SECTION 3.0

OBJECTIVES AND INITIATIVES

The goal of the strategy is to make the Leeds City Region vision for green infrastructure a reality by building and sustaining its contribution to the development of the city region in the coming years and by placing green infrastructure at the heart of spatial planning and economic development.

3.1 THE STRATEGY

The strategy builds on the strengths of the city region by taking account of existing green infrastructure assets, partnerships and projects and using these as the basis for future investment. It seeks to build on and maintain the momentum of existing projects and initiatives whilst identifying opportunities to expand their scope, to increase awareness of them and to win new investment.

To do so, it focuses on those investment opportunities where planning and designing green infrastructure will work best at the city region scale and acknowledges the challenges facing the resourcing of all types of infrastructures in the economic climate that may shape much of the forthcoming decade.

The strategy is both ambitious and innovative. It envisages a mutually beneficial relationship emerging between urban and rural areas of the city region in order to realise the full economic potential of the region whilst managing its response to climate change. It also anticipates green infrastructure playing a major role in reconciling historically conflicting aims.

The choice of strategic initiatives presented in the strategy has been guided by a clear focus on delivering green infrastructure investment that is able to promote sustainable growth and economic development and to adapt to and mitigate climate change. Every proposed action has a primary purpose of one or both of these objectives and as such there is a close correlation between the green infrastructure and the city region's investment plan[41]. But, whilst these are the focus of city region level interventions, all the proposed actions will also create significant opportunities to realise healthy living and biodiversity benefits.

The strategy will require a new way of thinking about green infrastructure. It will necessitate all parties to regard environmental improvement as essential rather than desirable, and in terms of value and not cost. Indeed, for the city region's core strategies to succeed into the long term, green infrastructure must be seen as an essential means of creating economic, social and environmental value. In doing so, it will add considerable substance to economic development and climate change plans that may otherwise remain disparate.

To be successful, the strategy will evolve over time as circumstances change. As such the choice of strategic initiatives proposed has been made to reflect the situation in 2010. As circumstances change and projects are delivered, so new projects and programmes will emerge. However, what is not likely to change is the role that green infrastructure will play in the success of the city region. As such the four strategic objectives set out in section 3.2 should continue to shape green infrastructure investment in the city region for many years to come.

3.2 STRATEGIC OBJECTIVES

Four strategic objectives have been selected to directly address the key drivers of green infrastructure set out in section 2 and to ensure that the strategy delivers the city region's transformational vision for green infrastructure in the city region set out in section 1. They are complementary in respect of actions, in that interventions and investments will deliver multifunctional benefits across several objectives at once. However, it is recognised that in more general terms a balance will have to be made between overall city region goals. For example, it is not the place for this strategy or the various interventions described to reconcile the potential conflicts between economic growth and climate change objectives at the project planning and delivery stage.

The relative importance of the objectives set out below will change over time and between different parts of the city region. The strategy reflects these differences in its chosen green infrastructure initiatives and in defining the spatial and delivery frameworks within which investment will be secured in the future.

OBJECTIVE 1: TO PROMOTE SUSTAINABLE GROWTH AND ECONOMIC DEVELOPMENT BY

- increasing the attractiveness of new and existing housing and employment land for investment;
- improving the quality of the local environment for local communities and businesses;
- enhancing the appearance of public transport hubs and services to promote use of the public transport network; and
- realising opportunities for new businesses, skills and jobs to meet the increasing demand generated by green infrastructure actions in the city region.

OBJECTIVE 2: TO ADAPT TO AND MITIGATE CLIMATE CHANGE BY

- enabling the city region to be more resilient to flooding and higher urban temperatures; and
- contributing to mitigating climate change by lowering the city region's carbon footprint.

OBJECTIVE 3: TO ENCOURAGE HEALTHY AND WELLBEING LIVING BY

- increasing the quality and accessibility of natural green space;
- increasing the use of green infrastructure assets by local people;
- improving the quality and health of the urban and rural environment; and
- enhancing rights of way and cycling networks to encourage a modal shift to walking and cycling to enhance healthy lifestyles and wellbeing.

OBJECTIVE 4: TO IMPROVE BIODIVERSITY BY

- increasing the area and quality of land regarded as being of high biodiversity value; and
- improving habitat connectivity to address issues of fragmentation and isolation of vulnerable species.

For each objective it is possible to identify more specific, measureable targets against which to monitor progress. As strategic initiatives are developed so such targets will be agreed to show the contribution each initiative is expected to make to deliver the strategy. Examples of targets that may be chosen are included in the Technical Baseline Report.

3.3 STRATEGIC INITIATIVES

There are four types of initiative proposed in the strategy with the aim of maximising the impact of green infrastructure in the city region. A summary of the various types of initiatives is presented below. Where relevant the geographic extents of the initiatives have been plotted on accompanying plans.

INITIATIVE TYPE	INTERVENTIONS
Investment Programmes create new investment opportunities for green infrastructure action across the city region with a focus on specific, common types of local intervention.	– Urban Green Adaptation – Greening our Economic Potential – Carbon Capture – Woodfuel – Rivers for Life
Strategic Projects promote significant exemplar green infrastructure actions with a city region impact.	– Fresh Aire – Central Ure Landscape Project (CUre) – Live Moor/Learn Moor
Green Infrastructure Growth Areas shape and secure high quality green infrastructure investment through the delivery of the City Region Housing Investment Plan.	– New Growth Points – Urban Eco-Settlements – Strategic Urban Renewal areas – Rural Economic Renaissance areas
Supporting Projects exploit the success of green infrastructure actions by capturing and retaining economic benefits in the city region.	– Green Hub – Eco-Skills Audit – Water Cycle Study

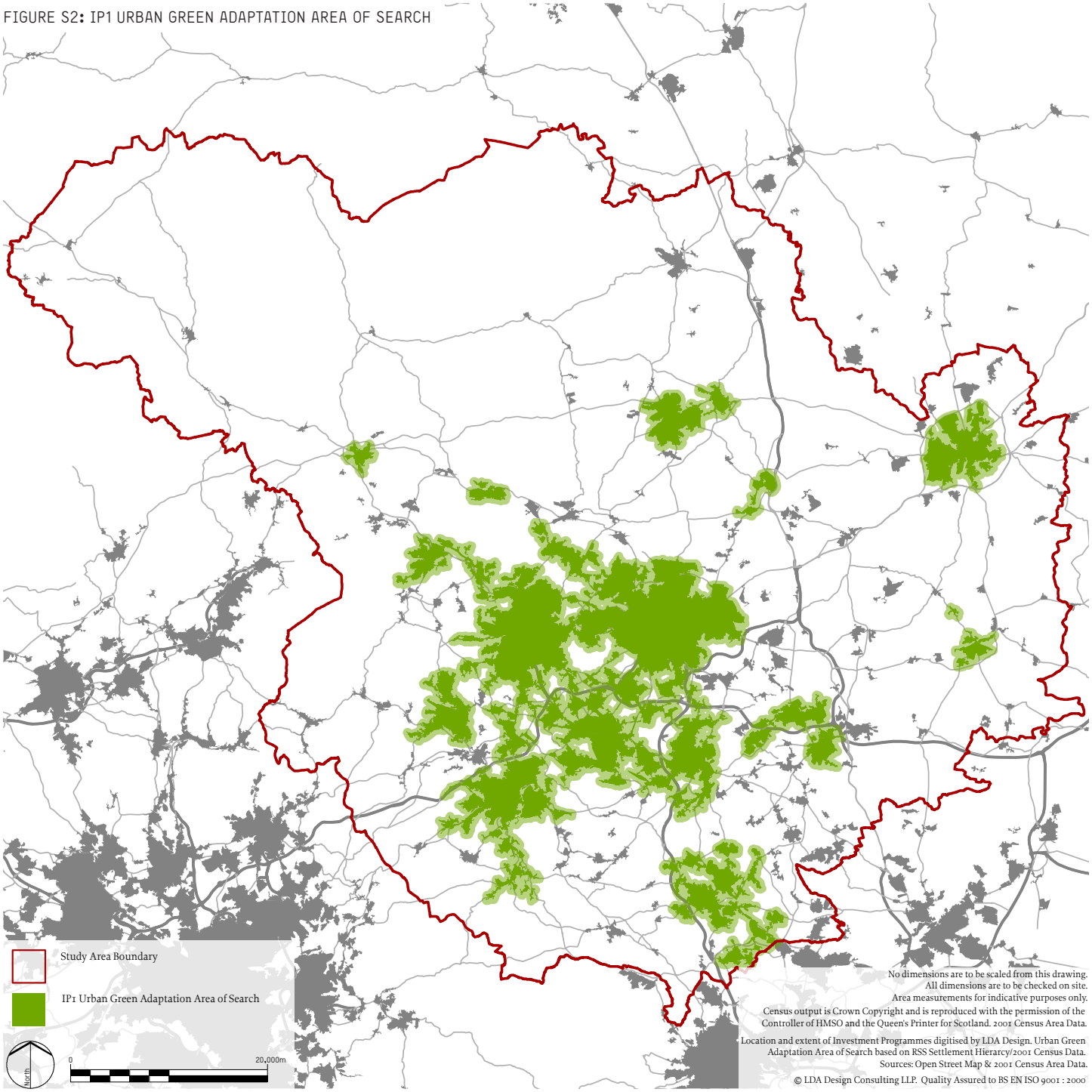
RIVER NIDD AND KNARESBOROUGH VIADUCT, IMAGE COURTESY OF P STRAND. NORTH YORKSHIRE COUNTY COUNCIL

3.4 INVESTMENT PROGRAMMES

Investment Programmes are intended to create the context for new investment opportunities focusing on similar types of green infrastructure projects in particular policy areas. The projects that come forward for funding under each programme in due course will be of a local scale but their cumulative impact across the city region will be significant.

The programmes have been chosen and shaped to provide a strategic focus for investment and activity without seeking to predict exactly when, where and how project planning and delivery will happen. The local partners will determine priorities depending on the relative importance of the programme to their area.

FIGURE S2: IP1 URBAN GREEN ADAPTATION AREA OF SEARCH



No dimensions are to be scaled from this drawing.
All dimensions are to be checked on site.
Area measurements for indicative purposes only.

Location and extent of Investment Programmes digitised by LDA Design. Urban Green Adaptation Area of Search based on RSS Settlement Hierarcy/2001 Census Data.
Sources: Open Street Map & 2001 Census Area Data.

IP1 - URBAN GREEN ADAPTATION

Refer to Figure S2: Investment Programme 1 Urban Green Adaptation Area of Search

WHAT IS IT?

As a result of climate change, our urban areas will have to face increasing summer temperatures and higher levels of rainfall in future years; our city and town centres will be particularly vulnerable.

As temperatures rise, heavily developed areas will be at risk of becoming 'urban heat islands', in part a result of the altered surface cover of the urban area through the replacement of vegetated surfaces (which provide shading, evaporative cooling and rainwater interception, storage and infiltration) with impervious built surfaces. Other climatic variations such as high winds can also be mitigated through the expansion of woodland cover and other green infrastructure solutions[42].

As such, the role of urban green spaces, parks, street trees, green building technologies and waterways will become increasingly important. They can provide not just respite from extreme weather conditions, but they can also become more productive, as well as attractive, assets.

WHAT WILL WE DO?

This programme will seek to secure invest for a wide range of green infrastructure actions to address these challenges. It will use tree planting to provide evaporative cooling and shading and use new surface water and greening to improve cold air drainage and air flows, especially along river and canal corridors which penetrate into the centre of our towns and cities. Properly designed tree planting can also form an important component of sustainable urban drainage schemes.

As these interventions will be focussed in places where the majority of people live and work, they will be designed as living urban environments to deliver a wide range of multifunctional benefits; offering existing and new residents with the facilities needed to grow food and access a diversity of leisure and environmental services.

The programme will also promote innovation in green technologies for adapting the existing and future built environment to accommodate green roofs and walls and 'vertical allotments' as well as large scale rainwater harvesting and storage for example.

WAKEFIELD, IMAGE COURTESY OF LEEDS CITY REGION

HOW WILL WE DO IT?

Although there is no current green infrastructure programme in the city region with these specific objectives, there are a number of initiatives that operate with similar intent that we can build on.

Through the Urban Eco Settlement Programme the Leeds City Region is already beginning to look at retrofitting existing developed areas to adapt and mitigate to climate change. In addition, each of the Local Authorities is undertaking work at the local level to address the impacts of climate change in their area.

Building on this work, and various complementary green infrastructure projects being planned across the city region, we will identify key pressure points across the city region where green infrastructure can make a significant impact.

Research will be required to develop the initiative further and identify a prospectus of sites for testing the effects of various interventions. This will parallel a PhD research project being taken forward by the Forestry Commission in conjunction with Manchester University that will be undertaken over the coming two to three years. This regional initiative will seek to replicate and further develop research previously undertaken by Gill, Handley et al in Manchester and will focus on the cities of Leeds, Hull and Sheffield.

WHERE WILL WE DO IT?

The Investment Programme will focus on densely built up areas that can be demonstrated to be particularly vulnerable to the effects of climate change, perhaps as a result of current built form and relative lack of suitable green infrastructure.

Densely populated residential districts will be a priority, particularly in areas with vulnerable populations and limited green spaces, and employment districts where environmental enhancement will play an important role in attracting new investment.

The geographic extents of the area of search for the programme, illustrated on Figure S2, have been defined by the extent of the city region's larger towns and cities and their immediate rural and peri-urban hinterlands as these will be the main area of search for identifying locations for investment and project development.

LCR ACTIONS

- Joint procurement of research to identify how green infrastructure interventions can be used to respond to climate change pressures.
- Develop prospectus of sites to achieve short, medium and long term projects that can be used for funding bids.
- Pull together Steering Group, wider delivery partners and consultees
- Identify opportunities to unlock investment and lever funding sources

LEAD PARTNER

- Leeds City Region

KEY PARTNERS

- Local academic institutions (to examine the application of local research and with local green infrastructure projects)
- Natural England
- Forestry Commission
- Yorkshire Wildlife Trust
- Environment Agency
- CABE Space

CORE OUTCOMES

The programme will make a significant contribution to the objective of adapting to climate change in the city region by:

- Significantly reducing flood risk in urban areas in the city region
- Reducing the 'urban heat island' effect in the major urban areas in the city region
- Offering opportunities to contribute to local biodiversity gain
- Offering new opportunities for community engagement with the natural environment

MERRION STREET GARDENS, IMAGE COURTESY OF LEEDS CITY COUNCIL

IP2 - GREENING OUR ECONOMIC POTENTIAL

WHAT IS IT?

Investment in green infrastructure has been proven, time and again, to lead to more inward investment, uplift land values, stimulate greener commuting and act as a mechanism for inspiring and motivating developers[43]. To capture these benefits successfully, green infrastructure must be integrated with a series of co-ordinated actions and be focused in the locations where it can make a real difference.

The focus of this programme is on planning for green infrastructure to support the remediation and redevelopment of brownfield sites and the promotion of strategic employment sites where the costs of site preparation and the perception of local environmental quality will be a factor in commercial investment decisions. This will include a focus on improving key transport corridors to these sites, especially where they coincide with local communities (as opposed to motorways for example).

It will support the regeneration of existing employment areas and business parks to reduce environmental costs and attract new tenants. Focus will also aim be given to the improvement of the appearance of public transport hubs and routes in both rural and urban locations that act as gateways to business and manufacturing districts and that play an important part in their overall appearance and attractiveness. In parallel the programme will also encourage green infrastructure that promotes green journeys to work, especially where public transport services and facilities offer potential to change commuting patterns for large numbers of people, bringing the added health benefits of more active lifestyles.

MELTHAM GREENWAY, IMAGE COURTESY OF LYNNETTE EVANS/ JEFF KEENLYSIDE, KIRKLEES METROPOLITAN COUNCIL

WHAT WILL WE DO?

The key locations where the programme will have most impact are where there are concentrations of and/or major:

- brownfield sites allocated for commercial development – using green infrastructure to prepare and promote land for development through advance remediation, land forming for sustainable drainage systems, and structural landscaping within and adjoining the site;
- strategic employment sites – using green infrastructure to promote development through advance structural landscaping on the site and at gateway sites and along key transport corridors adjoining local communities to improve attractiveness;
- underperforming business parks and industrial estates – using green infrastructure (including its ongoing management) to shape the identity of the park/estate to attract higher quality businesses and to improve the appearance of the site perimeter and adjoining transport corridors[44]; and
- public transport hubs & services – using green infrastructure to enhance the attractiveness and convenience of these facilities/services (e.g. the Leeds Next Generation Transport network) and the main access routes to them to encourage their use by commuters as well as helping reduce carbon emissions and improve air quality from roadside tree planting.

HOW WILL WE DO IT?

We will seek to build upon Groundwork Yorkshire & The Humber's 'Green Business Park'[45] proposals to prepare an investment prospectus for the programme (aimed at supporting owners to improve the environmental performance of their estates).

In these locations, the local authorities will ensure that any emerging planning policy documents and regeneration/spatial strategies and masterplans that are prepared to promote development, and subsequent planning applications, properly take into account the green infrastructure potential to both lower development costs and raise local land values.

The programme will seek to secure investment in all these green infrastructure actions and provide local planning authorities with greater leverage to use planning conditions and S106 agreements to negotiate high standards of green infrastructure works and ongoing management. Where sites include or lie close to existing or planned local assets (e.g. local nature reserves), then the site action will seek to respond positively to these assets, especially where there are opportunities to encourage walking and cycling as local journeys to work from neighbouring communities.

Following the launch of the Leeds City Region Transport Strategy, further research has been conducted to identify a list of potential options for decarbonising transport infrastructure, which identifies the improvement and expansion of walking and cycling networks[46]. A business case for this option will be developed as the next stage of the

work. We will build on the conclusions of this work by identifying how green infrastructure can bring additional benefits to the agreed options.

WHERE WILL WE DO IT?

The Investment Programme will focus on the target locations identified at an early stage of project development. Empahsis will be placed on identifying brownfield sites where remediation, redevelopment and promotion will be an important element in attracting new investment. Existing employment areas and business parks that will benefit from regeneration will also be identified as well as public transport hubs and routes that provide access to key business districts.

LCR ACTIONS

- Joint procurement of research to inform evidence base and identify most appropriate interventions.
- Develop prospectus of sites to achieve short, medium and long term projects that can be used for funding bids.
- Pull together Steering Group, wider delivery partners and consultees.
- Identify opportunities to unlock investment and lever funding sources.

LEAD PARTNER

- Leeds City Region

KEY PARTNERS

The location of the sites identified will have a bearing on partners at the local level. At the city region level, key partners to deliver this programme will be:

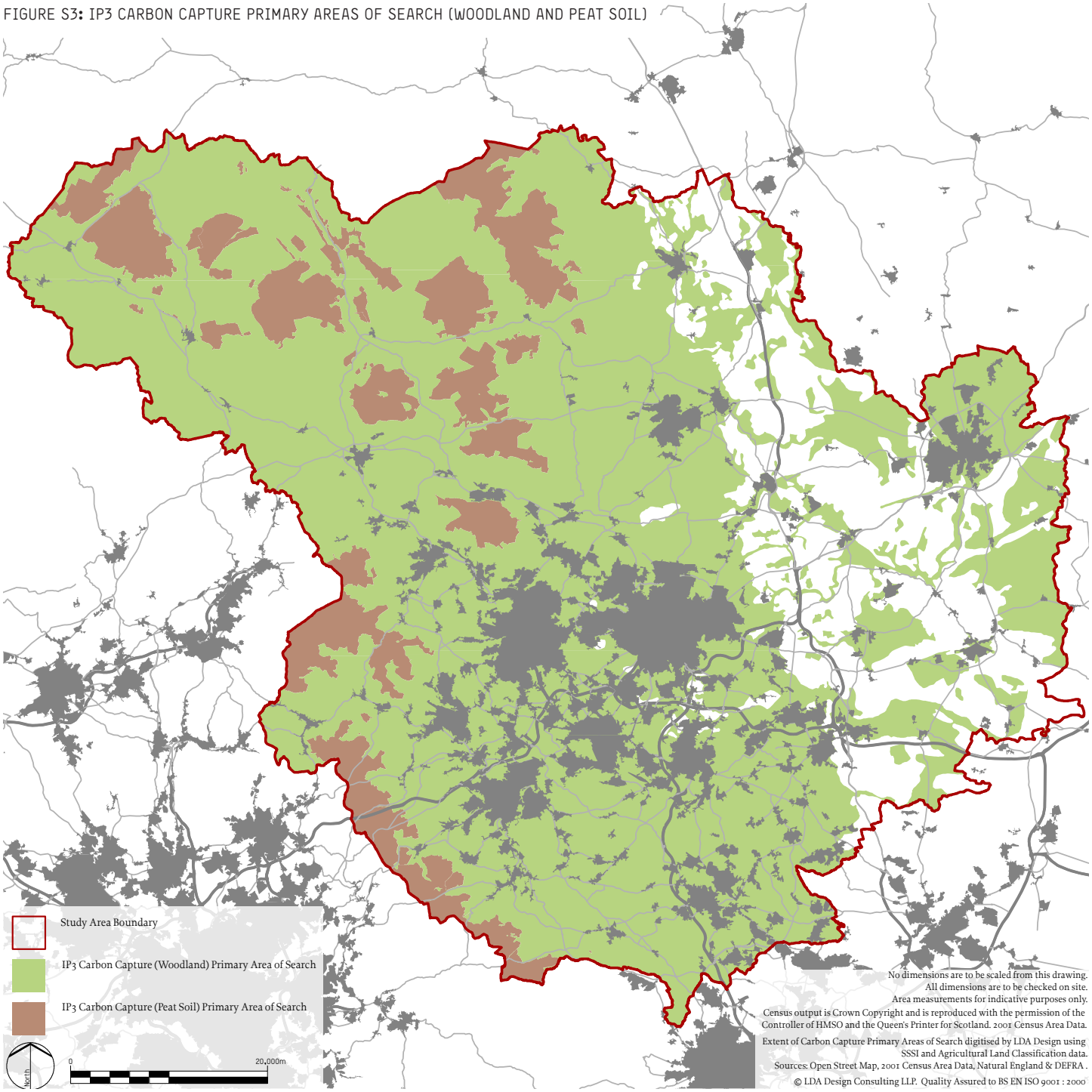
- Groundwork Yorkshire & the Humber.
- Metro.
- Natural England.
- Highways Agency.
- Network Rail.

CORE OUTCOMES

The programme will make a significant contribution to the objective of promoting sustainable growth and economic development in the city region by:

- Increasing the attractiveness of brownfield and employment sites for commercial investment, either as new-build or as estate refurbishment.
- Increasing and sustaining a high quality employment offer with a series of on-site open spaces, water bodies, footpaths and landscaping as appropriate.
- Enhancing the appearance of the public transport hubs and services to promote walking and cycling as journeys to work and improving the appeal of using public transport.
- Offering opportunities to address other green infrastructure objectives, perhaps by contributing to local biodiversity gain and mitigating the effects of climate change by incorporating wetland habitat into sustainable drainage systems and to promoting healthy living by connecting employment sites to neighbouring communities to encourage walking and cycling.

FIGURE S3: IP3 CARBON CAPTURE PRIMARY AREAS OF SEARCH (WOODLAND AND PEAT SOIL)



No dimensions are to be scaled from this drawing.
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Area measurements for indicative purposes only.

Extent of Carbon Capture Primary Areas of Search digitised by LDA Design using SSSI and Agricultural Land Classification data.

Sources: Open Street Map, 2001 Census Area Data, Natural England & DEFRA .

IP3 - CARBON CAPTURE

Refer to Figure S3: Investment Programme 3 Carbon Capture Primary Areas of Search (Woodland and Peat Soils)

WHAT IS IT?

Over the last five years, carbon emissions in the city region have dropped by 5%. Although this is higher than the average regional or national rates in carbon reduction[47], there is still have a major challenge ahead in terms of reducing emissions to the level required.

Whilst cleaner energy options and more efficient energy use will be the critical factors in contributing to national carbon reduction targets, green infrastructure interventions can also help mitigate emissions damage through carbon sequestration.

WHAT WILL WE DO?

The programme will seek to ensure that provision is made in new developments for retaining or creating carbon sinks – woodlands and peat restoration for example - and ensuring the long term management of assets is secured. It will also focus on green infrastructure projects outside of the development system that will create new significant carbon sinks.

The Yorkshire Peat Partnership for example is overseeing reseeding and managing drainage to protect large areas of upland peat from desiccation and loss and encourage new growth. This has been the subject of extensive recent research by Leeds University and others as part of the Rural Economy & Land Use Programme (the 'Sustainable Uplands Project'[48]). It may be possible to encourage similar interventions in low lying areas such as the Humberhead Levels; however, the value of land to agriculture may preclude this.

As demonstrated in the Read Report, woodland creation offers a very cost effective means of carbon sequestration. This Investment Programme will examine what contribution the Leeds city region might make to the national target of 25,000ha a year of new woodland planting advocated in the Read report.

Elsewhere in the lowlands existing woodlands would be managed for carbon capture and storage, whilst being sensitive to other uses and functions of the woodland resource.

In addition to their primary carbon sequestration and storage function, accredited schemes will provide new or enhanced habitat resources and provide areas for countryside access and recreation. Their design and management will be closely linked to local natural geography and cultural heritage assets and as such offer opportunities for large scale landscape protection and enhancement.

HOW WILL WE DO IT?

We will further develop our technical understanding of the science and practicalities of large scale carbon sequestration projects and refine the areas of search to identify key investment opportunities. The Live

IMAGE COURTESY OF PENNINE PROSPECTS

Moor/Learn Moor Strategic Project described later in the strategy is the flagship project for the peatland component of this programme.

The demand for investment to tackle large scale carbon sequestration and storage will be most obvious from developers and businesses seeking a means of meeting carbon reduction obligations. This programme is particularly well-suited to securing investment from the proposed Corporate Environmental Responsibility investment fund and Habitat Bank initiatives described later.

WHERE WILL WE DO IT?

Broad primary areas of search, illustrated on Figure S3, have been identified to focus the two types of intervention into areas where landscape character and prevailing environmental conditions would suggest that they are most appropriate.

The peatland component area of search is focussed on the moors and uplands of the Yorkshire Dales, South Pennines and Peak District. However, this does not preclude woodland planting opportunities, albeit there should be particular attention given to the impact of such interventions on landscape character, archaeology and biodiversity.

High quality agricultural land use and upland areas designated for their biodiversity importance will be largely excluded from the area of search for large scale new woodland planting. New woodland creation and the management of existing woodlands for carbon capture and storage will also need to be sensitive to other objectives and priorities. The Forestry Commission has created a national Woodland Carbon Taskforce that will examine the feasibility of delivering the Read Report recommendations. The Leeds city region will need to consider the issue and feed its recommendations into the work of the Taskforce as it develops.

IMAGE COURTESY OF GUY THOMPSON

These provide only basic areas of search at present in order to illustrate the potential spatial scope of the programme across the city region. Further research will be commissioned in due course by Forestry Commission in these areas to provide investors and project promoters with a more in-depth understanding of conditions that may affect carbon sequestration and storage and financial viability.

LCR ACTIONS

- Joint procurement of research to inform evidence base and identify most appropriate interventions.
- Develop prospectus of sites to achieve short, medium and long term projects that can be used for funding bids.
- Pull together Steering Group, wider delivery partners and consultees.
- Identify opportunities to unlock investment and lever funding sources.

LEAD PARTNERS

- Forestry Commission (woodland) and Pennine Prospects (peatland).

KEY PARTNERS

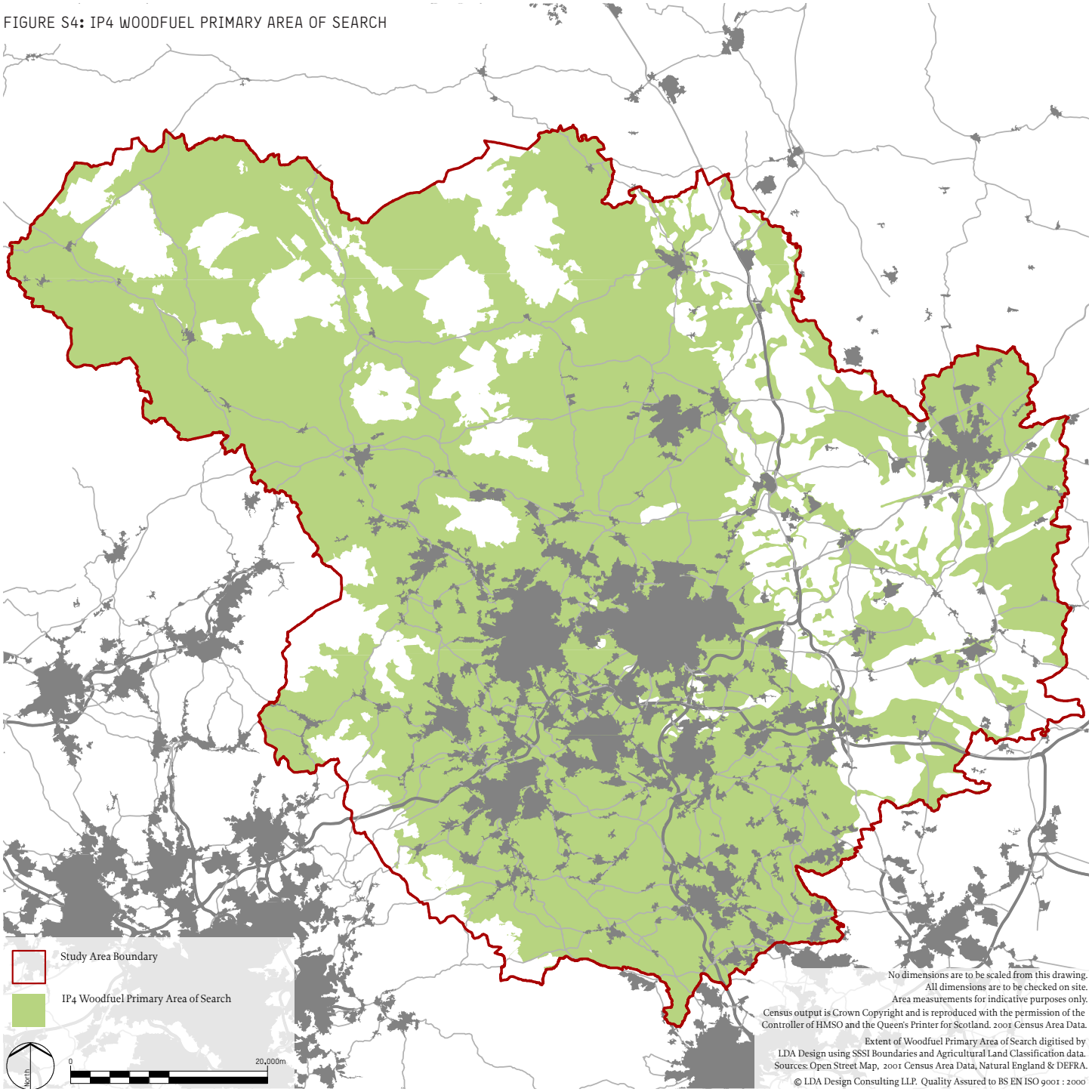
- Leeds City Region.
- Yorkshire Peat Partnership.
- Local academic institutions (notably Leeds University).

CORE OUTCOMES

The programme will make a significant contribution to the objective of mitigating climate change in the city region by:

- Significantly increasing the volume of carbon captured and stored to reduce the carbon emissions of the city region.
- Offering opportunities to contribute to local biodiversity gain.

FIGURE S4: IP4 WOODFUEL PRIMARY AREA OF SEARCH



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Extent of Woodfuel Primary Area of Search digitised by LDA Design using SSSI Boundaries and Agricultural Land Classification data.
Sources: Open Street Map, 2001 Census Area Data, Natural England & DEFRA.

IP4 - WOODFUEL

Refer to Figure S4: Investment Programme 4 Woodfuel Primary Area of Search

WHAT IS IT?

Published estimates indicate significant CO_2 savings are associated with substituting woodfuel for fossil fuels along with financial benefits of using wood derived fuels when compared to oil and gas. The Forestry Commission has set out a series of recommended interventions in their Woodfuel Strategy for England[49], that if implemented, could realise widespread benefits, including utilising an extra 2 million tonnes of woodfuel nationally, saving 400,000 tonnes of carbon, supplying the equivalent of 250,000 homes with energy. Additional benefits include conserving the woodland resource; reversing the decline in woodland diversity by increasing the number of sustainably managed woods; and creating economic opportunities, particularly in rural areas by developing a viable biomass industry and supply chain. This in turn supports businesses in the supply, installation and maintenance of woodfuel boilers.

The Regional Energy Infrastructure Strategy[50] highlights the important role that biomass heating systems, which are now becoming economic alternatives to fossil fuels, will have in the future. It also states that demand is developing an infrastructure that will need to be supported during its establishment. Likewise, the Yorkshire and Humber Vision for Biomass[51] includes an aim to *"support initiatives that will encourage owners of under managed woods to maximise their economic potential and social benefits, while enhancing their biodiversity value through sustainable woodland management. This should include appropriate support for biomass supply chains and the parallel development of generation technology for biomass, in line with the Forestry Commission's Wood Fuel Strategy"*.

WHAT WILL WE DO?

The Woodfuel investment programme will encourage the sustainable management of all of new and future woodland assets within the city region, whether in public or private ownership, to increase the amount of woodfuel available. It will promote the advantages of woodfuel as an alternative to oil, gas and coal and encourage the integration of woodfuel technology into new commercial and residential development. The programme will also further develop the market for all forms of woodfuel, thereby improving consumer confidence in fuel availability and in doing so stimulate a widespread increase in uptake.

The programme will focus on bringing existing woodlands into management and encouraging the creation of new woodlands in order to secure a long-term supply of woodfuel. Management will focus on thinning and forest residues for woodfuel and encourage management regimes that maximise woodfuel product whilst also being sensitive to other uses and functions of the woodland. For example, management for biodiversity will involve

felling of trees to increase light levels reaching the woodland floor, improve the structural diversity of the canopy, and favour native over non-native species of trees.

The programme will not include energy crops such as short rotation coppice and miscanthus as these are considered to be of limited benefit to meeting wider green infrastructure objectives. It is anticipated that such interventions, whilst forming a significant component of the total woodfuel available, will be of limited benefit to meeting wider green infrastructure objectives such as enhancing biodiversity and access provision and should be considered as part of evolving agricultural practices in the city region.

HOW WILL WE DO IT?

The programme will build on and extend current initiatives operating in the city region such as:

- the West Yorkshire Working Woodlands Project[52], operated by the Yorwoods Project, which aims to achieve the sustainable multi-purpose management of woodlands in the White Rose Forest area, with the primary objective being the production of woodfuel;
- CO2Sense Yorkshire's Woodfuel Infrastructure Programme[53] which assists woodfuel projects in the region and includes a number of grant schemes for businesses in the biomass supply chain including support for both suppliers and users; and
- the Forestry Commission's Under-Managed Woodland initiative which aims to bring woodlands into active management while also delivering other benefits such as improving biodiversity value.

The CO2Sense Yorkshire woodfuel programme is delivered with the support of partners in the Forestry Commission, Yorwoods, White Rose Forest and South Yorkshire Forest partnerships. The programme also seeks synergies with other delivery organisations such as the Carbon Trust, Natural England and DECC. Proposals for pilot woodfuel projects planned in the city region's Urban Eco-Settlements will also offer opportunities to demonstrate the benefits of woodfuel as part of planning new development.

WHERE WILL WE DO IT?

Further research will be commissioned to identify project areas based on a more in-depth understanding of the conditions that may affect woodland management and planting for woodfuel, as well as the financial viability of schemes, taking into consideration market conditions, transport costs and available markets.

Broad primary areas of search, illustrated on Figure S4, have been identified to focus interventions into areas where landscape character and prevailing environmental conditions would suggest that they are most appropriate. The area of search focuses on low lying rural and urban fringe landscapes. However, these areas provide only basic areas of

search at present in order to illustrate the potential spatial scope of the programme across the city region. Further research will be commissioned in due course by the Forestry Commission in these areas to provide investors and project promoters with a more in-depth understanding of conditions that may affect woodfuel production and markets.

LCR ACTIONS

- Promote woodfuel as a viable energy source.
- Joint procurement of research to identify potential of woodfuel in the city region and the infrastructure necessary to secure sustainable woodfuel industry.
- Develop prospectus of sites to achieve short, medium and long term projects that can be used for funding bids.
- Pull together Steering Group, wider delivery partners and consultees.
- Identify opportunities to unlock investment and lever funding sources.

LEAD PARTNER

- Forestry Commission.

KEY PARTNERS

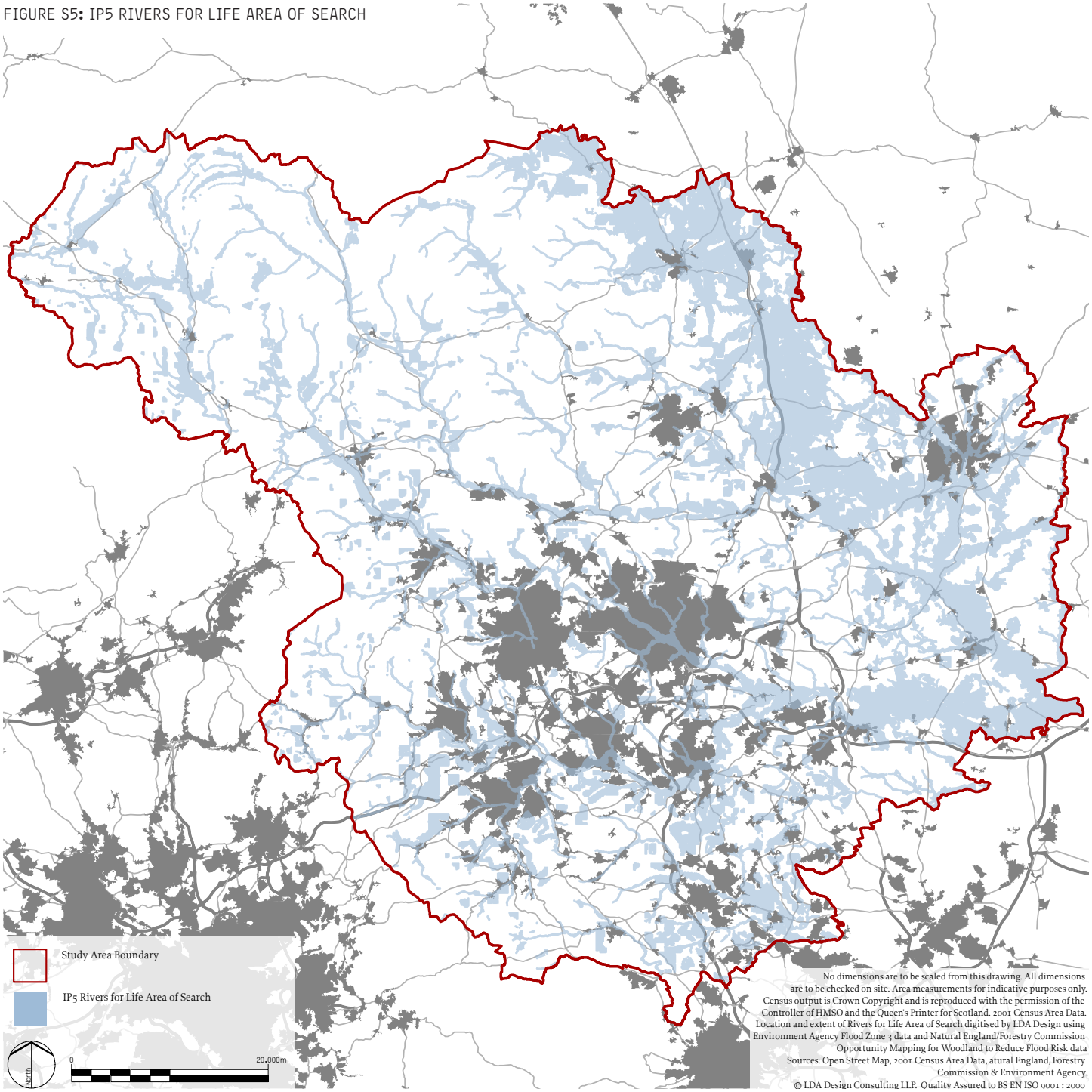
- Leeds City Region.
- CO_2Sense Yorkshire.
- White Rose Forest, Yorwoods and South Yorkshire Forest partnerships.

CORE OUTCOMES

The programme will make a significant contribution to the objective of mitigating climate change in the city region by:

- Reduce carbon emissions of the city region by increasing use of woodfuel as a source of renewable energy.
- Developing the green technology sector in the city region to create new businesses and jobs.
- Offering opportunities to contribute to local biodiversity gain.

FIGURE S5: IP5 RIVERS FOR LIFE AREA OF SEARCH



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Location and extent of Rivers for Life Area of Search digitised by LDA Design using Environment Agency Flood Zone 3 data and Natural England/Forestry Commission Opportunity Mapping for Woodland to Reduce Flood Risk data
Sources: Open Street Map, 2001 Census Area Data, atural England, Forestry Commission & Environment Agency.

IP5 - RIVERS FOR LIFE

Refer to Figure S5: Investment Programme 5 Rivers for Life Area of Search

WHAT IS IT?

It is anticipated that climate change will lead to increased winter and decreased summer rainfall in the years to come. In addition, rainfall events will be more intense which may increase flood risk from rivers and streams as drainage systems become overwhelmed[54].

The economic and social implications of flooding are significant, particularly when damage occurs to residential, industrial and commercial premises. There are also potential adverse impacts on the agricultural economy when the productivity of areas of land is affected by flooding and contamination[55].

It is clear that the effects of flooding will be felt across a large amount of the city region, in both built up areas and in rural locations[56]. Indeed, this highlights the symbiotic relationship between cities, towns and villages and their rural hinterlands; intense rainfall in the uplands may overwhelm a multitude of streams and lead to flash flood events in settlements downstream. Equally canalised rivers in a town may efficiently transport flood waters through a built up area, but cause damage downstream across wide areas of low lying countryside, damaging crops and pasture. As such flood water management is considered in the Rivers for Life Programme at the city region scale, with investment in both rural and urban areas, albeit employing different techniques and approaches that are appropriate to their local context.

WHAT WILL WE DO?

The Rivers for Life programme will establish a coordinated approach to river catchment management and enhancement across the city region. Its main focus will be on the restoration of river channels to reduce flood risk but will also deliver widespread access, recreation and biodiversity benefits through planning and designing for multifunctional benefit.

In rural areas upstream from the main centres of population in the city region the programme will focus on opportunities for restoring natural features in water catchments, such as wetlands and establishing new areas of riparian and floodplain woodland and grasslands. Wetland features, which include fen, open water, watercourses and ditches, have an important role in flood water detention, groundwater recharge, groundwater discharge and sediment retention. Wetland habitats such as grasslands and woodlands can also help slow water flows; aid infiltration; and reduce soil erosion which in turn influences the potential for sediment to reach the watercourse from adjacent fields. In addition, wetlands can be important carbon sinks, locking carbon in living material, litter, organic soils and peat.

BRADFORD CANAL, IMAGE COURTESY OF BRADFORD METROPOLITAN DISTRICT COUNCIL

In urban areas we will seek to secure investment in widespread reconfiguration of surface cover through the replacement of impervious surfaces, which have a notable effect on hydrological processes and can result in an increase in the runoff of rainwater, with permeable and vegetated surfaces which provide shading, evaporative cooling and rainwater interception, storage and infiltration.

The programme will also promote widespread adoption of sustainable drainage systems and features such as swales, infiltration detention and retention ponds, particularly in new developments and major housing renewal programmes. The Forestry Commission in partnership with the Environment Agency, Natural England and others has recently commenced a two-year pilot project (Slowing the Flow) in the Pickering and Sinnington areas to demonstrate how land management will be delivered in rural areas where opportunities for new floodplain and riparian woodland planting will also be exploited alongside general river corridor enhancement.

Priority will be given to improving the capacity of brownfield sites to deliver flood management capabilities. This will be achieved by investing in the removal of hardstanding and creation of temporary open spaces prior to regeneration and development being undertaken.

In many places we expect that the interventions described above will coincide with watercourse weirs that are impeding the recovery of self sustaining fish populations. Projects in these areas will incorporate fish passes into their design, thereby significantly increasing the environmental, recreational and economic value of our rivers.

HOW WILL WE DO IT?

The Forestry Commission has already completed opportunity mapping for woodland to reduce flood risk in the Yorkshire & Humber region[57]. This highlights in particular the role that woodland can have in assisting flood risk management. The Rivers for Life Investment Programme will expand the scope of this initiative over the next four years, with an initial focus on using land in local authority ownership. In addition the Yorkshire Wildlife Trust and Environment Agency, in partnership with the Strategic Waterways Group, has completed opportunity mapping for woodland, wetland and grassland creation and enhancement for biodiversity gain and the provision of ecosystem service, for most of West Yorkshire's waterways. This will be key to developing the Rivers for Life Investment Programme and various other green infrastructure investments described in the strategy and should be considered alongside the Forestry Commission's Woodland Opportunity Mapping. Further to this, the Environment Agency has identified where fish passes are required across the city region and have done significant work in building a business case for these interventions[58].

KIRKTHORPE WIER, WAKEFIELD, IMAGE COURTESY OF YORKSHIRE WILDLIFE TRUST

Various projects are already underway to address the issue of flood water management and go some way to demonstrating the benefits of the Rivers for Life Investment Programme The Environment Agency has recently commenced a two-year pilot project ('slowing the flow') in the Pickering and Sinnington areas[59] (which lie to the east of the Leeds City Region) to show that land management and natural processes can help to reduce the risk and severity of flooding and bring other benefits such as improving water quality, biodiversity and protecting soils. A similar project, the Ripon Multi-Objective Project (MOP)[60], aims to determine how changes in land management can reduce the risk of flooding and bring other environmental benefits. The Long Preston Wet Grassland Project is also demonstrating the benefits of landscape scale interventions. This has set out a long term vision for Long Preston Deeps landscape which will bring widespread benefits for people and wildlife, but will also deliver wetland restoration and flood risk management.

In identifying opportunities, consideration will be given to the wider social and environmental implications of interventions and the viability of initiatives in terms of capital expenditure and operational requirements into the long term.

WHERE WILL WE DO IT?

The geographic extent of the area of search for programme, illustrated on Figure S5, focuses on the main river channels, tributary streams and areas identified as being prone to flooding by the Environment Agency. It is acknowledged that land beyond the main river valleys and floodplains will also be an important focus for activity and investment to help reduce flood risk and contribute to the other objectives of the programme. As such areas of land identified by Forestry Commission and its partners as part of its Opportunity Mapping for Woodland to Reduce Flood Risk have been included in the extents of the area of search. Further research will be commissioned to identify project areas based on a more in-depth understanding of the conditions that may affect water catchment management.

LCR ACTIONS

- Joint procurement of research to inform evidence base and identify most appropriate interventions.
- Review and refine area of search and develop prospectus of sites to achieve short, medium and long term projects that can be used for funding bids.
- Pull together Steering Group, wider delivery partners and consultees.
- Identify opportunities to unlock investment and lever funding sources.

LEAD PARTNERS

- Forestry Commission and Leeds City Region.

KEY PARTNERS

The programme will be led and developed jointly by the Forestry Commission and Environment Agency, in association with:

- Environment Agency.
- Natural England.
- White Rose Forest Partnership.
- Yorkshire Wildlife Trust.
- RSPB.

These agencies will establish the detailed programme criteria for prioritising local projects and will identify the potential sources of funds.

CORE OUTCOMES

The programme will make a significant contribution to the objective of adapting to climate change in the city region by:

- Significantly reducing flood risk in urban and rural areas in the city region.
- Offering opportunities to contribute to local biodiversity gain.
- Increasing access and recreation along river corridors.
- Improving river corridors as visitor attractions to promote local tourism business and jobs.

RIVER NIDD AT KNARESBOROUGH, IMAGE COURTESY OF P STRAND. NORTH YORKSHIRE COUNTY COUNCIL

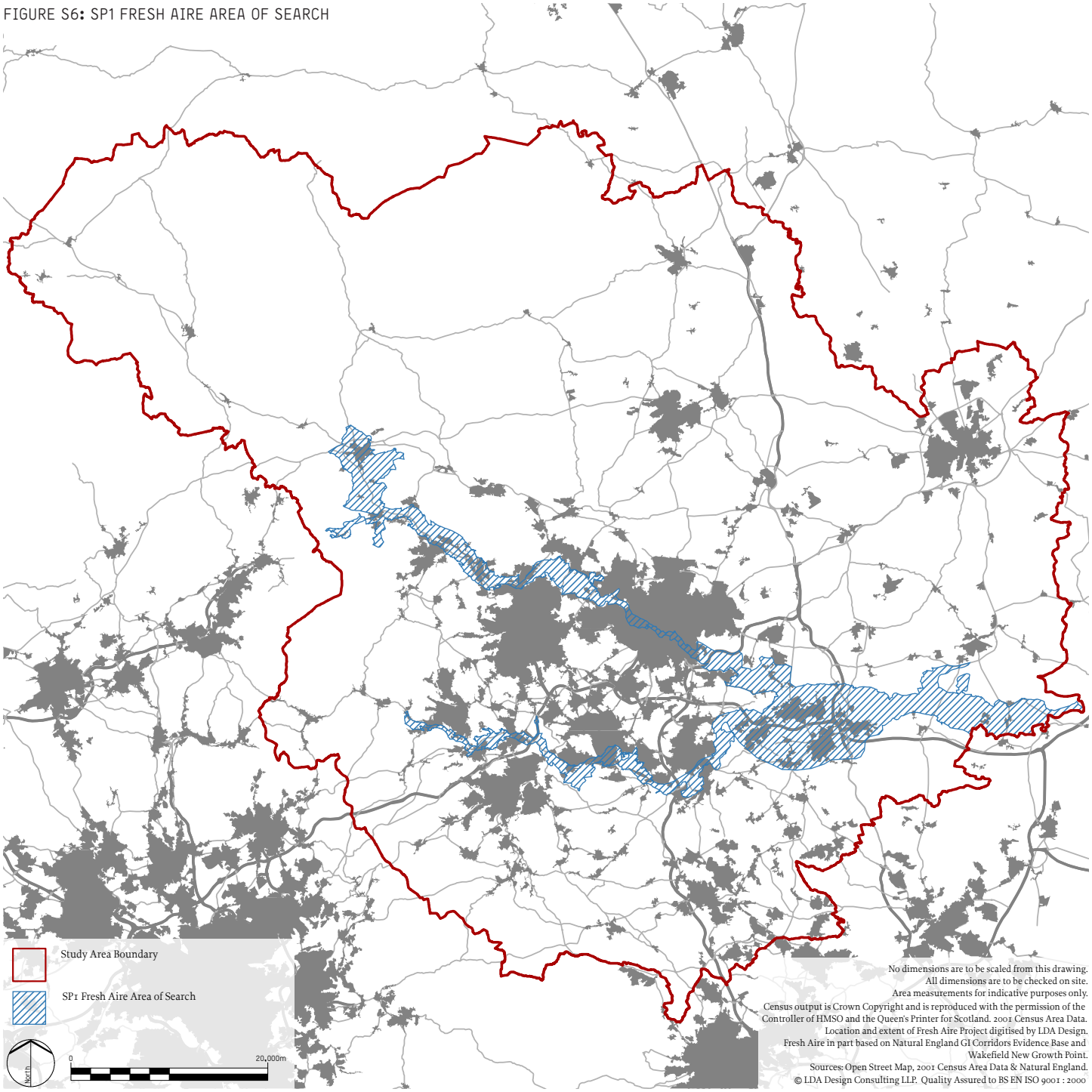
3.5 STRATEGIC PROJECTS

Strategic projects are site specific or clusters of green infrastructure actions that will create an impact at the city region scale. They have been identified as being of significant importance as they address particular needs that would be difficult to address through other mechanisms or because they will have a large impact, with significant benefits for people, wildlife or the environment more generally.

All three of the Strategic Projects identified are existing projects delivering green infrastructure benefits, or that have been in the planning stage for some time. They are considered in this strategy as they have the potential to significantly increase their impact across a wider range of functions if the investment is forthcoming. As such, there is confidence that the projects will have the delivery infrastructure in place to meet this challenge and become city region exemplars of green infrastructure action, which it is anticipated will stimulate other strategic or local projects to come forward.

The projects will be the focus for new city region scale investment secured from regional or national sources over and above local funding. Potential new funding streams are discussed in section 4 of this Strategy.

FIGURE S6: SP1 FRESH AIRE AREA OF SEARCH



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Location and extent of Fresh Aire Project digitised by LDA Design.
Fresh Aire in part based on Natural England GI Corridors Evidence Base and Wakefield New Growth Point.
Sources: Open Street Map, 2001 Census Area Data & Natural England.

SP1 - FRESH AIRE

Refer to Figure S6: Strategic Project 1 Fresh Aire Area of Search

WHAT IS IT?

The Aire river valley system, rising near Malham Cove at Airehead Springs in Craven District, forms the focus of a bold and innovative flagship project that will place the city region at the forefront of post industrial city planning in Europe.

A significant stretch of the river valley and its major tributary, the Calder, lie at the heart of the city region. The landscape is dominated by built development, transport and energy infrastructure which are testimony to the area's success and growth since a period of rapid industrialisation in the nineteenth century. Indeed, the river and navigable waterways such as the Leeds and Liverpool Canal had an important role to play throughout the industrial revolution and continue to offer widespread benefits for recreation and access in the area, as well as linking together some of the areas most significant environmental and cultural assets; the 'pearls on a string'.

Whilst some post industrial areas have witnessed strong economic growth, the decline in manufacturing and mining has left a legacy of dereliction and deprivation along significant stretches of the Aire and Calder. It is in this complex and often poor environment that a significant proportion of the city region's population live and major industrial and commercial interests are located. It is also where the change to a modern, environmental-led, post-industrial city region will be at its most prolonged and intense and where green infrastructure will have a crucial role in shaping a positive future and vibrant new sense of place and identity.

The area covers all or part of several of the Green Infrastructure Growth Areas identified later in the Strategy where large scale regeneration will provide numerous opportunities for innovate green infrastructure solutions. These include:

- Bradford-Shipley Canal Road Corridor Urban Eco Settlement
- Leeds Bradford Urban Renewal Corridor
- Aire Valley Leeds Urban Eco Settlement
- Wakefield New Growth Point
- Calderdale New Growth Point
- A52 Strategic Urban Renewal Corridor
- North Kirklees/South Dewsbury Urban Eco Settlement
- Calder Valley Rural Economic Renaissance

THWAITE MILLS VOLUNTEER ACTION WEEK, IMAGE COURTESY OF AIRE ACTION LEEDS

In addition to these areas, a wide range of existing and proposed projects will address a multitude of green infrastructure objectives including the creation and enhancement of new natural green spaces, flood mitigation and attracting economic investment. Projects and initiatives that come forward will add to or enhance existing assets. Of equal importance will be the linking of these assets together to make a cohesive, accessible network of green infrastructure assets. Project examples include:

– The Mid Aire Project is engaging with communities from Leeds and Bradford districts, to deliver biodiversity, access and interpretation benefits to a series of green spaces along the River Aire, encouraging local interest and use of the river corridor. The project delivers practical work on the ground, alongside community groups and local volunteers, creating a chain of safe and secure habitats for wildlife that will improve and strengthen the ecological network along the river and canal corridor for a variety of regionally important species. There is scope to extend the project upstream to include the Upper Aire and deliver on Yorkshire Wildlife Trust's Living Landscape Vision for the area.

– The St Aidan's Project, is a Vision to create a vibrant and sustainable landscape where people live, work and play. A place where wildlife will thrive on the restored land once dominated by the mining industry. This bold and innovative vision for the Lower Aire Valley, being driven by the RSPB in partnership with Leeds City Council, will see people and wildlife benefit from the restoration and enhancement of thousands of acres of land linking the M1 on the outskirts of Leeds to the A1 outside Castleford. This exciting new network of green spaces, transformed brownfield sites, floodplains and washlands will be regionally important for wildlife. It will provide a natural environment with exciting opportunities for recreation and healthy lifestyles, so improving the quality of life for hundreds of thousands of people (250,000 new visitors).

ST AIDAN'S SITE, LOWER AIRE VALLEY, IMAGE COURTESY OF RSPB

– The River Calder Project is active in promoting the uniqueness of the River Calder's natural and post-industrial heritage. Improvements to access and interpretation will be achieved through the creation of significant disabled access, self-guided wetland trails, way-marked circular walks and walks leaflets, which provide information on the sites of man-made history, their biodiversity interest, and their context in the local area. Such interventions will encourage use of the area and provide exciting opportunities for recreation and healthy living, so improving quality of life of many people. The project is also delivering biodiversity benefits through habitat creation and restoration works along the Calder between Brighouse and Wakefield, using volunteers and community groups, encouraging local use of sites by providing opportunities to learn practical habitat management and species identification skills. The project is key to establishing and strengthening a vital ecological network that delivers significant ecosystem services, and will expand to engage the local community in the Southern Washlands Nature Corridor and the wider Lower Calder Valley.

These actions will touch the lives of many thousands of local people and enhance the prospects of this area being the city region's economic and environmental hub.

WHAT WILL WE DO?

The Fresh Aire Project will be a major partnership initiative that will shape and help coordinate all activity within the Aire and Calder river valley system. It will bring together issues of environmental conservation, enhancement and land management and to make this compatible with enhancing the wider city region's growth and economic development.

In doing so, it will create a truly special place, centred on a resilient and successful post-industrial way of living. It will emphasise the mutual dependence that needs to exist between built up areas and environmental assets, set new standards for future growth and development in the city region and elsewhere in the UK, and provide opportunities to test new ideas and technologies as well as pilot and demonstrate several investment programmes.

The Fresh Aire Project will become a flagship for environmentally conscious development and regeneration, acting as a demonstrator for high standards of design, construction and environmental management as well as an engine for local environmental research and innovation, particularly in climate change mitigation, adaptation and sustainable construction. It will also demonstrate the benefits of enhanced, cross boundary and multi disciplinary planning and investment.

Delivery of high standards, environmental improvements and other projects is a key consideration and that is why the project area is not only focused on its rivers but also on UES's and the Aire Valley Leeds Area Action Plan area, which as a focus for new employment and 10,000 new homes offers a real opportunity to secure funding that will facilitate delivery of the project's objectives; via improving the quality of place and the place setting which will enhance land and property values.

On a broad scale, the project will lead to the celebration and promotion of green infrastructure in the city region by creating a sense of place and identity which can be used to brand the project area and its associated projects. The associated projects may be as large as an Urban Eco-Settlement or as small as a community food project. In each case, the project will benefit from the attention that the Fresh Aire project will generate amongst communities and investors that may generate new funding sources and that may enable greater co-ordination of effort.

HOW WILL WE DO IT?

The project provides an excellent opportunity to further develop partnership working across local authority boundaries and with the private and independent sectors over the next four years. Strategic planning of the project will be informed by emerging spatial plans or influence later ones within the project area and add to the clarity of the proposals coming forward in the Green Infrastructure Growth Areas and, in due course, the other relevant Strategic Projects and Investment Programmes proposed in this strategy.

WHERE WILL WE DO IT?

The geographic extent of the area of search for the Fresh Aire project, illustrated on Figure S6, focuses on the river valleys of the Aire and Calder and their hinterlands as defined by Natural England and its partners as part of their work to identify and describe Green Infrastructure Corridors. The corridor boundaries capture the main environmental and cultural assets which will form the basis of project development and enhancement of the local environment. The area of search has also been drawn to capture the full extent of the Wakefield New Growth Point, in order to take advantage of all of the opportunities presented by this major initiative.

LCR ACTIONS

- Develop a bold and imaginative Project Vision.
- Pull together Steering Group, wider delivery partners and consultees.
- Identify opportunities to unlock investment and lever funding sources.

LEAD PARTNERS

- Leeds City Region

KEY PARTNERS

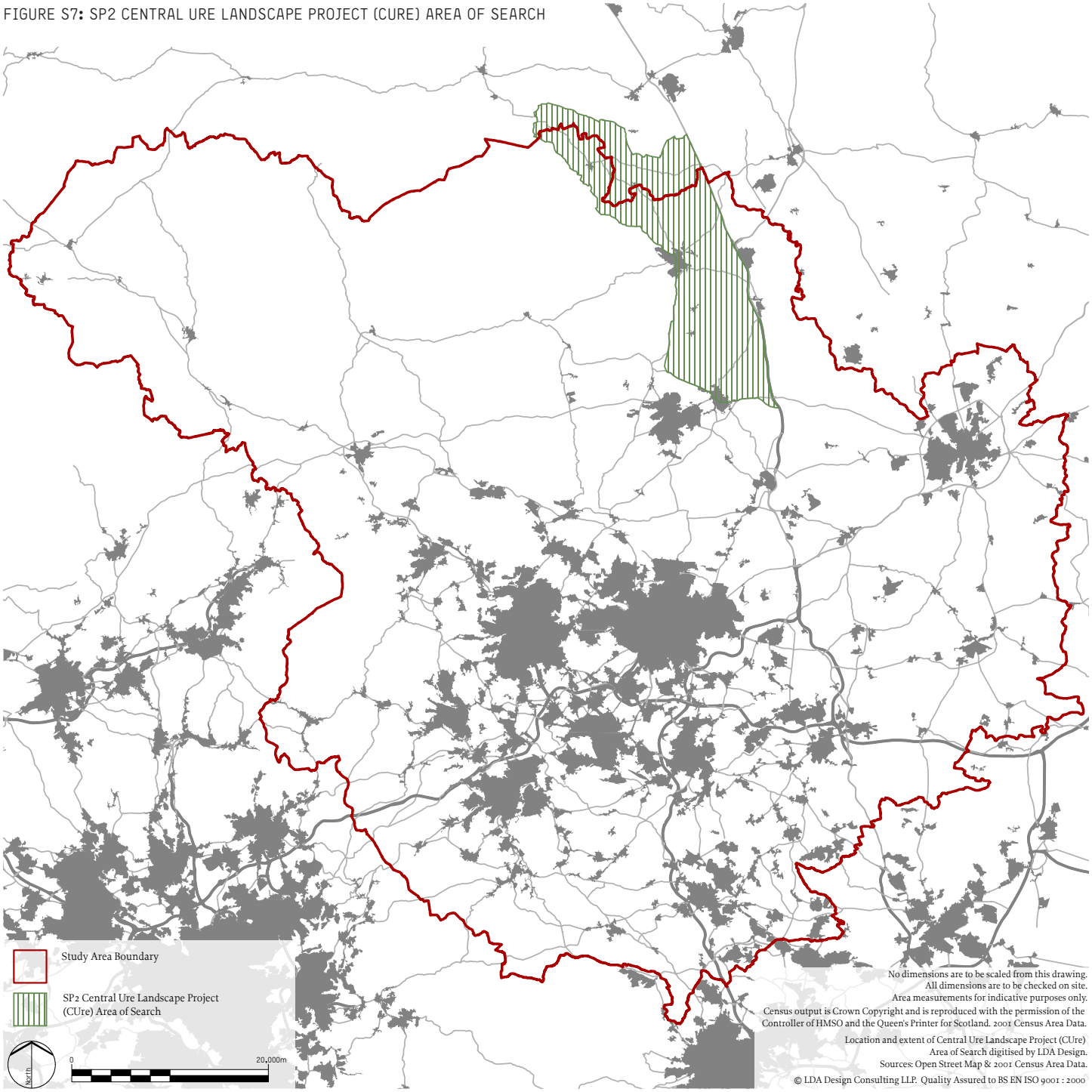
- Natural England.
- Forestry Commission.
- Environment Agency.
- British Waterways.
- Yorkshire Wildlife Trust.

CORE OUTCOMES

The initiative will make a significant contribution to the objective of promoting sustainable growth and economic development in the city region by:

- Raising the awareness of developers, landowners and investors of the opportunities, benefits and added value that can be associated with a growth and enhancement of green infrastructure.
- Creating new publically accessible open spaces and recreational facilities that add to the health and well being of the people of the region.
- Creating opportunities to contribute to local biodiversity gain and to reducing flood risk in the Aire-Calder river valley system – that will give security to residents and allow further flexibility in implementing development safely.
- Encouraging local communities to plan and co-ordinate local green infrastructure projects that will increase their sense of ownership and value of the project.
- Adding to the local tourism offer and thereby adding to economic development initiatives.

FIGURE S7: SP2 CENTRAL URE LANDSCAPE PROJECT (CURE) AREA OF SEARCH



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Location and extent of Central Ure Landscape Project (CUre) Area of Search digitised by LDA Design.
Sources: Open Street Map & 2001 Census Area Data.

SP2 - CENTRAL URE LANDSCAPE PROJECT (CURE)

Refer to Figure S7: Strategic Project 2 Central Ure Landscape Project (CUre) Area of Search

WHAT IS IT?

The River Ure, which rises in the uplands of the Yorkshire Dales National Park and Pennine Dales fringe, is a tributary of the River Ouse that ultimately flows into the Humber before entering the North Sea. Within the city region, the Ure meanders through alluvial floodplains and gently undulating countryside as it crosses a broad belt of glacial sand and gravel; a stark contrast to its upper reaches which are characterised by fast flowing streams in deeply incised moorland valleys.

The undulating topography, fertile - free draining, soils and lower lying wetlands bordering the Central Ure have long been the focus of settlement and activity. Indeed the Ure is at the centre of a landscape with evidence stretching back to the earliest periods of human occupation in the region. Of particular significance are the loose groupings of Neolithic henges and other prehistoric monuments between Thornborough and Ripon. At the heart of this ritual landscape is the important Thronborough Henges, sometimes referred to as 'the Stonehenge of the North'. Other features of the project area include ancient rural villages, several of North Yorkshires larger market towns and a notable concentration of historic parks and gardens. The Studley Royal and Fountains Abbey World Heritage Site, universally acclaimed as one of England's finest heritage assets and one of the city region's most popular destinations, is located a short distance outside the project area of search.

In recent decades, the fluvial sands and gravels of the rivers and the glacial deposits that fringe them have been extensively worked, leaving a legacy of open water and wetland habitats on restored sites. In some locations, the wetlands created have been designated for their wildlife value or form the central feature of widely valued nature reserves. Ongoing and potential future extraction of sand and gravel in this area is a notable force for change acting on the landscape and whilst extraction can be regarded as negative and harmful, it presents a significant opportunity to bring about widespread economic and environmental benefit through coordinated action and investment.

As such, the rich landscape of the Central Ure and the potential afforded by ongoing and future sand and gravel extraction offers significant potential for a multifunctional green infrastructure project that addresses a wide range of objectives; notably upper river catchment management and strategic landscape enhancement and restoration focusing on heritage and wildlife assets. Whilst the project focuses on landscape enhancement, investment will be directed to ensure activity brings benefit to the local economy through the creation of new jobs

associated with the tourism and recreation sectors and through increasing the attractiveness of the area to businesses wishing to relocate or invest.

The 'Strategic Partnership for the River Ouse and its Tributaries' has already been established by the Environment Agency to progress the aim of improving the environmental assets of the River Ouse and its tributaries, one of which is the Ure. A significant project being taken forward by the Partnership is the 'Enhancement of the River Ouse and Its Tributaries Opportunity Plan', which provides an environmental foundation for economic investment and growth over the next 25 years and beyond, and will transform how the rivers will look, how they are managed and how they are understood and used by people. The plan identifies a portfolio of projects, which itself forms the North Yorkshire Rivers Renaissance Programme. The CUre Landscape Project Area, captures three portfolio project clusters; Middle River Nidd, Lower River Swale, Swale & Ure Confluence & River Laver, and River Swale and River Whiske.

One initiative that has already been taken forward from the Opportunity Plan is the Ripon MOP (Multi Objective Partnership) which has been set up in order to help reduce the risk of flooding in Ripon by slowing down water run-off from the land through land management projects. It will also help prevent soil and nutrient loss and create new habitats to improve biodiversity. The Ripon Mop project area falls mainly within the Nidderdale AONB and covers an area of 140km$_{v.\,1.3}$ to the west of Ripon and the CUre project area. In addition, funding from the Environment Agency has been secured to provide a grant scheme for capital works on the rivers Skell, Laver and Kex Beck and their tributaries.

In addition, the Yorkshire Wildlife Trust has established a Living Landscape Project on the Ure, focusing in particular on the river and its adjacent floodplain. The River Ure Corridor Living Landscape Project was established in recognition that the Ure is one of the few near natural rivers in the region, having changed little over the past 150 years and widely valued for its otter populations. The project will be the focus of wet woodland and grassland restoration, notably through engagement with minerals companies to secure appropriate after-use of extraction sites. Other partnership work in the area is the Swale & Ure Washlands Project which is managed by the Lower Ure Conservation Trust whose pioneering work led to an innovative strategy for minerals after use in the former North Yorkshire Minerals Local Plan.

WHAT WILL WE DO?

The CUre Landscape Project will extend the scope of the 'River Ouse and Its Tributaries Opportunity Plan' portfolio projects that coincide with the project area and the Yorkshire Wildlife Trust River Ure Corridor Living landscape Project.

The project will direct green infrastructure investment into the creation of a major new regional landscape asset. It will focus on existing and proposed sand and gravel extraction sites to create

a series of linked recreational and wildlife assets of city region importance; the Cotswolds Water Park, Lee Valley Regional Park and River Nene Regional Park are examples in England where a focus has bought widespread benefit to biodiversity and local communities. These sites will form the 'pearls on the string', linked together by an enhanced river valley landscape and rural hinterland, extending across the study area to capture sites of significance. In the wider rural landscape particular emphasis will be given to areas that provide a setting to historic sites and where restoration would aid or improve their understanding. Elsewhere, focus will be given to landscape improvements within and fringing Ripon, Boroughbridge and Knaresborough, where an enhanced landscape setting will help to attract people and businesses to the area and also strengthen local property values. Knaresborough and Boroughbridge have been identified as Rural Capitals by Yorkshire forward and the CUre Landscape Project will add value to initiatives being taken forward as part of this programme.

Public access to key sites and the river will be improved, building on the already popular Ripon Rowel Walk, Sustrans and National Byway cycle routes that run through the project area. A large scale recreational landscape asset, perhaps including new sites for quiet water based recreation that is sensitive to the landscape character of the area, will be of particular value to the thousands of residents that live within the project area and in North Yorkshires larger market towns, a number of which are within 10km of the project area. It will also significantly improve the tourism offer, with the potential to attract many more visitors to the area, as well as cater for the needs of the local population, and reduce the need or desire to drive to destinations further afield.

The project also has the potential to test various wetland and habitat restoration techniques and monitor their effectiveness, benefitting the delivery of the Rivers for Life investment programme. By establishing a Wetland Research Outpost (The Wetland Station) linked to the Green Hub supporting project, it will also be possible to build on the work being carried out by the Ripon MOP which largely covers upland landscape by testing various sustainable drainage systems and new techniques and technologies for natural flood water management and habitat creation in a lowland context. Given the important role that waterways play, the Wetland Station will also offer additional space for school groups and other parties to benefit from a programme of learning and skills events. Particular emphasis will be given to interpreting the historic significance and ecological value of the river valleys and the local landscape. A further research/education strand will be focussed on cultural heritage, using the opportunities afforded by mineral extraction to collate a wealth of information on landscape evolution, both for the benefit of the academic community and visitors to/residents of the project area.

THE RIVER URE AT RIPON © G X MEGSON, NORTH YORKSHIRE COUNTY COUNCIL

HOW WILL WE DO IT?

In order to achieve its goals, the project will coordinate post extraction restoration at sand and gravel sites as part of a long term strategy to deliver landscape enhancement across the project area.

Over the next four years, the project will extend current initiatives being led by the Strategic Partnership for the River Ouse and its Tributaries and the Yorkshire Wildlife Trust and build on the earlier initiatives of the Swale and Ure Washlands Project. In the first instance, North Yorkshire County Council and Harrogate Borough Council, as joint lead partners, will liaise with the Wildlife Trust and Ouse Partnership and bring together local partners and other stakeholders to discuss an appropriate way forward.

North Yorkshire County Council and Harrogate Borough Council, as the responsible planning authorities for the area, are best placed to determine which approach would best inform their local development frameworks and guide future development proposals. Any programmes developed as part of the CUre Landscape Project will aim to coordinate the activities of stakeholders, including landowners, to manage positively landscape change through a wide range of funding mechanisms and incentives, including Environmental Stewardship.

WHERE WILL WE DO IT?

The geographic extent of the area of search for the CUre Landscape Project, illustrated on Figure S7, focuses on the river valleys of the Ure and its major tributaries in a lowland agricultural context where past, present and future minerals workings offer potential for project delivery. It captures a significant portion of the Yorkshire Wildlife Trust Ure Living landscape Project, albeit extending beyond the main river valleys to include some of the area's most significant access, cultural and biodiversity assets located in the wider countryside. Further research will be commissioned to identify project areas based on a more in-depth understanding of the conditions that may affect water catchment management and future minerals workings.

LCR ACTIONS

- Development of a project vision
- Joint procurement of research to inform evidence base.
- Prospectus of sites to achieve short, medium and long term projects.
- Pull together wider delivery partners and consultees.
- Identify opportunities to unlock investment and lever funding sources.

DALLOW GILL RUN-OFF PONDS (RIPON MOP), IMAGE COURTESY OF THE ENVIRONMENT AGENCY

LEAD PARTNERS

– North Yorkshire County Council and Harrogate Borough Council.

KEY PARTNERS

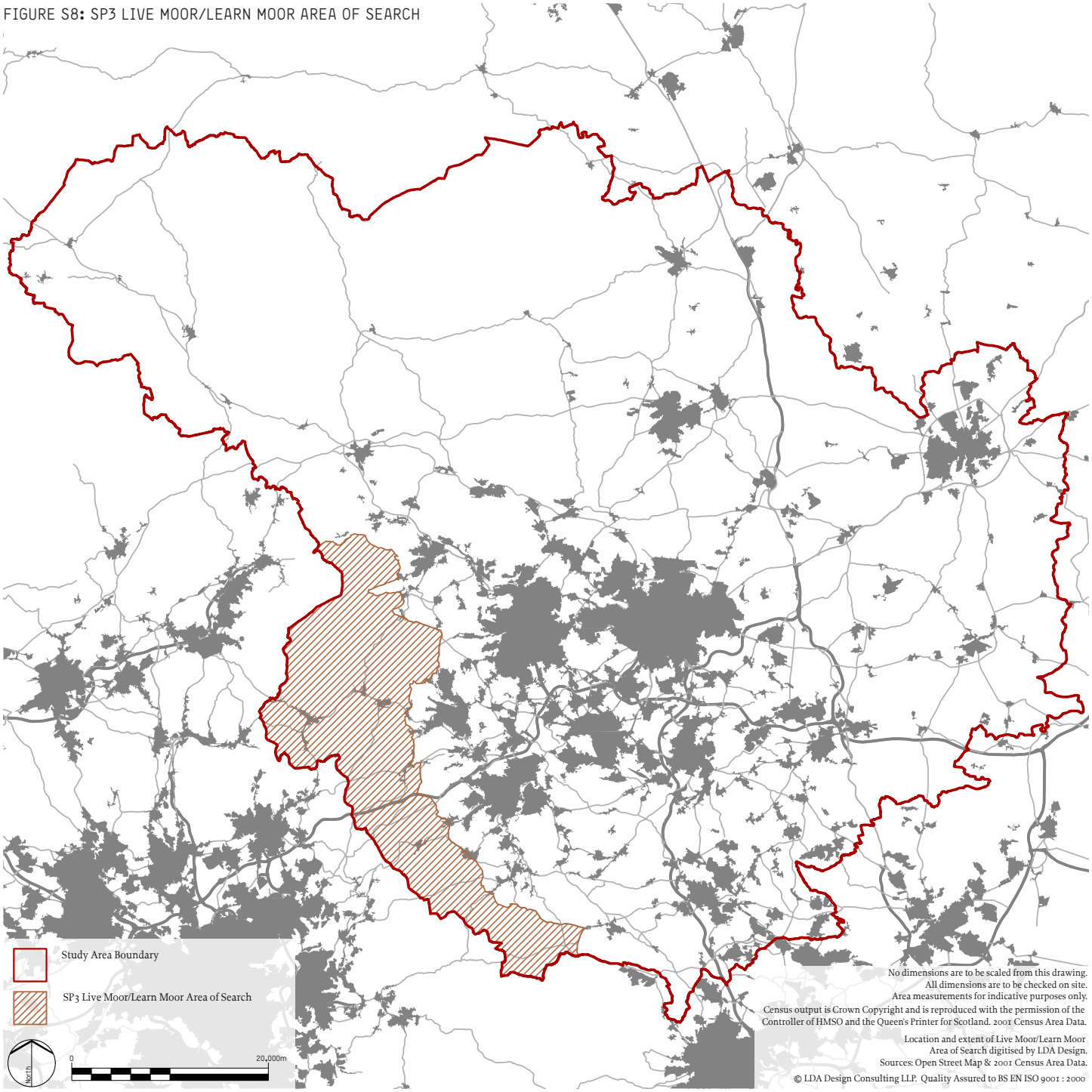
– English Heritage.
– Natural England.
– Environment Agency.
– Forestry Commission.
– Strategic Partnership for the Ouse and its Tributaries.
– Yorkshire Wildlife Trust.

CORE OUTCOMES

The initiative will make a significant contribution to the objectives of promoting health and well-being, promoting economic development, adapting to climate change and improving biodiversity by:

– Co-ordinating landscape enhancement across the project area and enabling the successful extraction and restoration of minerals workings to create a major recreational, wildlife and landscape asset for the city region and beyond.
– Creating new businesses and jobs in the leisure and recreation sector, as well as improving the attractiveness of market towns to inward investment.
– Reducing downstream flood risk through restoring hydrological integrity and flood storage capacity of floodplains and neighbouring agricultural land.
– Providing a national research facility and living laboratory for testing new techniques and technologies for lowland river management and understanding the historic environment of the project area.

FIGURE S8: SP3 LIVE MOOR/LEARN MOOR AREA OF SEARCH



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Area measurements for indicative purposes only.

Location and extent of Live Moor/Learn Moor Area of Search digitised by LDA Design.
Sources: Open Street Map & 2001 Census Area Data.

SP3 - LIVE MOOR/ LEARN MOOR

Refer to Figure S8: Strategic Project 3 Live Moor/ Learn Moor Area of Search

WHAT IS IT?

The South Pennine Moors is an area of upland landscape located between the Yorkshire Dales National Park and Nidderdale AONB in the north and the Peak District National Park in the south. The area defines the western fringes of the Leeds City Region and extends into the neighbouring Manchester City Region. Large areas of upland heath and blanket bog, noted for their remote and expansive character and high biodiversity value are of strategic importance and offer enormous potential to address a wide range of green infrastructure objectives, notably carbon capture and upper river catchment management, which will be of direct benefit to residents and businesses in the adjacent conurbations of West Yorkshire, Manchester and Central/East Lancashire.

In recognition of the significance of the South Pennines in delivering a range of physical, social and cultural services the area has been awarded pilot status by Natural England in order to identify the key services, quantify the public benefits and explore possible future payment mechanisms.

The South Pennine Moors Project is being successfully led by Pennine Prospects (the Southern Pennines Regeneration Company), a not-for-profit company established to deliver the key priorities of the Integrated Management Strategy and Conservation Action Programme (IMSACAP) and Heritage Strategy that had been drawn up for the self declared South Pennines Heritage Area.

Current work includes the Watershed Landscape Project; a suite of projects that will deliver landscape restoration, improvements to access, interpretation and a range of community engagement and training initiatives. The MoorLIFE project is due to begin in April 2010 and will see £2m being spent on peat restoration and associated works which will have benefits in a number of areas, notably in carbon storage, flood risk management, water quality improvements and the enhancement of biodiversity. The project focuses on the Dark Peak and South Pennines Rishworth and Turley Holes Moor. However, the rest of the South Pennines will benefit from similar works funded by High Level Stewardship grants (RDPE Axis 2) under the management of the Yorkshire Peat Partnership (YPP).

WHAT WILL WE DO?

The Live Moor/Learn Moor project will extend the scope of the South Pennine Moors Project by directing green infrastructure investment into a new large scale landscape restoration scheme that offers multiple green infrastructure benefits. Upper river catchment water management and carbon sequestration and storage through re-seeding peat will be a particular focus for the project. Project design will place significant emphasis on restoring unique moorland habitats and enhancing the legibility and interpretation of historic features in the landscape.

The project has the potential to test various restoration techniques and monitor their effectiveness, benefiting the delivery of the Carbon Capture investment programme. We will investigate the possibility of a research outpost linked to the Green Hub Project, offering additional space for school groups and other parties to benefit from a programme of learning and skills events. In addition to being a living laboratory, we will seek to deliver opportunities for all ages and abilities to experience the upland moors such as a network of visitor centres and information points comprising existing and new locations.

Use of public transport will be encouraged, and it may be possible to establish a dedicated Moor Shuttle servicing the main towns of the Leeds City Region. Open access across the project area will be possible, but a dedicated trail will be designed to access key points on the site. This will provide access to all, regardless of age and mobility. Establishing a 'honey-pot' site of this nature will help limit damage to other sites where access is more difficult to control.

HOW WILL WE DO IT?

The geographic extent of the area of search for the Live Moor/Learn Moor Project, illustrated on Figure S8, focuses on uplands of the South Pennine Moors. It captures a significant portion of the moorland habitats designated for their wildlife value and the self declared South Pennines Heritage Area. Further research will be commissioned to identify sub-project areas based on a more in-depth understanding of the conditions that may affect water catchment management and peat restoration. The project will build on and extend current initiatives operating in the South Pennines being led by Pennine Prospects and Yorkshire Peat Partnership. In the first instance, Pennine Prospects will bring together local partners to determine the full scope and potential for the project, identify appropriate sites and develop the business plan.

IMAGE COURTESY OF PENNINE PROSPECTS

LCR ACTIONS

- Joint procurement of research to inform evidence base
- Prospectus of sites to achieve short, medium and long term projects
- Pull together wider delivery partners and consultees
- Identify opportunities to unlock investment and lever funding sources

LEAD PARTNERS

- Pennine Prospects and Yorkshire Peat partnership/Moors for the Future

KEY PARTNERS

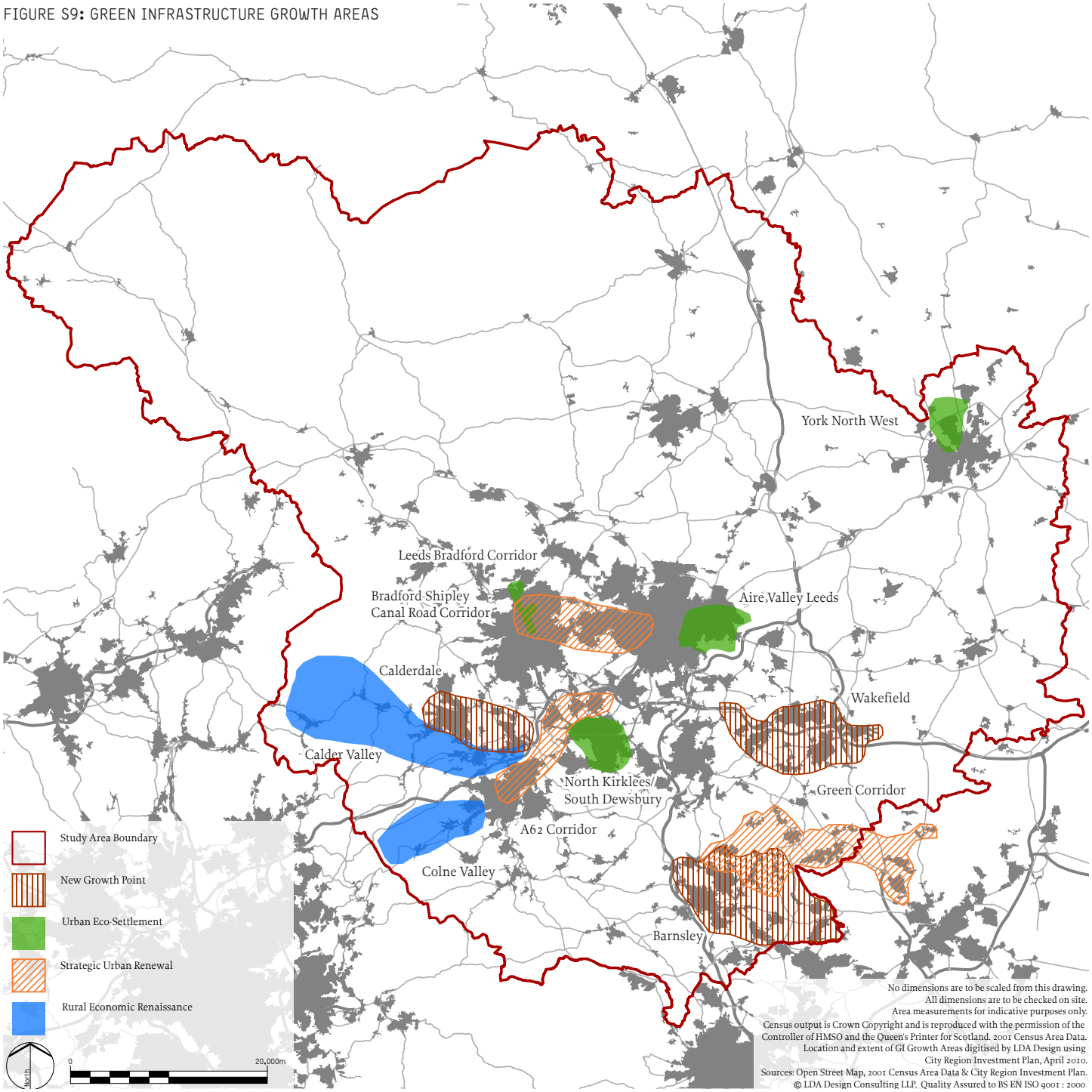
- Environment Agency
- Local academic institutions (notably Leeds University)
- Yorkshire Wildlife Trust
- English Heritage
- Natural England

CORE OUTCOMES

The initiative will make a significant contribution to the objective of mitigating and adapting to climate change by:

- Increasing the carbon storage capacity of large areas of the upland landscape.
- Reducing the frequency and severity of downstream flooding through restoring hydrological integrity through the stabilisation of bare and eroding peat.
- Providing a research facility and living laboratory for testing new techniques and technologies for carbon sequestration and storage on upland peat.
- Raising awareness of the importance of peat moors and the role the landscape has in climate change mitigation and adaptation.

FIGURE S9: GREEN INFRASTRUCTURE GROWTH AREAS



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All dimensions are to be checked on site.
Area measurements for indicative purposes only.

Location and extent of GI Growth Areas digitised by LDA Design using City Region Investment Plan, April 2010.
Sources: Open Street Map, 2001 Census Area Data & City Region Investment Plan.

3.6 GREEN INFRASTRUCTURE GROWTH AREAS

Refer to Figure S9: Green Infrastructure Growth Areas

WHAT ARE THEY?

Green Infrastructure Growth Areas are intended to complement Investment Programmes and Strategic Projects by identifying locations within the city region where an intensity of change is planned (primarily as a result of housing and economic development) and for which there is a timely opportunity for green infrastructure to shape that change through positive masterplanning and development management.

In all the locations chosen, green infrastructure has a significant role to play in shaping the character of the growth plans and all have been identified in the City Region Housing Investment Plan as 'spatial priorities for investment'. As such, these locations will deliver a large proportion of the planned housing and economic growth in the city region over the next 20 years and, although the precise blend of actions will differ on each site to address its opportunities and constraints, all the locations share an objective of raising the quality of green infrastructure. Further, the Investment Plan will become a key source of funding for green infrastructure as it complements growth plans.

WHAT WILL WE DO?

In each location green infrastructure planning will be undertaken to inform the masterplans and other spatial planning policy documents that will be prepared to guide development. This planning will identify the opportunities and constraints for action and play an important part in establishing the visions and objectives for each growth area.

The Green Infrastructure Growth Areas are:

NEW GROWTH POINTS

Barnsley, Wakefield and Calderdale are the three local authorities with Growth Point status in the city region and aim to deliver 20% growth in addition to RSS targets as housing led regeneration is seen as a means of increasing standards of housing and the quality of place. Most of the early deliverables sites have been identified in Barnsley and Wakefield.

The role of green infrastructure will be to strengthen the conditions and the setting in which housing will be developed. This can be a preliminary measure to attract investment as well as long term to increase the quality of life for the local community. It will help to integrate large areas of housing into the landscape setting and provide developments with a structure and legibility that will strengthen their sense of place and their relations to the wider environment. The review of existing green spaces and their functions will enable new green infrastructure assets to address gaps that new developments will create in terms of accessibility and functionality.

Barnsley Growth Point

The majority of the planned growth will take place in the east of the borough within Barnsley Town Centre, Urban Barnsley and the principal towns with investment focusing on housing growth in locations where investments in community, transport and green infrastructure will provide the prerequisite for future housing.

Barnsley is currently developing a local Green Infrastructure Strategy to ensure that Green Infrastructure underpins development taken forward both through the growth point and across the area. The Investment Plan also makes provision for increasing the capacity of key green infrastructure assets in the borough by 2014.

Wakefield Growth Point

In Wakefield Growth Points will support the concept of Urban Renaissance and other regeneration activities. The city of Wakefield and the Five Towns, Castleford and Pontefract in particular, are the areas where growth in housing, jobs and services will be implemented.

Wakefield is currently developing a local Green Infrastructure Strategy to ensure that Green Infrastructure underpins development taken forward both through the growth point and across the area. The Investment Plan also makes provision for increasing the capacity of key green infrastructure assets in the district by 2014.

Calderdale Growth Point

Housing growth in Calderdale will mainly take place close to Halifax with potential development sites including Hipperholme, Copley as well as Elland and Brighouse in the east of the district. Many of the projects that will be taken forward will be located on brownfield sites, some of them with declining industries still in place. The focus is mainly to create sustainable mixed use developments where sustainable housing will be located in close proximity to employment sites that will enable a balanced and sustainable lifestyle for its residents.

The project is at an early stage of its development so a Green Infrastructure Masterplan or equivalent will be timely to help translate these ambitions for green infrastructure into tangible outcomes, funding for which may come from the Investment Plan allocation.

URBAN ECO-SETTLEMENTS

Urban Eco-Settlements are planned as new eco communities within an urban setting in the city region that will create a new residential offer. They will reduce carbon emissions and move towards a low-carbon economy and help develop the region as a Centre of Excellence for eco-design and innovation; improving housing design, delivery, retrofitting and funding.

In respect of green infrastructure, the Urban Eco-Settlements are aiming to:

- Create high quality places for people to live, work and invest
- Maximise accessibility to social infrastructure and the integration of communities
- Support job creation and the creation of a sustainable economy

The landscape setting and on-site natural assets of each settlement will influence the sustainability of buildings, with orientation and shelter planting supporting the eco-friendliness of houses. Green infrastructure will help to coordinate the wider landscape setting and can support the use of local materials and to create a more attractive and sustainable setting for development. Green infrastructure planning in each location will also help co-ordinate the provision and management of new open spaces and other green infrastructure features and the Investment Plan makes provision for developing green infrastructure studies in each location by 2011 and for capital funding of early projects to 2014.

Bradford Shipley Canal Road Corridor Urban Eco-Settlement

This settlement will deliver 5,000 homes, 1,500 retro-fitted homes and create 5,900 jobs. The goal is to create a "series of vibrant and diverse new sustainable settlements ... linking the existing urban and economic centres of Bradford and Shipley". It envisages "the landscape between the settlements will be important, and that is likely to not just include the corridor itself : uses, vegetation, access in parts" and includes ambitions for new walking and cycle routes, new open spaces, enhanced biodiversity and remediation of brownfield land.

Further masterplanning work is expected in 2010 so a Green Infrastructure Masterplan in this location will be timely in shaping the briefs for that work.

North Kirklees/South Dewsbury Urban Eco-Settlement

This settlement will deliver 4,000 homes and 2,000 retro-fitted homes. The eco-settlement will work with the natural landscape by integrating innovative water compatible homes on previously underdeveloped floodplains. There is also the opportunity to focus on water recycling, green roofs and permeable paving and to develop an integrated catchment management approach to dealing with flood risk issues by making space for water and using green infrastructure to incorporate these spaces into the design of the settlement.

Significant green infrastructure investment has already begun in the area, including enhancement of waterways, green walking routes and new parklands and further opportunities such as wetland creation on former landfill sites are being identified. Looking forwards, specific green infrastructure planning will be undertaken for the UES that will maximise the benefits the infrastructure can bring to the settlement.

York North West Urban Eco-Settlement

York Northwest (YNW) will be a significant brownfield area of regeneration within the city of York. Comprising the former British Sugar and York Central sites, YNW is anticipated to deliver 4,300 homes and 5,800 jobs over the next 20 years.

Work to date has built on open space auditing of the area, considering parks and gardens, amenity open space, natural and semi-natural open space and allotments, amongst others. Moving forward, the provision of multifunctional green infrastructure will be integral to the emerging masterplanning for York North West, and will maximise integration and synergies with existing green infrastructure network.

Aire Valley Leeds Urban Eco-Settlement

This largest settlement proposed in the city region will deliver 15,000 new homes, 7,000 retro-fitted homes and 27,000 jobs. The goal is to create a new eco-district connected to Leeds city centre to "showcase ecological living for the ecological age" and to use the new Hunslet Riverside as "trailblazer" site in the city region.

Proposals include the creation of a new park at the centre and the reinvention of urban living with family-oriented residential offer. The park will complement the existing offer and there are proposals to link this part of the city centre with proposals for the edge of the city, with permeability, travel and links seen as important features of the proposals (the scheme will promote sustainable transport links with the Trans Pennine Trail for example).

A Green Travel Plan is planned for the development – pedestrian and cycle routes (tow path) will play an important role with green infrastructure providing the opportunity to embed them and raise the quality. Other issues that effective green infrastructure planning will address are resolving contamination and land remediation issues; managing the relationship of the scheme with adjacent industrial uses that have an adverse impact on the site; and connecting the scheme to neighbouring communities.

An Area Action Plan has been prepared for the settlement, so many of the most important decisions affecting the planning and delivery of green infrastructure have already been made. However, a Green Infrastructure Masterplan will enable the proposals to be further tested and related to the green infrastructure proposals made in this strategy.

STRATEGIC URBAN RENEWAL AREAS

The following three growth areas fall within the City Region Housing Investment Plan's theme of 'strategic urban renewal'. The focus of this theme is "to facilitate cross-boundary collaboration to accelerate the regeneration ... across the city region". The Plan recognises the importance of aligning investment in transport, worklessness, skills and green infrastructure to stimulate economic development, improve connectivity and enhance the environment.

Leeds Bradford Corridor

The Leeds Bradford Corridor covers a nine-mile area joining Bradford and Leeds city centres. The project aims to revitalise the neighbourhoods, employment opportunities, environment and transport links in the corridor, connecting people living there to the growing economies in the two cities.

The Corridor's objectives include "improving the appearance of the area and the quality of life in neighbourhoods and gateways" and "enhancing the value of green space, making it easier for people to use".

The projects within its programme include a series of redevelopment sites delivering many hundreds of new and refurbished homes. Each site will offer the opportunity to invest in improving the quality of the local environment and accessibility to complement other regeneration initiatives. A Green Infrastructure Masterplan in this corridor will enable these proposals to be co-ordinated and phased alongside the renewal works and the Investment Plan makes provision for masterplanning work by 2011 and for improvements to the West Leeds Country Park, the Airedale Greenway project and local neighbourhoods in East Bradford for example.

The Green Corridor (Barnsley and Wakefield)

The Green Corridor is a joint cross boundary initiative between the local authorities of Wakefield, Barnsley and Doncaster, in the area around the East Coast rail line. The area shares a coalfield heritage in a green and rural environment and although it is a rural area, it has many of the challenges associated with urban areas: high levels of deprivation, poor quality housing and environments and an underperforming economy

A strategic framework and spatial plan was developed by the cross boundary partnership in 2005 and this has provided the broad principles to regenerate the area. Although it is housing led regeneration project, the partnership has sought to influence wider local and regional partnerships to deliver the overall agenda. The strategy is currently being reviewed and an action plan is being developed for the completion of the 10 year programme.

Environmental improvements have been integral to the initiative. This has been both in areas that have been improved or remodelled and in clearance areas where new housing is being developed. New housing is being provided in the Barnsley and Wakefield areas of the Green Corridor with the Barnsley part being included in Barnsley's Growth Point.

A green infrastructure master plan in this area, together with master planning in the growth points and the green infrastructure strategies being produced by Barnsley and Wakefield will provide a coherent plan to coordinate and promote future environmental improvements. Proposals for investment in green infrastructure as part of this action plan are included in the Investment Plan.

Kirklees A62 Corridor

This project is planning a series of interventions aimed at exploiting the geographical position of North Kirklees to create a new residential and economic development proposition in the city region. It includes the settlements of Batley, Birstall, Birkenshaw, Dewsbury, and Mirfield as key areas of growth.

Other areas of development include Huddersfield Gateway and the Leeds Road corridor, including the Kirklees Strategic Employment Zone, where more than 90 ha of brownfield land will become available for a variety of development in the next ten years. Proposals are accommodating economic growth while at the same time addressing the visual amenity of the area as well as transport issues and the environmental quality (including land reclamation, transport gateway enhancements, walking/cycling routes).

Masterplanning of various sites in the corridor will be commissioned shortly, funded by the Investment Plan. There is therefore a timely opportunity for a Green Infrastructure Masterplan to shape the briefs for those subsequent masterplans and emphasise from the outset the green infrastructure opportunities.

Rural Economic Renaissance Areas

The Investment Plan also contains a further spatial priority for investment with the intention of "supporting rural economic renaissance". Here, the aim is to boost the principal towns as economic drivers by "building on assets and opportunities, including green infrastructure".

Colne and Calder Valleys

There is limited scope for development due to the geography and rural nature of valleys so the focus of this project is on making better use of the existing urban fabric and housing stock. Its area includes Todmorden, Hebden Bridge and Sowerby Bridge, Marsden and Slaithwaite.

A key component of the project will be capitalising on outstanding landscape, town centres and waterways in the area. Green spaces are being restructured into individual amenity spaces and community gardens for the production of food and community space. A Green Infrastructure Masterplan or equivalent will enable these aims to be translated into a phased programme of actions alongside the other renaissance interventions.

HOW WE WILL DO IT?

The four Urban Eco-Settlements in particular are intended to make a step change in the way that low carbon settlements are planned and delivered in the city region in future. This challenge is to be met by integrating green infrastructure into the visioning of major new development schemes, requiring a thorough understanding of the way in which the multi-functional benefits of green infrastructure can facilitate and add value to the development.

Each Growth Area is currently at a different stage in the planning process. For some, the process of promoting development is well advanced, masterplanning has been undertaken and proposals have been submitted to secure significant public funding (e.g. Aire Valley Leeds UES). In most other cases, either the precise locations of housing growth have not yet been determined or masterplanning is at a relatively early stage.

Some will also include all or parts of the strategic projects and/or investment programmes set out in this strategy. Identifying these initiatives in the Growth Areas in greater detail at the local level will enable the local planning authorities to ensure they are given proper consideration in future development proposals.

Green infrastructure planning will therefore be undertaken for each Growth Area to influence the design process by:

- establishing aims and objectives for how green infrastructure should form part of the future development proposition;
- locating and describing all known existing green infrastructure features on site(s), including proposals for strategic green infrastructure projects and programmes contained in this strategy;
- identifying green infrastructure features within the site (s) and their context, using the district green infrastructure strategy where available;
- explaining how green infrastructure assets should relate to other infrastructures, e.g. SUDS and renewable energy;
- proposing and locating key green infrastructure functions on site or offsite, using the opportunity to co-ordinate actions across a range of sites to ensure all sites benefit;
- identifying areas of green infrastructure which should be created or enhanced and areas which may be lost and why; and
- set out the criteria of protection that may be afforded to each typology of green infrastructure

The same general green infrastructure planning principles will also apply in those more remote locations in the city region where the absolute scale of growth planned is smaller but the local impact will still be significant and green infrastructure offers the opportunity to manage those impacts (e.g. the urban extensions at Skipton, Harrogate and Selby).

LCR ACTIONS

- Facilitating joint working across LCR local authorities in the planning and design of Growth Areas

KEY DELIVERY PARTNERS

- Leeds City Region local authorities and partnerships.
- HCA.
- Developers and landowners.

CORE OUTCOMES

The initiative will make a significant contribution to the objective of promoting sustainable growth and economic development in the city region by:

- Raising the awareness of developers, landowners and investors of the opportunities for development and of the potential of green infrastructure to shape development proposals.
- Creating new publically accessible open spaces and recreational facilities and improving the quality and functionality of existing assets.
- Creating opportunities to contribute to local biodiversity gain.
- Reducing flood risk.
- Promoting walking and cycling as a preferable mode of transport.

IMAGE COURTESY OF PENNINE PROSPECTS

3.7 SUPPORTING PROJECTS

The strategy has identified a series of additional investment opportunities that, although not physical green infrastructure actions in their own right, will make a significant contribution to its vision and meeting its objectives. The three supporting projects each have a distinctive role to play in maximising the economic, social and environmental value of investments in the city region.

GREEN HUB

WHAT IS IT?

Successful city region economies in the future will have exploited the demand for green infrastructure solutions to shape business innovation, technology development and skills growth. The Regional Economic Strategy[61] recognises that the city region has some potential comparative strengths in its planned scale of development and in its academic sector to realise this potential sooner than its competitor economies.

There are a number of academic institutions in the city region with specialisms in green technology development and commercialisation. They include the University of Leeds, Science City York, Leeds Metropolitan University, the University of Bradford/Bradford College and Barnsley College of Sustainable Construction. In addition, CO_2Sense Yorkshire delivers a green business support organisation (GBSO) which provides support and networking opportunities for consultants and services providers across the region.

However, translating this expertise and potential into real competitive advantage presents a challenge. Securing an edge in this field will require a more effective commercialisation of the research and development in this area, which in turn, will require a more effective connection network between the universities with the expertise in this area, and the businesses developing solutions to market demand in this area.

WHAT WILL WE DO?

It is proposed to formalise and expand the existing network of leading city region universities to include businesses and to create a Leeds City Region Green Hub with the aim of identifying specific opportunities arising out of this strategy to further the commercialisation of research and development in this field.

The Hub will begin by regularly bringing together all those in the city region green technology sector – entrepreneurs, academics, professionals, service providers – to understand the implications of increasing green infrastructure actions in the city region. Such actions may include bio-remediation, urban street tree planting, green building technologies, biomass/woodfuel production and sustainable drainage systems.

All these actions may require supply chain development in the city region and the provision of specialist skills if the city region is to benefit directly from this investment. The Green Hub will also seek to work closely with landowners and developers to provide effective green infrastructure technology solutions on problematic brownfield sites for example.

As the network develops, it may benefit from creating new green technology facilities to provide specialist accommodation for green business incubation, technology transfer and skills development and to provide a home of the network and knowledge base. This accommodation may either be in a single location in the city region or aligned with existing facilities at institutions across the city region. The network may also want to identify specific green infrastructure projects to develop green technology research.

HOW WILL WE DO IT?

The project requires the preparation of an action plan, which will be developed by the University of Leeds on behalf of the network of partner institutions, under the guidance of the city region's Economic Drivers & Innovation Panel in 2010. The action plan will be included in the wider Leeds City Region Innovation Prospectus to be published in 2010 and will set out the detailed objectives of the new network and its modus operandi.

The project requires further exploration as to the potential for this activity, which will be overseen by the city region's Economic Drivers & Innovation Panel. Should the Green Hub be taken forward, an action plan will be prepared and facilitated through the panel's innovation workstream, in collaboration with partner institutions and authorities.

KEY DELIVERY PARTNERS

The University of Leeds will lead the development of this programme, in partnership with:

- The Leeds City Region local authorities.
- CO2Sense Yorkshire.
- Science City York.
- Leeds Metropolitan University.
- Bradford University.
- Barnsley College of Sustainable Construction and Centre for Renewable Energy.

CORE OUTCOMES

The initiative will make a significant contribution to the objective of promoting sustainable growth and economic development in the city region by:

- Facilitating the commercialisation of green technology research to create new businesses and jobs.
- Meeting the increasing demand for green infrastructure skills in the city region through effective skills programmes.
- Supporting the start-up and growth of new local green technology businesses and organisations to win future green infrastructure project contracts.

LEEDS CITY REGION ECO-SKILLS AUDIT

WHAT IS IT?

There is national recognition of a decline in the numbers of people entering professions necessary to deliver the initiatives in this Strategy, such as horticulture, land design, land remediation, forestry and green infrastructure management[62]. Further investment in a broad range of green sector skills, such as green building technologies and low carbon energy is also becoming a significant national priority[63].

WHAT WILL WE DO?

The potential for a new Eco-Skills Programme will be investigated as part of the ongoing development of the City Region's Employment and Skills Plan, which will seek to ensure that skills provision meets demand. Scoping work will evaluate skills provision in the green technology sector in the city region to identify where there are likely to be skills shortages in areas such as landscape design and sustainable construction and consider whether a city region coordinated approach to such skills provision could offer added value and benefits.

This initiative will complement the Green Hub initiative, which will focus on aligning agencies in the green technology sector in the city region to meet the demand for new skills generated by increasing green infrastructure action in the city region.

HOW WILL WE DO IT?

Initial scoping work for the potential of an Eco-Skills programme will be undertaken as part of the development of the City Region Employment & Skills Plan[64], which will articulate skills needs for this sector amongst others in the city region. Initially, the city region will also work with the Yorkshire Cities policy network on a forthcoming research project that will identify the current strength of the low carbon economy and the numbers of jobs in 'green' industries and occupations, as well as assessing skills requirements up to 2020.

KEY DELIVERY PARTNERS

The Leeds City Region Employment & Skills Board will lead this project, working with:

– CABE.

– HCA Skills & Knowledge.

CORE OUTCOMES

The initiative will make a significant contribution to the objective of promoting sustainable growth and economic development in the city region by meeting the increasing demand for green infrastructure skills in the city region through effective skills programmes.

WATER CYCLE STUDY (WCS)

WHAT IS IT?

This study will consider the entire water cycle – supply, quality, wastewater and flooding, in light of the significant growth planned for the city region. Its objective will be to identify where sustainable water infrastructure is required in order to protect this important asset.

The Green Infrastructure Strategy has been developed to capitalise on the opportunities that green infrastructure can bring to improving our watercourses, both in terms of water quality and biodiversity gain. The WCS will build on the proposals in this strategy to maximise the benefits of green infrastructure to this agenda.

WHAT WILL WE DO?

Using the Environment Agency's guidance on water cycle studies, we will seek to find innovative and sustainable ways to protect our water courses[65]. Wherever possible, we will look to use multi-functional green infrastructure solutions to mitigate against any potential pressure points rather than single use grey infrastructure interventions.

HOW WILL WE DO IT?

The Leeds City Region, together with other regional partners, is currently undertaking a high level water cycle scoping study that will identify key pressure areas that require more detailed attention. Subsequent studies and strategies will commence in 2010 on completion of this regional study.

KEY DELIVERY PARTNERS

- The Leeds City Region local authorities.
- Environment Agency.

SUMMARY OF STRATEGIC INITIATIVES

STRATEGIC INITIATIVE	LOCAL AUTHORITY(S)	KEY PARTNERS
IP1 Urban Green Adaptation	All LCR LAs	Acad, NE, FC, YWT, EA, CABE
IP2 Greening our Economic Potential	All LCR LAs	GHY, Met, NE, HA, NR
IP3 Carbon Capture	All LCR Las	FC, PP, YPP, Acad
IP4 Woodfuel	All LCR Las	FC, CO2, WRF, YR, SYF
IP5 Rivers for Life	All LCR Las	FC, EA, NE, WRF, YWT, RSPB
SP1 Fresh Aire	Br, C, Cr, K, L, W, S, NY	NE, FC, EA, BW, YWT
SP2 CUre Landscape Project	NY, H	EH, NE, EA, FC, OP, YWT
SP3 Live Moor/Learn Moor	Cr, Br, C, K, Ba, NY	PP, YPP, MF, EA, Acad, YWT, EH, NE
Barnsley GP	Ba	HCA, Dev
Wakefield GP	W	HCA, Dev
Calderdale GP	C	HCA, Dev
Bradford Shipley Canal UES	Br	HCA, Dev
North Kirklees/South Dewsbury UES	K	HCA, Dev
York North West UES	Y	HCA, Dev
Aire Valley Leeds UES	L	HCA, Dev
Leeds-Bradford Corridor SURA	L, Br	HCA, Dev
Green Corridor SURA	Ba, W	HCA, Dev
Kirklees A62 Corridor SURA	K	HCA, Dev
Colne & Calder Valleys RERA	C, K	HCA, Dev
Green Hub	All LCR LAs	LU, CO2, SCY, LMU, BU, BC
LCR Eco-Skills Audit	All LCR LAs	ESB,CABE, HCA
Water Cycle Study	All LCR LAs	EA

START	NATURAL ENGLAND REGIONAL GREEN INFRASTRUCTURE CORRIDORS AND GREEN INFRASTRUCTURE AREAS
2014	
2014	
2011	
2010	
2014	
2014	R1 – Aire, R2 – Calder, Southern Pennine Uplands
2010	R16 – Ure, R8 – Nidd, Nidderdale AONB
2013	R1 – Aire, R2 – Calder, R6 – Don, South Pennine Uplands, Peak District National Park
2011	R4 - Dearne
2011	R1 – Aire, R2 – Calder
2011	R2 - Calder
2011	R1 - Aire
2011	R2 - Calder
2011	R9 - Ouse
2011	R1 - Aire
2011	R1 - Aire
2011	R4 - Dearne
2011	R2 - Calder
2011	R2 – Calder, South Pennine Uplands
2010	
2011	
2010	

ROUNDHAY URBAN FRINGE, LEEDS, IMAGE COURTESY OF MELANIE TAYLOR, LEEDS CITY REGION

KEY TO TABLE:

LCR LOCAL AUTHORITIES:

Ba - Barnsley
Br - Bradford
C - Calderdale
Cr - Craven
H - Harrogate
K - Kirklees
L - Leeds
S - Selby
W - Wakefield
Y - York
NY – North Yorkshire

KEY PARTNERS:

Acad - Academic institutions
BC – Barnsley College of Sustainable Construction and Centre for Renewable Energy
BU – Bradford University
BW – British Waterways
CABE - Commission for the Built Environment
CO2 – CO2Sense Yorkshire
Dev - Developers/landowners
EA - Environment Agency
EH – English Heritage
ESB – Leeds City Region Employment and Skills Board
FC - Forestry Commission
GHY - Groundwork Yorkshire & the Humber
HA – Highways Agency
HCA - Homes & Communities Agency
LCR – Leeds City Region
LMU – Leeds Metropolitan University
LU - Leeds University
Met – Metro
MF – Moors for the Future
NE - Natural England
NR – Network Rail
OP – Strategic Partnership for the Ouse and its Tributaries
PP – Pennine Prospects
PTE - Passenger Transport Executives
SCY – Science City York
SYF - South Yorkshire Forests
WRF - White Rose Forest partnership
YPP - Yorkshire Peat Partnership
Yr - Yorwoods
YWT - Yorkshire Wildlife Trust