uses of the canal include angling and leisure boating, with a marina located near to its confluence with the River Severn.

The canal is of moderate biodiversity interest, being locally designated as a Special Wildlife Site. Its marginal vegetation is well-developed with a rich flora and extensive beds of common reed which support a breeding population of reed warblers. Several pairs of swans are also associated with the canal and it is recorded as sporting a rich fish population.

The canal is an attractive feature, lined with trees along much of its route through urban Worcester and with hedgerows and hedge trees where it passes through rural areas.

River Teme

The River Teme is greatly valued for its unspoilt, rural character, however in the vicinity of Worcester its corridor is crossed by several large roads, resulting in a local adverse impact upon its character. Further west it is a very attractive, meandering watercourse with a broad, predominantly pastoral floodplain and very little settlement. Its banks are well-lined with trees, mostly alder and willow.

The river is of significant ecological interest, influenced by its undisturbed nature and natural variance with its underlying geology, from a relatively acidic upland stream at its source in Powys to a broad, meandering, base-rich watercourse as it passes through the study area to its confluence with the River Severn. It has been designated as a Site of Special Scientific Interest on account of its habitat diversity and populations of rare and protected species. Of principal importance is the river's otter population, which remained strong throughout the national population decline of the 20th Century and was used to re-populate other watercourses.

The river supports a rich fish population, including the very rare twaite shad *Allosa fallax fallax* and a range of rare invertebrates including the globally threatened white-clawed crayfish *Austropotomobius pallipes*, a range of nationally scarce beetles and the rare freshwater pearl mussel *Margaritifera margaritifera*. The river also supports a range of breeding bird populations along its length, including kingfishers, sand martins and grey wagtail.

With regard to public access, there is no route directly associated with the watercourse, other than a short stretch of the Monarch's Way between Powick Bridge and the confluence with the River Severn, however the surrounding countryside is well-served by public Rights of Way and a number routes combine to provide access in the vicinity of the river corridor. An opportunity therefore exists to create a new route providing pedestrian and cycle access directly associated with the watercourse (using existing public footpaths where feasible), which may encompass the Leigh disused railway on the southern side of the river, which is itself a Special Wildlife Site on account of its floral interest as unimproved neutral grassland. Careful consideration should be given to the ecological sensitivity of the watercourse and disused railway, however, and potential conflicts should be identified and resolved prior to the installation of any route.

Existing Minor Green Infrastructure Corridors

The existing minor green infrastructure corridors shown on the Strategic Framework Plan represent the finer detail of the framework and are the essential linkages that currently connect the landscape along existing routes such as minor watercourses of local ecological interest and long distance footpaths. Often these routes have the potential to deliver greater value through, for example, habitat improvement, landscape improvement (such as the planting or pollarding of streamside trees) or the provision of informal public access and therefore these corridors represent significant opportunities for further investment that may be realised from adjacent development.

Aspirational Minor Green Infrastructure Corridors

A number of aspirational minor green infrastructure corridors are also shown on the Strategic Framework Plan. These are routes where the opportunity has been identified to connect a number of isolated nodes into the existing green infrastructure framework to enable greater species dispersal within the landscape and greater opportunities for the public to enjoy contact with nature through improved access. These are priorities for investment that may be realised through the strategic growth of the City, reducing habitat fragmentation and providing a recreational access framework to the benefit of existing and new residents.

Interpretation

The purpose of the Strategic Framework Plan is to provide a useful tool for the strategic planning of Worcester, identifying not only those areas where development will or will not conflict with existing green infrastructure resources, but also identifying opportunities for development to deliver net green infrastructure gain through the improvement of adjacent nodes, strengthening of adjacent corridors or creation of new site-level green infrastructure resources that will connect with and enhance the identified framework, for example new native woodland or Sustainable Urban Drainage systems.

The width of green infrastructure corridors shown on this plan is purely indicative and does not represent any form of geographical boundary. In reality the width of the corridors will vary on a very fine scale in line with the natural features that comprise them and their zones of influence.

Development proposals should be able to demonstrate that they have fully engaged with the strategic framework and strategic principles and that the proposals will result in a net gain in the green infrastructure value of Worcester through the strengthening of the existing framework through investment and the creation of new, appropriate and well-planned green infrastructure to augment the framework.

Next Steps

7 Next Steps

7.1 Further Study

The most important area of further study required to support this Strategy is the Historic Environmental Assessment, as identified by Worcestershire County Council and Worcester City Council.

This process will enable patterns and trends to be identified within the considerable amount of available archaeological data, which will greatly improve the ability of the historic environment to inform the strategic growth of Worcester.

It is highly important that, once identified, areas for the broad directional growth of Worcester be subject to more detailed landscape and ecological characterisation to ensure that the value of these areas is fully understood and not compromised and to identify specific opportunities for green infrastructure gain in line with the recommendations made in Chapter 5.

7.2 Proposed Delivery Mechanisms

Delivery

It is likely that the majority of new green infrastructure arising from the strategic growth of Worcester will be delivered by private developers through agreed development layouts, planning conditions and Section 106 Agreements.

There is a risk, however, that this type of delivery will be unplanned and possibly uninformed by the strategic green infrastructure principles outlined above and therefore it is recommended that a strategic body be established to co-ordinate this delivery and act as a central point of contact for the development sector.

There are a number of existing bodies whose experience may be drawn upon, the most notable being River Nene Regional Park and the National Forest Company.

River Nene Regional Park is a Community Interest Company that has been created in response to the aspirations of the Sustainable Communities Plan and in particular the Milton Keynes and South Midlands Growth Area. Its purpose is to be the central mode by which green space provision will be accomplished and it is considered vital to the government's vision of the "liveability" of the Growth Area. It is guided by a Stakeholder Steering Group, which comprises individuals from a variety of organisations (including local authorities, government agencies and charities), which enables the needs and aspirations of these groups to be expressed through the Park's work.

River Nene Regional Park achieves its objectives by drawing in funding from a variety of sources to deliver a range of green infrastructure projects, such as the preparation of an Environmental Character and Green Infrastructure Suite for North Northamptonshire, the administration of a Small Grants Scheme (providing up to £75,000 match funding for green infrastructure-related projects) and working in partnership with the Forestry Commission to deliver the Salcey Forest Tree Top Way, a nationally-acclaimed walkway made of local timber which allows all ability access to tree top level and which recently won the Environment Prize in the British Construction Industry Awards.

The National Forest Company is a non-departmental public body established by Government in 1995 to lead the creation of The National Forest, a new, wooded landscape for the nation across 200 square miles of central England.

The National Forest Company has achieved much of its planting with landowners, through its annual Tender Scheme. This is a Defra- and Forestry Commission-funded competitive tender for 100% capital funding of woodland creation and associated public access provision to deliver the National Forest on land outside of the Company's control.

In the context of the strategic growth of Worcester, it is recommended that the River Nene Regional Park model be adapted to the needs of the New Growth Point to achieve the successful delivery of green infrastructure.

This would therefore involve the formation of a group of active environmental stakeholders (for example local authorities, Natural England, Worcestershire Wildlife Trust, English Heritage, the Environmental Agency and others) which would act as a “delivery champion” for green infrastructure. It would function by drawing in funding from a variety of sources and working with its composite members and private developers to ensure the protection of existing green infrastructure and the delivery of a co-ordinated network of multi-functional greenspace associated with the New Growth Point.

Prior to this model being adopted, however, further detailed study would be required into the reasons for the success to date of River Nene Regional Park and their compatibility with Worcester, as well as a process of consultation and involvement of environmental stakeholders. It should also be considered whether the Joint Advisory Panel is willing to engage a body similar to the Regional Park, which is independent of local authorities, to oversee the delivery of the New Growth Point’s green infrastructure.

The reason for the rejection of the National Forest model is that the National Forest Company is a public body with direct central funding to deliver a specific national objective, which does not fit with the more “broad brush” requirements of the strategic growth of Worcester. The original River Nene Regional Park model, with a dedicated project team backed up by a full stakeholder group, would require a much greater resource input than would be feasible for a New Growth Point therefore it is proposed to be adapted for the requirements of South Worcestershire’s growth.

Long Term Management: Delivery

The long-term management of existing and new green infrastructure will also be a key challenge to address and again there are a number of existing case studies to benefit from, notably the Milton Keynes Parks Trust, Greenbelt Group, and management by a Third Party organisation in the form of the Wildlife Trust.

The Milton Keynes Parks Trust, established in 1992, operates as a charity and company limited by guarantee to provide, maintain and equip public open space within Milton Keynes and its environs for the benefit of residents and visitors. It operates with full time management staff employing principally contractors to deliver the management on the ground.

Funding is principally through income from a property portfolio passed to the Parks Trust at its inception. The Parks Trust also secures commuted sums for additional areas taken over and it is able to offer project delivery services to developers looking to create new green infrastructure assets.

Greenbelt Group, established in 1997, takes control through freehold or long leasehold of the open space within individual developments with an agreement to maintain to agreed management standards in perpetuity. It also undertakes community liaison and can advise on management models. Funding is usually secured through an annual charge on the householders and businesses collected by the Group.

The Group is currently responsible for around 750 development sites across the UK, for example the North Hamilton urban extension to Leicester.

A good example of management of open space by a Third Party is that of Cambourne, a new 3,000 dwelling settlement in Cambridgeshire where all areas of informal open space (including components of the site’s Sustainable Urban Drainage system) are managed by the Wildlife Trust for Bedfordshire, Cambridgeshire, Northamptonshire and Peterborough. Roadside verges, tarmac paths, playing and sports fields and village greens are not managed by the Trust and have either been adopted by the Parish Council or are still the responsibility of the developer.

The Wildlife Trust is currently committing two man units to the management Cambourne, excluding conservation and education officer involvement. They are also using local volunteer support and have developed very good relations with the local community, with many of them now getting heavily involved in the management of the site as a nature reserve.

The open space on the development is managed in an informal and un-manicured manner, which gives a very good visual impression, as well as providing a high nature conservation benefit. The Wildlife Trust is also currently exploring opportunities for the grazing of open grassland areas with rare breed livestock.

The mechanism by which the Wildlife Trust has taken over the open space management responsibilities at Cambourne was that the developers “sold” the Wildlife Trust a building and site on the Cambourne development in exchange for the Wildlife Trust taking on the Section 106 obligations on the informal public open space in perpetuity. This building now houses the Trust’s office and a number of rent paying tenants with the outbuildings providing accommodation for the on-site management staff and equipment.

With regard to the Worcester New Growth Point, the scale of growth is more likely to suit the latter model and it is noted that Worcestershire contains an active county Wildlife Trust. The management methods undertaken by the Wildlife Trust are also likely to deliver greater multi-functionality, as the areas where frequent public access is not required are likely to quickly become valuable biodiversity reserves.

The Milton Keynes Parks Trust was considered less appropriate in the context of this strategy because of its high initial set-up costs and the fact that its scale and nature of operation is designed to operate over an entire city scale as opposed to the areas of growth associated with a New Growth Point.

Greenbelt Group was considered less appropriate than a Third Party organisation because, whilst it is providing the delivery of green space management in a significant number of new developments, issues have been identified with the level of innovativeness in the management of open space and the commercial nature of the company can also lead to potential conflict of interest.

Long Term Management: Funding

The traditional approach of adoption of open space arising from new developments by local authorities is no longer the regular approach due to issues associated with management cost.

It is therefore of critical importance that viable funding mechanisms are agreed in advance of the granting of planning permission to new developments to ensure that sufficient funds are available in perpetuity to facilitate the ongoing maintenance and management of new and existing green infrastructure within the development boundary and to undertake capital replacements as necessary, for example re-surfacing paths or replacing worn out or broken benches.

To address this issue, there are a number of mechanisms being explored to fund the long-term management of open space. These include the following:

- Section 106 commuted sums to local authorities to fund ongoing management.
- Dowry payments from developers to an open space management trust administered by local authorities, developers and environmental stakeholders.
- Development tariffs on planning gain, whereby a percentage of each contribution is allocated to open space management.
- Annual householder contributions.
- Drawing funds from Landfill Tax or the Aggregates Levy Sustainability Fund
- Environmental funding sources, such as Entry or Higher Level Stewardship or the English Woodland Grant Scheme.