



Natural Economy Northwest

Assessing the potential for Green Infrastructure development within projects

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Natural Economy Northwest



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Natural Economy Northwest

Assessing the potential for GI development within projects

1.0 Introduction

Natural Economy Northwest (NENW) is a regional partnership programme led by Natural England, the North West Development Agency (NWDA) and the SITA Trust on behalf of a wide range of economic and environmental partners. The main focus is to deliver priority action 113 in the Regional Economic Strategy, to optimise the natural environment's contribution to the regional economy and quality of life.

The programme includes working with a wide array of environmental and economic partners to mainstream the natural environment within sustainable economic development. The result of this collaboration has been the development of a significant body of knowledge that explains the critical role that the natural environment can play in contributing to socio-economic outputs and outcomes. The natural environment is increasingly described as a collection of physical assets that, individually or collectively, perform certain functions that are critical to the operation of society or an enterprise. The term green infrastructure is commonly applied when describing the natural environment in this way.

It was decided that one way of putting the region's accumulating knowledge to positive use would be to take a cross section of eight regeneration projects and examine the degree to which such projects were using green infrastructure as part of the planning and design process. The selected projects fell into two groups. The first grouping comprised of projects that were primarily economically focussed. These included examples of city centre regeneration and large commercial development sites. For this group, the task was to determine whether the use of green infrastructure could deliver additional economic outputs while at the same time increasing the value of associated socio-environmental outputs and outcomes. The second group comprised of projects that were predominantly focussed on delivering environmental benefits. Here, the task was to see how the concept of green infrastructure might provide a means of revealing added socio-economic benefits that would be of interest to a wider array of partners. The Pennine Lancashire Forest Park is a perfect example of this type of project. For both groups the task was mainly to see whether the level of economic output could be further increased through adopting an approach based on the concept of the 11 economic benefits that green infrastructure is able to deliver. This approach is set out in a study commissioned by NENW from the consultants Ecotec. A copy of the study '*The economic benefits of the natural environment*' (Ecotec, 2007) can be obtained from the NENW website:

<http://www.naturaleconomynorthwest.co.uk/resources+reports.php>.

The benefits were originally described as economic benefits for the purpose of engaging with an audience that was seen to have a predominantly socio-economic focus. However, the dominating feature of green infrastructure is that it is multifunctional and this means that the range can be regarded as producing benefits that can be social, economic and environmental at the same time.

It was recognised that certain schemes, whilst commencing with either an economic development purpose in mind or an environmental objective, might nevertheless be employing innovative ways to utilise green infrastructure. It was clear that, in these cases, it would be worth capturing best practice for further dissemination. In other words the demonstration projects would be capable of identifying opportunities to enhance the use of green infrastructure to increase the range of outputs of the schemes or would represent useful sources for identifying good practice.

The eight projects selected were:

- The Omega South Office development – one of the NWDA’s ‘strategic sites’ being developed by Miller Developments.
- The Irwell City Park – a large, riverside mixed development led by Central Salford Urban Regeneration Company.
- Liverpool Knowledge Quarter – a city centre development involving new university infrastructure, a new hospital and public realm improvements being led by Liverpool Vision.
- Oldham and Rochdale Housing Market Renewal programmes
- Pennine Lancashire Forest Park – a largely green infrastructure project to the east of Burnley town centre.
- Windermere Catchment Restoration Programme – a very large-scale project dominated by high quality green infrastructure that is seeking to address the problem of damaging contamination, arising from human activity, that is threatening the quality of the environment and the economic future a major tourist asset.
- The Weaver Valley Regional Park - another large-scale project comprising of rural areas and urban settlements each having its own mosaic of green infrastructure.

This paper draws together the results of the demonstration project and particularly looks at the lessons learned and the ways in which the concept of green infrastructure can increase the range of outputs available to regeneration initiatives.

The development of the methodology for running the demonstration projects is dealt with in the following section. However, the details of each individual demonstration project are not included but are available on the Natural Economy website.

2.0 Overview of process

The process followed a series of stages. The first stage was for representatives from each demonstration project to present the details to a team assembled under the leadership of the Green Infrastructure Manager of NENW. The NENW team varied in size and composition but was generally drawn from representatives of those organisations on the Green Infrastructure Steering Group that wished to participate. This included the Environment Agency, the Forestry Commission, English Nature, the NWDA, the Community Forests, the local biodiversity manager, the sub-regional economic partnership, the tourism sector, and the Commission for Architecture and the Built Environment (CABE). The second stage was a data gathering exercise involving the collection of the physical attributes of the project.

The third stage involved one or more meetings of the NENW team at which the combined expertise of the team was deployed to determine the best interventions for the demonstration project under review.

The final stage comprised of a feedback session at which the NENW team presented its considerations to the representatives of the project.

3.0 Developing a standard methodology

It was decided at the outset that a common approach would aid a consistent response. Furthermore, because the NENW teams were likely to be slightly different for each demonstration project it was felt that a standard system for considering the projects would help to deal with the complexity presented by the wide range of projects and aid replicability. The first step was therefore to develop a framework for conducting the demonstration

projects – a sort of expert system that could deal with the array of variable conditions and information that the chosen projects were likely to present to the NENW team.

The basic premise behind the development of this particular framework is that green infrastructure is a physical asset that can be described in terms of a series of attributes. Diagram 1 offers an array of these attributes. The conditions relating to individual sites will vary and this gives rise to a range of possibilities (variables) for each attribute. Each attribute carries the potential to determine an action or intervention that could be carried out on the green infrastructure asset in order to deliver a range of benefits. The physical size of the site (attribute 1) determines for example, the viability of many possible actions or interventions. A small, urban green space of less than 10 Hectares would be unsuitable for growing biomass but might be eminently suitable for use as a community horticultural scheme.

The variables were originally determined with the intention of producing some form of computer based toolkit that was capable of suggesting the best interventions through the submission of the relevant variables. However, because most actions and interventions would be the result of considering a multiplicity of attribute conditions it soon became clear that a computer based approach using some form of algorithm whilst possible would, due to the large number of possibilities, be outside the scope of time and funding in this particular project. Nevertheless, Diagram 1 was consistently used for the demonstration projects because it provided a suitable checklist against which to examine an array of possible actions. Given that the checklist covers 14 attributes and over 40 variables, the number of possible combinations runs into the many hundreds. A team of individuals each with their own expertise and knowledge represents, however, quite a powerful expert system with which to examine the potential of any project.

One fact that helps with the adopted approach is that while the number of possible actions might be mathematically large, the types of possible actions and interventions are already well known and are of a manageable size. These are set out in Diagram 2 where they have been sorted into groups that reflect the NENW 11 benefits mentioned previously. While a detailed discourse regarding all the possible permutations is clearly not possible an example is used below to show how the methodology works.

3.1 A case study demonstrating the checklist in action

To illustrate how the checklist was employed in practice the following hypothetical example can be considered where, for illustrative purposes, an array of variables has been arbitrarily determined. The numbers in brackets refer to a particular attribute in Diagram 1.

3.1.1 A site profile

A site has contamination present in the form of an earlier use as a waste disposal site but while there is a target in the form of a local stream, there is no leachate from the site (5). It is large in scale being over 100ha in area (1). Its shape is that of an irregular polygon but it is not fragmented and it is not a long, thin corridor (2). Its soils comprise of imported clay subsoils spread in a thick capping layer that has been in place for a sufficient amount of time for vegetation to develop naturally (6). The low nutrient levels, the moisture and the acidity have all contributed to the development of an interesting vegetation and habitat (3). Some areas have scattered distribution of pioneer tree species such as Silver Birch and, in more moist areas, Alder. Already the trajectory of this habitat is showing signs of a movement that would, some years hence, end in the development of climax species woodland. Over much of the area vegetation has developed that has attracted a particular species of moth that was thought to be all but extinct in the region. This is starting to attract visitors to the area interested in the natural history of the site (8). It is

zoned for an industrial use that reflects its previous status, first as a minerals extraction site and then for waste disposal (7). The site sits within an area that has a rich history of coal mining and associated industrial use the traces of which are fast disappearing in a post-industrial society (10). The geology that produced the industrial wealth also drives the characteristics of the landscape and the derivation of the Joint Character description within which the site is located (4). The site is in the ownership of the local authority (12) and despite being fenced to prevent access the area is nevertheless heavily used informally by residents of the local housing estate who have few green amenities and enjoy the site for dog-walking, and kindred forms of relaxation (9). The local community sits in an area high on the index of multiple deprivation where many residents are in receipt of incapacity benefit and there is a remnant pocket of long-term unemployed (11). The site is located on the edge of a river corridor that is developing as a green corridor within the sub-region (13). The site itself is not subject to flooding but the run-off enters a small stream that floods part of the local housing estate from time to time (14).

3.1.2 Possible green infrastructure interventions

The above array of attributes and variables would suggest a range of green infrastructure actions and interventions:

The site is of significant ecological value and it is worth protecting this important attribute. Left to a natural trajectory, the area would gradually lose the habitat for the moth species. This would impact on the local biodiversity and the sites potential for natural tourism. At this scale, it may be viable to build some form of educational/visitor facility. A building with a green roof would benefit climate change, mitigate flooding and help with temperature control of the facility.

A management plan would be an obvious action in order to preserve a balanced ecology. This would mean some form of maintenance such as removing young self set trees and this would offer volunteering opportunities to the local community. Further work in preserving the ecology of the site would benefit the land and biodiversity. Keeping the area free of fertilisers would keep the soils in a state of low fertility leading to a wider biodiversity.

At this scale the site would be large enough to warrant some form of retention of site storm water run-off. A balancing pond would certainly also increase the ecological opportunities and attractiveness to visitors. Here, other variable have to be taken into account however. The clay cap may not be structurally suitable, the topography may not be satisfactory and it might mean the removal of other valued habitat.

Opening the site to formal public access would benefit the social health of the adjacent community through providing a local recreation facility that could be properly managed. A friends group would increase a sense of community and provide a potential source of volunteer time.

Under formal management potential eyesores such as fly tipping and anti-social behaviour such as noisy use by motorbikes could be managed out and the site could become a visual asset that would lift the value of surrounding properties as well as creating a setting for investment.

The scale of maintenance on the site is such that it would be viable to run transitional employment schemes that aimed to help some of those in the local population to move from benefit dependency towards being employable.

Diagram 1 – Defining a project’s attributes

	Attribute	Variable
(1)	Area of Project (Ha):	10 10 - 50 50 -100 >100
(2)	Shape of Project:	corridor fragmented coherent
(3)	Existing ecological quality:	high - intervention to be minimal medium - some intervention allowable poor - intervention not an issue mixed - some areas to be preserved ecology not known – some data required
(4)	Landscape character:	Refer to Natural England Joint Character Areas
(5)	Contaminant levels:	none contamination is present - not polluting contamination is present - need for remediation contamination level not known
(6)	Soils characteristics:	ph moisture nutrients
(7)	Planning constraints:	none known Zoned Commercial Zoned Housing Zoned Public openspace
(8)	Natural Tourism Attributes	Assess tourism potential
(9)	Access Attributes	Public Access allowed No public access
(10)	Cultural/Heritage attributes:	Site has heritage value A cultural report has been produced None
(11)	Community attributes	Community in close proximity Remote site Local IB/IMD statistics
(12)	Ownership	Private Local Authority (or other public body)
(13)	Connectivity	Good connectivity to adjacent sites Isolated site
(14)	Flooding	High risk Low risk



Attributes and variables determine the range of possible interventions and actions relating to the provision, enhancement and maintenance of types of green infrastructure as set out in Diagram 2

Diagram 2 – Assessing the scope for green infrastructure interventions

Benefit	Possible GI Actions and interventions	Additional commentary
Climate change adaptation and mitigation.	<p>Climate proofing <i>Plant trees as Shelter belts</i> <i>Plant trees for summer shading</i> <i>Plant trees to reduce the urban heat-island effects</i></p> <p>Green construction <i>Put green roofs on buildings.</i> <i>Use site based coppice to construct grid shell buildings.</i></p>	<p><i>Designing grey infrastructure to incorporate green infrastructure increases a building's BREEAM and CEEQUAL assessments. The green infrastructure helps to reduce the urban heat island effect</i></p> <p><i>Green roofs do not have their own typology in the NW GI Guide. Their cumulative area is likely to be small for the next few years. Green roofs can be used to provide habitat for species such as the Black Redstart</i></p>
Flood alleviation and water management.	<p>Water management <i>Install SuDS</i> <i>Use ponds for storm balancing</i> <i>Utilise grey water recycling – using reed bed treatment</i> <i>Use green infrastructure to ameliorate flooding within and outside the site area.</i></p>	<p><i>SuDs and balancing ponds are excellent habitats, help manage storm water and can reduce surface water drainage tax</i></p> <p><i>SuDs will help to reduce the cost of drainage infrastructure and add to biodiversity, amenity and so on</i></p>
Quality of place.	<p>Improving visual amenity <i>Plant/maintain green infrastructure to create a high quality green space</i></p>	<p><i>Creating cleaner, safer greener communities is a central theme to CLG's sustainable communities policy and impacts on Local Area Agreements & Multi Area Agreements.</i></p>
Health and well-being.	<p>Reducing pollution <i>Plant/maintain green infrastructure to improve the quality of soils, water and air</i></p> <p>Improving social health <i>Provide planting and maintenance schemes as a vehicle to help special needs groups</i> <i>Use green infrastructure to support volunteering and improving social cohesion</i> <i>Use green infrastructure to provide facilities for walking, & cycling</i></p> <p>Education <i>Use green infrastructure as an outdoor classroom</i> <i>Use green infrastructure to help develop 'sustainable' schools</i> <i>Provide planting and maintenance schemes to support re-engagement schemes & helping NEET¹ cohort</i></p>	<p><i>Short rotation coppice can be used to lock up heavy metals in contaminated soils. Trees absorb very fine particulates – including emissions from road transport</i></p> <p><i>This action is based on the concept of the environment as an 'attractor' that encourages and motivates people to get involved in environmental pursuits. The underlying green infrastructure asset is therefore a critical resource for this action.</i></p> <p><i>Green infrastructure acts as an 'attractor' to groups that are often the most difficult to reach and help.</i></p>

¹ NEET Young people classed as being not in employment, education or training

Benefit	Possible GI Actions and interventions	Additional commentary
Land and property values.	Gateways & corridors <i>Provide green infrastructure to improve approaches to urban areas.</i> Housing <i>Plant/maintain green infrastructure to increase amenity to local housing</i>	See CABE's report 'Does Money Grow on Trees' ²
Economic growth and investment	Creating a setting for investment <i>Plant/maintain green infrastructure within and around green business parks and other forms of grey infrastructure.</i>	
Labour productivity.	Employment <i>Use green infrastructure as a vehicle for running transitional employment schemes (ILMs)</i> <i>Use maintenance of green infrastructure to increase employment</i> <i>Adopt green construction techniques.</i> <i>Embed horticultural work within green infrastructure</i> <i>Use green infrastructure as a resource to set up social enterprises</i>	<i>This action is based on the concept of the environment as an 'attractor' that encourages and motivates people to get involved in environmental pursuits. The underlying green infrastructure asset is therefore a critical resource for this action.</i>
Natural Tourism.	Iconic species <i>Use green infrastructure to provide habitats for species that attract visitors.</i> Improving urban visitor experience <i>Provide green spaces to improve the image and quality for visitors.</i> Maintaining the quality of green infrastructure <i>Protect the green infrastructure asset from the effects of high visitor numbers</i>	<i>Urban wildlife is constantly threatened by economic development. An imaginative approach to design can make provision for endangered species.</i>
Recreation and leisure.	Providing access <i>Use green infrastructure to increase the quantity and quality of accessible green space</i> <i>Provide greenways and cycle ways</i> <i>Provide facilities for outdoor sports activities</i>	
Land and biodiversity.	Habitat enhancement <i>Design and deploy green infrastructure to rebuild biodiversity</i>	

² <http://www.cabe.org.uk/files/does-money-grow-on-trees.pdf>

Benefit	Possible GI Actions and interventions	Additional commentary
	<i>Use green infrastructure to protect soils</i>	
Products from the land	<p>Food production <i>Use rural green infrastructure to support farming and rural development</i> <i>Use horticultural initiatives to set up community box schemes</i> <i>Plan and design allotments into green infrastructure.</i> <i>Plan and design Urban Farms into green infrastructure.</i></p> <p>Renewables <i>Produce biomass as part of green infrastructure</i> <i>Utilise recycled green waste through large scale composting projects to produce a nutrient source for short rotation coppice.</i> <i>Use short rotation coppice to address fuel poverty in rural areas</i></p> <p>Forestry products <i>Use green infrastructure as a source of forestry products</i></p>	<p><i>Combined Heat and Power schemes based on biomass could help to alleviate rural fuel poverty in areas not serviced by natural gas</i></p>

3.1.3 What happens with a different set of variables?

If we take the same project and change some of the parameters of the variables then we can see how the methodology can accommodate differing scenarios.

If, for example the site were producing leachate at a level that might now be defined as pollution and in consequence involved regulatory action by the Environment Agency, then many of the ecological attributes would be adversely affected. With a need to prevent pollution the existing self-generated vegetation might well have to be destroyed as a consequence of the physical interventions demanded by the remediation process. This would impact on the habitat of the rare species of moth and the site's status as a home for this 'iconic' species might be lost.

On the other hand, the reclamation of the site would involve large-scale earthworks that might allow for substantial reshaping allowing for a more interesting topography and the formation of water retaining features such as balancing ponds. Some pollution can be dealt with by green infrastructure. The egress of mine water contamination with iron oxide can, for example, be treated on site using reed beds.

The loss of habitat could be mitigated using what is now a well-understood process of natural regeneration. In other words the trajectory of natural regeneration could be mimicked in order to produce a landscape that was visually satisfactory at an early stage.

Advantage could also be taken of the large-scale interruption to dedicate part of the area for the economic production of short-rotation coppice that would employ local people. The landscape value of the area would quickly benefit the local community in terms of health and well being and the site might still warrant some form of visitor/educational facility. In these circumstances a grid-shell building constructed of coppiced timber from the site, erected by community volunteers and clad in a green roof would all be possible actions arising from this new set of variables.

It is easy to see that the variable of site shape and size would quickly impact on the viability of most of the above range of possible outcomes leading to an entirely new set of possibilities.

By the same token, if the site variable for the ecology were such that there was no significant ecological value then many of the interventions just outlined would become possible without needing the presence of pollution as a variable.

The above example demonstrates that a change in just one critical variable of one attribute can trigger a range of differing possible actions and interventions. Of course in the real world attribute variables do not readily switch conditions

Most organisations or partnerships involved in the delivery of an economically orientated project will naturally be preoccupied with the nature and amount of the cumulative economic benefit delivered. The demonstration projects therefore attempted to broadly characterise the economic payback of the recommended interventions. Three levels were generally used:

- | | |
|---------|---|
| Level 1 | Recommendations that will clearly lead to economic benefits to the project partners |
| Level 2 | Recommendations that may lead to economic benefits to the project partners, but where it is harder to |

evidence; or where the benefits would accrue to other partners, (who might in some cases be willing to engage or support interventions to maximise these.

Level 3

Recommendations which cannot be evidenced as yielding economic benefit but which would lead to other benefits in terms of the environmental quality of the project and which we would ask the project partners to consider. They may fund these out of CSR type budgets, or be happy to absorb the costs.

An example of a set of asset attributes is included in Appendix 1 and the resulting range of possible interventions is detailed in Appendix 2.

Summary Papers for each project are available on the Natural Economy website.

4.0 Further developments relating to the North West Green Infrastructure Guide

There are eight demonstration projects in the final portfolio of the NENW project spanning a study period of some 18 months. Over the same period the region has seen substantial progress in the development of regional and sub-regional planning of green infrastructure. Of particular importance has been the publication of the North West Region Green Infrastructure Guide (download available: <http://www.greeninfrastructurenw.co.uk>).

The NW Green Infrastructure Guide sets out a six step approach to the planning of green infrastructure and this methodology can be applied to any demonstration project to identify the way in which a site area relates to the wider surrounding area. Later demonstration projects have made use of this methodology as an additional section. An example of the process is shown in Appendix 1

Appendix 1 – Example of Asset attributes for a project

Project name: Pennine Lancashire Forest Park

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Asset Attributes:

Attribute	Variable	Notes:	Ref
(1) Area of Project (Ha):	120 Ha	Rowley landfill is a single major element – 40 Ha	
(2) Shape of Project:	Coherent large scale corridor wedge	The project forms a link between the Pennine fringe areas to the east with central Burnley	
(3) Existing ecological quality:	Probably varies due to individual parcels of habitat ranging from ancient, semi-natural woodland to recently restored mineral and waste development	An ecological survey was carried out in 2007.	
(4) Landscape character:	National Character Area 35 – Lancashire Valleys. Lancashire Character Area 6 – Industrial Foothills and valleys	The documents Landscape Character Assessment and Landscape Strategy for Lancashire provides details of key environmental features, local forces for change, their implications and a set of strategies accompanied by a series recommendations.	
(5) Contaminant levels:	Area contains significant contamination in the form of closed landfill sites.	June 2002 pollution incident affecting watercourse. Industrial source – East Yorkshire Platers Ltd. The landfill sites have been restored in accordance with Licence conditions imposed by the EA and LPA. The physical characteristics of the restoration will have an influence on the type of habitat developed in the future.	
(6) ECOscape characteristics:	not assessed		

Attribute	Variable	Notes:	Ref	
(7)	Planning constraints:	There appears to be no constraints for the proposed nature of the development	Identified in Burnley's Green Spaces Strategy (2006)	
(8)	Tourism attributes:	Site has extensive tourist attributes	The project outline provides detail on the use of the site as a significant destination for outdoor leisure.	
(9)	Access attributes	Public access widely available.	Cycling is seen as an attractor to a 'destination' centre for family cycling and biking at beginner and intermediate levels.	
(9)	Access attributes	Public access widely available.	Good infrastructure exists for car borne visitors	
(9)	Access attributes	Public access widely available.	The strategic significance for walking, cycling and equestrian purposes is well articulated.	
(9)	Access attributes	Public access widely available.	The site is particularly important because it provides safe access to open countryside through linking with an extensive network of trails.	
(9)	Access attributes	Public access widely available.	It also services a large, non car-owning population of local residents.	
(10)	Cultural/Heritage Attributes	Area has a well understood cultural and heritage value	See Lancashire Character Assessment and Strategy	
(11)	Community attributes	Index of Multiple Deprivation	5 of the 320 most deprived neighbourhoods are located within a 2km radius	
(11)	Community attributes	Population	(Neighbourhood statistics not available from ONS)	
(11)	Community attributes	Long term unemployed		
(11)	Community attributes	Economically inactive		

Attribute	Variable	Notes:	Ref
(12) Ownership	Burnley BC and Lancs CC	The project itself has the advantage of being within public ownership. This will not necessarily be true for some adjacent areas – the Michelin site (NWDA owned?).	
(13) Connectivity with GI	Large scale connectivity both ecologically and for people	The site is an important link to the surrounding network of green spaces.	
(14) Flooding	EA data set shows flooding within site and in adjacent town centre areas	Topography of site might preclude further large-scale water management features – balancing ponds, flood meadows etc. However and form of cover that slowed and delayed run-off is likely to have a beneficial effect.	

The NW Green Infrastructure Guide Approach

1	Partnership and priorities	Is part of the East Lancashire Regional Park. Steering group has representatives from: FC, LCC, Remade, LEP, BBC.
2	Data collection/audit and mapping	Typology mapping in line with the NW GI guide has been carried out. Link between The Mersey Forest team and Burnley GIS team has now been established. The project uses the Strategic Objectives from the Lancs Green Infrastructure Strategy to provide a coherent structure.
3	Functionality Assessment	The multi-functionality of the project has been demonstrated in terms of a range of benefits that are articulated within a framework that refers back to the Lancs GI strategic objectives (and to the NENW range of 11 economic benefits). A functionality assessment of the type being developed by the CFNW would help to provide a robust evidence base.
4	Needs / opportunities Assessment	Not yet carried out using the developing GIU methodology but many of the components of the proposal are clearly founded on a social, economic and environmental evidence base.

The project could deliver benefits to several key strategic areas:

- The adjacent Advanced Manufacturing Park
- Elevate HMR. (Opportunity to submit papers for 'Dig a little deeper' conference?)
- Links to HMR at street level (through a Green Streets approach) and consideration of 'heat island effect in inner Burnley.
- Delivery of LBAP targets.
- Consider the project's added value to town centre regeneration programmes as an aid to developing greater strategic significance in driving the regeneration of north and east Burnley.
- Burnley Education and Enterprise Park

To be developed

Appendix 2 – Example of GI interventions for a project

Pennine Lancashire Forest Park -

Part 1 - The NW Green Infrastructure Guide Approach

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|---|--|--|
| 1 | Partnership and priorities | <p>Is part of the East Lancashire Regional Park.</p> <p>Steering group has representatives from: FC, LCC, Remade, LEP, BBC.</p> |
| 2 | Data collection/audit and mapping | <p>Typology mapping in line with the NW GI guide has been carried out. Link between The Mersey Forest team and Burnley GIS team has now been established.</p> <p>The project uses the Strategic Objectives from the Lancs Green Infrastructure Strategy to provide a coherent structure.</p> |
| 3 | Functionality Assessment | <p>The multi-functionality of the project has been demonstrated in terms of a range of benefits that are articulated within a framework that refers back to the Lancs GI strategic objectives (and to the NENW range of 11 economic benefits).</p> <p>A functionality assessment of the type being developed by the CFNW would help to provide a robust evidence base.</p> |
| 4 | Needs / opportunities Assessment | <p>Not yet carried out using the developing GIU methodology but many of the components of the proposal are clearly founded on a social, economic and environmental evidence base.</p> <p>The project could deliver benefits to several key strategic areas:</p> <ul style="list-style-type: none">• The adjacent Advanced Manufacturing Park• Links to HMR at street level (through a Green Streets approach) and consideration of 'heat island effect in inner Burnley.• Delivery of LBAP targets.• Consider the project's added value to town centre regeneration programmes as an aid to developing greater strategic significance in driving the regeneration of north and east Burnley.• Burnley Education and Enterprise Park• Building Schools for the Future• Weavers triangle• Railway links• Queen Street Mills• Canals |
| 5 | Intervention Plan | <p>A detailed project plan has been developed that addresses a wide range of needs and opportunities</p> |

Part 2 – Project level actions and interventions

	GI Actions and Interventions	Economic benefit level	Comments & Notes	Lead
(i)	Climate change adaptation & mitigation			
	<p>Climate proofing <i>Shelter belts</i> <i>Summer shading</i> <i>Reducing urban heat-island effects</i></p> <p>Green construction <i>Green roofs</i> <i>Grid shell buildings</i> <i>BREEAM compliance</i></p>		<p>Links to HMR at street level (through a Green Streets approach) and consideration of 'heat island effect in inner Burnley</p> <p>Might be possible to argue that the project contributes to cooling of Burnley due to katabatic effect.</p> <p>Scope for hydro-powered scheme on the Brun?</p> <p>Methane capture thought to be limited by declining quantity of methane over time.</p> <p>Scope for wind turbines</p> <p>Visitor infrastructure could be used to exemplify the integration of grey and green infrastructure. The site provides the resources for coppiced timber and a grid-shell building (see Lothian example) would be a theoretical possibility.</p>	
(ii)	Flood alleviation & water management			
	<p>Water management <i>SuDS</i> <i>Storm balancing</i> <i>Grey water recycling</i> <i>Flood control</i></p>		<p>EA is currently working on a flood risk management strategy.</p> <p>Further retention of stormwater upstream might be possible (outside project area as defined at present)</p>	
(iii)	Quality of place.			
	<p>Improving visual amenity <i>High quality green space</i></p>		<p>Fly tipping might be an issue that needs some attention.</p>	

	GI Actions and Interventions	Economic benefit level	Comments & Notes	Lead
	<i>Cleaner, safer green space</i>		Motorbikes intrude in some areas	
(iv)	Health and well-being.			
	<p>Reducing pollution <i>Improving the quality of soils, water and air</i></p> <p>Improving social health <i>Providing schemes to help special needs groups</i> <i>Supporting volunteering and improving social cohesion</i> <i>Providing places for walking, & cycling and angling</i></p> <p>Education <i>Providing outdoor classrooms</i> <i>Developing 'sustainable' schools</i> <i>Re-engagement schemes & helping NEET cohort</i></p>		<p>Leachate and gassing infrastructure will have to be accommodated in the project. Mine water passes through leachate chamber.</p> <p>Coal Authority has developed methodologies for treating mine water contaminated with iron oxides. (large scale example at Taff Bargoed in Wales)</p> <p>The cap to Rowley tip varies in quality and has acidic soils. (this may be used to advantage in habitat creation – see (x) Land and biodiversity section)</p> <p>Links to PCT should be encouraged to support/fund project outputs</p> <p>3 'Building Schools for the Future' projects are located in the immediate area. All are to have boilers that can burn biomass.</p>	
(v)	Land and property values.			
	<p>Gateways & corridors <i>Improving approaches to urban areas.</i></p> <p>Housing <i>Providing adjacent green infrastructure to increase amenity</i></p>		<p>Covered in Part 1</p> <p>Elevate HMR slow to engage – needs some stimulus. (Opportunity to submit papers for 'Dig a little deeper' conference?)</p>	
(vi)	Economic growth and investment			
	<p>Creating a setting for investment <i>Green business parks</i> <i>Green infrastructure surrounding grey infrastructure.</i></p>		There is a need to 'blur' between the green and grey (industrial park) areas. There is a need for gaps in the boundaries and a green infrastructure plan for the Michelin site (owned by NWDA?)	

	GI Actions and Interventions	Economic benefit level	Comments & Notes	Lead
(vii)	Labour productivity.			
	Employment <i>Running transitional employment schemes (ILMs)</i> <i>Maintenance</i> <i>GI construction</i> <i>Horticulture</i> <i>Providing a vehicle for social enterprises</i>		Scope exists for a better 'plug in' to RDPE issues. Exploiting the agricultural area to the east of the project. Lots of scope for tourism-based employment – long distance trail head and Mary Townley loop being examples. Scope for transitional employment schemes to help deal with problems of worklessness and joblessness including biomass, green waste composting. (see WRAP brownfield trailblazer project) Link to NENW IF worklessness pilot?	
(viii)	Natural Tourism.			
	Iconic species <i>Providing habitat for species that attract visitors.</i> Improving urban visitor experience <i>Providing green spaces to improve the image and quality for visitors.</i> Maintaining the quality of green infrastructure <i>Protecting the green infrastructure asset from the effects of high visitor numbers</i>		Project already includes most of these benefits The area is included within (a) National Character Area 35 – Lancashire Valleys and (b) Lancashire Character Area 6 – Industrial Foothills and valleys. These could be used as a signpost for visitor experience. Cultural and heritage attributes (though largely removed) could be used to enhance interpretation of the landscape for visitors	
(ix)	Recreation and leisure.			
	Providing access <i>Providing greenways and cycle ways</i> <i>Providing facilities for outdoor sports activities</i>		Project already includes most of these benefits	

	GI Actions and Interventions	Economic benefit level	Comments & Notes	Lead
(x)	Land and Biodiversity.			
	Habitat enhancement <i>Rebuilding biodiversity</i> <i>Protecting soils</i>		The poor soils levels of the cap might be the catalyst for high ecological/diverse vegetation types. This might be an opportunity to build on the rich academic work of NW universities (see work of Bradley, Handley and Rodwell). Working 'with the grain of nature' could lead to high biodiversity and an interesting mosaic of habitats as well as mitigating maintenance costs.	
(xi)	Products from the land			
	Food production <i>Supporting farming and rural development</i> <i>Community box schemes</i> <i>Allotments</i> <i>Urban Farms</i> Renewables <i>Producing biomass</i> <i>Recycling green waste through large scale composting projects.</i> <i>CHP schemes</i> <i>Addressing fuel poverty in rural areas</i> Forestry products		Council owned – needs some form of overall maintenance – possibly rangering could be extended form the project. See labour productivity section (vii) LCC is working on this type of opportunity.	

Natural Economy Northwest

Assessing the potential for GI development within projects

Paper 2 – Omega

1.0 Introduction

This is one of a series of papers summarising the outcomes from a Natural Economy Northwest (NENW) initiative that is looking at economically orientated regeneration projects and assessing the degree to which such projects are using green infrastructure as part of the planning and design of the schemes. The companion Paper 1.'Overview and Methodology' is common to all projects and provides an explanation of the approach taken.

2.0 Description of the Omega project

The Omega South development is located just north of Warrington and sits to the west of junction 8 on the M62. It occupies an area of 240 Ha and, as one of the North West Development Agencies strategic sites, is planned to make a significant contribution to the regional economy through a 15 year programme of construction that will see the creation of some 3.1 million square feet of high quality office, light industrial, manufacturing and logistics space.

The developer, Miller Developments and their advisors are working to a masterplan that incorporates many elements of green infrastructure. These elements include: boulevard and car park planting, sustainable drainage systems incorporating streams lakes and wetlands, water harvesting and green spaces that are intended to have an extended community use.

3.0 Relevant site data

The preliminary stages of assessment involve building an understanding of the site's characteristics. This was done through a presentation from the development team that was then followed by a data gathering exercise. The results are summarised in brief below:

3.1 Asset attributes

At an estimated density of grey to green infrastructure of 50% the final area of green infrastructure will be between 110 and 120 ha. The shape is coherent and the existing ecology is based on extensive grassland. Some ecological survey work and appraisal has taken place. While intervention is not an issue, the developers realise that large areas of open grassland will be lost. The proposals for the site generally accord with the key elements of the Mersey Valley character area 60 within which the site is located. Contamination is not present although some local plumes of hydrocarbon compounds and other remnant contaminants from previous airfield use are a possibility. In terms of access, the land is privately held but the plans are to make certain of the green infrastructure assets open for community use. The site has few cultural or heritage attributes other than being the largest US airbase in Europe. The site is certainly of a size and location that makes it a suitable resource for running transitional employment programmes. There is good connectivity to the site and walking and cycling routes are proposed. Flooding is not an issue on the actual site but it sits near a flood prone area. This means that stormwater run off from the site needs to be managed.

4.0 Green infrastructure opportunities

The NENW team's opinion was that the planning to date had encompassed an impressive range of green infrastructure opportunities. The following are areas that the team felt might provide further opportunities:

Benefit	Possible GI interventions	Rating level
Climate change adaptation and mitigation.	<p>Deciduous trees can be used for Summer shade but will not impede winter solar heat gain.</p> <p>The mix should be capable of adapting to UKCIP forecasts (40° Summer time temperature by 2080)</p> <p>Water requirements will need to be planned and linked to water management plan for SUDS/greywater recycling.</p> <p>Promoting Green roofs would partially offset the loss of grassland habitat for ground nesting birds etc.</p> <p>The provision of green roofs would increase the BREEAM rating of buildings</p>	
Flood alleviation and water management.	SUDS has been planned in the scheme. This should help to provide water for irrigation of planting – particularly as climate change effects become evident.	
Quality of place.	The landscaping proposed clearly fulfils this role	
Health and well-being.	Site is planning innovative approaches to sustainable development and could be used as a vehicle for educational projects – possibly supporting corporate social responsibility objectives	
Land and property values.		
Economic growth and investment	The landscaping proposed clearly fulfils this role	
Labour productivity.	<p>Site is of a size and in a location that makes it a good vehicle for supporting ILM type activities.</p> <p>ILM/Social enterprise programmes could be used for part of the maintenance of the site/</p> <p>ILM programme could be used for part of the development of the GI on the site.</p> <p>The site could be used as a vehicle for NEET (Not in employment, education or training) type programmes</p>	
Natural Tourism.	The project does not lend itself to tourism	
Recreation and leisure.	<p>The site will allow limited access for the local community</p> <p>Walking and cycling routes are already incorporated into the project</p>	
Land and biodiversity.	<p>Ecological surveys carried out but may need updating.</p> <p>The development team are aware of loss of grassland. This might be offset by promoting green/brown roofs</p> <p>Mersey Forest have previously discussed tree planting with design team. NVC classification and planting based on FC Bulletin 112 suggested. Mix specification should be sufficient to withstand problems arising from climate change.</p> <p>WGS funding available</p>	
Products from the land	<p>Site is not suitable for horticultural projects</p> <p>The site is large enough to support a scheme of advance planting. This could take two forms:</p> <p>(a) Planting the main structural elements early to create a setting to attract investors</p>	

Benefit	Possible GI interventions	Rating level
	<p>(b) Planting temporary cover of SRC to provide energy for a small scale CHP plant. This could be linked to an ILM project.</p> <p>The amount of GI is possibly sufficient to support an on-site composting of green waste to PAS 100 standards as a nutrient source for any SRC. This might be combined with local composting initiatives</p>	

Key to colours in column 3:

This column assigns a simple and visual level of analysis to the capacity of the interventions to yield an economic benefit. Red = high; amber = medium. Yellow = low

Natural Economy Northwest

Assessing the potential for GI development within projects

Paper 3 – Irwell City Park

1.0 Introduction

This is one of a series of papers summarising the outcomes from a Natural Economy Northwest (NENW) initiative that is looking at economically orientated regeneration projects and assessing the degree to which such projects are using green infrastructure as part of the planning and design of the schemes. The companion Paper 1.'Overview and Methodology' is common to all projects and provides an explanation of the approach taken.

2.0 Description of the ICP project

The Irwell City Park is a new riverside park proposal with a continuous 8km riverside walkway, new development business and employment opportunities. Also planned are new green spaces, leisure and recreational opportunities, public realm improvements, a tourist destination and connections to the local communities. It is being developed by a partnership that includes the councils of Salford Manchester and Trafford together with the Urban Regeneration Company, business developers and the community.

The plans should, when realised make a significant impact on the area as a result of the infrastructure proposed. This includes: 5 new bridges, 7 Ha of new public realm, job support through the creation of 256,000 square metres of employment space and 700 permanent full time jobs. Additional economic benefit is planned through an anticipated 3.7 million visitors.

3.0 Relevant site data

The preliminary stages of assessment involve building an understanding of the site's characteristics. This was done through a presentation from the development team that was then followed by a data gathering exercise. The results are summarised in brief below:

3.1 Asset attributes

The area of potential green infrastructure within the project is estimated to be just over 10 Ha. Given the riverside nature of the development the site is corridor shaped. At the time of the study the ecology of specific locations was not known. However, the ecology is well covered in special ICP planning guidance. The landscape is varied and sits within the Manchester Conurbation Character Area 55. The site offers tourism opportunities – in 2005 Greater Manchester reportedly received 94 million tourist visits. The project sits within several communities and access plays a significant role in the ICP plans. The ICP guide reinforces the need for pedestrian and cycle access. There are recognised cultural and heritage attributes and this offers opportunities to shape the project along cultural themes. There are high levels of deprivation near to the project. This makes it suitable for considering transitional employment type projects. Several important areas of green space exist in adjacent areas (Peel and Ordsall Parks for example). These are seen as isolated and little used and there is a case for looking at cross-links to join areas to the project's hinterland. Various locations within the project are prone to flooding.

4.0 Green infrastructure opportunities

The NENW team's opinion was that the ICP planning guide was an excellent mechanism for the development of the project.. The following are areas that the team felt might provide further opportunities:

Benefit	Possible GI interventions	Rating level
Climate change adaptation and mitigation.	<p>Tree planting will help in reducing energy use for heating and cooling. Deciduous trees can be used for Summer shade but will not impede winter solar heat gain. Transpiration from GI will help to ameliorate the effects of summer temperatures.</p> <p>The mix should be capable of adapting to UKCIP forecasts (40° Summer time temperature by 2080). Manchester has been the subject of an ASCCUE (Adaptation Strategies for Climate Change in the Urban Environment) study – this could be used to reinforce the message</p> <p>Water requirements will need to be planned and linked to water management plan for SUDS/grey water recycling.</p> <p>Promoting Green roofs/green walls would partially offset the loss of some habitat. Green roofs (ICP 17) could be embedded in the proposed design guide. This would help with the delivery of LA duties under the Natural Environment and Rural Communities Act (2006).</p> <p>The provision of green roofs would increase the BREEAM rating of buildings</p>	Red
Flood alleviation and water management.	<p>SUDS has been planned in the scheme (ICP 19). Meadows & adjacent surroundings are designated a Super SUDS strategy Area.</p> <p>Most areas (other than Meadows) are small</p> <p>Grey water recycling will reduce pressure on water treatment and provide source for irrigation of GI</p> <p>Out of area planting (upstream at Bury) would help to mitigate flooding</p>	Yellow
Quality of place.	<p>The landscaping of the project will play a critical role in providing an 'iconic' landscape for the three authorities. This will have a positive impact on supporting Tourism, developing sustainable communities, encouraging economic development and so on</p>	Orange
Health and well-being.	<p>Site is planning innovative approaches to sustainable development and could be used as a vehicle for educational projects – possibly supporting corporate social responsibility objectives. 50 schools, 25 youth groups, 75 community groups identified within ICP plan</p> <p>The use of GI as a vehicle for ILM/Social Enterprise/volunteering will help to develop 'skills for life'</p>	Orange
Land and property values.	<p>The project would provide additional amenity to adjacent areas of housing.</p>	Yellow
Economic growth and investment	<p>The landscaping proposed clearly fulfils this role</p>	Orange
Labour productivity.	<p>Site is of a size and in a location that makes it a good vehicle for supporting ILM type activities.</p> <p>ICP plan states that existing maintenance by 3 LAs is 'reactive'. Single contract favoured. £338K cost when fully operational. ILM/supported employment programmes could be used for part of the maintenance of the site.</p> <p>Endowments (cash or assets) from developers, Section 106, could be considered.</p> <p>A social enterprise (developed as a recipient of trainees from ILM) could be used for the long-term maintenance.</p> <p>A BIDS programme might be viable.</p> <p>ILM programme could be used for part of the development of the GI on the site. Cumulative amount of GI might be sufficient for Social Enterprise creation</p> <p>The site could be used as a vehicle for NEET (Not in employment, education or training) type programmes</p>	Red
Natural Tourism.	<p>The site could play an important role in ameliorating future climate change and so help to</p>	Orange

Benefit	Possible GI interventions	Rating level
	provide an amenable experience for future visitors – thus helping to maintain high visitor numbers	
Recreation and leisure.	<p>The sites will encourage access for the local community. A Ranger resource is planned.</p> <p>Cross-links would be beneficial to enhance the utility of the riverside walkways and cycle routes. And help to reconnect communities to the new, high quality riverside environment.</p> <p>Walking and cycling routes are incorporated into the project. The links to the City centres and outwards to other areas is important. The access should therefore be viewed as bi-directional – encouraging City dwellers to walk/cycle towards the urban/rural fringes and providing easy walking and cycling routes for those commuting to city jobs.</p>	
Land and biodiversity.	<p>Ecological surveys are required by ICP 20.</p> <p>Several areas designated Sites of Biological Importance.</p> <p>Black Redstarts habitat identified – extended through Green/brown roofs. Other 'iconic' species (Peregrine Falcon) produce several related benefits</p>	
Products from the land	<p>Site is not suitable for horticultural projects</p> <p>Sites within the boundary are not large enough to produce significant biomass outputs – however, considering the site to have 'porous' boundaries would link it to wider possibilities and help to support the use of woodchip boilers etc.</p>	

Key to colours in column 3:

This column assigns a simple and visual level of analysis to the capacity of the interventions to yield an economic benefit. Red = high; amber = medium. Yellow = low

Natural Economy Northwest

Assessing the potential for GI development within projects

Paper 4 – The Liverpool Knowledge Quarter

1.0 Introduction

This is one of a series of papers summarising the outcomes from a Natural Economy Northwest (NENW) initiative that is looking at economically orientated regeneration projects and assessing the degree to which such projects are using green infrastructure as part of the planning and design of the schemes. The companion Paper 1.'Overview and Methodology' is common to all projects and provides an explanation of the approach taken.

2.0 Description of the Liverpool Knowledge Quarter project

The Liverpool Knowledge Quarter sits in a broad arc running approximately in a north westerly direction from the Anglican Cathedral to the Liverpool John Moores University 'City Campus'. It thereby incorporates the bulk of the city's knowledge 'assets' along with the infrastructure necessary to support a student and professional population. Included in the areas are major developments of the University of Liverpool, Liverpool John Moores University, the Royal Liverpool University Hospital and the Liverpool School of Tropical Medicine. The area is being regenerated through an ambitious initiative that will, for example see the provision of a new building for the Royal Liverpool Hospital. Together with redevelopments involving both Universities and public realm improvements, the project will have a significant impact on the City.

The development of an Urban design framework and a Public Real Implementation Plan comes at a time when there is a growing awareness of the serious environmental problems confronting the region's major cities. With summer time temperatures expected to reach a summertime level of 40° c by 2080 the project represents an ideal demonstration of the extent to which complex regeneration plans are able to respond to the many challenges.

3.0 Relevant site data

The preliminary stages of assessment involve building an understanding of the site's characteristics. This was done through a presentation from the development team that was then followed by a data gathering exercise. The results are summarised in brief below:

3.1 Asset attributes

While the total area covered by the LKQ is very extensive, the area of green infrastructure existing and proposed is currently less than 10 Ha. This means that the shape of the green infrastructure is likely to be fragmented. At the time of the study the ecology of specific locations was not known. The area sits within the Mersey Conurbation Character Area 58. An Urban Design Framework and Public Realm Implementation Plan exists and one output from the study is the production of an appendix that will map the green infrastructure within and around the areas and identify further green infrastructure objectives. It will also make recommendations for integrating into the individual components of the LKQ. The location of the project makes it a suitable resource for tourism development. There are high levels of deprivation near to the project. This makes it suitable for considering transitional employment type projects – providing sufficient green infrastructure can be developed within the area. There are no flooding issues but the development would need to

comply with developing water management requirements imposed by the Government.

4.0 Green infrastructure opportunities

The following are areas that the team felt might provide further opportunities:

Benefit	Possible GI interventions	Rating level
Climate change adaptation and mitigation.	<p>Tree planting will help in reducing energy use for heating and cooling. Deciduous trees can be used for Summer shade but will not impede winter solar heat gain. Transpiration from GI will help to ameliorate the effects of summer temperatures.</p> <p>The mix should be capable of adapting to UKCIP forecasts (40° Summer time temperature by 2080). Manchester has been the subject of an ASCCUE (Adaptation Strategies for Climate Change in the Urban Environment) study – this could be used to reinforce the message</p> <p>Water requirements will need to be planned and linked to water management plan for SUDS/grey water recycling.</p> <p>Promoting Green roofs/green walls would partially offset the loss of some habitat. Green roofs could be embedded in the proposed design guide. This would help with the delivery of LA duties under the Natural Environment and Rural Communities Act (2006).</p> <p>The provision of green roofs would increase the BREEAM rating of buildings</p>	High
Flood alleviation and water management.	<p>SUDS has not been planned in any of the schemes</p> <p>Grey water recycling will reduce pressure on water treatment and provide source for irrigation of green infrastructure This would be an important means of providing irrigation for any green infrastructure proposed for ameliorating the effects of climate change</p>	Medium
Quality of place.	<p>The landscaping of the project will play a critical role in providing an 'iconic' landscape for the area. This will have a positive impact on supporting employment, tourist experience, quality of life and so on.</p>	Medium
Health and well-being.	<p>Site is planning innovative approaches to sustainable development and could be used as a vehicle for educational projects – possibly supporting corporate social responsibility objectives.</p> <p>The use of GI as a vehicle for ILM/Social Enterprise/volunteering will help to develop 'skills for life'.</p>	High
Land and property values.	<p>The project would provide additional amenity to adjacent areas of housing.</p>	High
Economic growth and investment	<p>The landscaping of the project will play a critical role in providing a setting for investment. This will have a positive impact on supporting Tourism, developing sustainable communities, encouraging economic development and so on.</p>	Medium
Labour productivity.	<p>Site is of a location that makes it a good vehicle for supporting ILM type activities.</p> <p>Endowments (cash or assets) from developers, Section 106, could be considered to fund social enterprise.</p> <p>Green infrastructure could be linked to maintenance of other adjacent areas. A social enterprise (developed as a recipient of trainees from ILM) could be used for the long-term maintenance</p> <p>Green infrastructure is too small for construction phase ILM activities</p> <p>A BIDS programme might be viable.</p> <p>The site could be used as a vehicle for NEET (Not in employment, education or training) type programmes</p>	High
Natural Tourism.	<p>The site could play an important role in ameliorating future climate change and so help to provide an amenable experience for future visitors – thus helping to maintain high visitor numbers</p>	Medium
Recreation and leisure.	<p>The green infrastructure sites will encourage access for the local community.</p> <p>Cross-links would be beneficial to enhance the utility of the walkways and cycle routes and</p>	High

Benefit	Possible GI interventions	Rating level
	<p>help to reconnect communities to the new, high quality environment.</p> <p>Walking and cycling routes to and from the site are incorporated into the master planning The links to the City centre and outwards to other areas is important.</p>	Yellow
Land and biodiversity.	<p>Possibility of species habitats incorporated into green/brown roofs. Black Redstarts, other 'iconic' species (Peregrine Falcon) produce several related benefits. Duty for local and public authorities exists under the Natural Environment and Rural Communities Act (2006). DEFRA guidance published.</p>	Amber
Products from the land	<p>Site is not suitable for horticultural projects and food production</p>	Yellow

Key to colours in column 3:

This column assigns a simple and visual level of analysis to the capacity of the interventions to yield an economic benefit. Red = high; amber = medium. Yellow = low

4.1 Agreed actions

Improved green infrastructure in and around two universities and one teaching hospital offers what is perhaps a unique opportunity to engage academics and clinicians in a long term "action research" programme that provides an opportunity for them to carry out research on the economic, social and environmental impacts of the improved green infrastructure in and around the universities and hospital over time and also could provide GI professionals with a wealth of knowledge and information on GI benefits that can be used to improve guidance and practice across the country.

This will be taken forward through a series of agreed actions:

- (i) The provision of a green infrastructure appendix to the Urban Design Framework and Public Realm Implementation Plan.
- (ii) Hold a workshop with the 2020 team at LCC responsible for updating the Public Realm Implementation Framework. The objective would be to discuss whether any green infrastructure related standards could be included.
- (iii) Hold a seminar involving academics from both Universities and the Hospital to explore what research/ expertise already exists in the green infrastructure field in Liverpool with a view to taking the agenda forward in the form of a virtual landscape laboratory.

Natural Economy Northwest

Assessing the potential for GI development within projects

Paper 5 – Oldham Rochdale HMR Pathfinder

1.0 Introduction

This is one of a series of papers summarising the outcomes from a Natural Economy Northwest (NENW) initiative that is looking at economically orientated regeneration projects and assessing the degree to which such projects are using green infrastructure as part of the planning and design of the schemes. The companion Paper 1.'Overview and Methodology' is common to all projects and provides an explanation of the approach taken.

2.0 Description of the Oldham Rochdale HMR project

This study set out to determine the extent to which green infrastructure could help to progress the work of areas of housing market failure. Three areas of social housing were looked at: the areas of Alt and Sholver in Oldham MBC and Kirkholt in Rochdale. Presentations by the teams from Oldham and Rochdale described problems of antisocial behaviour, abandonment, employment issues, ethnicity related tensions, low incomes and high levels of deprivation. The HMR teams were working strenuously to reverse the outflow of residents, improve the conditions through better urban design and to create areas that people wanted to live. It was reported that the local authorities have long waiting lists and that economic prospects were being improved. The plan was to diversify tenure and use the inherent land value to reduce the cost to the public purse.

3.0 Relevant site data

The preliminary stages of assessment involve building an understanding of the site's characteristics. This was done through a presentation from the development team that was then followed by a data gathering exercise. The results are summarised in brief below:

3.1 Asset attributes – Alt and Sholver

Both areas are comprised of similar housing stock that was built between the wars. They display very similar characteristics and can therefore be described together.

The total areas of the estates are: Alt 30 Ha, Sholver 73 Ha. This is the gross area within the boundaries in each case. Aerial photography reveals a significant amount of this is green infrastructure. Using the University of Manchester designation of Urban Morphology Types and assuming a designation of medium residential the areas could be assumed to be covered by approximately 50% green infrastructure. In each case the areas of green infrastructure is well connected and coherent. At the time of the study the ecology of specific locations was not known.

The landscape is well defined and sits within the Manchester Pennine Fringe Character Area 54. Solid geology is millstone grit and coal measures. Surface geology may include glacial drift including sands and gravels.

Closed landfill sites are recorded within and adjacent to the areas. Pollution does not however appear to be an issue. Methods of earlier landfill restoration might have produced elevated and interesting levels of biodiversity. This would be picked up in detailed ecological surveys.

Oldham UDP provides a detailed framework for development control. This includes detailed policies relating to ecology, open spaces etc.

The sites offer no tourism opportunities. However, both estates sit within the Pennine fringe and as such enjoy potential access to large areas of attractive landscape. This would be a significant attractor if the housing offer were also made sufficiently attractive

Public access is permitted and encouraged by the UDP and Natural England's access standards (Angst) would presumably be easily met within site boundaries.

Alt enjoys better community connection than at Sholver. There is however a general disconnection with skills and there are employment issues and problems with community not being able to access jobs in larger employment areas. At Alt a community steering group exists.

The housing is predominantly in Local Authority ownership. An Arms Length Management Organisation (ALMO) manages the bulk of the housing. It was reported that there was some pressure on maintenance budgets – especially for landscape management.

Sites have good links to surrounding greenspaces and countryside and good internal connectivity of green spaces. The Pennine Edge Forest trail passes to both estates together with other recreational routes.

There is no flooding within sites but the adjacent valley is flood prone. This provides scope for retrofitting water management initiatives (sustainable drainage systems for example) to anticipate DEFRA's reports: 'Future Water' & 'Making Space for Water' and the RSS requirements for future housing.

3.2 Asset attributes – Kirkholt

The total area of the estate is 191Ha. The document 'Vision for Kirkholt has analysed the green infrastructure and calculated a total areas of 67 Ha. At the time of the study the ecology of specific locations was not known but a survey is to be commissioned in 2009.

The landscape is well defined and sits within the Manchester Pennine Fringe Character Area 54. The solid geology is millstone grit and coal measures. The surface geology may include glacial drift and sands and gravels. Landscape issues are well covered in vision documents and the master planning process.

The Rochdale MBC UDP provides a detailed framework for development control. This includes detailed policies relating to ecology, open spaces etc. Some dwelling are to be demolished. This may offer opportunities for the interim use of tree planting or advance landscape planting.

The sites offer no tourism opportunities. However, both estates sit within the Pennine fringe and as such enjoy potential access to large areas of attractive landscape. This would be a significant attractor if the housing offer were also made sufficiently attractive.

Public access has been comprehensively addressed in vision documentation and master planning. The Rochdale MBC UDP sets the standard used.

A cultural/heritage assessment has been produced. Balderstone Park features prominently in the Pathfinder Heritage Assessment and make reference to the housing reflecting the Garden City approach. A Cabe Space 'Spaceshaper' event focussing on Balderstone Park appears to have received strong community engagement and support.

Kirkholt sits in an area of relatively high IMD. There are employment issues and problems with community not being able to access jobs in larger employment areas. The strategic site of Kingsway is seen as providing important employment opportunities. The community is 93.5% white.

A Community steering group exists with advisory groups covering youth, spaces & procurement

The housing is predominantly in Local Authority ownership. An Arms Length Management Organisation (ALMO) manages the bulk of the housing. Maintenance appears to be an issue. The lack of maintenance was mentioned in the 'Spaceshaper' event.

The estate has good links to surrounding greenspaces and countryside and good internal connectivity of green spaces. These appear to be well understood and built into the Vision for Kirkholt. A travel study is required. A national cycle route passes to North of the area alongside the canal.

Part of the site is within a flood zone. A drainage survey has been carried out and concluded that the infrastructure is capable of the planned increase in dwellings. SuDS is specifically mentioned as an opportunity in the vision document. This provides scope for retrofitting water management initiatives (sustainable drainage systems for example) to anticipate DEFRA's reports: 'Future Water' & 'Making Space for Water and the RSS requirements for future housing.

4.0 Green infrastructure opportunities

The following are areas that the team felt might provide further opportunities:

Benefit	Possible GI interventions	Rating level
<p>Climate change adaptation and mitigation.</p>	<p>Individual sites are probably of sufficient size to consider designing shelter belt</p> <p>Tree planting around properties will help in reducing energy use for heating and cooling. Deciduous trees can be used for Summer shade but will not impede winter solar heat gain. Transpiration from GI will help to ameliorate the effects of summer temperatures.</p> <p>A 'Greenstreets' approach to estate roads could be considered</p> <p>The mix should be capable of adapting to UKCIP forecasts (40° Summer time temperature by 2080). Manchester has been the subject of an ASCCUE (Adaptation Strategies for Climate Change in the Urban Environment) study – this could be used to reinforce the message</p> <p>Water requirements will need to be planned and linked to water management plan for SUDS/grey water recycling.</p> <p>Promoting Green roofs/green walls would not be necessary for replacing any loss of habitat but would contribute to climate change adaptation and water management. The requirements of developers would possibly make such design proposals difficult to implement but Green roofs could be embedded in any proposed design guidance and particularly considered for public buildings. This would help with the delivery of LA duties under the Natural Environment and Rural Communities Act (2006).</p> <p>The provision of green roofs would increase the BREEAM rating of buildings.</p>	<p style="background-color: red; color: white; text-align: center;">High</p>
<p>Flood alleviation and water management.</p>	<p>SuDS would be a positive environmental contribution to the projects allowing government proposals in reports 'Future Water' 2 and 'Making Space for Water' to be planned in the scheme. SuDS is particularly relevant to the provisions of Planning Policy Statement 25, Annex F 'Managing Surface Water'</p> <p>Sufficient space exists for storm balancing subject to drain infrastructure and general topography are such as to allow for such modifications.</p> <p>SuDS and Grey water recycling will reduce pressure on water treatment and provide source for irrigation of GI</p>	<p style="background-color: red; color: white; text-align: center;">High</p>

Benefit	Possible GI interventions	Rating level
	At Kirkholt, the northeast corner of the site falls within a flood prone designation. GI could possibly be used to mitigate effects subject to detailed hydrological studies.	
Quality of place.	Well-maintained green infrastructure would increase visual amenity and help to build cleaner, safer, greener, sustainable communities. ILM programmes could be used for part of the development of the GI on the estates – helping to rebuilt community confidence.	
Health and well-being.	The site could be used as a vehicle for NEET (Not in employment, education or training) type programmes Innovative approaches to sustainable development (climate change adaptation, biodiversity, water management etc) could be used as a vehicle for educational projects – possibly supporting corporate social responsibility objectives. The use of GI as a vehicle for ILM/Social Enterprise/volunteering will help to develop ‘skills for life’	
Land and property values.	The GI will play a critical role in providing an long-term viability for the project and attracting new occupants and supporting land values. This is closely linked to providing adequate levels of landscape management.	
Economic growth and investment	The amount of GI would be sufficient for Social Enterprise creation (see labour productivity).	
Labour productivity.	Sites are of a size and in a location that makes them good resources for supporting ILM type activities. Paying for maintenance of GI will be an issue that will require negotiations with developers. Developers are increasingly aware of their Corporate Social Responsibility profiles and may be amenable to new solutions that are not based on traditional landscape maintenance models. ILM/supported employment programmes could be used for part of the maintenance of the site. Endowments (cash or assets) from developers and Section 106, could be considered. A social enterprise (developed as a recipient of trainees from ILM) could be used for the long-term maintenance.	
Natural Tourism.	The sites will not attract tourism. But the adjacent countryside is a tourist resource for residents of the estates.	
Recreation and leisure.	The sites will encourage access for the local community. A Ranger resource could be planned. Cross-links would be beneficial to enhance the utility of the riverside walkways and cycle routes. And help to reconnect communities to the high quality Pennine edge environment. Walking and cycling routes are incorporated into the projects. The access should be viewed as bi-directional – encouraging estate dwellers to walk/cycle towards the urban/rural fringes and providing easy walking and cycling routes for those commuting to city jobs.	
Land and biodiversity.	Ecological surveys are required as per advice from Greater Manchester Ecology Unit. Several areas designated Sites of Biological Importance. Some areas of earlier industrial use and recorded as closed landfill sites sit within the boundaries of Alt and Sholver. These might have particular biodiversity attributes due to low nutrient levels in soils and associated factors. A duty already exists under Natural Environment and Rural Communities Act (2006) to have regard to the conservation of biodiversity 1. Quality of place will require good levels of maintenance if the usual cycles of regeneration and decline are to be avoided A Habitats Management Plan would provide a solid basis for good management	

Benefit	Possible GI interventions	Rating level
Products from the land	<p>Sites within the boundary are not large enough to produce significant biomass outputs.</p> <p>Sites are probably of sufficient scale to consider neighbourhood waste and composting schemes. This could be linked to landscape maintenance/allotment food growing schemes. Areas are large enough for allotment proposals.</p> <p>Food growing at a community level could be used to generate community food box schemes</p> <p>A wind turbine would represent an 'iconic' feature</p>	

Key to colours in column 3:

This column assigns a simple and visual level of analysis to the capacity of the interventions to yield an economic benefit. Red = high; amber = medium. Yellow = low

Natural Economy Northwest

Assessing the potential for GI development within projects

Paper 6 – Pennine Lancashire Forest Park

1.0 Introduction

This is one of a series of papers summarising the outcomes from a Natural Economy Northwest (NENW) initiative that is looking at regeneration projects and assessing the degree to which such projects are using green infrastructure as part of the planning and design of the schemes. The projects usually fall in one of two groupings. The first grouping comprises of projects that are primarily economically focussed. These include examples of city centre regeneration and large commercial development sites. For this group the task is to determine whether the use of green infrastructure can deliver additional economic outputs while at the same time increasing the value of associated socio-environmental outputs and outcomes. The second group comprises of projects that are predominantly focussed on delivering environmental benefits. The Pennine Lancashire Forest Park is a perfect example of this type of project. In this grouping the task is mainly to see whether the level of economic output can be further increased through adopting an approach based on the concept of the 11 economic benefits that green infrastructure can deliver. The companion Paper 1.'Overview and Methodology' is common to all projects and provides an explanation of the approach taken.

2.0 Description of the Pennine Lancashire Forest Park project

The project envisages the creation of a new forest park covering some 120 hectares that sits immediately to the north east of the town centre of Burnley. At the core of the site area is the former Rowley landfill site of 40 hectares. The project exemplifies the way in which the multifunctionality of green infrastructure can generate a range of economic, social and environmental benefits.

Five of the most deprived neighbourhoods in the UK are located within 2 km making this project a potent demonstration of how green infrastructure can help to deal with some of the devastating socio-economic problems confronting such communities.

The project has been developed by a partnership led by staff at Burnley Borough Council and the NENW project team were highly impressed by the degree to which the project, as presented, already represents an advanced demonstration of the concept of green infrastructure. It was the NENW team's opinion that the Pennine Lancashire Forest Park was a demonstration project that provided as much learning for the NENW team as for the Burnley project team.

Mention should be made of the exemplary efforts made to align the project with developing regional and sub-regional thinking relating to green infrastructure. Particular mention should be made of the typology mapping that has been carried out by staff at Burnley Borough Council and of the way in which the project has been translated in terms of the emerging Lancashire Sub-Regional Green Infrastructure Strategy led by the team at Lancashire Economic Partnership.

3.0 Relevant site data

The preliminary stages of assessment involve building an understanding of the site's characteristics. This was done through a presentation from the development team that was then followed by a data gathering exercise. The results are summarised in brief below:

3.1 Asset attributes

The scale of the site is large – some 120 Ha in total. The shape of the project area is coherent and represents a very large scale corridor 'wedge' that forms a link between the Pennine rural fringe to the east and the concentrated urban form of central Burnley.

The site falls within the National Landscape Character area 35 - the Lancashire Valleys and the Lancashire Character Area 6 – Industrial Foothills and Valleys. One dominant attribute is the former landfill site of the Rowley Tip. This means that a significant part of the site is contaminated. That said there no significant site based issues of pollution. It may even be the case that the nature of the restoration will lead to interesting types of vegetation development on the low-nutrient soils forming the cap.

The project area sits adjacent to the Heasandford Industrial Site and close to high density urban housing including the Elevate HMR area. The site is linked to these areas and a large population through several cycleways, pathways, green ways and the like. This means that the project offers enormous potential for activities relating to tourism, leisure and recreation.

The project is located within 2 km of 5 of the 320 most deprived neighbourhoods in the UK offering the project substantial scope to help these damaged communities through improving social health and well-being as well as helping those on long-term incapacity benefit, the unemployed and young people not in employment education or training.

The project enjoys a major benefit in being located on wholly owned public land. It has the further benefit of support from partners that understand and value the nature of the wide range biodiversity that the project already has or that is potentially developable through careful planning and maintenance.

4.0 Green infrastructure opportunities

The NENW team's approach is detailed in the companion Paper 1 'Overview and Methodology'. The suggested interventions fall into two parts as laid out below. The first part looks at the project within the context of the wider area and follows the six-step approach suggested by the Northwest Regional Guide to Green infrastructure. Part 2 follows a more project level analysis and the interventions are suggested in response to the specific asset attributes of the site.

Part 1 - The NW Green Infrastructure Guide Approach

GI Guide step	Application to the project
<p>Partnership and priorities</p>	<p>Total Economic Value - This is a comprehensive proposal that appears to have benefited from using the Lancashire Green Infrastructure Strategy Strategic Objectives to develop and articulate it's proposals. The Strategic Objectives appear to be providing a strong potential structure to aid the communication of what the proposal offers in the round. The objectives provide a structure to set out and explain the potential "total economic value" of the proposal which is important to fully understanding the economic offer from developing the Pennine Lancashire Forest Park.</p> <p>The project is part of the East Lancashire Regional Park and has a steering group with a wide array of has representatives from: FC, LCC, Remade, LEP, BBC and so on.</p> <p>The project has potential to develop as an exemplar within the East Lancashire Regional Park. The proposal sets out a range of recreational activities that could be provided and correctly targets primarily the local market for casual and intermediate level activity. The proposal could however potentially review what opportunities there may be for the project to provide or encourage an increase in levels of business in the recreation, leisure and tourism sectors for the proposed activities in the wider area.</p> <p>Housing Market Renewal – THE HMR area should be encouraged to see itself as a part of the Pennine Lancashire Forest Park. The people living within it should be a key potential source of visitors and the Pennine Lancashire Forest Park should be seen as a key measure to help deliver a better quality of place to live and an opportunity to encourage healthy physical activity. Attention should be given not just to the value of the Forest Park as being adjacent to the HMR but to the need for the HMR to ensure natural continuity with it by incorporating green infrastructure at the street level to improve quality of place and help mitigate the risks associated with urban heat island effects which affect much of inner Burnley – especially areas of high housing density where communities may be considered more vulnerable. The HMR area should also consider the potential to use "Natural Signposting" to provide clear navigable green routes to adjacent areas such as the Pennine Lancashire Forest Park.</p>
<p>Data collection/audit and mapping</p>	<p>Typology mapping in line with the NW GI guide has been carried out. A link between The green infrastructure experts at the Mersey Forest and the Burnley Borough Council team has now been established.</p>
<p>Functionality Assessment</p>	<p>The multi-functionality of the project has been demonstrated in terms of a range of benefits that are articulated within a framework that refers back to the Lancashire Green Infrastructure sub regional strategy and its strategic objectives as well as to the NENW range of 11 economic benefits.</p> <p>A functionality assessment of the type being developed by the CFNW would further help to provide a robust evidence base.</p>
<p>Needs / opportunities Assessment</p>	<p>Not yet carried out using the developing CFNW methodology but many of the components of the proposal are clearly founded on a social, economic and environmental evidence base.</p> <p>The project could deliver benefits to several key strategic areas:</p> <ul style="list-style-type: none"> • The adjacent Advanced Manufacturing Park • Links to HMR at street level (through a Green Streets approach) and consideration of 'heat island effect in inner Burnley. • Delivery of Local Biodiversity Action Plan targets. • Consider the project's added value to town centre regeneration programmes as an aid to developing greater strategic significance in driving the regeneration of north and east Burnley. • Burnley Education and Enterprise Park • Building Schools for the Future • The Weavers Triangle • Railway links • Queen Street Mills • The adjacent canal network <p>The Advanced Manufacturing area should be encouraged to see itself as part of the Forest Park</p>

GI Guide step	Application to the project
	<p>landscape continuity with the adjacent Forest Park but also review and take all opportunities to incorporate green infrastructure in its site (including hard surfaces such as car parks and buildings) and building design to ensure the highest quality of place, the development of a setting for investment, climate change adaptation and an integrated opportunities for increasing biodiversity.</p>
<p>Intervention Plan</p>	<p>The project proposal notes the need to manage the project area in a much more integrated sense in order to develop a coherent management framework for the users. This approach might be usefully expanded to include the need to compliment and ensure a closer linkage with adjacent priority regeneration zones. This should include developing closer supportive links with the Housing Market Renewal area, Advanced Manufacturing Park, and reviewing ways in which the Forest Park might add value to any of the Town Centre regeneration programmes. Such an approach might aid the proposal to develop a greater strategic significance as a key driver for regeneration in north and east Burnley.</p> <p>Biodiversity - The benefits for biodiversity might be expanded to include an assessment of the potential for the Pennine Lancashire Forest Park to help deliver the Local Biodiversity Action Plan targets, the role that contact with nature could play in underpinning the quality of the visitor experience and the contribution the project could make to supporting and enhancing the operations of local ecological networks. The assessment should include the development of enhanced urban landscape permeability and providing robust landscapes capable of aiding species adapt to potential climate change.</p>

Part 2 – Project level actions and interventions

The following are areas that the team felt might provide further opportunities:

Benefit	Possible GI interventions	Rating level
Climate change adaptation and mitigation.	<p>The project could link to the HMR and help to tackle climate change issues through, for example, a Green Streets approach.</p> <p>The project also has scope to promote the use of green infrastructure as a means of reducing the urban 'heat island effect' in inner Burnley</p> <p>The scope for hydro-powered scheme on the Brun could be investigated and an extension of the conceptual boundary of the project might produce some scope for wind turbines</p> <p>Any newly developed visitor infrastructure could be used to exemplify the integration of grey and green infrastructure.</p> <p>The site could provide the resource of coppiced timber. This could be used to produce a grid-shell building built with community volunteers and with the added feature of a green roof as exemplified by other projects in the UK.</p>	
Flood alleviation and water management.	<p>The Environment Agency is currently working on a flood risk management strategy. The project could help to provide several interventions. For example, further retention of stormwater upstream might be possible. This would be outside project area as defined at present.</p>	
Quality of place.	<p>The project already contributes enormously to enhancing a sense of quality of place that benefits local commercial enterprises, housing and the general socio-economic well-being of the larger community.</p> <p>Fly tipping (particularly in adjacent commercial and allotment areas) might be an issue that would require positive intervention in order to preserve a high level of visual amenity. The project should, when fully operational, enjoy a sufficient reservoir of maintenance and rangers resources to provide these services in the wider area.</p>	
Health and well-being.	<p>The previous mining activity has left a legacy of isolated discharges of red ochre. If the egress of such contamination were to become a problem the Coal Authority has developed methodologies for treating mine water contaminated with iron oxides. (A large-scale example of reed bed technology is located, for example at Taff Bargoed in Wales).</p> <p>The cap to Rowley tip varies in quality and has acidic soils. (this may be used to advantage in habitat creation – see Land and biodiversity section)</p> <p>The project represents a valuable asset for improving the health of the local population and links to the Primary Care Trust should be encouraged to support/fund some of the project's outputs</p> <p>Three 'Building Schools for the Future' projects are located in the immediate area. All are to have boilers that can burn biomass. This might increase the viability of short rotation coppice growing on parts of the project.</p>	
Land and property values.	<p>The project's green assets will tend to increase the value of land and property within the vicinity. It is important that the project is therefore fully integrated with the adjacent areas and that the quality of the landscape provided and maintained by the project should be of the highest quality. The project needs to be seen as an integral part of the economic success of these adjacent areas and as such a worthy recipient of funding support.</p> <p>Elevate HMR should be a key target of the project since the project represents an asset that will add to the success of the HMR initiative.</p>	
Economic growth and investment	<p>Clearly, the project provides a significant contribution in creating a setting for investment. The links discussed in part 1 should form a strategic intervention to help the project optimise on the delivery of this benefit.</p>	

Benefit	Possible GI interventions	Rating level
	There should be an attempt to 'blur' the boundaries between the green and grey (industrial park) areas. This could be achieved by creating more permeability by way of gaps in the boundaries.	
Labour productivity.	<p>Scope exists for a better 'plug in' to RDPE issues. If the concept of the project were to be spatially extended then it might be possible to exploit the opportunities offered by the more rural agricultural area to the east of the project.</p> <p>There is a lot of scope for tourism-based employment – long distance trailhead and the Mary Townley loop being examples.</p> <p>The project represents a large area of green infrastructure asset that will need developing, enhancing and maintaining. This certainly means that it has sufficient critical mass to support transitional employment schemes that would help to deal with problems of worklessness and joblessness. Such examples include biomass, green waste composting (as exemplified in some WRAP brownfield trailblazer projects), short rotation coppice and other woodland craft based activities.</p> <p>The NENW Investment Forum is currently developing a worklessness pilot that would fit very well into the project.</p>	
Natural Tourism.	<p>The area is included within (a) National Character Area 35 – Lancashire Valleys and (b) Lancashire Character Area 6 – Industrial Foothills and valleys. These could be used as a theme for signposting to enhance the visitor experience.</p> <p>Cultural and heritage attributes (though largely removed) could be used to enhance interpretation of the landscape for visitors.</p>	
Recreation and leisure.	Project already includes most of these benefits.	
Land and biodiversity.	The poor soils levels of the cap might be the catalyst for high ecological/diverse vegetation types. This might be an opportunity to build on the rich academic work of NW universities (see work of Bradley, Handley and Rodwell). Working 'with the grain of nature' could lead to high biodiversity and an interesting mosaic of habitats as well as mitigating maintenance costs.	
Products from the land	See labour productivity section above	

Key to colours in column 3:

This column assigns a simple and visual level of analysis to the capacity of the interventions to yield an economic benefit. Red = high; amber = medium. Yellow = low

Natural Economy Northwest

Assessing the potential for GI development within projects

Paper 7 – Windermere Catchment Restoration Programme

1.0 Introduction

This is one of a series of papers summarising the outcomes from a Natural Economy Northwest (NENW) initiative that is looking at economically orientated regeneration projects and assessing the degree to which such projects are using green infrastructure as part of the planning and design of the schemes. The companion Paper 1.'Overview and Methodology' is common to all projects and provides an explanation of the approach taken.

2.0 Description of the Windermere Catchment Restoration Programme

The project includes all the hills, mountains, woodlands, buildings and so on from which water drains and, via streams, rivers and tarns finally flows into lake Windermere. Some 17 km long and England's largest natural lake, Windermere has a correspondingly large catchment covering 250 sq. km. This, in terms of spatial distribution makes this project the largest of the eight covered by the NENW study team.

One of the project's main aims is to deal with a deteriorating water quality that has been in decline for many years. This has led to a deleterious effect on several native plants and animals and a catalogue of unwanted changes caused mainly by human activities. Some changes are accountable in terms of global changes in the climate but many are of a local origin – Windermere is a key resource in terms of tourism for example.

A partnership of organisations has been formed to help to deliver the Windermere Catchment Restoration Programme (WCRP) these include:

- Environment Agency
- Lake District National Park Authority
- Natural England
- National Trust
- United Utilities
- Forestry Commission
- Cumbria Tourism
- South Lakeland District Council

The vision of the partnership is to restore Windermere to a state of high water quality that would have a direct benefit on natural wildlife and habitats and improve the quality of life for people.

3.0 Relevant site data

The preliminary stages of assessment involve building an understanding of the site's characteristics. This was done through a presentation from the development team that was then followed by a data gathering exercise. The results are summarised in brief below:

3.1 Asset attributes

The area of the project is some 250 sq. km. The area is made up of extensive green infrastructure dominated by lake Windermere. The most significant settlements are Windermere, Bowness on Windermere and Ambleside. The ecology of the area is well documented and well understood. The area is located within the South Cumbria Fells National Character area 19.

The levels of contamination – particularly of the water bodies are well researched. The levels of contamination are an important variable in considering the use and maintenance of green infrastructure. One important factor revealed by the scientific data is how close to the tipping point the system might actually be.

Particular problems include soil erosion – particularly in Ghylls and nutrient entering the watercourse from households and agricultural fertilisers.

The project area is an important contributor to the regional economy through tourism. Although not mapping precisely on to the catchment, the South Lakes area generated 10.2 million visitor days in 2007. Research shows that visitor numbers are steadily increasing.

Public access to the areas is widely available. This is, of course one of the major drivers for visitor numbers.

The area has a well understood cultural and heritage value and again, both play an important role in underpinning tourism.

The community attributes reflect a local affluence and rates of deprivation are the lowest in the region and do not greatly impact on green infrastructure planning. The total population is 16,500 and rates of economical inactivity and worklessness are low. However, significant clusters of high rates of multiple deprivation exist in adjacent areas around Carlisle and Barrow in Furness.

The ownership of land is mixed but the fact that the National Trust and the Forestry Commission are significant land owners eases the problem of dealing with land management issues

Some areas are susceptible to flooding

4.0 Green infrastructure opportunities

The NENW teams approach is detailed in the companion Paper 1 'Overview and Methodology'. The suggested interventions fall into two parts as laid out below. The first part looks at the project within the context of the wider area and follows the six-step approach suggested by the Northwest Regional Guide to Green infrastructure. Part 2 follows a more project level analysis and the interventions are suggested in response to the specific asset attributes of the site.

Part 1 - The NW Green Infrastructure Guide Approach

GI Guide step	Application to the project
Partnership and priorities	The feeling is that the focus of the partnership is too science based making it potentially too narrow. Could be strengthened by making links to Cumbria Strategic Partnership and, through such an engagement, demonstrate how WCRP outputs would help to deliver wider targets. Also potential should exist for selling benefits to organisations outside region. These include water, health, social inclusion, training, education and so on. This scale of lobbying would have resourcing implications and the critical question is how

GI Guide step	Application to the project
	far the project wishes to travel away from a strong focus on science.
Data collection/audit and mapping	The partnership should be encouraged to follow the general direction of the work that will be carried out in relation to the Cumbria sub-regional green infrastructure planning process.
Functionality Assessment	The project already has a grasp of this process – as evidenced by the way in which the WCRP can be expressed in terms of the NENW accepted array of economic benefits. Again, a close link with the Cumbria GI task Group will enhance both initiatives.
Needs / opportunities Assessment	This again returns to the issue of the scientific focus of the programme and the conclusion that there is scope for widening the nature of the outputs.
Intervention Plan	The intervention Plan envisaged by the NE GI Guide is the result of comparing need and existing functionality. Clearly the programme had already thought through a range of actions most of which are steered by the existing sub-groups. It would be interesting to see whether addressing steps 2, 3 and 4 of the NE GI Guide in the manner suggested would lead to modified outputs. There are of course more resource implications in this.

Part 2 – Project level actions and interventions

The following are areas that the team felt might provide further opportunities:

Benefit	Possible GI interventions	Rating level
Climate change adaptation and mitigation.	The programme has covered all current significant green infrastructure interventions with respect to this intervention.	Yellow
Flood alleviation and water management.	<p>River Basin Management Plan – should be delivering the WCRP</p> <p>Windermere does flood but radical changes to the surrounding fells would impact on the landscape and cultural heritage of farming and land management. This limits further green infrastructure interventions such as increasing the total tree cover in the upper catchment.</p> <p>Ghyll planting could help to reduce some flooding (and would aid biodiversity)</p>	Orange
Quality of place.	<p>Partnership used Landscape Character Assessments in HLF bid – everyone should be encouraged to use the themes designated in Areas of Distinctive Character.</p> <p>A bid for World Heritage status is being prepared. However, the question arises as to what would be the impact of increasing pollution on this designation? Windermere & Bowness will be required to contribute to OUV (Outstanding Universal Value). The WCRP would presumably have a significant role to play in delivering the required level of quality of place.</p>	Red
Health and well-being.	<p>Contamination issues in WCRP do not currently raise an alarm within a wide enough audience. There is a need to develop a wider case based on economic arguments – predominately relating to the negative impact on tourism. E.g. – Great North Swim is taking place for the second year in water of deteriorating quality.</p> <p>Use hard science to bring an understanding of the consequences of increasing contamination levels to the economic development wing.</p> <p>There is a substantial scope to develop green volunteering and conservation work through existing Cumbria Volunteer Network.</p> <p>A case needs to be made for funding: (i) supervision and (ii) coordination costs. In WCRP – this could be used to demonstrate a new tourism approach.</p> <p>Green volunteering would provide a useful contribution to Cumbria BAP.</p> <p>It should be possible to link initiatives (see also outdoor adventure sports strategies) - the partnership could usefully bring these together.</p> <p>Many of services are relevant to people and organisations sitting outside the catchment areas</p>	Red
Land and property values.		Yellow
Economic growth and investment	Primarily tied to tourism	Red
Labour productivity.	<p>Scope exists for a better connection to RDPE issues including rural deprivation and the opportunities offered by the Fells and Dales Local Action Group.</p> <p>There is only minor scope for transitional employment schemes due to length of travel time from centres of high IMD such as Barrow.</p>	Yellow
Natural Tourism.	It is estimated that the Windermere catchment attracts 60-70% of all tourist visits to Cumbria.	Red

Benefit	Possible GI interventions	Rating level
	<p>increased opportunities/threats</p> <p>In 2009 an estimated 200 volunteer days will be counted (amounting to approximately £5000 of value)</p>	
Recreation and leisure.	<p>The RDA and Environment Agency are developing adventure outdoor sports strategies. The EA initiative is based on water recreation.</p> <p>Maintenance of infrastructure is an issue. Opening jetty at Wray Castle led to increase pressure on footpaths that now need £10-11k investment</p>	
Land and biodiversity.		
Products from the land	<p>In terms of farming practice, a more holistic approach creating a 'bigger bang for the buck' is required.</p> <p>There needs to be a reduction in farm input costs – eg attention to amount of fertiliser that is used v that which is taken up. The residual being washed into river and lake systems producing a cost external to the direct farming cost</p>	

Key to colours in column 3:

This column assigns a simple and visual level of analysis to the capacity of the interventions to yield an economic benefit. Red = high; amber = medium. Yellow = low

Natural Economy Northwest

Assessing the potential for GI development within projects

Paper 8 – Weaver Valley Regional Park

1.0 Introduction

This is one of a series of papers summarising the outcomes from a Natural Economy Northwest (NENW) initiative that is looking at economically orientated regeneration projects and assessing the degree to which such projects are using green infrastructure as part of the planning and design of the schemes. The companion Paper 1.'Overview and Methodology' is common to all projects and provides an explanation of the approach taken.

2.0 Weaver Valley Regional Park

Encompassing an area of over 350 square kilometres this particular project is much larger in spatial scale than any of the other demonstration project studies undertaken. Some 350,000 people are resident within the project's boundaries. The landscape is a rich mix of towns such as Frodsham, Northwich and Winsford set within rural areas containing villages and smaller settlements.

At the time of the study the development was being affected by the administrative changes to the County the project being, in effect, cut in two by the new Unitary Authorities of Cheshire West and Chester and East Cheshire.

3.0 Relevant site data

The preliminary stages of assessment involve building an understanding of the site's characteristics. This was done through a presentation from the development team.

The presentation confirmed that a significant amount of green infrastructure planning had already been accomplished – generally in line with the North West Green Infrastructure Guide. Of particular note was the GIS mapping that had been accomplished - carried out by expert resources within Cheshire County Council and the Mersey Forest team. In fact the degree of development was such that it has set an important benchmark for green infrastructure mapping in the region.

The size and scale of the project, together with the advanced state of development of green infrastructure planning makes this a demonstration project that exemplifies the way in which green infrastructure can be used to help deliver the regeneration of areas suffering the effects of post- industrial changes. However the same issues of size and scale means that the Weaver Valley does not lend itself to the methodology developed for the other projects in the study and therefore the collection of site data to determine the projects asset attributes could not be followed in this particular instance. The team therefore used the Northwest Green Infrastructure Guide as a framework to assess and learn the lessons from the project.

4.0 Green infrastructure opportunities

GI Guide step	Application to the project
<p>Partnership and priorities</p>	<p>The process appears to be led by passionate planners who have yet to make the necessary links with other planning and development processes.</p> <p>The project commenced as a regional park but the client is no longer the Weaver Regional Park Board. This means that There is a need to look at a wider strategic partnership.</p> <p>The WV team has not yet understood how to present the ideas to a wider audience of economic planners in Cheshire.</p> <p>LESSON 1- At step 1 of the NW GI guide there is a need to look at wider strategies. There should be 2 objectives to consider. The first objective is meeting the requirements of the client group. The second objective should be to consider the umbrella under which the strategy is being developed.</p> <p>LESSON 2 – The 5 steps need to be iterative.</p> <p>LESSON 3 – There is a need to properly communicate the economic/regeneration to an audience that includes:</p> <ul style="list-style-type: none"> • Economic Development Officers • LA council members • Private Developers • Health Authority • Police Authority • LAAs <p>The GI Plan needs to be used as a planning tool available in the public domain. It needs to be a tool and not considered to be an end in itself</p>
<p>Data collection/audit and mapping</p>	<p>The project s leading the way in the development of GIS methodologies for the mapping of green infrastructure.</p>
<p>Functionality Assessment</p>	<p>The typologies defined by the data collection and mapping are being used to develop a method for assigning functionality to particular asset types. Again this project is setting a benchmark for this type of assessment of green infrastructure.</p>
<p>Needs / opportunities Assessment</p>	<p>The needs assessment methodology is being expanded within the project. When completed it will complete the suite of tools being developed by the team at the Mersey Forest and</p>
<p>Intervention Plan</p>	<p>There is a need/opportunity to link ‘hotspots’ along the river to develop the regional park concept as a process to aid regeneration</p> <p>A regional park is a place or a mechanism for regeneration that could deliver business opportunities, quality of place, develops a vibrant economy etc. All of these elements form a framework that is underpinned by a detailed GI plan.</p> <p>The budget for WVRP will be limited and they need to tap into the agendas of other agencies.</p> <p>Natural England has funding for Environmental Stewardship but WVRP can’t access it because regeneration framework does not meet the criteria. The WVRP could possibly represent a demonstration to tease out issues such as environmental stewardship</p> <p>There is a continuing need to deal with the problem of underused land.</p> <p>Funding needs to be found for certain key elements:</p> <ul style="list-style-type: none"> • Capital development • Revenue funding • Marketing and communication • Providing a resource for Influencing and embedding GI in policy.