



Biodiversity for Greenspace and Climate Change Adaptation

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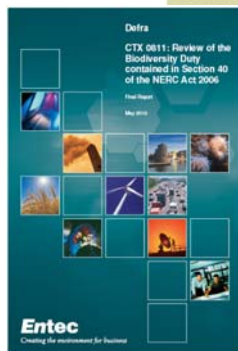
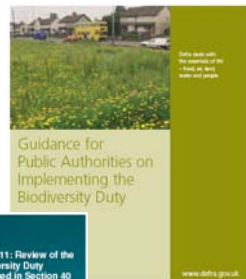


- Biodiversity Duty
- Climate Change Adaptation

<http://www.embiodiversity.org.uk/files/documents/documents/embp-1st-ann-conf-report-climate-change-adaptation.pdf>



The NERC Act 'Biodiversity Duty'

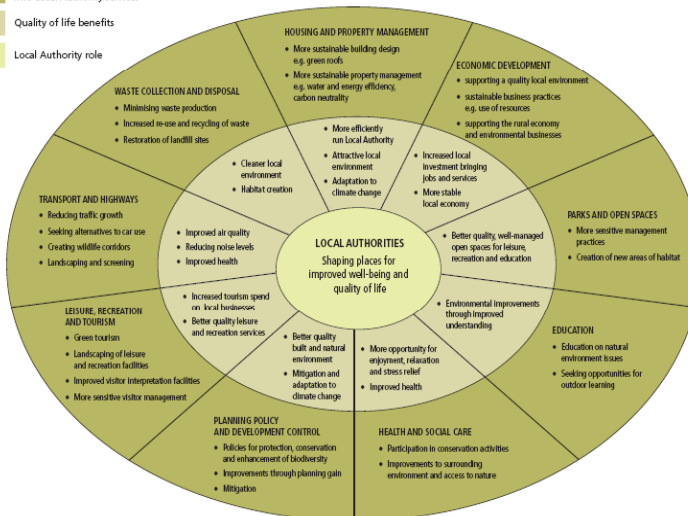


- Natural England and Rural Communities Act 2006
- *“Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity”*
- Guidance for Local and Public Authorities (2007)
- Defra Review of Local and Public Bodies implementation of the 'Biodiversity Duty' (2009-10)

Incorporating Biodiversity into Local Authority Services



- Examples of how biodiversity can be incorporated into Local Authority services
- Quality of life benefits
- Local Authority role

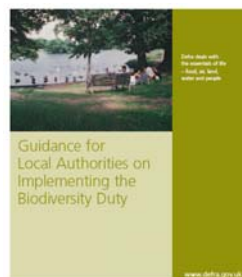


Biodiversity Duty Guidance

<http://www.defra.gov.uk/environment/biodiversity/documents/la-guid-english.pdf>



- A. Fulfilling statutory obligations within the forward **planning and development control** processes.
- B. Incorporating the conservation of biodiversity and its benefits into relevant **strategies of the local authority**.
- C. Having regard to biodiversity within **partnership arrangements**
- D. Taking account of the links between biodiversity and **other environmental programmes** such as waste management, energy conservation and response to climate change.
- E. Delivering the key principles for biodiversity set out in **national planning guidance**.
- F. Participating in **local biodiversity partnerships**.
- G. Working in partnership with other organisations to promote beneficial **land management** for biodiversity.
- H. Protecting and enhancing biodiversity on the **LA estate**.
- I. Identifying **policy drivers** and ensuring up-to-date **biodiversity data** is available.
- J. Identifying **Local Sites of importance for biodiversity** and managing systems to take these into account within the planning and land management processes.
- K. Using the **benefits of access** to biodiversity in the delivery of services to the public such as social care, community development, health, and recreation.
- L. Supporting appropriate **access to nature and understanding** of natural world within schools, community engagement, education programmes, and raising awareness of biodiversity to the public.



NERC Review – Recommendations



- Encourage all **local authorities** to:
 - have a **corporate biodiversity strategy** (or equivalent);
 - be an active member of their **local biodiversity partnership**;
 - have a **'Biodiversity Champion'** amongst their senior managers, who has responsibility for implementation of the duty; have access to ecological advice;
 - appoint a council member as a member-level **'Biodiversity Champion'**;
 - produce **management plans** incorporating a biodiversity element for all their land and buildings;
 - maximise the extent of eligible council-owned land in higher level tiers of **agri-environment schemes**;
 - employ sufficient suitably **qualified ecologists** to meet their responsibilities under the duty - county councils and unitary authorities should provide a biodiversity service to district/borough/community councils within their administrative area, which do not have an in-house ecologists; and
 - have access to up to date **biodiversity information** for their land, buildings and administrative area.
- **Defra/WAG** to:
 - develop a **framework for local authorities** to review their implementation of the duty;
 - provide an easily searchable **website** with information that supports different types of public authorities in implementing the duty;
 - produce a series of **short guidance booklets** on the duty aimed at different types of public authorities

Examples



- Working to implement the **Local BAP** and support the Local BAP partnership.
- Improved management of **Local Wildlife Sites** for biodiversity.
- **Enhancement of local authority-owned parks and open spaces** for biodiversity through, for example: the implementation of management plans that address biodiversity; the creation of wildflower meadows; native tree and shrub planting; wetland creation; improving grassland management regimes; species-specific measures, such as erecting bird and bat boxes; and integrating biodiversity considerations into the management contracts for council land.
- **Biodiversity enhancement of the grounds associated with council offices** and facilities (such as schools, old people's homes, healthcare facilities and housing estates).
- **Improving local authority-owned buildings for biodiversity**, for example by: incorporating green roofs in new buildings; retrofitting green roofs to existing buildings; establishing green walls; putting up bat and bird boxes; undertaking survey work to inform building maintenance (e.g. surveying roof areas for bats, and advising maintenance teams accordingly); training building maintenance teams; planting native plant species that are attractive to wildlife.
- Working with **local authority highways teams** to secure enhancements for biodiversity, for example through: the implementation of a highways BAP; planting on roundabouts; replacing areas of over-wide pavements with native planting; creating roadside nature reserves; improving the management of road verges; and sowing new road verges with seed collected from a Site of Special Scientific Interest (SSSI).
- **Promoting biodiversity with schools**, through for example: education programmes; undertaking baseline surveys of the wildlife present; improving the management of school grounds for biodiversity; and incorporating biodiversity measures into new buildings, such as green roofs, green walls, bat roosts and bird nest boxes (swift, house sparrow etc.).
- Carrying out **biodiversity outreach and environmental education work**, including for example: producing wildlife gardening packs; leading biodiversity walks; holding species identification training.
- Organising **volunteer groups** to undertake biodiversity conservation/enhancement activities.

Case Study 3.1: Implementing the duty - Sheffield City Council

The biodiversity duty gave weight to Sheffield City Council Parks and Countryside Service's successful bid to obtain funding from its board for two new posts, namely a Biodiversity Officer and a Biodiversity Monitoring Officer. The appointment of these two officers has raised the profile of biodiversity amongst council staff and the public, and has enabled Sheffield City Council to initiate a wide range of actions to implement the Duty. These include:

- Setting up a working group to ensure that biodiversity is integrated into all the functions of the Parks and Countryside Service.
- Through the South Yorkshire Biodiversity Forum (of which they are a member), producing leaflets with advice on how to integrate biodiversity into the functions of every Council department. These documents can be downloaded from Sheffield City Council's website.
- Organising a training session on wildlife legislation for the council's planners and providing advice to the planning department on incorporating consideration for biodiversity into development control.
- Incorporating biodiversity enhancement measures such as green roofs and walls into new and existing council buildings. In 2009, Sharrow School's green roof (pictured) became the first in the country to be declared as a Local Nature Reserve.
- Undertaking increased positive management of open spaces for biodiversity. Ecological management plans have been produced for all large parks, open spaces and countryside areas, and are in development for wider landscape areas such as the Porter Valley.
- Enhancing parks and open spaces. For example, in Millhouses Park a concrete canalised stream has been replaced with a rocky watercourse with marginal planting, allowing fish to pass upstream through the park. This has attracted a wide range of species and generated considerable interest from local people.
- Conducting research with Sheffield University on how to make biodiversity enhancements within parks attractive for both wildlife and people.
- Retaining hedges separating plots and providing biodiversity areas within allotments.
- Implementing a citywide biodiversity monitoring programme for Sheffield's 298 Local Nature Sites and encouraging participation by local volunteers.
- Securing funding from the Esmée Fairbairn Foundation for a two year project to conserve Sheffield's stronghold population of white-clawed crayfish, and recruiting a Crayfish Conservation Officer.
- Bringing moorland back into good management by working closely with the Peak District National Park Authority on its Moors for the Future Programme.
- Providing biodiversity advice to businesses and local people.
- Providing environmental education activities for schools, families and local groups aimed at developing a greater understanding of and respect for the natural world.



Case Study 3.2: Implementing the duty - London Borough of Islington

Islington Borough Council created a post for a biodiversity officer as a direct result of the duty. The officer is tasked with ensuring that biodiversity is integrated across the council's functions, which involves the officer liaising with personnel across different departments. Aided by the work of the biodiversity officer, the council has undertaken numerous other measures to implement the duty, including the following:

- Incorporating a biodiversity section within the council's sustainability action plan.
- ★ Including biodiversity improvements and conservation in the boroughs greenspace strategy for parks and open space.
- Developing a biodiversity strategy which states the council's responsibilities with regard to biodiversity.
- Rewriting the Islington BAP.
- ★ Retrofitting green roofs on council buildings. These roofs are being monitored for three years by Buglife to determine their value for invertebrates. The aim is to use these roofs as exemplars and case studies to demonstrate to developers and other organisations what can be done.
- ★ Surveying all Sites of Nature Conservation Importance within the borough.
- ★ Introducing a rolling programme for producing site management plans to ensure that as many sites as possible have biodiversity management plans in place. Previously management plans existed for only three nature reserves and green flag parks.
- Requiring green roofs to be fitted on most major developments within the borough. The council specifies the type of roof which should be fitted, and requires detailed specifications to be provided. The council strongly pushes for roofs of a higher specification than the standard Sedum roof, reflecting what it has done on its own roofs. As a result a recent study found that Islington has more green roofs than any other London borough; 16% of London's green roofs are in Islington.
- ★ Introducing a "Greening the grey" project, aimed at creating green spaces in otherwise very built up areas. For example, removing paving to create a soft landscape, and planting climbers against walls.
- ★ Producing guidance notes for developers on incorporating biodiversity enhancement measures into developments and other related topics, including, climate change adaptation, sustainable drainage systems, green roofs and green walls (these are available on their website).
- ★ Producing wildlife gardening packs for local residents.
- Creating a new wetland area, meadows and house sparrow habitat in Whittington Park, with the objective of improving the nature conservation value of the site from a 'local Site of Importance for Nature Conservation' to a 'borough Site of Importance for Nature Conservation'. This project also aimed to improve access to natural green space for residents.
- ★ Promoting a 'green gym' through practical nature conservation volunteer programmes around the Borough.
- ★ More recently Islington is looking at a landscape scale approach to the conservation of biodiversity and has started work on developing a green infrastructure policy and identifying priority areas for habitat creation.

The measures introduced by Islington demonstrate the wide range of actions which can be taken to enhance biodiversity in an urban environment.



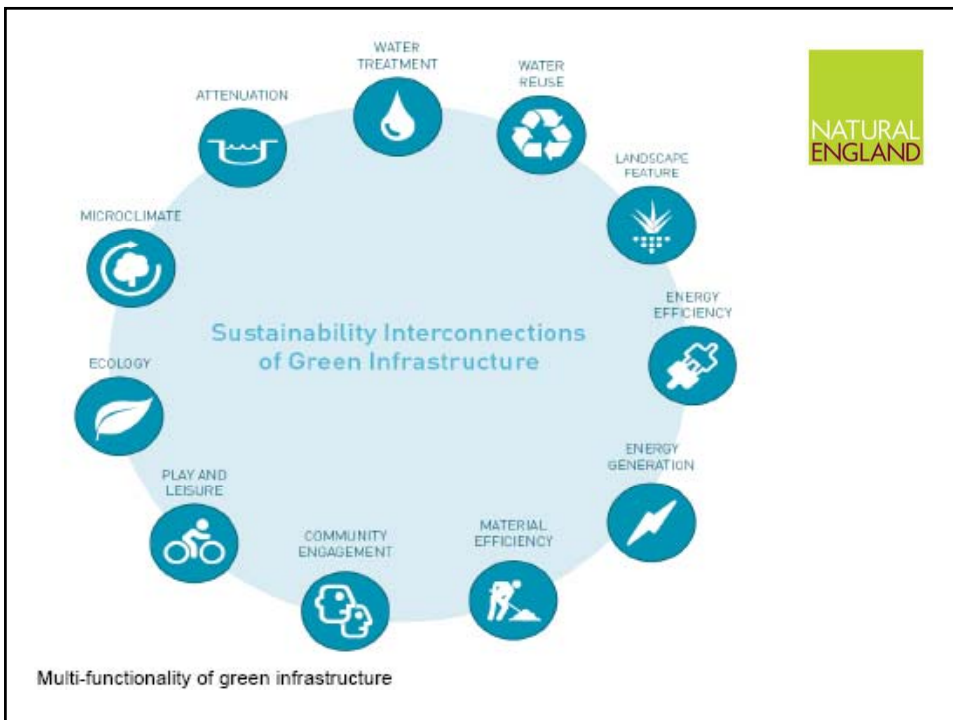
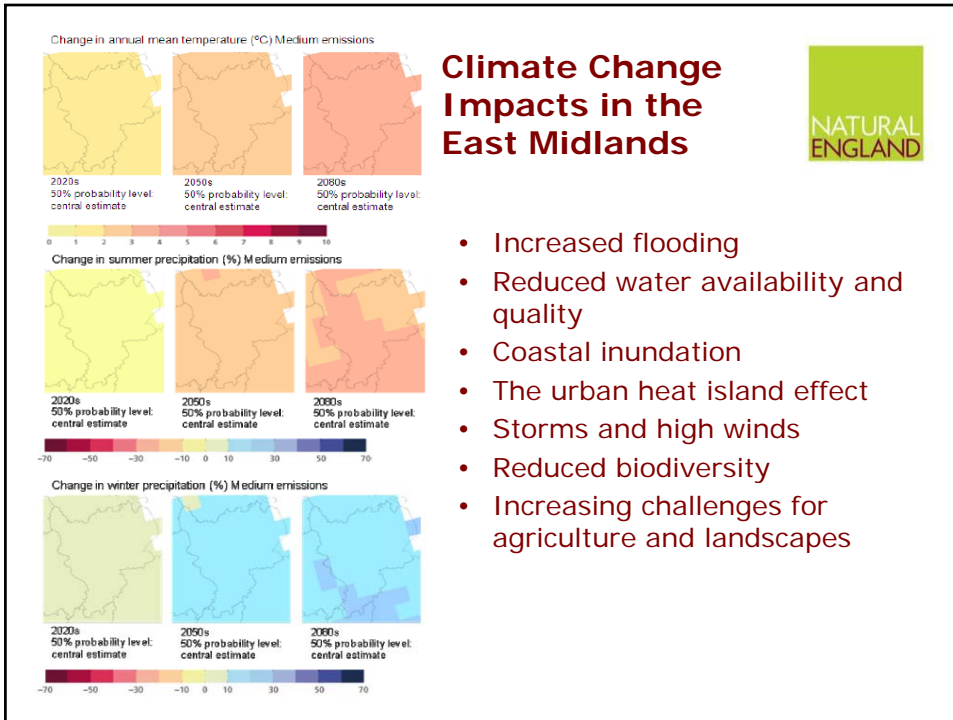
Adapting through natural interventions

A scoping report considering how decision-making can realise the benefits of the use of natural interventions to aid climate change adaptation in the East Midlands

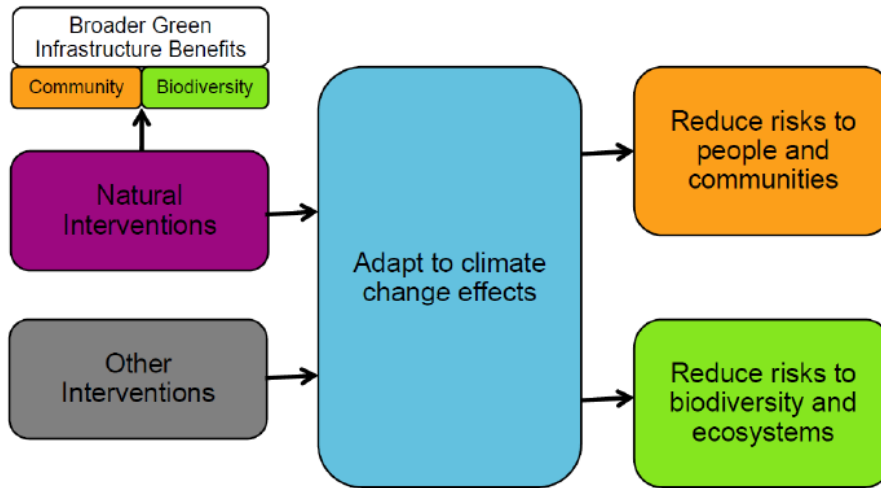
May 2010



Using green spaces for climate change adaptation



Multiple Benefits of Natural Interventions



| Intervention | Description | Pros | Cons | Adaptation effect | Suitable Locations | Deliverability |
|-------------------------------------|--|---|---|---|--|--|
| Living walls | Growth of climbers or installation of planted modules | Effective against heat islands, popular | Usually require irrigation | Summer cooling | Inner cities | High – easy to retrofit |
| Trellises, pergolas | Growth of climbers on supporting structures | Effective against heat islands, popular | Non traditional | Shade, summer cooling | Inner cities | High – can be retrofitted |
| Extensive green roofs | Low growing vegetation on shallow substrate on roof | Part of SUDS. Effective against heat islands, Biodiverse, multifunctional | Weight issues on lightweight structures | Summer cooling, improved drainage, increase in urban biodiversity | Inner cities, industrial sites | High with new build |
| Intensive green roofs | River gardens | Accessible | Usually require irrigation | Summer cooling, drainage, Outdoor respite in heat waves | Inner cities, residential, office blocks | High with new build |
| Street trees | Standards selected for suitability | Can be integrated with SUDS | Limited space available | Shade, cooling, drainage, biodiversity | Urban | High |
| Courtyards | Private open spaces (could include trees, SUDS features) | Close to dwellings | Integration of functionality may be a challenge | Shade, cooling, drainage, biodiversity | Urban, suburban | Medium – high urban land costs limit potential |
| Local parks, amenity spaces | Lawns, parking, trees, shrubberies | Sufficiently large to maintain pleasant microclimate | May have limited water retention capacity. Low biodiversity | Shade, cooling, drainage, biodiversity | Urban, suburban, Part of new settlements | Medium – high urban land costs limit potential |
| Water features | Fountains, formal pools | Instant relief in heat waves | Use energy, pollute water, High maintenance, H&S concerns | Summer cooling, Respite in heat waves | Public realm of inner cities and towns | Low – high cost and maintenance issues |
| Sustainable Drainage Systems (SUDS) | Drainage that mimics nature, Swales, pools, soakaways etc. | Designed to cope with excess water, Cooling and biodiversity | Limited space, Management issues | Drainage, summer cooling | Urban, suburban, Part of new settlements | Medium – space problems in inner cities, Needs innovative design |
| Sports facilities | Playing fields, courts etc. | Design could be modified to include SUDS and other features | Tend to be artificially drained and sterile | Microclimatic and drainage benefits possible | Urban, suburban | High because of primary function. Must be designed to be multifunctional |
| River Restoration Schemes | Removal of hard man-made banks | Can provide access, open space habitat, water quality improvements, Part of a network | Limited space available and cost | Flood, drainage, cooling and biodiversity benefits | Urban, suburban, rural | Medium – Complex and high cost |

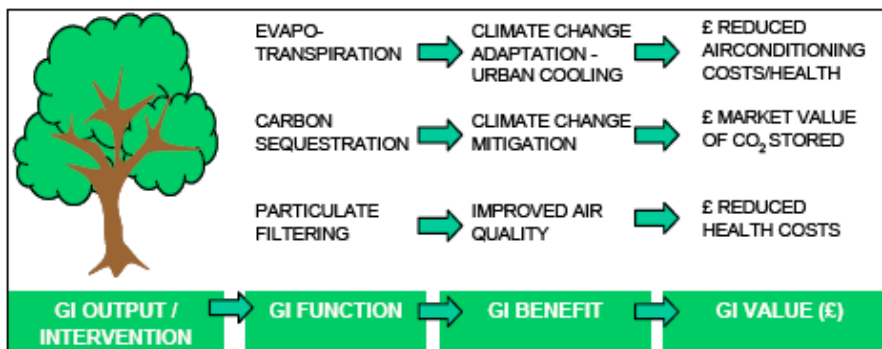
Adaptation Benefits



| | | | | | | |
|--|--|--|--|--|--|---|
| District, regional parks (e.g. Country Parks) | Grasslands, trees, woodland but also space for water and habitat | Policy requirement for open space. Could be integrated into SUDS, river restoration | Limited space available in urban areas. | Shade, cooling, drainage, biodiversity. Outdoor respite in heat waves. | Urban, Suburban, New settlements | High – required as GI component of growth |
| Greenways | Linear parks primarily for cycling, walking | Can include SUDS, part of ecological networks | May be remote from urban core | Drainage, biodiversity. Can be shaded cycling/walking routes. | Sub-urban, rural | High – as part of sustainable transportation projects |
| Floodplain restoration | Reconnection of and restoration of floodplain wetlands (washlands, meadows and wet woodland) | Important for flood alleviation | Fragmented land ownership. Cost | Flood management and biodiversity. | Suburban, rural | Medium – Complex and high cost |
| Woodland (Forests) | Strategic plantations as part of catchment management and provision of GI networks | Important for flood alleviation and biodiversity, multifunctional | Fragmented land ownership. | Flood management and biodiversity. | Suburban, rural | High – Many high profile projects already underway which could be expanded. |
| Restoration of peat bogs and other wetlands (e.g. wet woodland, wet heath) | Blocking of drains and rewetting of historic wetlands | Important for flood alleviation and maintenance of water supplies | Usually large scale, long term and expensive | Flood management, water supply security and biodiversity | Uplands, rural, river valleys, coastal | Medium – complex and high cost |
| Modification of farming practices and land management practices | Soil building techniques, agroforestry, short-rotation coppice, stream buffers, ponds, etc | Catchment management approach to flood alleviation, maintenance of water quality, biodiversity | May be contrary to commercial considerations | Flood management, water quality and biodiversity | Rural | High – supported by environmental stewardship schemes |



Urban Green Space, Trees and Climate Change adaptation



Urban Green Space, Trees and Climate Change adaptation - Cooling



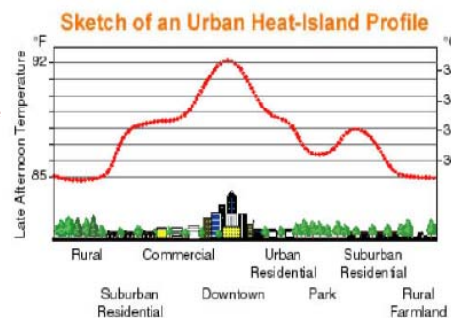
- Parks, gardens and street trees can help to reduce the impact of hotter summer temperature by providing natural cooling and shade, reducing temperatures locally.
- Shading from trees plays a role in mitigating the urban heat island effect. By shielding building facades and street surfaces from the sun, the amount of energy stored in the built fabric during the day is reduced, and the urban heat island effect mitigated.
- Trees are critical in reducing overheating in homes and offices.



Urban Green Space, Trees and Climate Change adaptation - Cooling



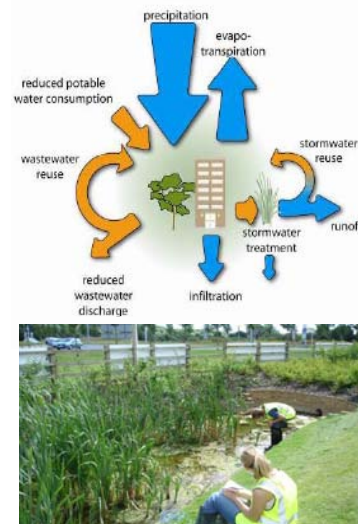
- Green spaces create cooler microclimates through evapotranspiration. Water is released through a leaf's pores and when it evaporates energy is absorbed from the air creating a cooling effect.
- In green spaces greater than 1 hectare in size, the effect can be sufficiently pronounced to develop a distinctive microclimate.
- For Manchester it has been calculated that an additional 10% green cover in high density urban areas could moderate temperatures sufficiently to entirely counteract warming due to climate change until 2050.
- Conversely, a 10% reduction in green cover will exacerbate the warming effect, increasing surface temperatures by 3-4°C in high emissions scenarios for 2080.
- In times of drought shallow soils can dry out, losing their ability to cool. The protection from direct sunlight afforded by larger trees can slow this process.



Urban Green Space, Trees and Climate Change adaptation - Water



- Urban green space can have a flood management role, providing water storage and attenuation.
- Land sealing in urban areas increases the impact of surface water by reducing infiltration rates to groundwater stores.
- Green space helps manage this flood risk by intercepting rainwater and by providing conduits for surface water to infiltrate the soil.
- Because winter precipitation is expected to increase, additional urban green space alone may not be sufficient to significantly reduce rising flood risks. Green space can be specifically designed to provide this service, e.g. Sustainable Drainage Systems (SUDS).



Urban Green Space, Trees and Climate Change adaptation – Energy Use



- Studies on the effect of vegetation on temperature and consequential building energy demand:
 - Wind-shielding impact of trees on heating-energy use in four Canadian cities. Estimated heating-energy savings in the range of 10–15%.
- Peak-power and cooling-energy savings from shade trees in two houses in Sacramento, California
 - Trees can reduce temperatures by about 0.3°C to 1°C at 2 pm.; in some situations the temperature was decreased by as much as 3°C.
 - The shading and micro-climate effects of the trees at the two houses yielded seasonal cooling energy savings of 30%, corresponding to average savings of 3.6 and 4.8 kWh/day. Peak demand savings for the same houses were 0.6 and 0.8 kW (about 27% savings in one house and 42% in the other).



Urban Green Space, Trees and Climate Change adaptation – Air Quality



- Air quality is likely to decline in the future, due to increasing temperatures which will intensify the effects of air pollution, particularly in urban areas.
- Vegetation and trees help to filter out air pollutants.



Adapting through Natural Interventions: launch event



Adapting through Natural Interventions: launch event

Friday 16th July 2010, 10am – 12pm

County Hall, West Bridgford, Nottingham, NG2 7QP

Part of Changing Climate Weeks Summer 2010

This event is the launch of the findings of the Adapting through Natural Interventions project, which was initiated by Natural England and delivered by Aecom on behalf of Climate East Midlands (the Regional Climate Change Partnership), with funding from Defra.

The project explored the role of the natural environment in helping humans adapt to a changing climate and examined how natural interventions can be selected and designed to bring about the greatest social, economic and environmental benefits. A literature review considered the current breadth and depth of current knowledge on this topic and highlighted any gaps. The study concluded by looking at the potential and scope of decision making tools that could help the East Midlands adapt to climate change through natural interventions.

Celeste Morgan from Aecom will present the key findings of the ANI project and invite participants to consider how they can be disseminated and utilised in practice, including the potential of the proposed tools. What are the next steps in this new and rapidly evolving policy and financial landscape? Come and help us decide!

Who should attend?

People working in climate change adaptation, planning, natural environment, biodiversity and green infrastructure in the East Midlands.

What's in it for me?

Be one of the first to hear about the findings of this pioneering project, join the debate about how to put them into practice and help decide the next steps.

How can I book?

Booking is essential, please book online: <http://bookwhen.com/ccweeks2010>
For more information, please contact Mike Peverill, 07854 284 588

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- County Hall, West Bridgford, Nottingham
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THANK YOU!

Further details/queries:

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