



Green infrastructure:

How and where can it help the Northwest mitigate and adapt to climate change?

June 2010

**Part of the Northwest
Climate Change
Action Plan
& GRaBS Project**

communityforestsnorthwest
supporting the memory, not just the present-day forests

 Northwest
REGIONAL DEVELOPMENT AUTHORITY

grabs
Green Regional Adaptation
and Resilience
and Best Practices
Study

 INTERREG IVC
INTEGRATED AND
COOPERATIVE
INTERREGIONAL
COOPERATION

 European Union
European Regional Development Fund

Executive Summary

This report has been produced through the green infrastructure strand of the Northwest Climate Change Action Plan, and is part of the EU funded 'Green and Blue Space Adaptation for Urban Areas and Eco Towns (GRaBS)' project. It builds upon a report from 2008 on 'Critical climate change functions of green infrastructure for sustainable economic development in the Northwest'.

Green infrastructure is defined as "the region's life support system – the network of natural environmental components and green and blue spaces that lies within and between the Northwest's cities, towns and villages, which provides multiple social, economic and environmental benefits". "Building greater resilience to climate change" is included as one of five essential actions for Northwest England in the recently Green infrastructure Prospectus.

This report sets out how and where green infrastructure can help the Northwest to mitigate and adapt to climate change. It is intended to raise awareness in the Northwest of the climate change services that green infrastructure can provide, and to start to target where these may be considered to be the most important; highlighting that it may be possible to get multiple services from the same piece of land and the need to take opportunities as they arise to do this. Indeed, green infrastructure can be seen as a 'win-win' solution as it can also deliver multiple other benefits whilst combating climate change.

A number of services that green infrastructure provides which help to combat climate change are identified and mapped according to where they are considered to be the most important across the Northwest. Broadly speaking, the mitigation services provided by green infrastructure are considered limited but important, whereas the adaptation services provided by green infrastructure are considered substantial.

Mitigation services	Adaptation services
<ul style="list-style-type: none">• Carbon storage and sequestration• Fossil fuel substitution• Material substitution• Food production• Reducing need to travel by car	<ul style="list-style-type: none">• Managing high temperatures• Managing water supply• Managing riverine flooding• Managing coastal flooding• Managing surface water• Reducing soil erosion• Helping other species to adapt• Managing visitor pressure

A number of approaches to targeting where action is needed are identified:

1. Targeting action where each service is considered important.

This is a good place to start if an organisation is interested in only one (or a few) of these services. Opportunities should still be taken by any green infrastructure intervention to maximise the other services that are important in that area.

Service	Where to safeguard	Where to enhance
Carbon storage and sequestration	Highest density areas, e.g. where carbon density is greater than the regional average of 178 tC/ha	Everywhere
Fossil fuel substitution	Woodlands currently managed for biofuels production	Areas of high potential yields of miscanthus or short rotation coppice
Material substitution	Woodlands currently managed for timber production and local processing plants	Other existing woodlands could be brought into management for this purpose and new processing plants created
Food production	Best and most versatile agricultural land	Urban areas
Reducing the need to travel by car	Existing green walking and cycling routes and local recreation areas in and near (e.g. within 5 km of) urban areas	Improving and linking existing green walking and cycling routes and local recreation areas in and near (e.g. within 5 km of) urban areas
Managing high temperatures	In urban areas, especially where vulnerable people live, where green infrastructure levels are currently low, and where people congregate	In urban areas, especially where vulnerable people live, where green infrastructure levels are currently low, and where people congregate
Managing water supply	Areas where water is currently available	Areas where the water resource is over-licensed or over-abstracted
Managing riverine flooding	Within flood zones and strategic locations in the catchment, especially areas designated as 'policy option 6' within Catchment Flood Management Plans	Within flood zones and strategic locations in the catchment, especially areas designated as 'policy option 6' within Catchment Flood Management Plans
Managing coastal flooding	Existing coastal habitats which provide a natural buffer	Where natural flood defence / realignment is suitable
Managing surface water	Existing green infrastructure in urban areas	In settlements at the greatest risk of surface water flooding
Reducing soil erosion	Where soil erosion risk is high or very high	Where soil erosion risk is high or very high
Helping other species to adapt	Existing habitats	Around existing habitat taking into account species' dispersal ability. In landscape character areas assessed as having a high vulnerability to climate change. Increasing the permeability of the wider landscape and linear corridors
Managing visitor pressure	Low or very low capacity to accommodate visitors	High or very high capacity to accommodate visitors, especially where these are within or close to urban areas, or to good public transport links

2. Targeting action in areas which are important for the greatest number of services.

Perhaps unsurprisingly, urban areas tend to come out strongly as being important for the greatest number of climate change services. Any green infrastructure intervention should then seek to optimise these services. The extent to which the services can be optimised will depend on their compatibility; whilst some services are considered to be generally incompatible with each other, many are considered to be generally compatible. This often depends on the considered and careful design and management.

3. Targeting action where prioritised services are considered important.

Urban areas and floodplains tend to come out as important for the priority services. Priority services were determined by scoring the need for mitigation or adaptation and the potential for green infrastructure as a solution (both in terms of effectiveness and practicality). Again, opportunities should still be taken by any green infrastructure intervention to maximise the other services that are important in that area. The priority services were identified as:

- Managing surface water
- Managing high temperatures
- Carbon storage and sequestration
- Managing riverine flooding
- Food production.

4. Targeting action where change or investment is taking place.

It is crucial to optimise climate change related services wherever structural change, new development and investment is taking place across the Northwest.

There is a wealth of information held in this report, including regional scale mapping. At this scale broad conclusions about areas where the climate change services of green infrastructure are most important can be made as a way of targeting and getting more out of regional interventions. The report also holds examples of sub-regional and local mapping and analysis, which demonstrate the possible use of the information at a finer resolution.

This report will be used to help develop a forthcoming action plan for the Northwest, which will set out green infrastructure actions to be taken to mitigate and adapt to climate change. This should set out green infrastructure actions to be taken for each climate change service, where these should be taken, delivery mechanisms and organisations who could lead on each.

All work produced through the green infrastructure strand of the Northwest Climate Change Action Plan can be accessed via www.ginw.co.uk/climatechange. Please refer to this website for the latest updates and contact us via this website if further clarification is needed.