

The value of greenspace in Wales: a scoping study

Final report

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CJC Consulting

with

Catherine Bickmore Associates

Prof. Ken Willis, University of Newcastle upon Tyne

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CJCCONSULTING

45 Southmoor Road Oxford OX2 6RF

83 Blenheim Place Aberdeen AB25 2DZ

T/F 01865310088 M 07884436514

Email: r.crabtree@zetnet.co.uk

www.cjcconsulting.co.uk

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Bob Crabtree
CJC Consulting Limited
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Abbreviations

AONB	Area of Outstanding Natural Beauty
BT	Benefit transfer
CABE	Commission for Architecture and the Built Environment
CAP	Common Agricultural Policy
CCW	Countryside Council for Wales
CROW	Countryside and Rights of Way Act
CV	Contingent valuation
CWS	Community Woodland Supplement
EA	Environment Agency
ESA	Environmentally Sensitive Area
EAGGF	European Agricultural Guarantee and Guidance Fund
FC	Forestry Commission
GIS	Geographic information system
GRP	Gross Domestic Product
HPM	Hedonic price model
IMD	Index of Multiple Deprivation
LA	Local Authority
LAD	Local Authority District
LDP	Local Development Plan
LNRs	Local Nature Reserve
MASCE	Multi-attribute stated choice experiment
NOMIS	National On-line Manpower Information System
NNR	National Nature Reserve
NP	National Park
NPV	Net Present Value
ODPM	Office of the Deputy Prime Minister
PMC	Programme Management Committee (Objective 1)
PBRS	Public Benefit Recording System
PPG	Planning Policy Guidance
PPW	Planning Policy Wales
RDPW	Rural Development Plan for Wales
RDR	Rural Development Regulation
SAC	Special Area of Conservation
SINC	Special interest for nature conservation
SME	Small and medium sized enterprises
SP	Stated preference
SPA	Special Protection Area
SPD	Single Programming Document (Objective 1)
SSSI	Site of Special Scientific Interest
SUD	Sustainable drainage system
TAN	Technical Advice Note
TCM	Travel-cost method
TPO	Tree Preservation Orders
UDP	Unitary Development Plan
WAG	Welsh Assembly Government
WDA	Welsh Development Agency
WFD	Water Framework Directive
WTA	Willingness to accept
WTB	Wales Tourist Board
WTP	Willingness-to-pay

Executive Summary

Context and remit

The study was set up to assess the benefits to society from green/open space and its management in Wales. Open space benefits are not explicitly priced in markets and it is difficult to derive an 'optimum' allocation of these spaces; it is therefore possible that the benefits to people and business are undervalued. The environment is valued as a national asset and with increasing income over time we might expect society to demand a stronger role for open and greenspace in order to contribute to their quality of life.

The remit defined four tasks: policy evaluation; benefit identification; research and data collection; and reporting on options for Phase 2.

Definition

Open/green space was defined as unbuilt land or water that:

- Provides benefits to the public and business through amenity, landscape, biodiversity, recreation, sport or access.
- Has scope for intervention on the part of the study partners.

Policy review

The major EU, UK and Welsh Assembly policies relating to open and green spaces were reviewed. It was concluded that open/green space could play a significant role in policies relating to sustainable development, environment, health, and economic and social development (including urban development and tourism). Much of the strategic policy in Wales is targeted to assist disadvantaged communities and areas. This has implications for the spatial distribution of open/green space funding.

Contribution of greenspace to policy agendas

Open/green spaces are typically multifunctional, providing a mix of benefits to the public and communities, the economy, and the environment. They can also provide derived benefits for health, mainly when accessible space is used for physical exercise. The distribution of benefits from greenspace in relation to economic and social disadvantage is unclear.

The analysis of benefits from open/green space to the different policy agendas concluded that:

- Benefits to economic policy are likely to be greatest through the support of tourism and in improving urban design and image. It is not clear what types of expenditure on open/green space will provide the greatest benefits to tourism.
- Greenspace management is central to the Assembly strategy for the countryside and environment, and there is a priority to improve biodiversity and environmental quality.
- The Objective 1 measures appear to offer remarkably little funding for open/greenspace other than measures relating to agriculture and forestry. It may be that the lack of evidence to support the economic benefits from the improvement of green/open space has resulted in it not being adequately funded in the programme.
- There are opportunities in taking forward "Wales: A Better Country" in ways that enhance greenspace benefits.
- Community policy is highly targeted to those suffering social and economic deprivation, and associated impacts on health and wellbeing. Greenspace contributes to community policy through visual amenity and a resource that can facilitate healthy lifestyles (see below). There is scope for open/green space as an input to community regeneration, land regeneration, and the fostering of a

- green image throughout Wales both in towns and in the countryside.
- ❑ The sustainable communities section of the Wales Spatial Plan includes the promotion of healthier lifestyles as one of the primary actions, including the need to improve the quality of public spaces in degraded urban areas.
 - ❑ Greenspace can contribute to active lifestyle and sports policies. It may also be significant for mental health and wellbeing. Benefits from reduced air pollution appear quite localised.
 - ❑ The overall importance of maintaining and enhancing Welsh greenspace seems to be undervalued in tourism policy.
 - ❑ We recommend that consideration should be given by local authorities to develop greenspace strategies, including provision for long-term maintenance.

Benefits: methods and estimates

The principal methods of estimating public benefits were reviewed. Methods should be selected according to context, objectives and the feasibility of obtaining data for analysis. Many studies on recreational value have used travel cost or contingent valuation methods. Hedonic pricing models that analyse differentials in property values use observed preferences and these are more reliable than methods based on stated preferences. However, it may be difficult to separate the effects of greenspace from other variables. Multi-attribute stated choice experiments are useful when the objective is to estimate the benefits from different greenspace attributes (e.g. landscape, biodiversity, access).

The main text contains a comprehensive review of benefit values in relation to different generic types of greenspace (woodland, water, footpaths and access, wildlife areas and other spaces). All are valued positively by society but the size of the values varies enormously depending on the characteristics and context of the greenspace. Very few studies in Wales have been undertaken. Open/green space may make a significant contribution to health and wellbeing in both urban and rural contexts, but little economic analysis and evaluation has been undertaken in relation to health. It may be that longer-term health benefits are undervalued by respondents in recreation studies because they do not have full information about their health status or the contribution of exercise to health.

Estimates are also notably lacking for impacts on business location decisions. There is only limited direct information on the impact of greenspace on regeneration and tourism in Wales. Greenspace can contribute significant benefits to local economies. The immediate beneficiaries are suppliers of food, accommodation and equipment but the multiplier effects mean that the ultimate impacts are much wider. These benefits are most apparent where 'new' opportunities are created for activities such as a long distance walking, mountain biking and nature tourism.

Distribution of benefits; disadvantaged communities

Use benefits from greenspace improvement are likely to be greatest in urban and peri-urban areas or where there are areas of post-industrial or unutilised land. IMD (Index of Multiple Deprivation) is not on its own a satisfactory basis for measuring the impact of open/green space measures. A better approach is to consider the degree to which communities lack quality green/open space.

Policy mapping

Mapping of partners' open/greenspace policies on to those at a higher level revealed a very close fit in nearly all cases. However, a much more detailed assessment of agency expenditure patterns would be needed to realistically assess the balance of activities and whether this matched with the higher level policy agenda.

Phase 2

The conclusion from our review is that hedonic pricing models that use property values and multi-attribute stated choice experiments are likely to be the methods of choice for estimating the value of open/green space. Partners should consider the following areas as having most scope for open/green space to contribute to the emerging higher-level policy priorities:

Health, recreation and sport

There is a need for research that links behavioural change, activity levels and health outcomes in order to provide a sound basis for investment. Current evidence suggests that policy should focus on:

- ❑ Areas of deficit close to where people live (this emphasises open town space, parks etc.). Conversion of brownfield sites is a key route for reducing greenspace deficits;
- ❑ Targeting high risk communities who will benefit most, rather than healthy, physically active users;
- ❑ Active sport and recreation development of greenspace; and
- ❑ Integration with other agencies etc. to remove barriers to participation (e.g. health promotion).

Tourism

The WTB has strategic plans for the principal outdoor recreation areas. Project partners should assess greenspace development in terms of demand by both tourists and the resident population. There is a lack of detailed evidence on returns to investment, but high-use specialised sport facilities probably offer the greatest overall benefits.

Urban design and greenspace

Planning and community policy guidelines do not set quantitative requirements for local authority greenspace. Key activities in order to raise the profile of greenspace include:

- ❑ Obtaining better quantitative evidence on the benefits to communities and business from enhanced open/greenspace including parks.
- ❑ Assessing the extent to which benefits are integrated into strategic LA policies such that greenspace is given due prominence in council policies.

Economic and social development

Greenspace is important as an element in the WDA strategy of creating a clean, green image for investment. It is a factor in image creation and rebranding, although opportunities are limited and mainly occur as part of regeneration and development. There is some evidence that quality open and greenspace in towns produces high benefits but more evidence specific to Wales would be valuable. The evidence for greenspace impacts on business location and economic performance is quite limited and the outcomes largely indeterminate.

Assembly policy is highly targeted to deprived areas and this is where open/greenspace enhancement could contribute most to the policy agenda. It suggests that partners need a very targeted approach, taking account of IMD if social and economic benefits from greenspace are to be maximised.

Environment

Analysis of environmental policy was severely limited by the lack of an Assembly strategic policy for the environment. Much of the EA and CCW activity will be concerned with obligations under the WFD, the Habitats and Birds Directives and CROW, together with the overall commitment to environmental sustainability. Whilst there is considerable data on the public benefits from wildlife, nature reserves, rivers

etc. little applies directly to Wales and much depends on context and use by the public.

1 Introduction

1.1 Context

This study was set up to assess the benefits to society from green/open space and its management in Wales. The overall aim was to identify and quantify the benefits, identify the role of green/open space in current policy and set the scene for more detailed research and analysis in a second phase.

The client group for the report consisted of the following organisation:

- Forestry Commission Wales
- Welsh Development Agency
- Environment Agency Wales
- Countryside Council Wales
- Wales Tourist Board
- Groundwork Wales
- Local Authority Representatives
- Greening the Valleys Partnership

1.2 Study objectives

The objectives as stated in the remit are to:

- Critically examine the array of existing environmental and related policies and policy drivers. Identify policies that promote the creation, improvement and maintenance of green/open space and further, identify any policy shortcomings that exist in the context of delivering green/open space.
- Review and identify relevant existing research related to the project and its aims.
- Identify ways in which the promotion, delivery, improvement and maintenance of green/open space would support relevant existing policies of the WAG and other funding providers.
- Define appropriate criteria for evaluating the benefits of investment in environmental improvements.
- Assess the appropriateness of existing methods of objectively evaluating the benefits of promoting, delivering, improving and maintaining green/open space in economic terms or in some other acceptable form that will allow these benefits to be objectively compared to other relevant externalities.

1.3 Definitions of green and open space

Both open and greenspace are terms normally used in a built or urban context. For example, Kit Campbell Associates (2001) produced a definition and typology of open space (Table 1.1) which subdivides open space into green and civic (non-green) space but places the whole of open space within urban boundaries. This definition of greenspace does not account for vegetated land outside a settlement/urban boundary even where it is intimately associated with the urban area (e.g. green wedges and greenbelt¹). Planning guidelines in Scotland (PAN 65) now use the Kit Campbell classification of open space (Scottish Executive, 2003).

□

¹ There is no formal greenbelt or greenbelt policy in Wales.

Table 1.1 Typology of open space

OPEN SPACE	
Any unbuilt land within the boundary of a village, town or city which provides, or has the potential to provide, environmental, social and/or economic benefits to communities, whether direct or indirect.	
GREEN SPACE	CIVIC SPACE
Any vegetated land or structure, water or geological feature within urban areas.	Urban squares, market places and other paved or hard landscaped areas with a civic function.
Parks and gardens Amenity greenspace Children's play areas Sports facilities Green corridors Natural/semi natural greenspace Other functional greenspace	Civic squares Market places Pedestrian streets Promenades and sea fronts.

Note: from Kit Campbell Associates (2001)

From an economic perspective, space *per se* can be valuable to society where it prevents a loss of utility from concentrations of buildings or urban development. However, most green/open space also provides positive public benefits - e.g. from visual amenity and public access. Both the quantity and quality of the space will be important in determining the public benefits it delivers.

Open and green spaces have been variously defined in planning legislation. The Town and Country Planning Act 1990, Section 336 defines open space as 'land laid out as a public garden, or used for the purposes of public recreation, or land which is a disused burial ground'. Planning Policy Guidance² Note 17: Planning for Open Space, Sport and Recreation (PPG17) 2002 states that, 'open space should be taken to mean all open space of public value, including not just land, but also areas of water such as rivers, canals, lakes and reservoirs which offer important opportunities for sport and recreation and can also act as a visual amenity'. Annex I gives the typology and functions of open space as detailed in PPG17.

For the purposes of this study we define open/green space as unbuilt land or water that:

- Provides benefits to the public and business through amenity, landscape, biodiversity, recreation, sport or access.
- Has scope for intervention on the part of the study partners.

The main types of green/open space considered are:

- Woodlands.
- Country parks, community parks.
- Nature reserves.
- Environmental landscaping of industrial estates and relevant brownfield land.
- Urban and rural coastlines, canals, lakes, ponds and rivers.
- Rural and urban cycleways, footpaths and bridleways (both rural and urban).
- Public landscaping, gardens and street trees.
- Rural and urban parks, play areas, public open spaces and commons.
- Access land (as defined by the CROW Act 2000).

Agricultural land is excluded from the list except in so far as it falls under one of the above categories – e.g. by providing public access.

² PPG only applies to England but may inform policy in Wales. It is used as a reference when there are no relevant Technical Advice Notes (TAN) (see Section 1.4).

1.4 Standards of provision

There are no national standards for the provision of public open space. However the Technical Advice Note (TAN) 16 on Sport and Recreation provides some guidance and makes reference to the so-called '6 acre standard' set as a minimum by The National Playing Fields Association (minimum standard for outdoor playing space of 2.4 hectares (6 acres) per 1000 population). This includes a specific allocation of 1.2 hectares per 1000 population for pitch sports.

The TAN 16 also provides a breakdown of the total standard. This is based on an aggregation of space within the ranges given below:

Facilities for Outdoor Sport 1.6-1.8 ha

Outdoor equipped playgrounds for children 0.6-0.8 ha.

The Sports Council for Wales can further advise on standards to evaluate levels of local provision, usually as part of the development plan process. Otherwise The Welsh Assembly Government's (WAG, 2002c) Planning Policy Wales suggests that local authorities are required to set their own standards for open space provision with part 2 of the UDP (or equivalent part of the forthcoming LDP under the Planning and Land Compensation Act, 2004) providing guidance to developers on open space provision. This advice broadly corresponds with that in PPG17.

Planning Policy Wales requires local authorities '*to ensure adequate space for formal and informal recreation taking into account recreational space needs and levels of provision*'. The actual mechanics of this are not provided. However on the guidance in PPG17 suggests the provision is an essential task of local authorities. Also PPG17 provides supplementary guidance on a procedure for a local assessment. It proposes that an assessment can help to define priorities to meet Community strategies and Best Value objectives, and can assist with funding opportunities, for example it resulted in London Borough of Barking and Dagenham securing £1 million. In separate documentation Community strategies are specifically identified for the development green space strategies. Guidance on their production also includes a list of what constitutes greenspace.

Some guidance is provided on extent of provision of facilities by Sport England, and of natural space in English Nature's Accessible Natural Greenspace Standard (English Nature, 1996). This advocates that:

'every home should be within 300 m of an accessible natural greenspace of at least 2 ha, plus:

- At least one accessible 20 ha site within 2 km
- At least one accessible 100 ha site within 5 km
- At least one accessible 500 ha site within 10 km'

A number of local authorities have established a hierarchy of open space accessibility along the lines of the Greenspace standard, with others providing guidance with respect to provision associated with new development. There is no similar guidance provided by the Countryside Council for Wales.

1.5 Economic functions of green/open space

Towns and cities grew up because they reduce the costs of trade. However, communities also created open and greenspaces to improve health and amenity. The planning system is now the main determinant of the amount and type of open space in urban areas. Much of rural greenspace is valued for its marketable outputs (from agriculture and forestry) but greenspace is also valued for its habitats and

landscapes. Considerable investment has taken place in enhancing open and greenspace to increase the benefits it provides, and this is most evident with land that is derelict or visually unattractive (see Hyder Consulting, 2004).

Since open space benefits are not explicitly priced in the market it is difficult to derive an 'optimum' allocation of these spaces; it is therefore possible that the benefits to people and business are undervalued. Certainly within the Welsh Assembly Government's strategic policy agenda (WAG, 2003a) the focus is on jobs, skills, health and community development. The environment is valued as a national asset and also plays a role in supporting the main agenda elements. With increasing income over time we might expect society to demand a stronger role for open and greenspace in order to contribute to their quality of life.

1.6 Tasks

The remit defined four tasks for the scoping study:

1. Policy evaluation: investigate existing policies, critically examine the drivers and define the opportunities for promoting, creating, improving and maintaining green spaces. Examine the way in which the partners' own policies fit with higher-level policies.
2. Mapping: collate and identify all the main benefits arising from the delivery, maintenance and improvement of green space.
3. Research and data collection: literature review of valuation studies, including methodologies for evaluation.
4. Reporting: present findings and report on options available for Phase 2.

1.7 Structure of the report

The report first examines the major higher-level strategic policies that impact on green and open spaces in Wales. Chapter 3 discusses the types of benefit that green/open space can provide, and maps these on to the main WAG strategic policies. Chapter 4 is a literature review of the economic benefits from green/open space. Finally, Chapter 5 assesses the priorities in policy, the gaps in evidence and action, and concludes with a way forward for Phase 2. Much of the detailed policy analysis and evidence on green/open space benefits is located in Annexes I-III.

2 Policies and policy measures relating to green/open space in Wales

2.1 Introduction

The aim in this section is to examine the main strategic policies that drive action on green/open space in Wales. The principal policies reviewed were:

- EU: Water Framework Directive, Habitats and Birds Directives, Structural measures (Objective 1) and Bathing Water Directive³
- WAG: Wales: a Better Country (overall strategic agenda)
- WAG: Sustainable Development Action Plan
- WAG: Planning Policy Wales
- WAG: The Communities First programme
- WAG: People, Places, Futures: The Wales Spatial Plan
- WAG: A Winning Wales (national economic development strategy)
- WAG: Well Being in Wales
- WAG Healthy and Active Lifestyles in Wales
- WAG: Health Challenge Wales
- WAG: Climbing Higher (sports policy)
- WAG: Wales a Better Place
- WTB: Achieving our Potential: a Tourism Strategy for Wales
- ODPM: Living Places, Cleaner, Safer. Greener

The following sections give a broad overview of the main policy measures as they relate to green/open space. In most cases we adopt a top-down approach using strategic policy aims as the definition of policy. In some cases we have used a bottom-up or mixed approach – where strategic policy does not exist or where the measures in place are a better guide to the reality of intervention.

2.2 European Directives and measures

A substantial number of EU Directives impose duties on national governments in relation to greenspace. The principal measures are the Water Framework Directive (WFD), the Habitats and Birds Directives and structural policy measures. The role of WAG and the environmental agencies in Wales depends on the Directive and its implementing regulations.

Table 2.1 presents an overview to indicate where the policies impact on open/greenspace. Broadly speaking the measures have quite limited impacts on urban greenspace with the exception of the structural funds. The Habitats and Birds Directives relate to protected areas for biodiversity but can impact on proximal land and water. Encouragement is given in the Habitats Directive to the development of policies which promote the management of features of major importance for wild flora and fauna in particular those which may encourage migration, dispersal and genetic exchange.

□ _____

³ There are a large number of other environmental regulations and initiatives that may affect the quality of greenspace. These include the contaminated land regulations, water quality and quantity legislation under the Environmental Protection Act, and air quality legislation. It was beyond the scope of the study to assess the effects of these interventions in detail.

Table 2.1 Effects of EU Directives on types of open/greenspace

	Water Framework Directive	Habitats and Birds Directives	Structural fund measures	Bathing Water Directive
Functions	Requires all inland and coastal waters to aim to achieve "good status" by 2015. It will do this by establishing a river basin district structure within which demanding environmental objectives will be set, including ecological targets for surface waters. To achieve this, the relevant water assets are to be the subject of strategic management plans.	Requires Member States to introduce a range of measures including the protection of listed species. Protection is by means of a national Natura 2000 list of sites - Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).	Objective 1 of the Structural Funds aims to promote the development and structural adjustment of regions lagging in economic growth. The programme of regenerative measures applies only to West Wales and the Valleys (2002-2006)	Sets binding standards for bathing waters.
Types of open/greenspace				
Woodlands.	Possible local impacts where woodlands impact on water quality.	Increased protection of SACs, SPAs.	Funding for forestry measures including woodland management.	None
Country parks, community parks.	Indirect	Indirect	Indirect	None
Nature reserves.	Positive effects on some reserves	Increased protection of SACs, SPAs.	Limited work on NNRs has been funded	Indirect
Environmental landscaping of industrial estates and relevant brownfield land.	None	None	Measures to regenerate deprived areas though community-led action: includes projects to improve the local physical environment.	None
Urban and rural coastlines, canals, lakes, ponds and rivers.	Major measures to reduce polluting discharges, abstraction and diffuse pollution where these reduce water quality.	Only SACs, SPAs and protected species.	Indirect relevance via regeneration projects except for measures to reduce pollution and remediate industrial sites.	May positively affect use of coastline where bathing water quality is improved to minimum standards. Impacts on polluting discharges to rivers but the WFD will have much greater impacts.
Rural and urban cycleways, footpaths and bridleways (both rural and urban).	None	None	Development of recreational opportunities supported.	None
Public landscaping, gardens and street trees.	None	None	As part of regeneration.	None
Rural and urban parks, play areas, public open spaces and commons.	None	None	As part of regeneration.	None
Access land (as defined by the CROW Act 2000).	None	Possible	None	None

The WFD will have the most pervasive impact, especially on rural greenspace, since it will often require a mix of measures to attain good ecological and chemical quality of surface waters, and good chemical and quantitative groundwater. A recent paper by Pearce (2004) suggests that the costs to the UK will lie in the range £3.5-12.1 billion. Benefits were estimated to be less than costs. Expenditures in Wales were not estimated but we would expect there to be significant costs to businesses mainly in relation to pollution.

2.2.1 Objective 1 measures

The 2002-2006 Objective 1 programme for Wales is an important source of funding for regenerating the socio-economy of West Wales and the Valleys. Those aspects of the Single Programming Document (SPD) that relate directly or indirectly to green/open space are summarised in Annex II Table 8.1. The key priorities are:

- Priority 3: Community economic regeneration
- Priority 5: Rural Development and the Sustainable Use of Natural Resources
- Priority 6: Strategic infrastructure Development

In addition, Environmental Sustainability is a cross-cutting issue that modifies the other priority actions.

The Objective 1 measures appear to offer remarkably little funding for open/greenspace (or other investment in environmental improvement) other than measures relating to agriculture and forestry. There may be a missed opportunity to improve open/greenspace in deprived environments as a contribution to community regeneration and quality of life. It may be that the lack of evidence to support the economic benefits from the improvement of green/open space has resulted in it not being adequately funded in the programme.

Project monitoring of environmental sustainability targets (PMC(03)07 and PMC(04)11) indicated that projects were over target for community environmental enhancement (3.3). The indicators for land management, access management and sustainable forestry management projects were over-target. Many projects under priorities 5.3, 5.7 and 5.8 scored poorly both for job creation and environmental sustainability indicators.

2.3 Welsh Assembly government's strategic policy

The WAG strategic agenda is embodied in "Wales: A Better Country" (WAG, 2003a). Annex II Table 8.2 analyses the main strategic policy areas: economic policy, countryside planning and environment, communities and health. The key themes are employment, community development and health.

Reference to the role of environment in policy areas other than *Countryside Planning and Environment* is very limited. Although not explicitly identified, improvements to the quality and/or quantity of green/open space may have a role in:

- Creating a context that is attractive to re-locating businesses and the long-term expansion of existing companies.
- Tackling environmental poverty by providing a better living environment in deprived areas.
- Providing a context for healthy living by facilitating active lifestyles especially in the context of acute illnesses.

There are opportunities in taking forward "Wales: A Better Country" in ways that enhance greenspace.

2.4 Sustainable development policy

The National Assembly for Wales has a binding legal duty to pursue sustainable development in all it does. This is built into its constitution through section 121 of the Government of Wales Act. The implications of sustainable development for green/open space are not immediately obvious because it is not a well-defined concept and much depends on how it is interpreted.

The policy implications of the Bruntland Commission and Rio Agenda 21 are that:

- Environmental and social aspects of development should be taken into account alongside economic development in the formulation of policy;
- Policy should be more integrated to take account of economic, environmental and social impacts; and
- The environment should be valued and protected as a resource stock, and for the ecosystem services it provides (Costanza *et al.*, 1997).

The economics literature attempts to quantify sustainability and identify the constraints that it may place on economic development. The basic economic theory of *weak sustainability* is that stock of capital assets available to society should not decline over time. This then permits a stable or increasing level of wellbeing into the future. In this approach all forms of capital (social, economic and environmental) are included in the overall stock and are treated as substitutable. *Strong sustainability* gives greater weight to those elements of environmental (natural) capital that are non-substitutable. Natural capital with a low level of substitutes has been termed 'critical natural capital'. In the strong sustainability approach development is constrained to maintain critical capital. The dilemma in practice is that it is not clear what should be included in critical capital (English Nature, 1995) since the theory indicates an imperative that the stock of each critical asset must not be allowed to depreciate over time.

Annex II Table 8.2 summaries the measures embodied in the Assembly's Sustainable Development Action Plan 2004-2007 (WAG, 2004c) that are directly or indirectly relevant for green/open space. The focus is on maintaining the natural resource stock (natural capital) but it is not clear that this has great priority because no new measures are identified. One could conclude that existing measures are perceived as being satisfactory apart from the need to respond to EU Directives and reform of the CAP. There is a focus on the planning system as the main driver of sustainable development with a role in reducing demands on resources, and increasing quality of life. The key greenspace issues relate to:

- Reform of the planning system;
- WFD and CAP reform measures;
- The focus on deprived areas and quality of life issues for people with poor environments; and
- The specification of the sustainable development indicators.

The WAG Integration Tool (WAG, 2004d) and the mechanisms adopted by agencies to implement sustainable development (e.g. WDA, 2004, 2005) are strong policy drivers for creating sustainable places and spaces.

2.5 Planning and community policy

2.5.1 Planning legislation and guidance

'Planning Policy Wales' (WAG, 2002c) sets out policies and initiatives fostered by the Assembly and provides guidance for local planning authorities in the formation of unitary development plans (or forthcoming Local Development Plans (LDPs)) and

guidance for the determination of planning consent. The Town and Country Planning Act 1990 and its successor Planning and Compulsory Purchase Act 2004 is the main primary legislation, with secondary legislation through the Government of Wales Act 1998. Technical advice notes (TANs) for Wales provide guidance in the interpretation of legislation (see Annex II Table 8.4). There is a rolling programme for the updating of TANs in line with Planning Policy Wales and subsequent planning legislation (e.g. the Planning and Compulsory Purchase Act, 2004). TAN Sport and Recreation is in the current programme for updating.

Policies and plans are subject to sustainability appraisal and strategic environmental assessment: the latter is a requirement under European law. The requirement to prepare a community strategy is seen as complementary to the preparation of an UDP (LDP).

The main planning duties with implicit implications for greenspace encompass biodiversity, and the protection of designated National Parks and Areas of Outstanding Natural Beauty. The Wildlife and Countryside Act 1981 and the Countryside and Rights of Way Act 2000 require all public bodies and the Assembly to further the conservation of identified priority habitats and species, and the conservation and enhancement of SSSIs. Local planning authorities must address biodiversity issues. Such areas could incorporate greenspace.

There is a duty to protect National Parks and AONBs from inappropriate development either within or adjacent to areas so designated. Also local authorities have a duty to make adequate provision for the planting or preservation of trees and to consider the setting of listed buildings.

Secondary legislation on sustainability is pivotal in both recognising and relating features of the natural heritage to those of health, social and economic wellbeing. Thus, an Assembly priority is that urban areas should become more desirable places in which to live and work, with priorities for the countryside including for it to be *'attractive, ecologically rich and accessible'*⁴.

Many of the planning policies are restrictive, seeking protection from the effects of development. In most cases positive enhancement as well as protection is sought with important implications in terms of the on-going management of greenspace over and above more static protection. This applies to green wedges, trees and woodlands contributing to local character, commons and greens, sites designated for nature conservation, undeveloped coastlines, sites of archaeological interest, formal and informal open spaces of significant recreation and amenity value, and the rights of way network. Many greenspace uses are listed as functions of green belts and green wedges. Allotments should be retained particularly where they have an open space function although the Assembly can grant consent for their disposal.

Other planning requirements include the need to ensure that there is adequate informal and formal recreation in terms of the space needs and provision, with scope for the use of disused land for such purposes in urban areas. The Assembly encourages physical activity on land in recreational uses. There should be easy access for everyone including by sustainable means of travel, to a network of good quality and well-designed facilities and open space. Design briefs are suggested as a tool to assist with external spaces. The design should incorporate features to discourage vandalism and crime. To improve health, facilities for cycling and walking in towns are encouraged.

Urban land allocated for housing should be related to the retention of areas of greenspace (for recreation, amenity and nature conservation). The provision of

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⁴ Planning Policy Wales para 2.4.4. (WAG, 2002c).

facilities and open space should be an integral part of any new development. In particular housing developers are expected to provide open space with the UDP establishing policies providing guidance as to its provision. 106 planning agreements are suggested as one mechanism for obtaining contributions towards the provision and maintenance of open space.

Indirect implications for greenspace are included in the need for good landscape to integrate new buildings into residential areas with opportunities for energy efficiency through the incorporation of planting of shelter vegetation and use of local topography. Importantly local authorities are called on to promote '*attractive landscape around dwellings with useable open space and regard for biodiversity and nature conservation*⁵'. With respect to flood risk and climate change, new development should not be exposed to flooding. There are indirect (not stated) opportunities to use flood lands as greenspace provision including through the implementation of sustainable drainage systems (SUDs).

2.5.2 Wales Spatial Plan

Planning Policy Wales is supported by the Wales Spatial Plan (WAG, 2004a) - a requirement of the 2004 Planning Act. This seeks to provide a strategic framework to guide future development and accommodate local characteristics and distinctiveness in particular local development plans. The sustainable communities section includes the promotion of healthier lifestyles as one of the primary actions, with the improvement of the quality of public spaces in degraded urban areas additionally noted. The sustainable economy recognises the role of attractive places with one of the objectives seeking to ensure that places are attractive for investors and as places in their own right. In the enhancement of the natural and built environment this is stated as a further objective on the basis of providing an economic asset for tourism and quality of life. This is repeated in the section 'Valuing our environment', with objectives emphasising the need to manage the environment comprehensively, looking forward to the forthcoming Assembly's Environment Strategy in 2005.

2.5.3 Community policy

The Local Government Act 2000 gave Local Authorities (LAs) the power to do anything to improve the promotion or improvement of the social, economic and environmental well being of their area. The Act also contains a mandatory requirement for each LA to produce a community strategy for promoting or improving the social, economic and environmental wellbeing of their area. WAG (2001b) has produced guidance on how strategies should be prepared but this does not indicate the content of strategies or give priorities for action. It is essentially a community-owned approach which encourages logical citizenship and action.

In 2004 a group of Statutory and Voluntary organisations developed guidance for community strategy partnerships in Wales ('Environmental Issues for Community Strategies'). This is a list of aims and indicators for making community strategies more environmentally-friendly and sustainable. It encourages the provision of accessible greenspaces for all, but numerous proposals relate to the management of, or impacts on, greenspace. Although the proposals would almost certainly be generally supported in WAG policy many require funding or regulation and these cannot be treated as equivalent to fully-costed policy measures. It is more of a check list for communities which attempts to raise the role of the environment in contributing to health, and economic and social regeneration.

WAG (2001c) has targeted the 100 most disadvantaged communities in Wales for special funding under the 'Communities First' programme. Priority will be given to

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⁵ Planning Policy Wales para 9.1.2.. (WAG, 2002c).

funding those items that directly address the root causes of poverty and disadvantage.

Key objectives relating to greenspace for the programme are:

- Improving housing and the surrounding environment.
- Improving health and well being through an active and healthy lifestyle, and by addressing a range of issues that affect people's health.
- Making communities safe and secure places in which to live, work and play.

The programme typifies the WAG emphasis on targeting funding to the most deprived areas, incorporating a large element of bottom-up community initiative and capacity building, and encouraging environmental improvement as a factor in improving wellbeing.

2.5.4 ODPM strategic policy

Central government has set out its vision for public space⁷ (ODPM, 2002; Annex II Table 8.5). This also gives the government's response to the Urban Green Spaces Taskforce report 'Green Spaces, Better Places'. The underlying aim is to make towns and cities more "liveable", and the achievement of high quality public spaces underpins the UK government's approach to planning, regeneration and renewal.

It is accepted that clean, safe greenspace is a public benefit that enriches the quality of people's lives and communities. Poor quality urban space characterised by vandalism, lack of cleanliness and poor design typifies urban neglect and decline. The evidence that "people want action on this agenda" comes from community consultation, although on some issues (good quality parks and green spaces) government states that everyone has a *right* to have these close to home. The text uses case studies of improvements to open space to demonstrate the types of gain achieved. It does not attempt to quantify the costs and benefits of improvement. The implication is that there is no shortage of situations where open space improvement gives social benefits and it is a lack of inspiration, good design and coordinated action that limits action. However the "Green Spaces, Better Places" report indicates the problems faced by local councils in disadvantaged areas where a backlog of maintenance and repairs on degraded spaces requires £500m of additional capital investment from budgets external to the local authorities. We are not aware that any similar assessment has been undertaken in Wales although some related studies such as that on underutilised land (Hyder Consulting, 2004) have been undertaken. An audit of the situation in Wales with respect to degraded spaces would be valuable.

Much of the proposed action relates to awareness, encouraging good practice, reducing legislative barriers and refocusing of existing budgets. Some use of special funds such as the Neighbourhood Renewal Fund (£525m in 2005-2006) and Heritage Lottery Fund is indicated. New 'strategic enablers' and 'community enablers' schemes offer assistance to councils without greenspace strategies and communities who wish to take action to enhance greenspace. Most of the proposed measures only apply in England but may influence policy in Wales at some later stage.

ODPM funds Cabe Space (part of the Commission for Architecture and the Built Environment) which champions excellence in the design and management of parks, streets and squares. On behalf of government in England it promotes good design and practice with greenspace. It has published on the value of public space (e.g. Cabe Space, 2004a, 2004b, 2005) but the publications largely assert the benefits from greenspace, and use selective case studies to imply positive benefits without

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⁷ Most of the proposed measures apply only in England but may influence action in Wales.

any systematic review of the evidence. Although there is a somewhat parallel body to Cabe Space in Wales (Design Commission for Wales⁸) this specialises on quality in the building design and does not appear to be concerned with the role of green and open space within urban design.

2.6 Economic and social development

2.6.1 WDA strategy

Economic and social development is central to the strategic policy aims of the WAG. It is therefore appropriate to treat the strategic policy aims of the Welsh Development Agency (WDA) as part of the overarching policy frame for the study.

Annex II Table 8.6 gives the main elements of the WDA's strategy for development in Wales. It contains a wide-ranging set of aspirations and measures. Greenspace is a strategic resource, the aim being to create a clean, green, healthy image, attractive both to the workforce and to green and high-tech companies. There is little indication in the strategy that open/greenspace policy is relevant to the development of the built environment or as an element in the regeneration of derelict or post-industrial land. However, there is scope for open/green space as an input to community regeneration, land regeneration, and the fostering of a green image throughout Wales both in towns and in the countryside.

2.6.2 Tourism

Tourism is major contributor to the economy of Wales and is particularly important in many coastal and rural areas. The Wales Tourist Board (WTB, 2000) has numerous strategies for different aspects of tourism (sports tourism, countryside experience, cultural tourism, golf etc.) Here we restrict the analysis to the national tourism strategy. Annex II Table 8.7 gives the main elements.

The strategy has support for small and medium enterprises (SMEs) as a priority in order to improve the quality of the tourism experience, and especially accommodation provision. The emphasis is on tourism that is sensitive to the environment and benefits local people and economies.

The contribution of open/greenspace to the tourism sector is to complement the attractions of towns and cities, and as an attraction in coastal and rural areas, often associated with outdoor activities. The supply and quality of open/greenspace is not a strategic issue for tourism, and the main lines of development involve other aspects affecting competitiveness (branding, marketing staffing, accommodation etc.). The issue for Welsh greenspace is the extent to which it is competitive in quality, accessibility and distinctiveness.

There is little in the strategy to indicate that the WTB will invest in the basic greenspace resource other than to discourage damage. It will invest strategically to develop specialist leisure activities. However, at present it is difficult to envisage that other agencies will benefit from WTB finance unless it is clear that tourism is suffering from a degraded natural resource. The overall importance of maintaining and enhancing Welsh greenspace seems to be undervalued in tourism policy. The outstanding quality of certain Welsh green space for example Heritage coastlines is mostly taken for granted.

2.7 Health, recreation and sport

There are major policy concerns with the health status of an ageing and relatively inactive Welsh population (WAG, 2005). 'Better Health Better Wales' (Secretary of State for Wales, 1998) set the stage for policy development, and in 2002 this was taken forward with 'Well Being in Wales' (WAG, 2002b). Much of the focus in WAG

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⁸ <http://www.dcfw.org>

strategy is to tackle ill health but the promotion of healthy lifestyles is also important in the strategy. The recent WAG (2004b) initiative (Health Challenge Wales) identifies six priority areas which give 'big returns from investment'. These are:

- smoking;
- obesity;
- accidents and injuries;
- alcohol and other substance abuse;
- infections; and
- mental health and wellbeing.

WAG (2002b) recognises the importance of good urban design as contributing to mental health and wellbeing. It is stated that people are more likely to take up physical activity (cycling, walking) if activities are easy to access and take place in pleasant, safe environments. However, the only action that follows from this is that WAG will 'improve the way people's health is taken into account as part of planning policy and planning decision making'. There are no policy measures that relate directly to open or greenspace in either of the key WAG documents. Given the clear importance of green and open space as a resource for health and recreation we recommend that it should be profiled in the future development of policy.

In 2003 WAG produced a framework for action on healthy lifestyles (WAG, 2003b). Annex II Table 8.8 summaries the key actions. The plan is to encourage healthy and active lifestyles through increased opportunities for activity, better information, and the creation of living and working environments that encourage active lifestyles. The priority is on target groups where activity levels are low and where enhanced activity will improve health and wellbeing.

The role of open/greenspace in WAG health strategies is thus primarily as a resource for healthy lifestyles, the reduction of obesity, and the fostering of good mental health and wellbeing. It has implications for all types of greenspace, but especially those that facilitate walking and outdoor activities. Health policy offers support for the expansion and management of a lack of good quality accessible greenspace is limiting active lifestyles, and where additional provision would increase activity in target groups of beneficiaries. A key player in the provision of activity networks is the Wales Centre for Health⁹ which works in partnership with a number of organisations in Wales to establish a physical activity network for Wales.

In its long-term strategy for sport and physical activity the Assembly aims is to convert the nation into a physically active and healthy one with spin-off benefits to citizens, communities and the economy (WAG, 2005). Although detailed targets are set, the strategy is weak on implementation measures. It is important to distinguish the WTB (see below) interest in sport (as a generator of expenditure by tourists) and the WAG strategy which concentrates on the benefits to residents. However for both, there is a marked synergy between sport/physical activity and the natural environment.

2.8 Environmental protection and enhancement

The State of the Environment Report published in 2003, highlighted the need for an overarching Environment Strategy to provide a co-ordinated approach to the environment in Wales. Work on the Strategy started in April 2004 and will not be complete until late in 2005. It will provide a mechanism for ensuring that the contribution the environment makes to economic wellbeing and the quality of life is

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⁹ <http://www.wales.nhs.uk/sites/home.cfm?orgid=369>

recognised and enhanced. Until the environmental strategy is developed there is no WAG strategic policy frame for the environment comparable to those discussed above.

Although technically the agencies deliver on policy set by WAG we might expect that much of the content of an environmental strategy for Wales will relate closely to the priorities currently set in the delivery programmes of the agencies. These currently deliver on the statutory responsibilities of the Assembly. Important for greenspace is legislation relating to the protection of SSSIs, national parks and other protected areas, public access to land under the CROW Act, and legislation relating to the disposal of waste and other pollutants to air, land, water and the sea.

2.9 Conclusions

- The sustainable development policy of the Assembly should underpin the maintenance of open and green spaces as a central element in the nation's natural capital. In practice, the planning system, together with European and domestic environmental legislation, provide the mechanisms for protecting open/green space. There are few binding obligations relating to the quantity and quality of open/green space provision within the planning system.
- Greenspace plays a key role in environmental policy but the absence of an environmental strategy for Wales limits analysis of the Assembly's strategic vision for greenspace. ODPM stresses the important role of urban open and greenspace for community wellbeing.
- Open/green space has a role in Assembly strategies for health, sport, communities and economic and social development. Health and the concern to establish healthier lifestyles are major issues. Greenspace is an important resource for exercise and sport, and contributes to wellbeing. A high quality environment underpins the WDA green business strategy, a healthy context for business and the creation of a better regional image. Within tourism the emphasis is on greenspace as a resource for specialised leisure activities. Less importance is attached to maintaining and enhancing Welsh greenspace as a tourism resource.
- Much strategic policy is targeted to assist disadvantaged communities and areas. This has implications for the spatial distribution of open/green space funding where it is directed at social and economic goals.
- We recommend that consideration should be given by local authorities to develop greenspace strategies, including provision for long-term maintenance.

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3 Benefits from green/open space

3.1 Introduction

Some benefits to society from green and open space are derived from the psychological effects of space as a contrast to a built or developed environment. Such benefits might be expected to be greatest in and around an urban environment where open space provides a contrast to the built environment. In the case of green belt and green wedge policy the benefit is from limiting the coalescence of large settlements. But to maximise the benefits from greenspace it must be accessible, non-threatening and free of negative effects such as litter. Major benefits have been achieved through the conversion of brownfield sites especially in the South Wales valleys, into green spaces (see Hyder Consulting, 2004).

However, green/open space typically provides benefits other than those from the space itself. Some reflect outputs valued in the market such as timber or products from farming. But in the current context the focus is on the public (environmental and social) benefits associated with green/open space. There is no accepted classification of these benefits but the following are generally considered to contribute to the welfare (wellbeing) and quality of life of at least some members of the public:

- access and recreation
- landscape and visual amenity (unbuilt environments)
- open space and visual amenity (built environments)
- biodiversity
- water quality
- flood control (reduced risk and damage from flooding)
- urban air quality
- tranquillity and absence of noise
- health (derived from the above)

It is helpful to think of the list of benefits above as generic *attributes* of the green or open space in question. Green and open spaces will frequently deliver more than one benefit attribute. So an urban park might provide *access, recreation, landscape* and *visual amenity*, with possible contributions to *biodiversity* and *urban air quality*. A space that is accessible for walking and recreation will normally be much more valued by a community than one that only provides visual amenity. Benefits may also be classified as *use* or *non-use*. Non-use benefits are those derived from the knowledge a person has that a green/open space is being protected (e.g. to maintain biodiversity) quite separately from any direct use of the space (see Section 4.1).

Some attributes contribute to *derived* benefits such as improved *health*. For example, recreational activity on accessible green spaces may lead to a greater sense of wellbeing, and health walks are now promoted to address certain medical conditions such as the risk of coronary heart disease. Improved air quality from greater open space in towns may also be beneficial particularly where pollution is dissipated.

3.2 Types of benefit and beneficiary

Benefits to society and the economy from green/open space may be specified in a number of different ways. These are explored below.

Benefits to the public and communities

The public usually benefit from green and open space without any direct payment dependent on use. There may be public rights of access (e.g. rights of way, parks, access land under CROW) or private owners may provide permissive access. Of course, much of the public space is paid for in local or national taxes but this gives no clear indication of its value because of the aggregated nature of the payments.

As discussed in greater detail in Chapter 4, methods have been developed for measuring the economic welfare provided by environmental goods such as green/open space. In broad terms this will be determined by:

- The attributes of the space and its relative scarcity.
- The value attributed to the attributes/space by the public over and above any costs involved in accessing the space (measured by, for example, their willingness-to-pay for entry (WTP)).
- The number of beneficiaries and their characteristics.

The number of beneficiaries is a key determinant of aggregate benefits. The most valued open/greenspace will be where it is appreciated by large numbers of people - either through visits to popular locations or through non-use benefits to a large population.

Open/green space also provides less tangible benefits from fostering community development, social inclusion and local pride (Cabe, 2005). A sense of local ownership may also help to prevent anti-social behaviour.

Benefits to the economy

This reflects the contribution of green/open space to economic activity, most commonly measured in terms of incomes and employment. The economy will benefit where greenspace is a factor in attracting business and associated employees to an area. This will most obviously be where greenspace is an element in an attractive environment for working, living or visiting. It will be important where businesses require a 'green' image, and where greenspace provides an attractive residential and working environment for staff.

Tourism is a rather different case. Here, it is the expenditures of visitors from outside an area that generate turnover in local businesses and support employment. At a *per capita* level it is tourists that stay overnight (or for longer periods) and have high daily expenditures that provide the greatest benefit to the economy. The key issue for green/open space (and its *attributes*) is the extent to which it is an important factor in the decisions of tourists to visit an area. This might reflect the general image that an area has or its specific characteristics of interest to tourists. The latter tend to be landscapes, fauna, water bodies, recreation opportunities etc. that are distinctive in some sense. But civic spaces may also be an element in the decision to visit cities. It is particularly difficult to disentangle elements in the decision making of tourists who are not travelling with a single specific activity in mind.

The provision and improvement of green/open space may also be a key factor in the regeneration of areas and the creation of improved place images. This reflects the negative impacts of derelict and post-industrial land on quality of life, and the positive effects of good urban design.

Benefits to environment and sustainability

Changes to the area of greenspace and its management affect the numbers and diversity of valued habitats and species. Any ecological gains from greenspace will increase the stock of natural capital and hence, all else being equal, contribute to sustainability. The contribution will be greatest per hectare where gains are made in rare habitats and species. However, a broad programme of work over a wide area

would also deliver gains. The protection of such natural capital is addressed by a wide range of European Directives (including the WFD and the Habitats Directive) and national policies (e.g. for SSSIs, National Parks, waste disposal etc.).

Benefits to health

Public use of accessible green/open space, most obviously through physical exercise, may lead to health and quality of life benefits. Habitual physical activity has been shown to be associated with a decrease in coronary heart disease risk factors (Katzmarzyk *et al.*, 1999) and a “walking prescription” of up to 30 minutes a day can improve cardiovascular health and body composition in previously sedentary adults (Coleman *et al.*, 1999). Outdoor walking has been shown to be more effective than indoor treatment for Seasonal Affective Disorder (Palmer, 1995).

The WAG Chief Medical Officer has emphasised the benefits of exercise to health, and the sense of wellbeing that can be derived from the countryside (Hall, 2004). It is recommended that adults should undertake at least 30 minutes of exercise, five days per week. Increased exercise in the majority of adults failing to achieve this level will improve their health. Physical activity and the experience of nature (natural views) can also improve quality of life. Recent reviews of the health benefits from greenspace and access routes (RSPB, 2004; Regeneris Consulting 2005) conclude that a lack of exercise is a key contributor to poor health and is particularly associated with heart disease, diabetes, strokes, cancer disability, osteoporosis, anxiety and sleep problems. The cost of physical inactivity has been estimated by the Department of Health (2004) as £8.2bn per year.

The distribution of benefits: disadvantaged communities

The distribution of benefits between different people and communities is important in a policy frame that gives considerable weight to resolving deprivation and assisting disadvantaged communities. WAG (2000) has an Index of Multiple Deprivation (IMD) calculated and mapped at the Electoral division scale. This is composite index based on indicators of deprivation in income, employment, health, education, housing and access to services. It does not at present include any element of environmental deprivation. A working group is currently looking at the whole of the IMD and the potential for including environmental indicators within it.

The most IMD deprived areas are in the South Wales valleys, much of West Wales, Anglesey and part of the North East. There is no urban/rural element in the mapping which would help to focus open/greenspace policy in relation to deprivation. However it is clear that much of the most deprived areas in Wales (in area terms) are in rural areas. But this may not be the case in terms of population. It would be important to map the IMD on population density to better inform on this aspect. For this reason the mapped IMD does not provide a satisfactory basis for measuring the contribution to deprived communities of open/green space measures.

A different approach to deprivation is to consider the degree to which communities lack quality green/open space and by implication would benefit from its expansion or improvement. The extent to which communities or businesses in high IMD areas are deprived of green or open space is unclear. However, population density suggests that use benefits from greenspace improvement are likely to be greatest in urban and peri-urban areas or where there are areas of post-industrial or unutilised land (as indicated in Hyder Consulting, 2004).

3.3 Costs of green/open space provision

The benefits from green and open space are not usually cost-free, the main types of cost to society being:

- Capital costs of purchase and enhancement.

- Maintenance, management and monitoring costs including legal costs of enforcement and grant aid to landowners.
- Opportunity costs - where land or water has a value for development or alternative activities. This is most obviously the case in an urban location. Where LAs are able to secure greenspace as a condition of planning permission this is cost free for the public sector but will involve costs to the developer.

The maintenance and management costs of greenspace to the public sector are considerable and account for a sizeable element of the CCW¹¹, FC and local authority budgets. There may also be costs to the private sector associated with publicly accessible greenspace, especially on protected sites and where the public access private land. However, a study on SSSIs in Scotland concluded that designation had not affected land values, and this suggests that costs to landowners of protected greenspace may be small (Scottish Executive, 2002).

3.4 Mapping of benefits to policy aims

This section maps benefit attributes on to policy aims in order to identify where the benefits from green/open space contribute to the achievement of the Assembly's strategic aims. The emphasis is on the evidence required to substantiate a contribution to a specific policy aim. Table 3.1 analyses how the benefits from green/open space may contribute to the main WAG strategic policy goals.

3.5 Conclusions

- Green and open spaces typically provide a mix of direct benefits – e.g. a park may provide visual amenity, access for recreation, and biodiversity. Characterising multi-functional spaces by such attributes often provides greater insights into the benefits they provide.
- Open/green spaces can provide benefits to the public and communities, the economy, and the environment. They can also provide derived benefits for health mainly when accessible space is used for physical exercise.
- There is considerable policy focus on disadvantaged communities in Wales but the distribution of benefits from greenspace in relation to disadvantage is unclear. This is an important issue for greenspace.
- Benefits to economic policy are likely to be greatest through the support of tourism and in improving urban design and image. It is not clear what types of expenditure on open/green space will provide the greatest benefits to tourism.
- Greenspace management is central to the Assembly strategy for the countryside and environment, and there is a priority to improve biodiversity and environmental quality.
- Community policy is highly targeted to those suffering social and economic deprivation. The contribution to community policy is primarily through the provision of visual amenity.
- Greenspace can contribute to health, active lifestyle and sports policies. It may also be significant for mental health and wellbeing although benefits from reduced air pollution appear quite localised.

□ ¹¹ For example, the 2003-2004 budget for CCW is £50.2m of which possibly £10-£15m can be allocated to protected site management and supporting operations (CCW, 2004).

Table 3.1 Contribution of green/open space benefits to Assembly strategic policy objectives

Links to policy	Analysis
Economic policy including tourism	
Access and recreation Landscape and visual amenity (unbuilt environments)	Little benefit to the main economic policy objectives of WAG (2003a) but more to tourism objectives. The important issue for the economy is whether tourism responds to additional investment in access/recreation and visual amenity, and if so where this investment should be targeted. The CROW Act will increase the supply of accessible land and the quantity of accessible land is unlikely to constrain tourism. Important as part of the setting for attracting and retaining businesses in an area.
Open space and visual amenity (built environments)	Important as part of the setting for attracting and retaining businesses in an area.
Countryside planning and environment	
Landscape and visual amenity (unbuilt environments)	Important as an element in attracting businesses to rural areas where environmental quality is a factor in business location decisions.
Biodiversity Water quality Flood control (reduced risk and damage from flooding)	A strategic priority to improve biodiversity and the quality of the environment.
Communities	
Landscape and visual amenity (unbuilt environments) Open space and visual amenity (built environments)	This policy objective is directed at communities suffering from exclusion and low health status and quality of life. The focus is on benefits from open/greenspace where target communities live and work. It is not clear what the most important benefits conferred by green/open space are in such situations but the evidence suggests that visual amenity in both built and unbuilt environments may be the most significant contribution.
Access and recreation Urban air quality Tranquillity and absence of noise	These benefits are probably less important to deprived communities than other socio-economic constraints (health aspects are considered below). However, it is possible to envisage that very poor quality of these attributes could be a significant constraint on quality of life. A detailed spatial analysis would be required to assess this aspect.
Health and social care	
Access and recreation	Many attributes of green/open space can contribute to the health and wellbeing of the population. The provision of attractive opportunities for physical exercise near where people live is essential if active lifestyles are to be encouraged. Exercise through walking is almost certainly the lowest cost route for provision of exercise but <i>opportunity</i> for exercise is not a sufficient condition for the achievement of active lifestyles. There may be social and economic barriers that prevent greenspace from being used.
Landscape and visual amenity (unbuilt environments) Open space and visual amenity (built environments)	There is evidence that mental health and wellbeing can be enhanced by provision of good quality open and green spaces. However, the emphasis in health policy is on physical activity and this requires space to be accessible.
Urban air quality Tranquillity and absence of noise	Whilst it is difficult to dispute that there may be benefits to quality of life from improved air quality and less noise, evidence is needed that the creation/enhancement of green and open space is a cost-effective method of achieving these aims. Space operates as a diluent and does not tackle the cause. Many of these benefits are only valuable in localised contexts. For example, WAG (2004a) indicates that air pollution is only a problem around Swansea and Cardiff/Newport. Noise will similarly be a restricted issue. Where space dilutes negative effects there is almost always a policy preference in favour of direct measures to reduce the negative factor (reduced emission of noise or pollutants). Space may be more valued as a component of urban design which enhances quality of life.

4 Benefits of green/open space: methods and estimates

4.1 Types of values

Economic benefits comprise both use values (e.g. use of green spaces for recreation; pleasant views from neighbouring properties; etc.) and non-use values (e.g. knowledge that wildlife is being protected by nature reserves; character of the landscape is being maintained by woodland; etc.).

The impact of these benefits can differ between people and businesses. Business interest lies in their impact on property prices or rental, and the marketability of the property (the impact of green/open space on the location and attraction of businesses, employees, and customers to the area). Businesses will also be interested in the impact of green/open space on sales e.g. where tourists are attracted by water and other open space features.

The public also derive monetary benefits from green/open space that are analogous to business interests e.g. impacts on property prices. However, the public also gain utility and non-pecuniary benefits from green/open space e.g. non-priced recreation and wildlife benefits. These are less important to business interests since no expenditure is involved from which businesses derive revenue and profits.

Public policy is concerned with changing the quantity, type and quality of green/open space to maximise the combined value to business and the general public.

4.2 Benefit estimation methods

Methods to value the green/open space are either based upon (1) assessing the related market impact of environmental changes through their effect on some marketed production (2) individuals' revealed preferences for green/open space, and (3) individuals' expressed preferences for the maintenance and provision of green/open space.

4.2.1 Effect on marketed production

'Effect-on-production' or market based measures are used to estimate the value of greenspace through changes in the price and quantity of marketed outputs affected by the provision of greenspace e.g. property prices or rental values. Typically not all the benefits of green spaces are captured in an 'effect on production' or market based method, for example if the neighbouring property is non-commercial, or if an entrance price for recreation on the greenspace is not charged. Nor do market based methods necessarily reveal consumer surplus values even when a price is charged. In these situations, values need to be determined through revealed and expressed preference techniques. However, only expressed preference methods can be used to determine the non-use value of greenspace goods. Market-cost based measures can express the value of greenspace in opportunity cost terms: the value of what is being lost by having a greenspace rather than some other alternative land-use. Thus, the SACTRA report (1992) argued (falsely as it turned out) that the opportunity cost of land (alternative use precluded by planning control) equated with the value of amenity lost.

4.2.2 Revealed preference

The principal revealed preference methods used to value greenspace are the travel-cost method (TCM) and the hedonic price model (HPM). Both of these methods only measure use values. The travel-cost method infers the value of greenspace by how much people are prepared to pay to travel to gain access to it. Thus people are prepared to pay to travel to country, community and urban parks, coastlines, canals, lakes, rivers, and gardens for recreation. Even if there is no entrance charge to a

site, visitors pay an implicit price in terms of travel and time costs to gain access to it. A survey of visitors to these sites would elicit the time and travel expenses incurred in visiting that site, and frequency of visit. By observing how visit rates vary as the cost of reaching the site differs across space, a recreational demand curve can be estimated for the site, and hence a value imputed. HPMs value greenspace by the premium people are prepared to pay, say in house prices¹², to live in close proximity to such a space, e.g. an urban park, canal, river, or woodland. HPMs have also been used to value negative externalities, e.g. the disutility that locally unwanted land-uses such as green corridors for electric power lines, have on house prices.

Unfortunately, TCMs and HPMs cannot be used to value all types of green space: people may not be able to live close to a nature reserve if land use planning prohibits or restricts housing near such sites. The benefits provided by preserving such green spaces as nature reserves need to be valued by an expressed preference approach such as contingent valuation. TCMs and HPMs cannot estimate non-use values, since there is, by definition, no related market good for the mere existence, as distinct from the use of the good. Hence, an expressed preference method is required to value non-use benefits of woodland, nature reserves, lakes, ponds, and other open spaces which provide major non-use benefits.

4.2.3 Expressed preference

Expressed preference methods, such as contingent valuation (CV) and multi-attribute stated choice experiments (MASCEs) have been used to estimate the non-use value society loses through development that damages natural resources. Contingent valuation is derived from the nature of the method: responses are sought from individuals as to their actions *contingent* on a particular hypothetical situation occurring. For example, individuals might be asked their maximum willingness-to-pay (WTP) to purchase a tract of land for a nature reserve contingent upon the nature reserve being created if sufficient funds are raised; or the minimum amount of compensation required to maintain the individual at his original utility level, if a nature reserve was abandoned to development.

CV provides a 'holistic' value for a good: it is usually applied to measure the value of a change in the quantity of greenspace across all its attributes. In formulating policy it is important to ascertain people's and decision-makers' preferences for the attributes or elements of green space. Multi-attribute stated choice experiments (MASCEs) allow the different attributes of greenspace and the surrounding development context to be valued as well as the value of the greenspace as a whole. By presenting different combinations of attributes of greenspace to an individual, and asking the individual to choose, say between pairs of combinations or alternatively to rank different choice sets, it is possible to extract the individuals' preferences and utility for specific attributes.

4.3 Issues in measurement

The benefit provided by greenspace can be measured by valuing green/open spaces individually, sequentially, or simultaneously. This benefit might be in terms of the amount of space (quantity), or its attributes (quality), or a combination of both quantity and quality.

4.3.1 Individual valuation

Most studies adopt an individual valuation approach: the greenspace is valued as a whole, under the *ceteris paribus* assumption. This is justifiable when only one greenspace (or other new tax call) is provided that will affect the household's budget.

□ _____
¹² HPM uses the differential in house prices as a method of quantifying the value residents place on their local environment. It should not be implied that increases in absolute house prices are desirable since such changes may discriminate against the less well off in society.

However, it is not justifiable to apply this value to subsequent provisions of green spaces (or other new tax calls) where these also affect the household's budget. This occurs because the benefit of any greenspace in isolation will be substantially greater than the benefit of the same greenspace considered as an increment to the existing amount of greenspace or other package of public goods.

4.3.2 Additional green space

The value of additional increments (new green spaces) can be determined by asking respondents their WTP for the first X number of green spaces, and then their WTP for $X+1$ green spaces. When green spaces such as woodland, country parks, community parks, nature reserves, environmental landscaping, public landscaping, footpaths, urban parks and play areas, are measured sequentially, the order in which a greenspace park is valued influences the value ascribed to it. Goods that are valued first are valued more highly than goods valued later. Thus, the value ascribed to each greenspace is not unique, but depends on the sequence selected.

This was demonstrated by Majid *et al* (1983) in the provision of additional national parks; and by Santos (1998) in the maintenance of different attributes in a rural landscape. When each element was valued independently, visitors' WTP was similar for each of the three elements (approximately £43 each per year) (Santos, 1998). However, when visitors were asked how much they valued say $P3$ (small broad-leaved woodland) conditional upon already having paid for $P1$ (dry stone walls and barns), their WTP was much smaller (at £17 per year). When visitors were asked how much they valued say $P3$ conditional on already having paid for $P1$ and $P2$ (hay meadows), their WTP was even less (£11 per year). This simply illustrates the fact that people see greenspace attributes as being substitutable. The value of the sequential provision of greenspace attributes can be estimated through contingent valuation techniques.

4.3.3 Substitution between attributes

When there are significant substitution effects between attributes, the total value of an environmental good is not the sum of independently valued attribute changes. Thus Santos (1998) estimated the sequential value for the maintenance of landscape attributes as a whole to be £72 per household per year. However, if each element of the landscape was valued independently and summed, then the total value for the complete conservation scheme would have been estimated at £128 per household per year. Thus valuing policy elements independently and then aggregating them overestimates the value of a policy.

The design of regeneration schemes permits several greenspace attributes (trees, grassland, lake, pond, public landscaping, play areas, etc) to be provided simultaneously. It is important therefore that any greenspace attribute is valued simultaneously alongside the provision of other greenspace attributes; this can be achieved with the use of multi-attribute stated choice experiments.

4.3.4 Valuing multiple attributes with MASCEs

People's preferences, demand and willingness-to-pay (WTP) for improvements or additions of greenspace attributes can be encapsulated through a MASCE. Such an experiment would present various combinations of greenspace attributes (e.g. trees, water features, other open space, and price change) to the public or developers, who would be asked to choose their most preferred alternative bundle of attributes (trees, water features, other open space, and price change). The attribute bundle set could also include the *status quo* or current situation with no price increase. By analyzing customers' preferences for different bundles of attributes, it is possible to estimate customers' values and WTP for improvements or additions of trees, water features, and other open space. It is also possible to estimate the proportion of the public who would be willing to accept a change from the *status quo* position (if this is included in

a MASCE) for any given combination of tree, water feature, other open space provision, and price change; i.e. it will be possible to estimate the market acceptability or demand for the change in greenspace provision. A MASCE approach has some advantages over other techniques such as HPMS and CV techniques. A MASCE can be designed to avoid problems of multicollinearity which can affect HPMS; and it can more easily and accurately estimate the demand and WTP for characteristics of a good than CV; whilst estimating, like CV, a value for the green/open space package as a whole.

It is important that any analysis is able to measure each greenspace attribute separately and additively, since a regeneration scheme or new development will have the option of combining different elements of green/open space. Economic value is maximised when the marginal benefit of additions of greenspace attributes equal the marginal (opportunity) cost of provision in the development.

4.3.5 Additionality of green/open space

In assessing the impact of green/open space on the location of firms and scale of employment, it is important to correctly identify the *addition* attributable to green/open space from that which would have occurred *without* its provision. Environmental attributes (green/open space, landscape quality, river water quality, etc.) are relatively insignificant or marginal variables affecting location decisions compared to availability of land, labour, and transport access. Because their influence on the decisions of firms is small compared to other variables, their effect is difficult to detect, and invariably studies have resorted to qualitative or intuitive methods to assess their impact. This has usually involved asking the managers of firms during interview discussions what effect the presence of green/open space had on their decisions. Information derived in this way, and particularly that based upon a small number of interviews, is questionable in terms of reliability and accuracy.

4.3.6 Other methods

There are various more quantitative techniques that can be used to identify the additional effect of green/open space. Trend analysis compares the number of firms or employment in two areas, over time, with differing degrees of green space. However, unequal change in employment between industries renders this approach unreliable unless the industrial mix is identical between the areas, with the only difference being the amount of green space. Alternatively, employment changes within similar firms located in areas with differing amounts of green/open space could be compared.

The major problem with all these approaches based on revealed or observed data is to control for all confounding factors apart from variations in green/open space. If the impact of different attributes of green/open space is required then a number of areas with differing quantities and qualities of green/open space would have to be identified. Obtaining accurate data on the number of firms and the employment in these firms for particular spatial areas over time might prove extremely difficult. NOMIS (National On-line Manpower Information System), for example, does not have a detailed spatial resolution of employee numbers because of problems of confidentiality.

An alternative way to proceed would be to use a contingent evaluation or stated preference method. This would ascertain from directors and managers of firms themselves whether different quantities or qualities of green/open space would have affected their actual location and employment decisions (for firms already in areas provided with green/open spaces) or will affect their location and employment decisions (for prospective firms considering moving into the area). Whilst this may initially be perceived to be subject to the same criticism that can be applied to

qualitative interviews, by adopting a more rigorous questionnaire and survey structure, and a larger sample size, more accurate and reliable results can be drawn.

4.4 Benefits from generic types of greenspace

Most economics research has focussed on the benefits derived from different types of green space. Taking account of the available studies we classify space as:

- Trees and woodland;
- Water;
- Footpaths and access ;
- Wildlife areas;
- Other types of green/open space without distinguishing characteristics.

Each of these types of green/open space can have different outputs in terms of recreation, landscape, biodiversity, air pollution absorption, and health effects, as well as differing attractiveness to firms. However, relatively few studies have identified the separate values of each output from the different types of green/open space. The following section provides some examples of typical values for these different generic forms of open space.

Studies of the demand for green/open space (e.g. woodland, water, wildlife areas, etc.) have invariably concentrated on their value rather than on their impact on the quantity of customers (e.g. attracted) to an area, or their impact on economic regeneration and sustainability. Thus research has investigated the recreational value of green/open space in terms of people's WTP for access to green/open space sites, rather than how the attributes of the green/open space affect the number of visitors attracted to the site. Similarly for property, research has concentrated on the value that green/open space adds to property rather than estimating the marketability of property with trees.

It should be noted that there are many factors influencing the demand for and value of property in addition to green/open space, including other location factors (such as proximity to areas of employment and trade, socio-economic neighbourhood characteristics), market conditions (local capital and rental values), and developers' and property owners' attitudes to risk (preferences and tastes, presence of other development and cost factors). Hence it is often difficult to separate the effects of trees and woodland, water, footpaths, wildlife areas, and other open space from the numerous other factors that affect value, marketability, regeneration and sustainability. The Department of the Environment (1995) found that improvements in an area's 'visual environment or amenity' reinforced investment decisions, but not sufficiently to induce investment. Other factors (e.g. reduction in crime levels) may play a much more important role in urban regeneration and influence on property values: Schwartz *et al* (2003) found that falling crime rates were responsible for about one-third of the post-1994 boom in property prices in New York.

Annex III provides a review of the benefit for the different types of green and open space listed above. The review collated the major sources of quantitative evidence from the economies and other literature. There is a marked lack of specifically Welsh studies. This limits the application of the data to Wales because of concerns about errors in the transfer of quantified benefit estimates from one context to another. However, the following general conclusions can be made:

Woodland

- Trees can contribute to property and landscape values and also in some instances to biodiversity values. Much depends on the type of trees and their scale or dominance in the landscape. Trees also impact on people's decision to purchase property.

- ❑ The value of woodland depends upon the context in which trees and woodland feature in the urban and rural landscape; the sequence in which this greenspace attribute is provided; and the scale of the existing provision of trees and woodland in the area.
- ❑ There is a dearth of evidence on the impact of trees and woodlands with respect to business location decisions in urban areas.

Water

- ❑ Water appears to add a significant premium to property values, especially for property fronting onto desirable water features: lakes, rivers and canals with good water and scenic qualities, and a smaller premium to properties in close proximity and with views over water features.
- ❑ The location decision of certain types of business are influenced by the presence of water features, especially those in the leisure and tourism industries.

Footpaths and access

- ❑ The value and people's WTP for additional local footpaths and access is quite small for local access, whether to water, woodland, or open space, if existing footpath provision is adequate i.e. substitute footpaths exist that can be used for recreation walks.
- ❑ WTP for footpaths for ubiquitous activities such as dog-walking, casual walks, etc. are very low: a few pence per walk; although a large number of walks (or visits) fall into this category.
- ❑ WTP for purposeful walks in rural areas along well managed paths and trails (e.g. in Forestry Commission forests, or along national footpaths) is much higher; although by comparison with local urban casual walks, the number of walks (or visits) undertaken in this category is relatively small.

Wildlife areas

Benefits vary enormously depending on:

- ❑ Type of wildlife and habitat conserved.
- ❑ Perceived quantity of the existing habitat.
- ❑ Whether the habitat or species (being conserved or restored) is rare or endangered.

Other open/green space

Other open/green space:

- ❑ Impacts significantly on surrounding property prices.
- ❑ Provides recreation values per visit that in urban areas are often small, relative to purposeful trips to countryside sites. However, urban parks can attract large numbers of visitors.
- ❑ Has a small but largely indeterminate effect on business location decisions.

4.5 Benefits to health

Health effects of green and open space represent a benefit derived from their use. Because of their policy importance we analyse these effects separately. It is usually assumed in WTP and related studies of recreation that people's WTP incorporates their perceived health benefits. If so they are already incorporated in the estimates given in Annex III. However, it may be that longer-term health benefits are

undervalued by respondents because they do not have full information about either their health status or the contribution of exercise in producing positive health outcomes.

Benefits from greenspace

There is a well-documented literature (reviewed for example by Morris, 2003) that suggests natural open and greenspace have health and wellbeing impacts on the residents of inner city and suburban areas. There are also therapeutic benefits from rural greenspace and 'wilderness' areas. For example, trees have been shown to lessen stress and encourage positive social interaction. A study of residents in Chicago assessed social ties, personal relations, and means of dealing with conflicts between family members and neighbours of residents who lived in tree lined streets compared to those in non-tree lined streets. In buildings with trees, residents reported significantly better relations and stronger feelings of unity and cohesion with neighbours, and greater reliance on more constructive and less violent means of dealing with conflict (Sullivan and Kuo, 1993). The impact of trees on enhancing recovery from illness has been studied in the USA. Ulrich (1981) measured pulse, skin conductance, and muscle tension, and found that subjects exposed to scenes dominated by trees had slower heart rates, lower blood pressures, and more relaxed brainwaves, and recovered faster from stress than those exposed to urban scenes. Another nine-year study of hospital surgical patients compared recovery rates of patients with natural views including trees through their windows compared to similar patients whose windows looked out onto brick walls. Patients with tree views took, on average, 10% less time to recover, and made fewer requests for analgesics, than other patients (Ulrich, 1979).

In the health literature the benefits from open and greenspace is associated with the opportunity to obtain physical exercise (e.g. Department of Health, 2004). There is universal agreement that a lack of exercise contributes to poor health status. Physical activity can reduce the incidence of a wide range of important diseases and medical condition including coronary heart disease, diabetes, stroke, hypertension and certain types of cancer. However, exercise-related benefits from open and greenspace only occur when the space is used for activity. Benefits are thus dependent on increased use; benefits will be greatest for those individuals at greatest risk from a lack of exercise.

Air pollution

Probably not included in house price and stated preference WTP values for health impacts of greenspace is the contribution that trees make towards air quality improvement. A study by Powe and Willis (2004) assessed the benefits of SO₂ and PM₁₀ absorption by trees by an epidemiological model in terms of extending life expectancy of the population and reducing hospital admissions. Working at a resolution of 1km² with woodland over 2 hectares, it is estimated that, for Britain as a whole, woodland saves between 5 and 7 deaths, that would otherwise have been brought forward, and between 4 and 6 hospital admissions each year. The economic value of the health effect of woodland is estimated at less than £1 million per year for the whole of Great Britain. This occurs because most trees are located in areas of least pollution and population. The pollution absorption value for a small area of woodland in an urban area will be extremely small. However, because trees are located closer to population, and pollution sources, urban woodland will generate proportional greater additional benefits per hectare of air pollution absorption than those estimated over the country as a whole.

Economic impacts

Beneficial impacts on health are difficult to quantify in economic terms, but estimates have been made for the value of increased output resulting from improved health and reduced costs to the NHS (Department of Health, 2004). Swales (2004) used a risk

model to estimate the benefits in reduced mortality from a 25% reduction in the number of sedentary adults in Northern Ireland. The reduction in health service costs was £0.62m per year but the total savings to society would be vastly higher if the value of lost output and the human cost of death were included.

The open/greenspace interest in analysing health benefits is to determine the extent to which additional investment in creation and management of such space would provide a public benefit. In economic terms, this would reflect the valuation people place on improved health status and reduced risk of ill-health. A related measure is the extent to which such investment contributes to policy objectives (e.g. in Health Challenge Wales) and in reducing NHS treatment costs.

Conclusions

The literature suggests that:

- Benefits to society from increased physical exercise can be substantial in 'at risk' groups.
- Green and open space also provides benefits through enhanced wellbeing and quality of life.
- The economic costs and benefits of greenspace as a mechanism for improving health and well being are under-researched and not well quantified.

4.6 Impacts on the economy

Where open/greenspace generates expenditures there is an impact on incomes and employment¹⁵. Such expenditures could relate directly to the management of the space itself (e.g. maintenance expenditure on footpaths, woods, reserves, parks). But they also occur when greenspace attracts tourists to an area and they spend on accommodation, food and equipment. A good example of where greenspace use generates economic activity is the creation of long distance trails, CROW land and specialist areas for mountain biking. The Offa's Dyke path generates £1.3m per year in expenditure and the Pembrokeshire coast £11.0m (Entec, 1998). Not all of this expenditure is additional, especially in Pembrokeshire, because some users of the path would have visited the area anyway. There is also good evidence for job creation from specialised activity areas (e.g. mountain biking in Glen Tress) and nature based tourism (CJC Consulting, 2004). In such cases tourists are attracted to an area by the special qualities associated with the greenspace.

Such expenditures also create multiplier effects in the local economy such that the ultimate impacts on income and employment are higher than that from the first round of expenditure. The 1990 Pennine Way study derived a total income generation coefficient of £0.16 per pound spent, and an employment coefficient of 0.6 jobs per £10,000 spent.

The economic impacts of the environment in Wales have been calculated in National Trust (2001) and summarised by Bilsborough and Hill (2002). The report concluded that 1 in 6 jobs in Wales depended on the environment (direct environment-related jobs plus multiplier effects). The role of the environment in economic expansion was through tourism, inward investment, environmentally beneficial farming, value-added environmental goods, and increased waste reduction and recycling.

4.7 Conclusions

HPM have shown that green/open space, and its attributes, add to house values. There is less evidence of the systematic impact of green and open space attributes on commercial and industrial property values. CV and TCM have also estimated the

□ ¹⁵ Equally, where protected green or open space prevents other economic activity there may be negative economic impacts.

value of recreational access to urban parks and local woodland. The additional value attributable to green/open space is generally small (and also variable, depending upon the attributes of the space) compared to other factors determining house prices. Recreational values of green/open space are also small compared to many other urban recreational attractions. Estimates of the value of woodland, water, wildlife areas, and other greenspace produced by different studies vary enormously. These values are a function of the actual characteristics of the good (green/open space), the methodology used (HPM, TCM, CV, etc.) to estimate value, and the local context in which the valuation is undertaken.

Methodologically, in valuing green/open space, revealed or observed preference methods (HPM and TCM) cannot value all of the externality aspects of this good (e.g. non-use values such as existence and bequest values). Thus CV or stated preference methods need to be employed in addition to revealed preference approaches. However, in applying more than one method to value green/open space, there is a need to avoid double counting. For example, some recreation value will be capitalised into house prices along with landscape and amenity value, so undertaking a separate TCM or CV model to estimate the recreation value of urban green/open space will involve some double counting.

It is also difficult methodologically to isolate accurately the effect of one variable amongst many that affect the rate of economic development, or a business decision to locate in one area rather than another; especially for a factor, such as open/green space, that, for most industries, is relatively insignificant compared with other factors affecting their rate economic development or decision to relocate to an urban regeneration area. Moreover, there is only limited direct information on the impact of greenspace on regeneration and tourism in Wales.

Greenspace can contribute significant benefits to local economies. Where greenspace attracts tourists there are benefits to local economies from any additional injections of expenditure. The immediate beneficiaries are suppliers of food, accommodation and equipment but the multiplier effects mean that the ultimate impacts are much wider. These benefits are most apparent where 'new' opportunities are created for activities such as a long distance walking, mountain biking and nature tourism.

5 Conclusions and implications for Phase 2

5.1 Policy gaps

The fit between the activities of partner organisations and WAG strategic policy with respect to open/green space was assessed by mapping one on the other. Since this is an economics study we limited the mapping to the strategic, sustainable development and economic policies of the Assembly (WAG, 2002a, 2003a, 2004c).

Analysis of the Forestry Commission, WDA and CCW strategies (Annex II Tables 8.9, 8.10) shows a very close fit, presumably because the partners' strategy documents were written to achieve this. Since the principal WDA policy document ('A Winning Wales') is Assembly's economic development strategy there is by definition a perfect fit between WAG and WDA policies. We can also identify a very close fit between WAG policy and WDA delivery in other aspects of policy including the delivery of sustainable development. However, policy mapping at this level of detail is not very informative. A much more detailed analysis of agency expenditures would be required to take this further.

With the Environment Agency (Annex II Table 8.11), the fit is less precise and this presumably reflects the fact that the EA's strategic policy is not specific to Wales but covers all regions of England and Wales.

The strategy and activities of Groundwork Wales have recently been reviewed (Baker Associates, 2004). They listed 25 strategic objectives of which Annex II Table 8.12 gives the principal ones relevant to green and open spaces. It is clear that there is a very close link between the Trusts' activities and the strategic objectives of the Assembly. Baker Associates conclude that 'The review has shown that Groundwork Trusts deliver projects, programmes and initiatives that respond to almost all of the relevant objectives of the Assembly.....Trusts contribute to the social, economic and environmental parts of the sustainable development agenda. The overall conclusion on Groundwork's contribution to the delivery of Assembly objectives must therefore be that, in the areas where Groundwork Trusts operate, the contribution is diverse and substantial'.

There are few identifiable gaps between higher-level (especially WAG) strategic policy statements and partner policies within their statutory domains. This not surprisingly reflects the fact that partner policies have generally been designed to conform to higher level strategic aims. Searching for gaps is thus not very productive. It would have to be done at a much more detailed and programme-specific level to assess the effectiveness in delivering WAG policy and its value for money. This is not possible within a scoping study.

5.2 Methods and approaches

We suggest the following as the main research methods that partners should consider in future work.

Methods for valuing open/green space in Wales

To provide benefit values for different types of space, the methods of choice are HPM and MASCE.

- **HPM.** This could use revealed or observed behaviour to evaluate how much households are willing-to-pay for the green/open space available in different areas of Wales. Open/green space would be carefully characterised e.g. in terms of quantity and its attributes, and substitute green/open space sites in the neighbourhood.
- **MASCE.** This would present to existing residents and industrial/commercial firms different factors (e.g. road access, parking, density, green/open space, house-

price or commercial rent, etc.) associated with development in their area and potential changes to these factors. From the analysis of choices it will be possible to estimate the utility and value (WTP amount) respondents place on open/green space and its attributes. Potential residents and industrial/commercial firms would also be asked to indicate, from developments with alternative bundles of attributes, in which area they would choose to locate. An analysis of these responses would provide information on potential residents/firms' value of green/open space; and also the number of respondents who would move to the area, compared to the current *status quo*, as attributes, including greenspace, change.

The second method is attractive because it provides more information about environmental quality attributes and the case for environmental improvement. However, the HPM methods are based on revealed preferences which are normally considered to be a more reliable source of evidence than stated preference.

Economic analysis of specific measures

This would use benefit values from the literature (or new estimates) as a basis for a cost-benefit assessment of the contribution of open/green space.

Taking health as an example, a benefit study could be focused at national level or on specific case study areas. In either case the key determinants would be

- Mechanisms for increasing activity levels in sedentary groups (e.g. Groundwork's 'Walking the Way to Health' programme and CCW's 'Walking to Health' scheme).
- The scope for changes to greenspace to facilitate greater exercise (e.g. signage, new routes etc).
- The value of benefits (determined from participants using CV or MASCE methods and health outcomes).
- Modelling the costs and benefits of action.

Similar types of investigation could be designed to assess benefits to tourism, urban open and greenspace or community regeneration programmes.

5.3 Phase 2 options

The conclusion from our review is that the partners should consider the following areas as having most scope for open/ green space to contribute to the emerging higher-level policy priorities:

Health, recreation and sport

Improving the health status of the Welsh population is a central element in Assembly policy, and a healthier lifestyle with more exercise is seen as an important mechanism for achieving this. The WAG sports strategy emphasises the role of greenspace in providing facilities for outdoor sport.

The message for open/green space is that benefits will be greatest where greenspace provision and/or quality is (i) limiting the ability of the population to exercise, and (ii) can be developed to allow increased activity. Changing the behaviour of sedentary people, and offering attractive opportunities for exercise have to go hand in hand.

There is a need for research that links behavioural change, activity levels and health outcomes in order to provide a sound basis for investment. Evidence currently available suggests that policy should focus on:

- Areas of deficit close to where people live (this emphasises open town space, parks etc.). RSPB (2004) conclude that to increase physical activity in greenspace the space should be accessible (within 2 km of home) have a good

surface and feel safe. English Nature (1996) has similarly established an Accessible Natural Greenspace Standard ANGSt);

- Targeting high risk communities who will benefit most, rather than healthy, physically active users;
- Active sport and recreation development of greenspace; and
- Integration with other agencies etc. to remove barriers to participation (e.g. health promotion).

Two types of evidence would be valuable to support this approach:

- Economic evidence on the costs of additional greenspace (creation, enhancement) and its benefits in terms of health outcomes.
- GIS analysis to map out the where additional greenspace for physical activity offers the best return to society.

Tourism

The emphasis in WTB strategy is on increased tourist numbers and expenditure as a contribution to the Welsh economy. Benefits to individual visitors (as quantified in WTP studies) are important because these will in part determine tourist numbers and spend. Information on the benefits from specialised activities on greenspace (mountain biking, orienteering etc.) is limited. FC has a research study underway to improve the benefit estimates for different types of forest recreation. EA has estimated the benefits from angling. The benefits to users from these leisure activities, and their local economic impacts can be substantial. For example, CJC Consulting (2004) has shown excellent returns to FC investment in mountain biking facilities in Scotland.

The WTB has strategic plans for the principal outdoor recreation areas. Project partners should assess greenspace development in terms of demand by both tourists and the resident population. There is a lack of detailed evidence on returns to investment, but high-use specialised activity facilities probably offer the greatest overall benefits. This will be informed by the current FC work.

Urban design and greenspace

The lack of evidence on the size of the benefits from urban parks and greenspace had been noted in our review. Cabe (2005) encourage further work 'to establish quantifiable and robust indicators of the economic benefits'. Much of the existing evidence from assertion and comparative case studies is unreliable because it fails to differentiate the impacts of green/open space from other changes over time or across space. But this is a challenging area for research because greenspace is only one of a large number of attributes that affect property values and the welfare of urban residents.

Planning and community policy guidelines do not set quantitative requirements for local authority greenspace. Key activities in order to raise the profile of greenspace include:

- Obtaining better quantitative evidence on the benefits to communities and business from enhanced open/greenspace including parks.
- Assessing the extent to which benefits are integrated into strategic LA policies such that greenspace is given due prominence in council policies.

Economic and social development

Greenspace is important as an element in the WDA strategy of creating a clean, green image for investment. It is a factor in image creation and rebranding, although opportunities are limited and mainly occur as part of regeneration and development. There is some evidence that quality open and greenspace in towns produces high

benefits but more evidence specific to Wales would be valuable. The evidence for greenspace impacts on business location and economic performance is quite limited and the outcomes largely indeterminate.

Assembly policy is highly targeted to deprived areas and this is where open/greenspace enhancement could contribute most to the policy agenda. It suggests that partners need a very targeted approach taking account of IMD if social and economic benefits from greenspace are to be maximised.

The role for environment in economic development is minimal in Objective 1 policy, and opportunities for synergy may have been lost. In the Scottish Objective 1 and 5b programmes there were over 100 environmental projects with an investment of £23.5m (Hill *et al.*, 1999). These produced multiple benefits - to the environment and in terms of beneficial impacts on the local economy in remote areas. Many increased employment at relatively low cost.

Environment

Analysis of environmental policy was severely limited by the lack of an Assembly strategic policy for the environment. Much of the EA and CCW activity will be concerned with obligations under the WFD, the Habitats and Birds Directives and CROW, together with the overall commitment to environmental sustainability. Whilst there is considerable data on the public benefits from wildlife, nature reserves, rivers etc. little applies directly to Wales and much depends on context and use by the public.

As viewed from the perspective of other WAG policies the environment has multiple functions as an enabling resource for economic development, community wellbeing, health, sport etc. Since these are often spatially targeted to focus resources where impacts will be greatest, again this indicates that agencies need to review the spatial focus of their activities.

The Assembly is currently writing its environmental policy. Much of the content will be concerned with obligations and strategies relating to EU policy (see above). Nevertheless, there is a strong case for a more generic appreciation of the role that greenspace plays as an environmental asset for people in Wales, but an asset that needs to be valued and managed if its full benefits are to be realised.

6 References

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7 Annex I Definition of green and open space in planning legislation

7.1 Definitions of open and greenspace

Planning Policy Wales 2002 makes one reference to greenspace and otherwise refers to open space. The greenspace reference is used in conjunction with open space with local authorities required to include planning policies to promote access to such areas. There is no definition of open space in TAN 16 Sport and recreation, however the wider embracing more recent English equivalent Planning Policy Guidance Note 17: Planning for Open Space, Sport and Recreation (PPG17) 2002 states that, 'Open space should be taken to mean all open space of public value, including not just land, but also areas of water such as rivers, canals, lakes and reservoirs which offer important opportunities for sport and recreation and can also act as a visual amenity'.

Based on the recommendations of the Urban Green Space Task Force, PPG17 provides the following typology to illustrate the broad range of open spaces that may be of public value:

- i. parks and gardens - including urban parks, country parks and formal gardens;
- ii. natural and semi-natural urban greenspaces - including woodlands, urban forestry, scrub, grasslands (eg downlands, commons and meadows) wetlands, open and running water, wastelands and derelict open land and rock areas (eg cliffs, quarries and pits);
- iii. green corridors - including river and canal banks, cycleways, and rights of way;
- iv. outdoor sports facilities (with natural or artificial surfaces and either publicly or privately owned) - including tennis courts, bowling greens, sports pitches, golf courses, athletics tracks, school and other institutional playing fields, and other outdoor sports areas;
- v. amenity greenspace (most commonly, but not exclusively in housing areas) - including informal recreation spaces, greenspaces in and around housing, domestic gardens and village greens;
- vi. provision for children and teenagers - including play areas, skateboard parks, outdoor basketball hoops, and other more informal areas (e.g. 'hanging out' areas, teenage shelters);
- vii. allotments, community gardens, and city (urban) farms;
- viii. cemeteries and churchyards;
- ix. accessible countryside in urban fringe areas; and
- x. civic spaces, including civic and market squares, and other hard surfaced areas designed for pedestrians.

This typology, or variations of it, should be used by local authorities when preparing assessments of need and audits of existing open space and recreational facilities.'

7.2 Functions of open and greenspace

The function of the spaces also has implications with respect to a definition, with PPG17 noting that open space can perform multiple functions such as:

- i. strategic functions: defining and separating urban areas; better linking of town and country; and providing for recreational needs over a wide area;

- ii. urban quality: helping to support regeneration and improving quality of life for communities by providing visually attractive green spaces close to where people live;
- iii. promoting health and wellbeing: providing opportunities to people of all ages for informal recreation, or to walk, cycle or ride within parks and open spaces or along paths, bridleways and canal banks. Allotments may provide physical exercise and other health benefits;
- iv. havens and habitats for flora and fauna: sites may also have potential to be corridors or stepping stones from one habitat to another and may contribute towards achieving objectives set out in local biodiversity action plans;
- v. as a community resource: as a place for congregating and for holding community events, religious festivals, fêtes and travelling fairs; and,
- vi. as a visual amenity: even without public access, people enjoy having open space near to them to provide an outlook, variety in the urban scene, or as a positive element in the landscape.'

8 Annex II Policy analysis

Table 8.1 Objective 1 – West Wales and the Valleys

Policy origin	EU EAGGF, ERDF, ESF and FIGF funds
Reference	West Wales and the Valleys Objective 1 Single Programming Document (SPD) 2000-2006, Welsh European Funding Office

Policy themes with direct or indirect relevance to environment and open/greenspace

Themes	Relevant to environment?	Relevant to green/open space?	Main message
Priority 3 Community economic regeneration	Indirect	Indirect	Declining manufacturing and extractive industries not replaced by development of the service sector has left much of peripheral Wales with communities with low skills, limited sustainable employment and multiple deprivation, including poor physical environments.
Priority 5 Rural development and the sustainable use of natural resources	Direct	Direct	Agriculture and forestry are no longer developing sectors and the direct and multiplier-induced workforce is in decline. Policy needs to encourage sustainable jobs in new SMEs and maintain a high quality environment as a resource for rural activity.
Priority 6 Strategic infrastructure Development	Indirect	indirect	The aim is to remove key constraints to growth and help develop the potential for economic development in the peripheral regions of Wales. The development of environmental infrastructure is related to the requirements of the Waste Directive and WFD.
Cross cutting issue; Environmental Sustainability	Direct	Direct and indirect	Strong community identity provides a basis for community-led action and addressing social problems

Stated measures and actions relevant to green/open space

Policy area	Measures and aspirations	Reference to specific measures in place	Consultant notes
Priority 3 Community Economic Regeneration	<input type="checkbox"/> Will address poor physical environments.	<input type="checkbox"/> 3.3 Regeneration of deprived areas through community-led action: includes projects to improve the local physical environment.	Measures spatially targeted using an index of deprivation. Although the importance of improving poor physical environments is recognised the environmental element is quite marginal within the overall priority area.
Priority 5 Rural Development and the Sustainable Use of Natural Resources	<input type="checkbox"/> Protect and enhance the environmental assets of the region. <input type="checkbox"/> Ensure regeneration funds are used to maximum effect.	<input type="checkbox"/> 5.3 Forestry measures including woodland management. <input type="checkbox"/> 5.7 A sustainable countryside – enhancement and protection of the natural environment and countryside management.	This priority includes a wide range of measures associated with agriculture, forestry, the countryside and the natural environment. Funding is derived from EAGGF and the principal expenditures are on agriculture, forestry and land management rather than the development of the environment either as a

Policy area	Measures and aspirations	Reference to specific measures in place	Consultant notes
		<ul style="list-style-type: none"> <input type="checkbox"/> 5.8 Support for recreational opportunities and management of the natural environment. <input type="checkbox"/> Numerous measures within the Rural Development Regulation (RDR). 	<p>stock of natural capital or an asset for economic and social activity.</p>
<p>Priority 6 Strategic Infrastructure Development</p>	<p>It is stated that this will enable environmental strategies to be delivered in parallel with the economic strategy.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> 6.4 Environmental infrastructure: The main focus is remediation of contaminated land and polluted discharges. 	<p>Few projects anticipated - while this will provide benefits to greenspace it is a highly specialised measure for addressing previously unsustainable industrial and waste management practices.</p>
<p>Cross cutting issue: Environmental Sustainability: to maintain and enhance the environmental assets of the region.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Promote efficient use of natural resources (protect greenfield sites, reduce pollution from surface runoff; measure to promote sustainable agriculture and forestry). <input type="checkbox"/> Support sustainable land use. <input type="checkbox"/> Develop monitoring programmes to establish links between community health and environmental quality. <input type="checkbox"/> Improve the quality of the environment to support sustainable development and protect vulnerable communities. 	<p>No direct measures but two mechanisms (sustainability targets and questions) have been adopted to encourage projects submitted under other priorities to contribute to this objective. These issues therefore impact at the point of project selection.</p>	<p>Very difficult to determine how effectively these issues have been developed in the programme.</p>

Table 8.2 Wales: A Better Country (2003a)

Policy origin	Welsh Assembly Government
Reference	http://www.wales.gov.uk/themesbettercountry/strategic-e.pdf

Policy themes with direct or indirect relevance to environment and open/green space

Themes	Relevant to environment?	Relevant to green/open space?	Main message
Helping more people into jobs	Indirect	Indirect	The challenge of raising the level of economic activity by increasing the number of people participating in work.
Improving health	Indirect	Indirect	Poor health is higher in Wales than in the rest of the UK and is associated with deprivation. Improving health means better services, primary care and the promotion of healthy lifestyles.
Developing strong and safe communities	Indirect	Indirect	Strong community identity provides a basis for community-led action and addressing social problems.

Stated measures and actions relevant to green/open space

Policy area	Measures and aspirations	Reference to specific measures in place	Consultant notes
Economic policy: Promoting a diverse, competitive, high value-added economy, with high quality skills and education that minimises demands on the environment.	<ul style="list-style-type: none"> <input type="checkbox"/> Getting more companies into Wales, especially modern companies in IT and high-tech sectors. 	<ul style="list-style-type: none"> <input type="checkbox"/> Economic policy: "A Winning Wales." <input type="checkbox"/> Objective 1. 	Opportunities stated to occur in environmental goods and services. Is a lack of quality green/open space a factor limiting the location of new businesses of this type in Wales?
Countryside planning and environment: To enhance pride in the community, supports biodiversity, promotes local employment and helps to minimise waste generation, energy and transport demands.	<ul style="list-style-type: none"> <input type="checkbox"/> Improve biodiversity and quality of the environment. <input type="checkbox"/> Inclusion of sustainable development principles in planning policy. 	<ul style="list-style-type: none"> <input type="checkbox"/> Planning Policy Wales. <input type="checkbox"/> Planning: delivering in Wales. 	New environment strategy under development.
Communities: Action on social justice that tackles poverty and poor health.	<ul style="list-style-type: none"> <input type="checkbox"/> Promote social inclusion. <input type="checkbox"/> Tackling poverty. 	<ul style="list-style-type: none"> <input type="checkbox"/> Communities First programme. 	The new index of deprivation shows that problems are concentrated in poorer inner city areas and the upper valleys but also in many coastal ports and towns.
Health and social care services: Supporting people to live healthy and independent lives.	<ul style="list-style-type: none"> <input type="checkbox"/> Shift the balance in the acute sector towards preventing ill health. <input type="checkbox"/> Active lifestyle strategy for older people. 	<ul style="list-style-type: none"> <input type="checkbox"/> Local Health, Social Care and Wellbeing strategies. 	

Table 8.3 The Sustainable Development Action Plan (2004)

Policy origin	Welsh Assembly Government
Reference	http://www.wales.gov.uk/themessustainabledev/content/review/action-plan-let-e.htm

Policy themes with direct or indirect relevance to environment and open/green space

Themes	Relevant to environment?	Relevant to green/open space?	Main message
Liveable places, strong communities	Direct (built environment and transport)	Indirect	A re-think on the design of villages, towns and cities and transport such that they make fewer demands on natural resources and improve the lives of inhabitants.
Our natural environment	Direct	Indirect	Natural resources are a major asset. Too many people in Wales suffer from a poor quality environment and the challenge is to provide good quality local environment of clear benefit to the inhabitants.
Developing strong and safe communities	Indirect	Indirect	Strong community identity provides a basis for community-led action and addressing social problems.

Stated measures and actions relevant to green/open space

Policy area	Measures and aspirations	Reference to specific measures in place	Consultant notes
Liveable places, strong communities	<ul style="list-style-type: none"> ❑ Improve planning and transport to make it more sustainable and provide better outcomes for citizens. 	<ul style="list-style-type: none"> ❑ Communities First programme. ❑ Wales Spatial Plan. 	Mainly a re-think on planning strategy and policy, and a focus on the situation of the most deprived communities. No specific mention of green/open space but this is clearly an element in design of the built environment.
Our Natural Countryside	<ul style="list-style-type: none"> ❑ Mainly responses to obligations under the WFD and CAP. ❑ An environment strategy to be published in autumn 2005. ❑ Consult on vision for the future of the countryside. 	<ul style="list-style-type: none"> ❑ Tir Cynnal agri-environment scheme. ❑ Action on diffuse pollution as required by the WFD. 	Much of this theme relates to the delivery of obligations under EU Directives or the CAP. Both will be important for the quality of green spaces and their management. The measures will do little to address the main message which is the poor quality of the environment suffered by too many people in Wales.
Monitoring and reporting	<ul style="list-style-type: none"> ❑ Development of a set of high-level and additional indicators covering (amongst others) biodiversity, deprivation, the level of economic activity, economic progress as reflected in wider measures than GDP. 	<ul style="list-style-type: none"> ❑ Indicators Working Group to develop indicators. 	Indicators can now be key drivers of policy - the type of indicators and the way they measure issues such as deprivation, biodiversity and 'economic progress' will have important repercussions for funding in the future.

Table 8.4 Technical Advisory Notes

TAN ¹⁶	Key themes	Relevant to Environment ?	Relevant to green/ open space?	Measures relevant to green/open space	Other information	Drivers
5: Nature conservation & planning	Maintenance of nature conservation value.	Direct	Direct (but only to open space with value for nature conservation)	Protection of international /national/ local statutory designated sites of nature conservation importance.	Considers integrity of SACs, SPAs & SSSIs through planning process including potential off-site impacts. Identify & have regard for LNRs in local plans, in particular value for local communities.	EC Habitats Directive (92/43/EEC); EC Birds Directive (79/409/EEC); Habitats Regulations 1994). (Wildlife & Countryside Act, 1981).
				Recognition of value of & protection of local sites & wider countryside. The development of a network of linkages between sites for genetic exchange.	Contribution of wider countryside to habitat network; selection of SINCS (<i>criteria usually include value to local communities</i>). Potential importance of common land ecologically & of its protection & management.	Habitats Directive, Article 10 Habitats Regulations, 1994, Regulation 37.
10: Tree Preservation Orders	Protection of trees within development plans.	Direct	Indirect	Provision of TPOs associated with trees/ woodland of significant value for environment & amenity.	Trees should be visible (from a public place or reasonable number of properties). Indirectly places added value of open space with TPOs	Town and Country Planning Act 1990.
				TPOs as a material planning consideration.		
13: Tourism	Great importance of tourism to Welsh econom.	Direct	Indirect	Development plans to guide appropriate projects & provision of facilities. Protection of sites of importance designated for natural features (NP, AONB, Heritage Coast etc.).	Indirect value of greenspace strongly linked to tourism.	Economics Caravan Sites and Control of Development Act 1960 Indirectly EC nature conservation directives.
	Potential conflicts between tourism & other uses.	Direct	Indirect	Ensure development of accommodation is sympathetic with environment.	Particularly consider coastal locations & visual intrusion.	
14: Coastal planning	Importance of coastal zone for a range of users.	Direct	Indirect	Considers impacts of development upon other uses.	Importance for conservation/ recreation - Visual impact for recreation; impacts on integrity of internationally designated sites. Development that does not require a coastal location should not be permitted.	Bathing water (76/160/EEC); Assessment of Environmental Effects (85/337/EEC); Urban Waste Water Treatment (91/271/EEC); Birds Dir; Habitats Dir.
	Importance of dynamic physical	Direct	Indirect	Considers impacts of development on natural	Indirect value of greenspace as a buffer e.g. against coastal flooding in low lying	



¹⁶ Note that all TANs will be updated to reflect publication of 'Planning Policy Wales' 2002, Welsh Assembly Government

TAN ¹⁶	Key themes	Relevant to Environment ?	Relevant to green/ open space?	Measures relevant to green/open space	Other information	Drivers
	marine processes.			processes & vice versa – risk to development.	coastal areas.	
				Impacts of proposals on site & off site (again due to dynamic natural processes).	Requires definition of the coastal zone.	
	Public access to the coast as a basic principle.	Direct	Direct	Public access considered as positive feature of any development.	Where appropriate – may conflict with nature conservation.	
				Heritage Coast landscape designation.	Balance recreation with nature conservation.	
15: Development & flood risk	Direct new development away from areas at high risk of flooding ('Precautionary Framework').	Direct	Indirect	Restriction of development on land classed as vulnerable to flooding.	Government policy directs resources for flood & coastal defence at reducing risks for <i>existing</i> development & not to provide defences in anticipation of future development. Offers indirect level of protection to some green/open space but may also direct development to other areas if they are at low risk of flooding.	Planning Guidance (Wales): Planning Policy: First Revision 1999; Town and Country Planning Act (1990) amended by the Planning and Compensation Act (1991). Sustainable development principles (adopted by PPW, WAG).
	Zoning for appropriate development in areas at risk of flooding.		Direct	Acceptance of proposals for public open space, outdoor recreational uses & agricultural developments in areas where there is a risk of flooding.	Zoning policies dictate what type of development is permitted within them & trigger the appropriate planning tests by local PA's. The EA has a duty to advise PA's & developers on flood risk assessment.	Planning Guidance (Wales): Planning Policy: First Revision 1999; LA Unitary Development Plans.
16: Sport & recreation	Provision of adequate sport & recreation facilities.	Direct	Direct	Protection of open land resource for recreation/amenity, particularly in areas of deficiency.	Potential conflict with natural/historic environment. Recognises value of open space for communities. LA obligations to protect open space. Value of sports pitches for wider recreation use by community & contribution to urban environment.	Town and Country Planning Act 1990; Local Government (Misc Provs) Act 1976; Recreational Land General Disposal Consent 1977.
18: Transport (draft)	Development of a sustainable & integrated transport system.	Direct	Direct	UDPs are the principle method of integrating strategic planning & transport policies and are subject to environmental appraisal.	Recognition of the negative impacts of transport. Demand & alignment of new roads (which may have some indirect relevance to green space) is considered in UDPs.	Planning Guidance (Wales): Planning Policy: First Revision 1999; 'Transporting Wales into the Future, Welsh Transport Policy Statement', Welsh Office 1998.
			Indirect	Ensure leisure services are located in areas accessible by public transport, walking &		

TAN ¹⁶	Key themes	Relevant to Environment ?	Relevant to green/ open space?	Measures relevant to green/open space	Other information	Drivers
				cycling.		
	Provision of greenspace to integrate open space opportunities with transport needs.	Direct	Direct	Local Planning Authorities should "make provision for the interim use of disused rail alignments as open space corridors".	N.B. Less of a key theme but it is mentioned in the TAN.	
21: Waste	Comprehensive, integrated & sustainable land use planning framework for waste management.	Direct	Indirect	Encouraging sensitive waste management, enhancing quality of the environment; minimising adverse environmental impacts associated with waste management.		Planning Guidance (Wales): Planning Policy: First Revision 1999; EC Landfill Directive (99/31/EC); EC Waste Framework Directive (91/156/EEC).
	Future use of landfill site.	Direct	Indirect	Consideration is given to options for reclamation and after-use.	Opportunity for green/open space could be stressed more.	
Welsh Trunk Road Estate BAP	Improving the transport system in a sustainable manner.	Direct	Direct	TREBAP contains a selection of habitats & species. Incorporates 'opportunities' in relation to species/habitats for which actions undertaken could make a positive difference i.e. as a wildlife corridor, by applying appropriate management e.g. grass cutting regimes.	Audit of the associated 'soft estate' identified species & habitats most at risk from the trunk road network. Emphasises the environmental value of the soft estate.	Countryside and Rights of Way Act 2000; Sustainable development principles (adopted by PPW, WAG); Transport Framework for Wales: Welsh Assembly Govt (2001).
Water Framework Directive	Sustainable integrated policy for the protection of water resources & to adjacent & dependant riparian habitats	Direct	Indirect	River basin management plans indicate protected areas & details of legislation under which they have been designated. Riparian habitats and areas where water quality is an important factor in the protection of habitats or species are included, as are bodies designated as recreational waters.	Requirement (Article 10) concerns controls relating to diffuse sources of discharges including, as appropriate, best environmental practices. May indirectly affect green/open space. Weak link though regarding action on green space. Under Article 11 there is some provision regarding the recreation & restoration of wetland areas.	EC Water Framwork Directive 200/60/EC esp. Article 6/13 (river basin management plans).
Land Use Planning	Green wedges/ belts	Direct	Direct	Coordinated use of green wedges in preference to the introduction of Green Belts.	Some scepticism re green belts in relation to sustainability objectives & their effect in distorting land values.	Planning Guidance (Wales): Planning Policy: First Revision 1999 ¹⁷ ; Sustainable development principles

¹⁷ Note that this document is superceded by 'Planning Policy Wales' (WAG, 2002c).

TAN ¹⁶	Key themes	Relevant to Environment ?	Relevant to green/ open space?	Measures relevant to green/open space	Other information	Drivers
						(adopted by PPW, WAG)
	Transport & infrastructure	Direct	Indirect	Integration of transport & planning policies to reduce conflict with environmental objectives; Importance of proximity to open space by walking/cycling.		Planning Guidance (Wales): Planning Policy: First Revision 1999; Sustainable development principles (adopted by PPW, WAG).
	Housing	Indirect	Indirect	Strategies relating to the type of land developed for housing needs – brown versus green: brown preferred although some green liable “linking to wider issues such as infrastructure, site viability etc.”	A national plan for housing on brownfield sites only was not supported.	PPG 3 specifically & Planning Guidance (Wales): Planning Policy: First Revision 1999; Sustainable development principles (adopted by PPW, WAG).

Table 8.5 Office of the Deputy Prime Minister: Living Places: Cleaner, Safer, Greener (2002)

Policy origin	ODPM
Reference	http://www.odpm.gov.uk/stellent/groups/odpm_urbanpolicy/documents/page/odpm_urbpol_023398.hcsp

Policy themes with direct or indirect relevance to environment and open/green space

Themes/Objectives	Relevant to environment?	Relevant to green/open space?	Main message
Programme of action in 4 key areas			
1: Getting the basics right.	Indirect	Indirect	Need for improved policy coordination, availability of funding, fit-for purpose legislation.
2: Tackling the particular problems of the poorest communities.	Indirect	Indirect	Need for better targeting and coordination, and a review of social exclusion.
3: Tackling the needs of urban parks and green spaces.	Direct	Direct	The mechanisms for this are to establish a new CAFE unit for urban spaces, implement a clear national policy framework and institute a programme of work.
4: Communicating ideas and promoting best practice.	Indirect	Indirect	Raising awareness of the benefits of high quality urban space, appointing design champions.

Stated measures and actions relevant to green/open space

Measures	Consultant notes
<input type="checkbox"/> CAFE unit for urban spaces	CAFE has been given a detailed remit to develop new integrated ideas for parks and green spaces. CAFE will market the idea of well designed open and greenspace and its benefits, develop appropriate skills and launch awareness campaigns.
<input type="checkbox"/> Local strategic planning	Strategic enablers scheme for councils without greenspace strategies to raise the profile of greens space and encourage LA action.
<input type="checkbox"/> Effective land use planning and design	New PPG note 17. The guidance provides a new strategic framework in which LAs will be better able to plan for delivering new provision and management of open spaces.
<input type="checkbox"/> Raising standards and good practice	This relates to proposals for performance assessment and monitoring, and the development of good practice.
<input type="checkbox"/> Involving local communities	A new community enablers scheme and other measures to encourage local initiatives and action by groups at local level.
<input type="checkbox"/> Legislative measures	Numerous measures are proposed for action to reduce problems with abandoned cars, dog fouling etc. and to facilitate more coherent and effective support for green and open space through legislation.

Table 8.6 A Winning Wales (2002) – The National Economic Development strategy of the WAG

Policy origin	Welsh Assembly Government
Reference	http://www.wales.gov.uk/themesbudgetandstrategic/content/neds/awinningwales-0302-e.pdf

Policy themes with direct or indirect relevance to to environment and open/green space

Themes	Relevant to environment?	Relevant to green/open space?	Main message
Setting a fresh direction	Indirect and Direct	Indirect and Direct	Wales should be promoted as a green business location and this is linked to opportunities for encouraging green businesses.
Establishing Wales in the world	Indirect	Indirect	Poor health is higher in Wales than in the rest of the UK and is associated with deprivation. Improving health means better services, primary care and the promotion of healthy lifestyles.
Supporting rural Wales	Indirect	Indirect	Strong community identity provides a basis for community-led action and addressing social problems.

Stated measures and actions relevant to green/open space

Policy area	Measures and aspirations	Reference to specific measures in place	Consultant notes
Setting a fresh direction: The aim is to link the quality of the natural environment in Wales to good environmental practice in business and as a setting for attracting green industries/ companies using clean technology.	<ul style="list-style-type: none"> <input type="checkbox"/> Invest in sustainable tourism and recreation. <input type="checkbox"/> Enhance the attractiveness of the Welsh countryside. 	<ul style="list-style-type: none"> <input type="checkbox"/> None specified – mainly working with existing agencies. 	Overall support for maintaining and enhancing a green Wales. The support for a 'green' economy fits well with the overarching theme of sustainable development in Wales.
Creating strong communities: The aim is to develop community capacity by promoting community enterprise, removing barriers to work and improving infrastructure.	<ul style="list-style-type: none"> <input type="checkbox"/> Work with Community First to tackle poverty and social exclusion in the most deprived communities. <input type="checkbox"/> Ensure regeneration funds are used to maximum effect. 	<ul style="list-style-type: none"> <input type="checkbox"/> None specified – mainly working with existing agencies. 	The focus of expenditure is likely to be on deprived communities and areas in need of regeneration. There may be a role for environmental improvement and for greening as part of regeneration.
Supporting rural Wales: To achieve a sustainable long-term future for agriculture based on high quality value added food, and an attractive countryside rich in biodiversity.	<ul style="list-style-type: none"> <input type="checkbox"/> Targeting rural areas. <input type="checkbox"/> Strengthen the contribution of tourism to the rural economy. <input type="checkbox"/> Encourage 	<ul style="list-style-type: none"> <input type="checkbox"/> Rural Recovery Plan <input type="checkbox"/> RDPW <input type="checkbox"/> Partner policies such as Tir Gofal 	Much of this policy will impact on rural greenspace but most of the measures are not additional but within existing budgets such as the RDPW and Tir Gofal.

Policy area	Measures and aspirations	Reference to specific measures in place	Consultant notes
	environmentally sustainable farming.		
<p>Spatial development: This is a spatial focus on development to ensure that socio-economic diversity across space (e.g. disadvantaged areas; areas with high growth potential) is approximately addressed within policy.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Revision of national planning policy. <input type="checkbox"/> Better understanding of relative economic performance of different areas in Wales. 	<ul style="list-style-type: none"> <input type="checkbox"/> Wales Spatial Plan 	<p>Not clear at this stage what implications the spatial planning has for green/open space. In so far as planning procedures vary spatially there may be both threats to existing greenspace and opportunities for development-link environmental measures.</p>

Table 8.7 Achieving our Potential: A Tourism Strategy for Wales (2000)

Policy origin	Wales Tourist Board
Reference	www.wtbonline.gov.uk

Policy themes with direct or indirect relevance to to environment and open/green space

Themes/Objectives	Relevant to environment?	Relevant to green/open space?	Main message
Objective 2: To exceed the expectations of visitors to Wales by providing high standards and ensuring that investment in tourism is responsive to their changing needs.	Possibly	Possibly	An emphasis on supporting tourism SMEs (the mainstay of Welsh tourism) to adapt and invest so as to increase competitiveness. Improving the quality of the tourism experience, especially as regards accommodation, is crucial – this is perceived as constraint on the number of visitors and their satisfaction. The investment strategy is to be flexible responding to a changing market but directed at increasing competitiveness and quality.
Objective 4: To embrace a sustainable approach to tourism development which benefits society, involves local communities and enhances Wales’ unique environmental and cultural assets.	Direct	Direct	An emphasis on tourism that is sensitive in its use of the environmental resource and benefits local people and economies.

Stated measures and actions relevant to green/open space

Policy area	Measures and aspirations	Reference to specific measures in place	Consultant notes
Objective 2:	<ul style="list-style-type: none"> <input type="checkbox"/> Development of a limited number of flagship attractions. <input type="checkbox"/> Support in developing special interest and activities. 		Support for specialist activities on greenspace including cycling, nature, walking, heritage and water sports. Here may be potential for expansion of specialist leisure activities and nature-related activity on greenspace. (Specific WAG strategies for walking, cycling and other leisure activities have since been developed).
Objective 4:	<ul style="list-style-type: none"> <input type="checkbox"/> Enhancing the environment. 	<ul style="list-style-type: none"> <input type="checkbox"/> WTB with CCW have launched a “Greening your Business” guide to encourage business to operate in a more environmentally-friendly way. <input type="checkbox"/> Green Coast award. 	This is more of a prevention of damaging impacts on environmental resources than measures to increase environmental quality. Measures to reduce erosion, litter and damaging operator practices are indicated. The strategy mentions a pilot “paying for conservation” scheme to be introduced by CCW.

Table 8.8 Healthy and active lifestyles in Wales (WAG, 2003b).

Policy origin	Welsh Assembly Government
Reference	http://www.wales.gov.uk/subihealth/content/keypubs/pdf/healthy-active-lifestyle-e.pdf

Policy themes with direct or indirect relevance to environment/ green/open space

Themes	Relevant to environment?	Relevant to green/open space?	Main message
1: Develop national and local partnerships and strategies to increase physical activity through active living.	Indirect	Indirect	Partnerships are needed to effect change. Promotion of the importance of physical activity and methods of best practice.
3: Address issues of public knowledge of the health benefits of physical activity and of opportunities to increase physical activity.	Indirect	Indirect	There is a lack of awareness of the benefits of physical activity for health. Initiatives are needed to encourage individuals to increase activity levels. The policy is targeted to specific groups where additional activity would be especially beneficial for their health and wellbeing.
4: Reduce the barriers to increasing active living.	Indirect	Indirect	An emphasis on removing barriers to increasing physical activity in lifestyles but environmental barriers including a lack of cycle and walking paths.

Stated measures and actions relevant to green/open space

Policy area	Measures and aspirations	Reference to specific measures in place	Consultant notes
Create an agenda at national and local levels to engage all partners.	<ul style="list-style-type: none"> <input type="checkbox"/> Establish an all-Wales physical activity group <input type="checkbox"/> Develop and implement the Cycling and Walking Strategy for Wales. <input type="checkbox"/> Provide support for the Forestry Commission in developing action plans based on their Wellbeing and Woodlands for Wales strategy. <input type="checkbox"/> Community strategies including Health, Social Care and Wellbeing strategies to identify clear objectives for increasing physical activity. 	<ul style="list-style-type: none"> <input type="checkbox"/> None specified but a number of elements are on-going. 	A firm policy background for developing accessible greenspace facilities for cycling and walking. However, the framework is heavily targeted to defined social groups and emphasises the importance of removing barriers to uptake as well as provision.
Commit local government to consider physical activity in local strategies.	<ul style="list-style-type: none"> <input type="checkbox"/> Ensure that cycling and walking are promoted in community strategies and planning policies. 	None specified – but ongoing.	Not clear what the impacts will be on greenspace. It should raise the profile of accessible greenspace as a health resource.
Promotion of physical activity should be targeted at key population groups.	<ul style="list-style-type: none"> <input type="checkbox"/> Green gym projects to encourage activity among priority groups. <input type="checkbox"/> Pilot projects for older people. 	<ul style="list-style-type: none"> <input type="checkbox"/> None specified 	A central feature of the policy is the targeting of intervention at specific groups where additional physical activity would provide the greatest benefits to health and wellbeing.
Support local initiatives addressing barriers to	<ul style="list-style-type: none"> <input type="checkbox"/> Small grants for evidence-based community projects to reduce barriers to physical activity and 	<ul style="list-style-type: none"> <input type="checkbox"/> Commission an evaluation of the grant scheme 	Targeted at priority groups. Unlikely to address barriers from low provision - more

Policy area	Measures and aspirations	Reference to specific measures in place	Consultant notes
physical activity.	reduce obesity.	<input type="checkbox"/> Hold workshop with key partners to explore issues around barriers to physical activity for people in priority target groups.	likely to address barriers in uptake of existing opportunities amongst target groups where activity is low.

8.1 Fit with partners' policies

Table 8.9 Forestry Commission

Forestry Commission Wales Strategic policy (source: Woodlands for Wales, WAG, 2001a)

Key policies and measures relating to open/greenspace	Main messages
1. Woodlands for people	Contributes to the WAG priority of community development by focussing on woodland benefit for disadvantaged communities, educational use and to encourage community involvement in woodland management.
2. A new emphasis on woodland management	The aim is to promote best practice, move to greater use of continuous cover systems and find sites for new planting.
3. A diverse and healthy environment	To conserve and enhance biodiversity and landscapes.
4. Tourism, recreation and health	Promotion of woodlands as a place for exercise and enjoyment with benefits to visitors, tourists and to the health of communities.

Forestry Commission Wales fit with higher level open/greenspace policies

Higher level policy	Partner policies and measures that contribute to open/greenspace benefits	Consultant notes
Wales: A Better Country (2003):		
Economic policy	None through greenspace	
Countryside planning and environment	2, 3	Measures to enhance biodiversity and other environmental benefits from woodlands.
Communities	1	Focus on use of woodlands as a social and cultural asset for the most disadvantaged communities. Strategy document not specific on what additional benefits will be delivered to disadvantaged communities.
Health and social care services	4	Promoting health through access to woodlands. Untargeted, and not clear that access is a limiting factor to achieving health objectives.
The Sustainable Development Action Plan (2004)		
Living space, strong communities		No clear contribution.
Our natural countryside	3	Move to more economically and environmentally sustainable systems through continuous cover.
Monitoring and reporting		Not clear that woodlands will feature in the set of high level and additional sustainable development indicators.
A Winning Wales (2002) – The National Economic Development		

strategy of the WAG		
Setting a fresh direction	4	FC has a role in providing resources for tourism and enhancing the attractiveness of the Welsh countryside.
Creating strong communities	1, 4	There is a strong link to WDA policy with FC policy supporting the contribution that woodlands can make to deprived communities. The measures in place to deliver benefits (including health benefits) need to be detailed.
Supporting rural Wales	4	FC has a role in contribution to tourism and to agriculture through grant aid for woodland management and creation.
Spatial development	1	Focus on disadvantaged communities.

Note the numbers in the second column refer to the numbers of the key policies in the preceding table.

Table 8.10 Countryside Council for Wales

CCW Strategic policy (source: *A Better Wales: The natural environment of Wales in 2010; CCW Grants Programme 2005-2007*)

Key policies and measures relating to open/greenspace	Main messages
1. Sustainable living	The environment as a sustainable resource contributing to the economy and a healthier population. There is a specific aim to develop urban greenspace networks and green design by grants to LAs, Green Flag Park awards and other measures.
2. Raising quality	Safeguarding and improving the natural heritage in Wales (relevant to nature reserves).
3. Enabling others	Working with and through partners in environmental management.
4. Improving accessibility	Making the natural heritage more available through education and improved physical access (relevant to access land under CROW).
5. Understanding change	Information on the state of the natural heritage and its role in delivering social and economic wellbeing. This includes activity to implement indicators under the sustainable development strategy.

CCW fit with higher level open/greenspace policies

Higher level policy	Partner policies and measures that contribute to open/greenspace benefits	Consultant notes
Wales: A Better Country (2003):		
Economic policy	1	Not clear that CCW has a role in (i) improving green/open space where it may limit business development, and (ii) facilitating businesses delivering environmental goods and services.
Countryside planning and environment	2, 3, 4, 5	Improvement in biodiversity (2) is the key action that relates to the WAG strategy. Nature reserves are the main greenspace instrument here.
Communities	1	CCW has a strategic policy to support a healthier population. Implementation of CROW will contribute but it will be important to demonstrate (i) that spending is concentrated on delivering a better environment to deprived communities, and (ii) that this increases their quality of life. CCW has a £250k grant pot (Environment for All) which is used to target excluded groups and communities.
Health and social care services	1	See above.
The Sustainable Development Action Plan (2004)		
Living space, strong communities		No clear contribution.
Our natural countryside	1,2,3,4,5	Core activity of CCW.
Monitoring and reporting	5	Biodiversity indicators will be in the set of high level indicators.
A Winning Wales (2002) – The National Economic Development strategy of the WAG		

Higher level policy	Partner policies and measures that contribute to open/greenspace benefits	Consultant notes
Setting a fresh direction	4	The link between quality of the environment, good environmental practice in business and the attraction of green and high-tech companies needs to be made.
Creating strong communities	1, 4	CCW Community Strategies including aid to LAs can deliver environmental benefits but it is not clear that these are targeted to deprived communities and areas in need of regeneration.
Supporting rural Wales	4	Numerous measures to support rural activity (e.g. agri-environment measures) but not specifically related to rural greenspace.
Spatial development	1	CCW does not have a spatial development plan that coincides with that of WDA. It has a £250k budget for targeting excluded groups and communities.

Table 8.11 Environment Agency

Environment Agency (source: <http://www.environment-agency.gov.uk>)

Key policies and measures relating to open/greenspace	Main messages
1. A better quality of life	EA will improve environmental quality so that people will be confident that the environment is not damaged by pollution and does not provide a health risk. Actions will reflect sustainable development principles. EA will work with all sectors to enhance the quality of the environment and the services it provides.
2. A greener business world	EA will work to simplify and improve the regulatory process for business, improve access to environmental information for business and the public, and promote the prevention of pollution and minimisation of waste in industry.
3. Improved and protected inland and coastal waters	EA will work to clean up polluted waters and to reduce the risk of further pollution, and will ensure that aquatic and wetland wildlife has the amount of clean, healthy water it requires.
4. Cleaner air for everyone	Aim is to improve air quality from all sources. Provision of information in an understandable, accessible format will be a priority.
5. Healthy soils	EA aims to put as much contaminated land as possible back into productive use. EA will publish better data on contaminated land, and guidance on standards. The Agency will press for improved policies to ensure better protection for land and soil.
6. Reducing flood risk	Improve flood defences and information on flood risks; reduce flood risks through preventive planning, restoration of rivers and flood plains, better management of the disposal of surface water and better design of buildings.
7. An enhanced environment for wildlife	EA will ensure that its activities and those it authorises do not threaten key species and habitats. It will work with many partners at local, regional and national levels to safeguard and enhance biodiversity.

Environment Agency fit with higher level open/greenspace policies

Higher level policy	Partner policies and measures that contribute to open/greenspace benefits	Consultant notes
Wales: A Better Country (2003):		
Economic policy	None directly through greenspace	Important regulatory framework for business.
Countryside planning and environment	3,4,5,7.	Regulatory measures are an essential element in supporting biodiversity and adhering to sustainable development principles.
Communities	1	Although a high quality environment is important for community wellbeing, EA does not focus on derived communities nor directly on issues of poor health.
Health and social care services	None	
The Sustainable Development Action Plan (2004)		

Higher level policy	Partner policies and measures that contribute to open/greenspace benefits	Consultant notes
Living space, strong communities		No clear contribution.
Our natural countryside	3,4,5,7.	Very significant in the protection of the environment, especially water, soil and air quality.
Monitoring and reporting		Expected that indicators will be directly relevant to resources where EA has a major responsibility.
A Winning Wales (2002) – The National Economic Development strategy of the WAG		
Setting a fresh direction	2	Important in that a high quality environment is central to the WDA strategy of attracting green industries.
Creating strong communities	No link	
Supporting rural Wales	2,3,4,5,6,7,	Maintaining environment quality contributes to the WDA aim of encouraging sustainable farming and strengthening tourism.
Spatial development	No link	

Table 8.12 Groundwork Wales

Selected Objectives relating to green and open space (from Baker Associates, 2004)

Environmental objectives

- 1 Visibly improving prominent underused land and building sites and bringing them back to community or other use.
- 2 Promoting sustainable transport modes, community routes and implementing the Wales Walking and Cycling Strategy.
- 3 Implementing the Wales Woodland Strategy with particular reference to community access.
- 7 Maintaining and enhancing biodiversity with particular reference to local nature reserves and biodiversity action plans.

Economic objectives

- 9 Making companies more competitive with particular reference to promoting environmental best practice, developing sustainable business parks, and working with businesses to improve the environment on industrial estate.s
- 10 Growing the “green business sector” (environmental products and services).
- 12 Developing the social economy generally, but also to enable it to take a stronger role in waste management, recycling, environmental maintenance, and renewables.
- 13 Revitalising town centres and community hubs (especially those linked to – but not necessarily in – Communities First areas).
- 14 Implementing the Wales Tourism Strategy with particular reference to green tourism and improving access to the countryside.

Social objectives

- 15 Developing area-based, community-led regeneration programmes, including the successful roll-out of Wales’ flagship area renewal programme (Communities First).
- 19 Improving health with particular reference to preventative action (healthy lifestyles, active recreation).

9 Annex III Benefit estimates

9.1 Woodland

Studies of the value of trees range from trees in gardens to the recreational and access value of woodland (see Table 9.1, p71). Morales (1980) sampled houses in Amherst, Massachusetts both with a substantial amount of tree cover on the plot, and with no tree cover at all. Trees were estimated to add \$2,686, or 6 per cent of the total, to the value of the houses observed. A rather more comprehensive study by Anderson and Cordell (1988) of 844 single family residential property sales in Athens, Georgia, indicated that landscaping with trees was associated with a 3.5 to 4.5 per cent increase in sales prices.

A HPM study by Garrod and Willis (1992a) of the area surrounding the Forest of Dean concluded that the presence of at least 20 percent woodland cover in the one kilometre grid square encompassing a property would increase the purchase price by as much as 7.1 per cent. A higher percentage of tree cover did not appear to add to property value. A subsequent study investigating the effects of the relative concentrations of Forestry Commission (FC) woodland on house prices in Great Britain (Garrod and Willis, 1992b) found that a 1 per cent increase in the relative proportion of broadleaved woodland increased the value of a property by about £42, whereas a similar increase in the relative proportion of mature conifers such as Sitka spruce was found to depress house prices by around £141.

The benefits of trees to the community have traditionally been measured through their effect on real estate prices and business profits. Increased property values, increased tax revenues, increased income levels, faster real estate sales turn-over rates, shorter unoccupied periods, increased recruitment of buyers, increased jobs, increased worker productivity, and increased number of customers have all been linked to tree and landscape presence (Coder, 1996).

The benefits from trees and woodland have also been investigated through stated preference (SP) techniques. SP methods ask respondents directly how much they would be willing to pay to acquire trees or woodland of differing quantities, types, and age. Various studies of the landscape value of woodland have shown that people have a strong preference for a 'natural-looking' woodland or forest compared to the blanket uniform structure that typifies many commercial plantations (Entec, 1997); and a preference for a patch-work of woods and fields in the landscape rather than 100% forest cover (Garrod and Willis, 1992a).

An investigation of the value of alternative tree densities, in developing a neighbourhood park in Fort Collins, Colorado, by Brookshire and Coursey (1987) used SP techniques to assess willingness-to-pay (WTP) and willingness-to-accept (WTA) compensation for changes ± 25 and ± 50 trees from a norm of 200 trees in a small neighbourhood park, across different elicitation methods: CV, a field auction, and a laboratory auction process. Marginal WTP declined as the number of trees increased: mean household WTP was \$14.00 for an additional 25 trees, and \$19.40 for an additional 50 trees. In another study, Combs *et al.* (1993) examined citizens' reaction to the offer by a private benefactor of a matching grant for the improvement of a park in Lenoir, North Carolina, using a trichotomous choice iterative bidding CV experiment.

Trees and woodland are often only one attribute of many natural elements in an urban or rural landscape. The value of trees and woodland in such cases depends upon people's marginal rate of substitution of other greenspace attributes for trees and woodland. Few such studies of the value of trees in the context of provision of other greenspace attributes have been undertaken. A study by Hanley *et al.* (1996) identified woodland as an attribute in the Breadalbane ESA landscape in Scotland. The study

estimated how much people were prepared to pay to conserve native woodland whilst simultaneously paying for the protection of grasslands, moorlands, walls, and archaeology in the Breadalbane ESA (see Table 9.2). The amount that a random sample of all households in Scotland were willing to pay to protect woodlands in the Breadalbane ESA, in the context of their WTP to conserve the other features of the ESA amounted to £182 per household per year.

Table 9.2: Choice experiment results for Breadalbane

Attribute	Coefficient	't'-statistic
Protection of woodlands	0.58	16.0
Protection of archaeology	0.07	2.2
Protection of moorlands	0.26	7.5
Protection of grasslands	0.24	6.8
Protection of walls	0.13	3.8
Tax	-0.007	8.2

Chi-square = 507.95; log-likelihood (unrestricted) = 1281.56; n = 4440
Source: Hanley *et al.* (1996).

A study of the sequential value of attributes by Santos (1998) noted earlier, illustrates the fact that, within a particular context, value depends upon sequence of provision and the extent to which greenspace attributes are both substitutes and complements in to each other.

A survey of visitors to 7 English and Welsh forests [Brenin (in Wales), Dartmoor, Delamere, Epping, New Forest, and Thetford] by Scarpa (2003) estimated both open-ended and discrete choice estimates of WTP for access to these forests for recreational purposes. The pooled visitor data for the 7 forests indicated a mean maximum WTP amount that varied between £1.66 (median £1.50) to £2.75 (median £1.91) depending upon the analytical model adopted (open-ended CV response, or double bounded log). The data also permitted estimates of the value of forest recreation to different classes of visitors [£0.90 for forest visits within a short distance from home (less than 10 miles) and £1.80 for longer distance visits]. The data also permitted WTP to be calculated according to different combinations of forest attributes. For example, for forests of 900 ha, with 60% conifer, 20% broadleaved, 12% larch, 5% of trees planted before 1940, with a nature reserve, and a congestion index of 20, people were prepared to pay £1.47 per visit.

In conclusion

- Trees can contribute to property and landscape values and also in some instances to biodiversity values. Much depends on the type of trees and their scale or dominance in the landscape. Trees also impact on people's decision to purchase property.
- The value of woodland depends upon the context in which trees and woodland feature in the urban and rural landscape; the sequence in which this greenspace attribute is provided; and the scale of the existing provision of trees and woodland in the area.
- There is a dearth of evidence on the impact of trees and woodland with respect to business location decision in urban areas.

9.2 Water

Research on water has estimated both the value of water space and water quality and their associated attributes, and has provided some qualitative conclusions on the impact of different water features on economic regeneration. Table 9.3 provides a summary of various studies that have used HPM and SP techniques to estimate waterside

premiums. The estimation of additional value attributable to a water body involves consideration of a series of associated amenity effects including: proximity and view of the water body; water quality; and the size and type of the water body.

Two studies considered canal side locations: Willis and Garrod (1993); and Luttik (2000). The premiums observed were similar, with Garrod and Willis estimating a premium of 2.9%-5.2% for a waterside frontage and Luttik 4%-5% for a canal view. Other studies considered the amenity from lakes, wetlands, streams and bay side locations. Luttik (2000) estimated the premium of waterside location to be up to 32% for a garden facing a lake. Kulshreshtha and Gillies (1993) showed that the waterside premium was observable for both capital and rental prices, whereas Mahan *et al.* (2000) found the premium to depend on the size of the water considered, with a 0.02% premium per acre of wetland. Studies by Michael *et al.* (2000) and Leggett and Bockstael (2000) have found the water quality to increase house prices by 5%-23% and 1% respectively, where the former depends on the variable by which water quality is assessed. The highest premiums for water are those observed for lakeside properties (Luttik, 2000).

Beyond the waterside, there may also be benefits of living within close proximity of water amenities. Mahan *et al.* (2000) found there to be a 0.36% premium per 1000 feet closer a property is to a wetland, 0.21% for streams and 1.34% for lakes. As all properties considered were relatively close to the waterside amenity, this premium will peter out as the distance becomes large. Luttik (2000) found a premium of 5%-7% for properties within the vicinity of a lake. However, houses in streets running adjacent to canals were found by Willis and Garrod (1993) to have a premium of only 1.5% in the case of London and no statistically significant effect was found using Midland properties.

HPM studies suffer from various problems of estimation. Measuring the view or proximity to a water body is a major problem in data sets relying only on post code information to establish location. Accurate information on views and access to water can only be obtained from a site survey for each property, where the quality of recreational access, presence/absence of historic features and quality of the environment / landscape can be accurately measured. This was the approach taken by Luttik (2000), where each property was visited individually. Measuring water quality is another issue. Not all householders purchasing waterside properties consider the same water clarity statistics. Michael *et al.* (2000) found the implicit price to vary markedly due to the choice of water quality variable used. With the multi-attribute amenities associated with waterside location and the variation in provision, these results illustrate the difficulties involved in estimating the premium on property prices.

Further problems are encountered in the measurement and choice of environmental variables: waterside amenity may be correlated with neighbourhood and structural variables. Statistical models have been developed to explore this issue (Orford, 1999); but it still remains a problem, and the omission of neighbourhood variables can also cause bias in the coefficients of the remaining variables in the model (except where the omitted variables are uncorrelated and orthogonal to the remaining variables). This omitted variable bias issue was considered by Kulshreshtha and Gillies (1993), who found the magnitude of the premium from a river view to be affected by both the neighbourhood in which the house is located and the size of the house considered.

Table 9.3 also presents the results of some SP studies that valued residential waterside location premiums. The estimated premiums for a waterside location vary substantially between studies, between 9%-20% of the price of property (using mean values); values which are generally higher than observed in the HPM studies. Garrod and Willis (1993) undertook a contingent valuation (CV) survey of a random sample of 59 members of the Royal Institute of Chartered Surveyors in areas with canals. RICS members were sent a

brief questionnaire together with a specification of a four-bedroom house and were asked to consider three landscape views:

- A waterside location immediately overlooking the river;
- An identical house within the same development, has no view of the water but is within 20m of the waterside; and
- An identical house some miles away from the waterway.

A layout diagram was presented of the property detailing the size of rooms and a specification of the property's attributes. The RICS members were then asked to estimate the market price of this property in the three different locations with respect to waterways in their area. Differences between the estate agents' expressed price in the different locations with respect to water permitted the house price premium for this attribute to be calculated, since other variables are held constant. This approach has the advantage of holding all other variables constant apart from proximity to a canal. The estimated premium from residential properties with canal frontage was 16.4%; and 8% for properties with no view but within 20 meters of a canal; compared to other properties in the area (Willis and Garrod, 1993). However, the estimated premiums varied significantly between estate agents. The range of valuations by estate agents in a single city further illustrates the complexity involved in estimation, with premiums varying by local housing sub-markets.

A similar CV type approach was used by Wood and Handley (1999), who asked the following question to nine property valuation experts without being specific about the property being valued:

"If a piece of residential real estate was to be independently valued for sale, what would be the percentage difference for a unit facing water from a similar unit facing away from water?."

Information on the impact of water bodies on non-residential property is more limited. The limited number of sales or rentals of any type of non-residential property in a single market render HPM generally infeasible as a technique to apply to leisure, office and retail establishments. Nicholson (1997) and Wood and Handley (1999) used a form of CV to assess the waterside premium for these types of properties.

Nicholson (1997) questioned agents / developers of commercial properties concerning rental premiums attributable to the presence of water, typically man-made lakes in business parks. Although estate agents did not feel the presence of water speeded up lettings for commercial development, they thought the waterside location had increased viewings and provided an additional selling point. The few agents that stated a rental premium indicated an average of 10%. In a survey of nine property valuation experts in the Mersey Basin, Wood and Handley (1999) reported results suggesting enhanced rental values of 0-15% (mean nearer 0%) for offices and 0-25% (mean nearer 10%) for leisure developments.

In urban centres, road and other communications tend to be important to hotels, where business custom is likely to be of greatest importance. Visual amenity is expected to be a lesser concern, but may still be influential. Large leisure schemes may not be particularly sensitive to the surrounding environment, tending to be attractions in their own right. Medium sized leisure developments may still benefit from their waterside environment. For example, Ecotec Research and Consulting (1998) report the success of the Sealife Centre in Birmingham. Furthermore, in Goytre Wharf, following canal improvements, an art gallery and coffee shop have benefited from the increased visitor numbers in the area. In the Brecon Canal Basin a new theatre and bistro have benefited from a quality waterside location, but, as ever, the extent of these benefits is unclear.

Wood and Handley (1999) highlight the importance of specific niches of the booming leisure market, particularly youth-based pubs and bars that offer a unique feature such as a waterside terrace, which can provide an important lift in this fiercely competitive market. Location is also important to public houses / restaurants that benefit from extra visitors to waterside locations. Ecotec Research and Consulting (1996) provided examples of the link between waterside location and public house / restaurant leisure development.

Compared to leisure developments, office occupants are less concerned with attracting users to their place of business and therefore environmental considerations are typically of lesser importance. Although an attractive environment may be good for corporate guests and employees, these are likely to be less important than, for example, the availability of car parking. Despite this caveat, the frequency and the size of waterside developments suggests there is a link between quality waterside location and office development (see Table 9.4 and Ecotec Research and Consulting, 1996; 1998). Following discussions with property agents, Ecotec Research and Consulting (1998) concluded that, although canal improvements are believed to contribute to the overall marketability of the scheme (in relation to office and industrial premises), this cannot be readily converted into a monetary basis in terms of increased rental values.

Developments such as supermarkets and superstores are of a character largely independent of their environments. Within other retail sectors, however, environments are important in seeking to attract and retain shoppers in competition with other centres. Visual amenity can act as a complementary attraction to shopping and improved access, perhaps through pedestrianisation. Waterside locations may also provide a theme for speciality shops. For example, Ecotec Research and Consulting (1998) reports of a craft workspace / retail development within the Coventry Canal Basin. Although the potential for such development exists, few examples are detailed in the literature.

As Table 9.4 suggests, mixed developmental use of areas are common and can help to give an identity to an area. The Birmingham, Gloucester, Sheffield and Saltaire case studies, presented within Ecotec Research and Consulting (1998) all indicate that tourist and leisure uses can thrive in harmony with offices (public and private) and retail activity. The presence of recreational opportunities for office employees, for example, can also provide an additional market for some of the leisure and retailing uses and be mutually supportive.

Other examples are provided by Ecotec Research and Consulting (1996; 1998)¹⁸. For example, in the Coventry Canal Basin project the combination of canal infrastructure and visual amenity improvement was found to be important for residential development. In the case of the Bratch (Wombourne), visual amenity was improved through an increase in open space enforced within the planning process and through the availability of local recreational facilities that have improved the perception of the area. Developers suggested that these aspects have improved the marketability and take-up of the developments. Montgomery Canal (Welshpool) provides another example, where 44 houses have been built, ten with a frontage onto the canal. In the case of the Montgomery Canal, it was reported by Ecotec Research and Consulting (1996) that local agents did not feel that the properties beside the canal sold for any premium. Indeed, the presence of walkers on the towpath, as well as the danger posed to young children by the presence of the canal, could be a disincentive to purchasing these houses for certain types of consumer. More generally, the canal was thought to help dispose of the 44 properties more quickly, but did not result in a higher asking price¹⁹.

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¹⁸ See Table 9.4.

¹⁹ Sale of a property more quickly is equivalent to an implicit asking price. For example, if the price of such a new house was £100,000, with a discount rate of 8%, and if proximity to the canal resulted in the house

Despite the latter suggestion with respect to the Montgomery canal, the general conclusions from the review of water on values and location decisions are:

- Water appears to add a significant premium to property values, especially for property fronting onto desirable water features: lakes, rivers with good water and scenic qualities, and a smaller premium to properties in close proximity and with views over water features.
- The location decision of certain types of business are influenced by the presence of water features, especially those in the leisure and tourism industries.

9.3 Footpaths and access

TCM and SP methods have been used to estimate the value of access (see Table 9.5). The value of access depends upon the uniqueness of the area or site; and the purpose of the visit.

For access to the towpath along the Montgomery canal dog-walkers and short cut-takers were estimated to be willing to pay 2p in 1988 prices; but more purposeful walkers and those intent on viewing the canal scene were willing to pay more (7p and 23p respectively) (Table 9.5). Those visiting a specific and more unusual location, e.g. Frankton where the Montgomery and Llangollen canals meet, were willing to pay more: £1.32. Similarly holiday makers were willing to pay more than day-trippers: 15p and 34p respectively (Willis and Garrod, 1990). Similar results have been estimated in other studies of footpath access to towpaths along canals in other areas of the country.

WTP increases for more purposeful or longer walks. Willis (1991) using a TCM estimated consumer surplus of £1.43 to £3.31 per person per visit to various Forestry Commission forests throughout Great Britain depending upon the cost of access to the forest. Forested areas used by local people tend to have lower consumer surplus values per visit. Bennett et al (1995) in a CV study estimated a consumer surplus of £1.11 per person per visit to 1052 ha of mainly mature Scots pine on the urban fringe of Bracknell, Berkshire. Given the number of visitors, and the cost of maintaining footpaths in the forest, this consumer surplus value per visit gave an implicit cost/benefit ratio of 1.17.

A study of the Community Woodland Supplement (CWS) (for which woodland must be within five miles of the edge of a village, town or city where there are few other woodlands available for recreation) revealed that 16% of respondents, on average, said they had visited a CWS woodland. This varied by site from 6% to 36% where woodland was part of a larger recreational area (Crabtree *et al*, 2001). The distance decay function for visits was steep: while 69% of respondents living within ¼ mile of a CWS woodland had visited the woodland, this declined to 6% for those living >5 miles away. However, only 6% to 19% of respondents (depending upon distance from the site) indicated a positive willingness to contribute financially towards continued procurement of access. The mean WTP for CWS woodland was £15.38. When these values were aggregated the public benefit varied from £25 to over £32,000 per hectare per year depending on the woodland and the size and characteristics of the local population. However, only a small part of this public benefit derived from physical (recreational) access to the woodland. Most residents are more interested in trees in their locality for other reasons than access. Indeed, Crabtree *et al*, (2001) estimated that the mean use value per household (for households within 4 miles) of CWS woodland, varied from a lower bound estimate of £0.13 to an upper bound estimate of £0.56 per household per year.

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being sold in three months instead of six, this is equivalent to a 1.9% premium on the house price as a result of the influence of the canal.

Access is important to the functioning of developments. However, once that access is provided, the research literature shows that the value of additional access for amenity purposes is quite small, especially when substitute footpaths exist for recreational walks. Hence it can be concluded that

- ❑ The value and people's WTP for additional local footpaths and access is quite small for local access, whether to water, woodland, or open space, if existing footpath provision is adequate, i.e. substitute footpaths exist that can be used for recreation walks.
- ❑ WTP for footpaths for ubiquitous activities such as dog-walking, casual walks, etc. are very low: a few pence per walk; although a large number of walks (or visits) fall into this category
- ❑ WTP for purposeful walks in rural areas along well managed paths and trails (e.g. in Forestry Commission forests, or along national footpaths) is much higher; although by comparison with local urban casual walks, the number of walks (or visits) undertaken in this category is relatively small.

9.4 Wildlife areas

The value of nature reserves and wildlife areas varies enormously depending upon the rarity, uniqueness, and characteristics of the wildlife being protected or conserved. Rare and unique habitats are valued much more highly than fairly ubiquitous habitats. WTP for the preservation or creation of habitats varies according to whether the habitat is perceived to be under threat: the greater the threat to the habitat the greater the WTP to preserve it.

Some habitats do not feature strongly in people's preference sets: people tend to have low preferences for habitat additions in terms of coniferous forests, peat bogs, marsh and fen, and man-made lakes; and conversely high preferences for broadleaved woodland, traditional hay-meadows, river beds and streams, and coastal dunes and salt marshes (Garrod and Willis, 1994). People also have preferences for certain types of living creatures: birds and fauna perceived to be 'cuddly and cute' e.g. squirrels, badgers, etc. (Metrick and Weitzman, 1994, 1998). Conversely they have low, zero or even negative preferences for creatures deemed to be dangerous (e.g. snakes, wolves, etc.), with little visual appeal (e.g. insects, toads, etc.), or with which phobias are associated (e.g. spiders). Spending thus tends to be biased towards large well known birds and mammals: 'charismatic megafauna' that are less endangered than many species with less charisma. Studies valuing wildlife and biodiversity have tended to focus on rare, unique and nationally important habitats rather than more mundane local wildlife reserves. Thus studies have estimated the value of Ramsar sites, national nature reserves, sites with Red Book species, ESAs, and the larger more important SSSIs. These factors have resulted in a distribution of wildlife values that are skewed towards habitats and species with higher values.

Table 9.6 lists some of the studies that have valued wildlife habitats and species in Britain. It is important to identify the separability of this greenspace attribute (i.e. wildlife) from other greenspace attributes (e.g. open space *per se*, trees, etc.) that may also be associated with wildlife and nature reserves.

The conclusions from studies valuing wildlife are that values vary enormously depending upon the:

- ❑ Type of wildlife and habitat conserved;
- ❑ Perceived quantity of the existing habitat; and
- ❑ Whether the habitat or species (being conserved or restored) is rare or endangered.

9.5 Other green/open space

Valuation studies

Other green/open space primarily provides recreation and amenity (landscape) functions. These can vary in quantity and quality by the type of other green/open space. For example, green belts often have little recreational access, if the main land-use is agriculture, so that the main benefit local residents derive from them is aesthetic: landscape and views.

HPM, CV and TCMs have all been used to value open access public spaces. In the case of urban open spaces, the main problem encountered in estimating people's willingness-to-pay (WTP) based on TC models centres around the lack of variation in travel costs to estimate a demand curve. Many people simply walk to urban parks, so there is only a time cost of access, compared to the usual transport and time cost incurred when visiting more distant parks in rural areas. Estimating the demand for urban parks through TCMs based only on time costs has proved problematic (see Garrod *et al*, 1993), producing estimates of value that are plausible but not always robust. More reliable values are generally estimated through CV or HPMs.

HPM and property prices

The establishment of green spaces is known to have a positive impact on neighbouring house prices. Wabe (1971) in an analysis of house prices to establish the value of journey time, the rate of time preference, and the valuation of some aspects of the environment in the London region, estimated, on the basis of 1,800 house purchase transactions, that proximity (indicated by a dummy variable in the HPM) to the London green belt added £276 per house at 1968 prices to houses within 2 miles of the green belt: this represented about 4.9 per cent of the value of the house (Table 9.7).

A study in the USA by Correll *et al.* (1978) sampled residences within one kilometre of a green belt and measured the actual distance of the property from three green belts in Boulder, Colorado. Results revealed that distance from the green belt had a statistically significant negative impact on the price of residential property. Specifically, *ceteris paribus*, there was a \$13.78 decrease in the price of residential property for every 1 metre one moved away from the green belt, and holding other variable constant the average value of properties adjacent to the green belt would be 32 per cent higher than those a kilometre away. This was a very high value and implied that value fell rapidly with increasing distance from a green belt.

The impact of various urban attributes on property prices in Tyneside, using a HPM was estimated by Powe *et al.* (1995). Being within 500 metres of a large open space was found to add about 6% to property values; but this was considerably less than the property being within 500m of a Metro station (+9%), deciduous trees (+8%), and being located on and subject to disturbance from a major road (-15%) or a school or college (-5%). All of these were statistically significant, although the goodness of fit of the model as a whole was relatively poor, in that it only explained 63% of variation in house prices.

A more recent example of the use of a HPM to estimate the value of green spaces is the study by the Greater London Authority (Economics) (2003). It estimated that a 1% increase in greenspace in a typical London ward was associated with a 0.3% to 0.5% increase in the average house price in the ward. However, this HPM study suffers from a number of problems. It only regressed the area of green space, overcrowding, dwelling density, deprivation (% on income support claimants), school education scores, domestic burglaries, travel time to central London, health service accessibility, NO₂ levels, and a dummy for high house price wards in central London, against price. No account was taken of the structural characteristics of the property, or other location, neighbourhood, and environmental variables that affect property values. There was evidence in the study of measurement error associated with some variables (e.g. where a large open space is located in one ward but borders another, the first ward is credited

with the space and the second ward is recorded as having none); omission of relevant explanatory variables; multicollinearity between some of the variables in the model; and nonlinear relationships between house prices and some variables. Moreover, since the study is based on spatial data it suffers from the modifiable areal unit problem or the ecological fallacy: change the ward boundaries and the estimated coefficients in the model will change. Hence little reliance should be placed on the results of the GLA (2003) study.

Cabe (2005) has recently examined the impact of urban parks on property prices using case studies. Again the methodology is weak and they state that 'the evidence of value uplift is unproven'. However, the circumstantial evidence suggests that there are positive effects from high quality parks on residential property values.

Contingent valuation

Contingent valuation (CV) methods have also been used to value green spaces. Willis and Whitby (1985) estimated that households would be willing to pay on average £35 per household per year to avert loss of neighbouring green belt land in north Newcastle. In one of the two areas sampled, green belt land was subsequently lost in the late 1990s to a major housing and office development. WTA compensation for loss of neighbouring green belt land averaged £104 per household per year. Both values were assessed through a change in local property tax. Average property tax in 1981 at time of survey was £187 per house per year. The analysis of the amenity value of green belt land in relation to its opportunity cost (development value) suggested that too much green belt land had been designated around London; but that the 7,700 ha of Tyneside green belt was probably economically justified, although the analysis did not support the proposed extension in 1980 of the green belt to 24,860 ha.

Coskeran (1999) also used CV to estimate the utility of urban parks to residents in Northampton. Northampton has a large number of parks and public open spaces covering some 788 hectares. These parks are a typical 'public good': non-rival and non-excludable in consumption. Mean WTP to avoid/maintain council spending on urban parks and their facilities (flowers and plants; children's play areas; toilets; 'free' events, etc.) varied between £27 and £45 depending on the parametric or non-parametric econometric estimation method used. These values assumed all non-respondents had a zero WTP value for urban parks in Northampton. Coskeran revealed that the value of the parks to Northampton's residents was greater than current spending on maintaining parks; and also that the parks differentially benefited lower income groups in the town.

9.6 Business location decisions

There are few conclusive studies on the role of the open/greenspace in business location and retention decisions. Keeble *et al.* (1992) studied enterprise creation and development in England and found that the quality of the environment was a significant influence on the location decision of rural migrant entrepreneurs (Table 9.8). However for only 3.8% of urban companies was it a reason for their choice of location.

A study of factors affecting local economic development in the North West and South East regions of the UK also found that the traditional economic factors such as human resources, infrastructure, finance and capital, and industrial structure were consistently assigned higher ranks by respondents in both study regions than the more intangible, quality of life factors (Wong, 1998). 17% of respondents indicated that intangible factors such as community identity and quality of life were not at all important to local economic development. Respondents argued that the need for locating businesses within a high amenity environment was reduced by the fact that there are high amenity pockets of residential areas within commutable distance wherever one worked in Britain.

Table 9.8 Reasons for choice of company location

	Company Location		
	Remote Rural (%)	Accessible Rural (%)	Urban (%)
Nearness to founder's home	18.0	20.7	18.6
Environmental attractiveness	15.9	9.9	3.8
Labour advantages	9.2	9.3	9.5
Premises advantages	25.9	30.0	25.1
Local market or materials	9.2	6.4	7.4
Good communications	7.4	12.5	14.4
Government grants	4.6	0	0.7
Historic reasons	2.3	4.7	6.1
Company acquisition	3.2	1.7	2.4
Accessibility to clients, staff, suppliers	0.2	0.6	9.4
Other	4.2	4.1	2.6

Source: Keeble *et al.* (1992)

The fact that environmental quality varies over space permits an analysis of the impact of the environment on economic development and income generation. This methodology was used in a recent study by Park *et al.* (2004), to assess the impact of environmental quality on rural development. They concluded on the basis of a quantitative econometric analysis, qualitative data, and from discussions with a variety of stakeholders, that the degree to which economic development in rural Local Authority Districts (LADs) can be explained by the quality of the natural environment is, at least in the study period 1996-2001, both variable and limited, according to their economic growth model. Their national growth model constructed as part of this research suggests that the importance of high quality environments in rural development is varied. Only 14% of income change was accounted for, suggesting that much less of the variation in income between LADs, or change over time within LADS, can be attributed to the indicators, including environmental indicators, specified in the model. With respect to change in employment, the figure was lower still (4%) and from this it can be inferred that employment in a given LAD is not strongly linked with indicators of high quality environments, taking all employment sectors together.

These studies suggest that open/greenspace is perceived as a minor factor in business decisions especially in an urban context. It may be important once other requirements for premises, transport links etc. are met or where firms wish to be associated with a clean, green location. But the effect of environmental quality may be indirect. Property price analysis reveals that open/greenspace is valued by residents, and making towns attractive as places to live can change their image. But whilst good urban design, including green and open spaces, increases quality of life and might be expected to increase local competitiveness there is a lack of decisive evidence on the topic.

9.7 Development and regeneration

The benefits from the creation of attractive greenspace on abandoned or derelict land are likely to be large. The Forestry Commission undertook an *ex-ante* cost-benefit analysis of part-brownfield, part-agricultural land investment in three community forest areas of the UK. The total discounted expenditure including land purchase was £14.49m. The FC listed a wide range of social, environmental and economic benefits including attracting inward investment, new business related to woodland, enhanced property values, amenity, biodiversity and carbon fixing. However, only with recreation and timber was the evidence adequate to quantify the benefits. Benefits from timber and recreation were calculated at £0.37m and £22.45m respectively, giving an NPV of

£8.33m. The North West Development Agency in northwest England has a £23m Newlands scheme for regeneration of brownfield sites. In order to target areas that will give greatest benefit an expert-based scoring system (Public Benefit Recording System, PBRS) has been developed. This scores the expected benefits from woodland creation for social, access, economic and environmental benefits. For example, the access score is based on measures of the presence of public rights of way, proximity of other public open space, and accessibility by road, train, cycle and bus. The PBRS is a good approach and one that has provided a basis on which FC can approach landowners with a view to land purchase. It also provides the basis for strategic planning and prioritisation. The problem is that such scores have a large arbitrary element and may not relate well to preferences of the local population. Even so, they represent the best low-cost approach available so long as they are based on careful consultation with stakeholders.

Table 9.1 Trees and woodland valuation studies

Study	Country or area of study	Type of trees	Effect considered	Valuation premium
Hedonic pricing				
Morales (1993)	USA	Garden	Impact on property prices	A premium of 6% on residential property prices was estimated for properties with trees in their garden plots.
Anderson and Cordell (1988)	USA	Garden	Impact on property prices	3.5% to 4.5% increase in sales price of property.
Garrod and Willis (1992a)	Forest of Dean	% of woodland in 1km ²	Impact on property prices	20% woodland cover increased average property values by 7.1%.
Garrod and Willis (1992b)	Great Britain	Forestry Commission forests	Impact on property prices	1% increase in broadleaved trees in 1km ² added £42 to house.
Stated preference				
Hanley et al (1996)	Scotland	Farm woodland	WTP for woodland in ESA cultural landscape	MASCE model with woodland simultaneously valued alongside other attributes: archaeological, moorland, grassland, and walls. Average WTP £182 per household per year.
Santos (1998)	England	Farm woodland	WTP for woodland in ESA cultural landscape	Visitors WTP £43 per year in IVS study; £17 if 2 nd attribute; and £11 if 3 rd attribute provided.

Table 9.3 Waterside residential valuation studies

Study	Country or area of study	Type of waterside	Amenity/disamenity considered	Waterside premium
Hedonic pricing				
Garrod and Willis (1993)	UK	Canal	Waterside frontage and adjacency to the canal	A premium of 2.9% was calculated for waterside frontage in London and 5.2% in the Midlands, adjacency was only significant in London giving a premium of 1.5%.
Kulshreshtha and Gillies (1993)	USA	River	River view	Positive effect on capital and rental prices and related to neighbourhood. Information not provided to estimate a percentage premium.
Mahan <i>et al.</i> (2000)	USA	Wetlands, lakes and streams	Size and proximity of wetland and proximity to lakes and streams	Based on the average values, 0.02% per acre wetland. In terms of proximity 0.36% per 1000 feet closer to the wetland, 0.21% for streams and 1.34% for lakes.
Luttik (2000)	Netherlands	Canal and Lake	View and proximity	View of a canal 4%-5%, vicinity of a lake 5%-7%, if view of an extra 8%-10%, if facing garden an extra 8%-10%.
Michael <i>et al.</i> (2000)	USA	Lake	Water clarity	5%-23% for an improvement in water clarity
Leggett and Bockstael (2000)	USA	Bay	Water quality	Moving from a high to a low fecal coliform count increases house prices by 1%
Stated preference				
Feitelson (1992)	USA	Bay	Water frontage, water view and water access	All found to be significant and, based on average house prices, willing to pay a premium of between 9% and 22% for a water frontage.
Garrod and Willis (1993)	UK	Canal	Waterside location overlooking and 20 meters from the canal	Properties within 20 meters of a canal were estimated to have an 8.1% premium and properties with canal frontage a further 8.3%.
Wood and Handley (1999)	UK	Canal and river	Waterside location	A premium of between 10-40% (mean nearer 20%).

Table 9.4 Summary of findings from Ecotec Research and Consulting (1996; 1998)

Developments and date of study	Forms of development					Importance of quality waterside location
	Residential	Leisure	Office	Retail	Canal and access	
Urban / city centre						
Blackburn Waterside (Blackburn) (1996)	Yes	Yes	Yes	Yes	towpath; open space.	Added value, especially to the canal side pub and restaurant uses.
Coventry Canal Basin (Coventry) (1996)	Yes	Yes	Yes	Yes	infrastructure and environment.	Provided a focus for development; benefits to residential and public house restaurant.
Aston Science Park (Birmingham) (1996)	Yes	Yes	Yes	Yes	towpath; visitor moorings expected.	Canal side played an important role in plans; less evidence that occupiers have identified canal side benefits
Gas Street Basin / Brindley Place (Birmingham)(1996;98)	Yes	Yes	Yes	Yes	towpath; bridge; engineering.	Canal has provided a focus for development; improved access to the area; important for leisure activities; had a role attracting occupiers.
Gloucester Docks (Gloucester) (1998)	No	Yes	Yes	Yes	marina; safety railings; dry dock.	Provided a focus for the development linking offices with recreation and leisure; public policy need for the development of this area.
Sheffield Canal Basin (Sheffield) (1998)	Yes	Yes	Yes	Yes	towpath; mooring; facilities; dry dock.	Waterways were judged to have given added value to every aspect of the development.
Shipley Saltaire Canal (Bradford) (1998)	Yes	Yes	Yes	Yes	towpath; access; mooring.	The canal has provided a focus to extend the tourist activity from the Saltaire site.
Small town / rural						
Montgomery Canal (Welshpool) (1996)	Yes	No	No	No	Restoration.	Canal helped to dispose of property quicker but walkers may be a disincentive; used by local authorities to stimulate future development.
The Bratch (Wombourne) (1996)	Yes	Yes	No	No	access; towpath; lock; picnic area.	Improvements may have encouraged development; residential planning process led to further improvements.
Brecon Canal Basin (Monmouthshire) (1998)	Yes	Yes	No	Yes	new basin; bridge; tow path.	Although an asset to the town and an attraction for visitors, there is no evidence of a waterside premium.
Goytre Wharf (Powys) (1998)	No	Yes	Yes	Yes	towpath; footpath access; aqueduct.	In combination with the environment of the surrounding valley, the canal has provided a central role in the success of the development.

Table 9.5 Footpaths and access

Study	Country or area of study	Type of footpath	Amenity/disamenity considered	Value of footpaths and access
Travel-cost Willis and Garrod (1990)	Wales	Linear	Access to canal towpaths	Consumer surplus of 9 pence per walk along Montgomery canal towpath.
Willis (1991)	UK	Forest areas	Access to FC recreation sites.	£1.43 to £3.31 person per visit.
Stated preference Bennett <i>et al.</i> (1995)	Bracknell forest	Forest trails	Access to FC mature Scots pine woodland	£1.11 per person per visit.
Scarpa (2003)	UK	FC forests	Access to FC recreation sites.	Visitors WTP £1.62 per visit.

Table 9.6 Wildlife areas

Study	Country or area of study	Type of trees	Effect considered	Valuation premium
Travel-cost Everett (1979)	Yorkshire	SSSI	Recreation.	£1.92 per visit; which aggregated to £31.00 per ha per year
Willis and Benson (1988)	Yorkshire	SSSI & NNR	Use value.	Upper Teasdale, Skipwith Common and Derwent Ings: £1.02 to £2.29 per visit: £32 to £264 per ha per year
Stated preference Willis, Garrod and Saunders (1995)	South Downs and Somerset Moors	ESAs	CV use and non-use values.	South Downs: £1.98 per household for non-use per year; £19.47 per visitor per year; £27.52 per resident per year. Somerset levels and Moors: £2.45 per household for non-use per year; £11.84 per visitor per year; £17.53 per resident per year.
Hanley <i>et al.</i> (1996)	Breadalbane & Mahair, Scotland	ESAs	MASCE use and non-use values.	Breadalbane: woodland £83 moors £37, grassland £24 household/year. Mahair: birds £6.05, flora £3.68 per household/year.

Table 9.7 Open space

Study	Country or area of study	Type of trees	Effect considered	Valuation premium
Hedonic pricing				
Wabe (1970)	London	Green belt land.	Impact on property prices.	A premium of £276 per house for properties within 2 miles of green belt; equivalent to 4.9% premium on house price.
Correll <i>et al.</i> (1978)	Boulder, USA	Green belt land.	Impact on property prices.	\$13.78 decline in house prices per metre from green belt; equivalent to 32% decline in house price 1km distant from green belt.
GLA Economics (2003)	London	Open greenspace.	Impact on property prices.	1% increase in open greenspace in a ward increases average house prices by 0.3% to 0.5%.
Stated preference				
Willis and Whitby (1985)	Tyneside	Green belt land.	Loss of green belt land.	WTP to avert loss of neighbouring green belt land £35 per household per year; WTA compensation for loss of neighbouring green belt land £104 per household per year; through changes in local property tax. Average property tax in 1981 at time of survey was £187 per house per year.
Coskeran (1999)	Northampton	Urban parks.	Loss of parks and their attributes.	WTP extra local property tax of £27 to £45 per household per year.
Willis (2003)	Naples	Historic urban park	Entrance charge.	£1.60 per visit.