



A new
**Northern
Forest**



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Panta Rhei - everything flows

Let's plant a thought. We live in a time when it seems as if almost anything could happen. Technology, ecosystems, politics, economies, our everyday habits; change is ubiquitous. Some change is positive, some less so. Mutability is something we are learning to live and work with.

Life is flux, as Heraclitus famously put it.

The Northern Forest covers an area of 13 million people and 7.6% woodland cover - well below Europe's average. Our plan to plant 50 million trees will transform this landscape to make it more resilient, beautiful and prosperous.

It is at times of shift and turbulence that the boldest of thinking and action is needed. If your desire is to help shape a stronger and more resilient future as the jet stream of history propels us all forward, then the challenge is to think across the horizon and to connect causes, effects and powerful solutions.

That's where the Northern Forest has emerged from, as an urgent idea of our time, addressing the challenges of today and tomorrow, deploying a natural solution that's much, much older than we are but that has the most contemporary relevance.

We want to plant 50 million trees, across a generation and across the North of England. We know where they can go and how it can be achieved. If trees are planted in the right place, we know that we can: reduce the risk of flooding for up to 190,000 people; create thousands of new jobs; store thousands of tonnes

of carbon; and of course, make the citizens of our great Northern cities and regions happier, and healthier.

Our rise is unstoppable, our logic is fierce. Across the pages that follow we set out our prospectus. We start with a clear case for a major economic uplift from increased property values and regional attractiveness. We then move through reduced carbon emissions, greater ecological resilience - including from flooding - the need for more timber and timber planting, benefits for health and air quality, and the biodiversity boost to be expected. And finally we turn to the practicalities of getting 50 million trees into the ground.

Inspired by the work of our community forests across England and the Tree Charter, our partnership is driven by the desire to make sure that our children, and their children, enjoy a better and more equitable natural environment than we inherited from

our forebears. We want to see habitats thrive, planting rates soar, a woodland culture flourish and our ancient woodlands better protected.

Ours is a demand, a promise and a proposition; for a rich and silvan future. The impact will be on the streets of our cities, around new developments and old, across key areas of our uplands, and along our riversides. This will happen in our gardens and across our neighbourhoods.

The Northern Forest is an idea that fits this moment in time perfectly. As a recent parliamentary enquiry¹ rightly pointed out, planting rates have virtually stalled in this country, even as we struggle to try and raise our levels of woodland cover to a fraction of those enjoyed elsewhere.

forward to an uncertain supply. Local communities don't have the access to green space that can be so transformative. The song bird has nowhere to land.

The government's own figures put our existing woodland resource as being worth £1.8 billion⁴ to us in terms of social, environmental and economic benefits. The estimate is that for every 250,000 of new hectares planted, £500 million of social benefits are generated each and every year.⁵

And then there are the benefits you can't put a price on. A woodland walk with someone you love. A child climbing up their first tree. A riot of autumn colour that reminds you, yet again, how much you like the season after summer.



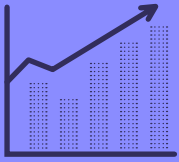
Across England, only 10% of our land area is covered by woodland.² In Scotland that stands at 18%, and in France, Germany and Spain it is 31%, 33% and 37% respectively.³ England's woodland cover is only just over a quarter of that enjoyed, on average, across the rest of Europe. Our planting level for new trees in the year 2015-16 stood at just 700 hectares; some argue that if you look at the amount of trees being removed in cities like Sheffield for example, we are in truth seeing a net decline in our woodland cover at the moment, while policy and common sense alike says we should be headed in the opposite direction.

This means the benefits that accrue from trees are simply slipping away from us. When the hard rains fall, they land on even harder surfaces and run off swiftly to create flood risks downstream. When the heat rises through climate change, we don't have the shade or the evaporative power of leaves to keep us cool. Our dirty air is unfiltered. Our timber mills look

Our Northern Forest is a plan to plant 50 million trees in and around our great cities of Liverpool, Manchester, Leeds, Sheffield and Hull. It is an area of 13 million people and has woodland cover even lower than the paltry England average at just 7.6%. There are 650,000⁶ new homes planned, £75 billion⁷ of infrastructure in the pipeline and there are new powers being exercised due to changes in planning powers across the region.

We have a plan to transform this landscape to make it more resilient, even more beautiful and more prosperous too. There is an evidence base, a strong partnership and a vision we can follow. For people, nature and for the economy, we will plant 50 million trees and hope for a future we can all be proud of.

Join us.



As beauty meets prosperity

Setting the scene for growth

There are two ways in which trees and woodlands impact on our economy. One is through the direct services they deliver: cleaning and cooling the air, slowing the flow of floodwaters, and producing food or timber. The second way is perhaps even more powerful; it's the way they transform how we feel about ourselves and the places where we live.

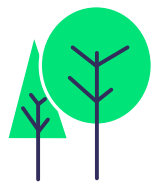
This is a true story. A few years back there was a roundtable discussion for a leading business magazine featuring property agents in one of our great Northern cities. A senior director from a major property agent shared a tale of one successful deal they had managed to swing. They had been commissioned by a firm looking to relocate thousands of jobs out of London and were prospecting Grade A office space across a selection of cities in the North and the Midlands.

While the Managing Director of this firm was being shown some of the best floor plates on offer in this particular city, the MD's partner, who had come along on the trip, was being shown green spaces — in this case National Trust estates circling the city. When it came to the crunch, the MD had a favourable impression of the city but not enough to tip the decision in

its favour; the MD's partner however had their mind made up, and it was the quality of the city's environmental assets that made all the difference. The deal was done.

Our environment, and trees in particular, has a dramatic and positive impact on our economy.¹ Trees create attractive environments for business investment and development, they bolster our urban and rural identities, they have a direct influence on property values and of course, they create the spaces and places that we all want to visit, relocate to or work in.

The fact is that if we want to see greater prosperity across the North, it has to be green. We need to plant trees and protect those we already have. Trees set the scene for growth, and the symbolism of this contribution is worth exploring.



**For the North
to prosper
we need to
plant trees
and look after
those we
already have.**

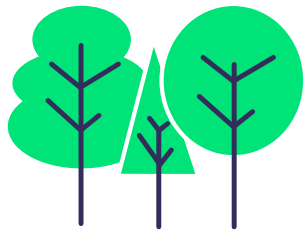
Adding value, with trees

For major development schemes, increasingly enlightened developers are recognising that green space and better public spaces and amenities are critical in ensuring that their projects are successful and fully let. Trees are a fundamental part of landscape design and any signature scheme that does not include significant levels of planting should meet public expectation and responsible development practices.

Then there's what's been called 'The Airport Road' experience for international visitors and investors, recognised by many international marketing experts as being as critical as hotel service standards or city cleanliness in 'sealing' a deal. For too many cities, this is a scrappy inauguration for visitors. Along lineal transport gateways whether they be road, rail or cycleway, we should be planting more trees, particularly as evidence shows that commuters' quality of life is enhanced too, by tree-lined routes.²

Total aesthetic value of the UK's woodlands is around

£2bn



Including other woodland services it goes up to

£270bn

And for house prices and housing market renewal, trees are critical too. Right across the world the evidence shows that being adjacent to woodland and having street trees as part of a development can and does enhance the attractiveness and value of properties. Closely associated with an uplift in monetary value are the values held by communities themselves. If our aesthetic experience is enhanced we are more likely to feel a stronger bond of community, and a stronger identification with place and others that we share it with.

The numbers back this proposition up. In a recent issue of the international journal Urban Forestry & Urban Greening³, two researchers looked at the impact street trees had on property values in Portland, Oregon. For rental values they found that having a tree on the rental plot itself saw monthly rent increase by \$5.62; if there was a tree in the street outside, rent went up by \$21. A modest contribution but when they looked at overall property value, they found that a street tree boosted overall property value by \$7,000 (around £5,300 at time of producing this document). Another Portland-based study put the contribution even higher and estimated that a home's value could be boosted by over \$22,000 if it was located on a tree-lined avenue.⁴

Closer to home, the Forestry Commission in England asked the District Valuer for the North West to study their investments in green infrastructure and increase in property values, following a multi-million pound programme to turn brownfield sites into thriving community woodlands.

At Bold Moss in St Helens, a former colliery site, the study⁵ looked at derelict industrial land that had been transformed into a community woodland and nearly

600 new homes built. The District Valuer found property values in the surrounding area had risen by £15m as a direct result, and new developments worth £75m had been attracted — a significant return on investment. Another study based in North West England showed that a view of a natural landscape added up to 18% to a property's value, and that homebuyers would be willing to pay £7,680 per household for views of broadleaved woods.⁶

The evidence is strong, too, for the attractiveness of business locations that boast decent green space.⁷ One example, cited in a report by Groundwork UK, is Riverside Park Industrial Estate in Middlesbrough, where extensive planting of trees helped to attract new, high profile, occupants. The green space

improvements increased occupancy from 40% to 78%; levered in more than £1m of private investment; and attracted 28 new businesses and more than 60 new jobs.⁸ Another study, for Groundwork, showed landscaping improvements in Portland Basin, Tameside and Winsford, Cheshire yielded respectively over 16% and 13% of net growth in employment.⁹

After the trees have boosted job numbers, the evidence is that commuters would like to see them on their way to work too. A Forestry Commission report from 2003 showed that green commuting routes are preferred and that the willingness to pay for woodland views on journeys to and from home could be estimated at £226.56 per annum per household (2003 prices).¹⁰

Mab Lane Community Woodland



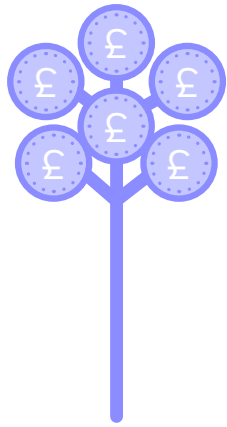
West Derby, like many areas with a similar profile, suffered from a lack of quality green space. What it did have however, was a 25 hectare area that had become misused and mistreated. In 2008 The Mersey Forest, with support from other partners, secured the funds to transform two large and disused playing areas into a usable green space. Community consultation days were held to help decide what to do with the area and hundreds of local residents volunteered and helped to plant over 20,000 beautiful trees. New pathways for cyclists and walkers were put in, designated areas for family picnics were set up and timber structures were designed by children from local schools. The woodland, opened in 2010, is now being used by local residents and primary and secondary schools for sports and outdoor lessons. House prices are on the rise and local businesses are more likely to move to or stay in the area. As a result of this project West Derby is becoming a more desirable place to live and work.

Location: Stockbridge Village, Liverpool

Partners: Liverpool City Council, Forestry Commission, Riverside, and The Mersey Forest

Whilst a UK worker generates

£1



German workers generate

£1.35

Money grows on trees

The UK has a problem with productivity. For every £1 generated by a worker here in the UK for example, German workers make £1.35. The so-called UK productivity gap has been growing since the early 'noughties' and is now a significant cause for concern, particularly as Brexit looms large on the horizon.¹¹

Now the evidence is emerging that alongside better working conditions and general wellbeing, getting the environment right for business can make a difference, too. One report commissioned by Glasgow City Council showed that as well as attracting more talent, businesses located next to newly regenerated green space showed better staff retention and morale, specifically due to the ameliorated environment.¹²

If workers can see a natural environment from their workspace, studies show that they report fewer ailments and greater job satisfaction. And even bringing the green indoors with office plants helps to speed up the completion of work and reduce stress levels.^{13 14}

A greener setting can impact on clients and customers, too. One study of central business districts in the United States set out to test the idea of a 'retail urban forest' and showed study participants two 'Main Street' scenarios, one with a dense urban canopy and one denuded of trees. Led by researcher Kathleen Wolfe, the study team conducted a national survey asking people which street would be likely to get their custom; the results showed that the presence of trees made people feel the place had a more positive atmosphere, was a more comfortable place to be, and that they'd be more likely to visit, spend more, stay longer and even be willing to pay

a higher price for parking. Across every factor, the 'no trees' version of the street scored less well.¹⁵

An earlier study by the same team also saw trees help to form more positive consumer experiences in central business districts, in this case increasing willingness to visit and pay a higher price for goods by around 11%.¹⁶

Invest now, avoid disappointment

You could rightly argue that it's hard, if not impossible, to put a price on beauty.¹⁷ That said, if you're asking developers, cities and investors to plough more cash into planting trees, it would be reasonable to at least give them an informed estimate of the value of that investment.

According to a recent Woodland Trust report on the economic contribution of woodlands, the total aesthetic value of the UK's woodlands, in economic terms, is around £2bn. If you add in the other services that those woodlands deliver, from water management to food or timber, their value comes in much higher at around £270bn.¹⁸ That's existing woodland. We could generate an even greater return if we plant and protect.

With 650,000¹⁹ new homes planned across the Northern Forest area in the next 20 years, the time is now to ensure that a strategic plan is agreed for a significant increase in woodland cover, including street trees. If the studies into property values are factored against this figure, with each home potentially worth around £5,000 more if it has street trees or a woodland view, that's more than £3.2bn potential uplift in real value to our housing stock across the cities and regions of the North.

Each home could be worth around **£5,000 more** if it had street trees or a woodland view.





Breathe, you've gone green.

More trees mean better health. Trees can clean the air, cool the temperature, quieten the noise and lighten your mood. Planting more trees means investing in our future health and cutting the future costs of health care too; it's also a strategy that benefits the most vulnerable in society.

As you read this, pause for breath. The average human being will inhale 250 million litres of air during their lifetime, making clean air, alongside clean water and healthy food, an absolutely fundamental part of any healthy society.

First let's start with the positives – in the UK, a recent study commissioned by the Office for National Statistics (ONS) found that in 2015, it is estimated there were 5,800 fewer respiratory hospital admissions, 1,300 fewer cardiovascular hospital admissions, 27,000 fewer life years lost and 1,900 fewer premature deaths as a result of pollution removal by plants. This resulted in an estimated saving of over £1 billion of avoided health costs in 2015 alone.¹

Across the world however, we are moving rapidly in the wrong direction. There is mounting alarm that the quality of our air is failing and that as a result, lives are being cut short. Local neighbourhoods, particularly in poorer areas, are feeling the brunt of a very contemporary 'silent spring'.

According to a new report from the Royal College of Physicians (RCP)², every year around 40,000 deaths can be attributed to outdoor air

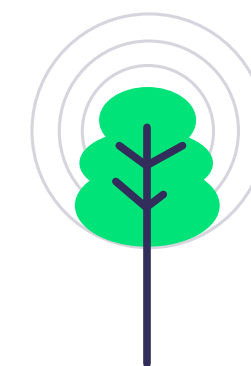
pollution. Once you add indoor air pollution the toll climbs higher still. In their report, entitled 'Every Breath You Take', the RCP states that air pollution is now an urgent cause for concern on public health and has been linked to cancer, asthma, stroke and heart disease, diabetes, obesity, and even to dementia.

And here's the real wake up call in the report. Even though we're 'breaching' air quality limits set by the EU across a number of UK cities, that really isn't that meaningful a calculation. The fact is there is no safe limit, at all, for these pollutants. The conclusion drawn by the RCP and others is that what we really need is urgent action, and a new Clean Air Act, to halt the inexorable rise of air pollution that is costing lives and weighing in on hard stretched NHS resources.

In cities like Manchester, Liverpool, Sheffield, Hull and Leeds, airborne pollution comes largely from traffic and more specifically diesel engines. This pollution affects you throughout your life but is particularly dangerous for babies in the womb and toddlers, as their growing heart, brain, hormone systems and immunity can all be harmed.

Large healthy trees

have the greatest per tree effects at pollution removal



Trees can cut outdoor and indoor air pollution **by 50%**



Older people, and adults with long-term health conditions, are also vulnerable.

Fairness is a factor. Pollution hits hardest those who live in deprived areas – which often have higher levels of air pollution.³ It impacts those who live, learn or work near busy roads and those who, ironically, are least likely to own a car. Poor quality housing, lack of access to green space, lifestyle factors such as smoking, the stress of being on a low income and compounding conditions like being overweight or obese all amplify the risk.

All this comes at a cost. According to the RCP, costs from exposure to air pollution add up to more than £20 billion every year for business, insurance, social services and most critically of course, the NHS.

Planting more trees and protecting those that we already have in our Northern towns and cities is a key part of the solution. It's also considerably cheaper as a strategy than waiting until ill health hits and seeing the impact in our hospitals and health centres; the NHS is stretched enough already.

Particulate Matter (PM) is the microscopic particles that become trapped in the lungs of people breathing polluted air. It comes from a range of sources, but in our urban areas road traffic is the key culprit. Well considered and planned urban

trees can, according to one study by US-based The Nature Conservancy, reduce Particulate Matter near a tree between 9% and 24%. It also stated that trees on average can cool an urban area by 2°C.⁴

Another study, led by Lancaster University, explored in more detail how the leaves of road-side trees could radically cut pollution by absorbing particulates, even inside people's homes. One of the more sinister facts about particulates is that if you live on a busy road, they can attack you in your own home.

The Lancaster-led study team lined a terraced street in their home town with silver birch trees in planters and measured pollution levels (PM1, PM2.5 & PM10) inside the homes before and after the trees had been put in place; they saw pollution levels in these homes drop by more than half once the roadside trees had been put in place.⁵

As ever, the right tree in the right place is the mantra to follow. Trees with 'hairy leaves' do a great job of cutting pollution, but care needs to be taken over creating dense canopies that could potentially stop particulates from dissipating. One recent study examining this factor led to ill-judged headlines about street trees 'causing pollution'; a particularly unfair conclusion to draw given that it's the road traffic creating particulate emissions and, for older streets, the trees could well have been planted well before cars became such a

major factor in our urban centres. In fact, research has shown that this so-called 'canyon effect', where pollution gets trapped by buildings alongside roads, can be helped by planting trees and vegetation, cutting nitrogen dioxide pollution by up to 40% and particulates by up to 60%.⁶

More trees mean a stronger society. An increase in mixed-use, accessible areas of woodland will bring direct and immediate health benefits. Happier and healthier communities are ones where green space – and particularly trees – have a major part to play. Across the North of England there is a clear health challenge to be grasped that's much wider than just air quality, and investing in community forests could be critical.

Just one case study from Chicago comparing people living in flats both with and without a view of trees and grass found that a greener environment:⁷

- reduced stress in children;
- increased concentration and self discipline;
- reduced symptoms of ADHD;
- increased the amount of play for local children;
- halved the incidences of violent crimes and domestic violence;
- increased strength of community, and;
- increased the ability of the poorest single parent mothers to cope with major life issues.

Pollution hits those in deprived areas most, and ironically, those who are least likely to own a car.

Maximising the potential of the planning system to increase tree and woodland cover

Location: East Riding of Yorkshire, Kingston upon Hull

Partners: HEYwoods Forest, East Riding of Yorkshire Council, Hull City Council



Together, the East Riding of Yorkshire and Kingston upon Hull is recognised to be the least wooded area of England. With only 2.2% of land currently wooded, the area lacks the necessary tree cover needed to deliver the range of environmental, social and economic benefits that can be derived from woodland. HEYwoods Forest, East Riding of Yorkshire Council and Hull City Council worked hard and thought innovatively to secure funding from various partners. As a result, in the last five years they have planted over 80,000 trees, incorporating a number of community-based planting events, and over 12km of new hedgerows in both urban and rural areas. Not only does this help to build community spirit but it improves health, image and wildlife, reduces air pollution and fights climate change.

Trees make life more liveable. Woodlands are restorative environments; they screen out noise from nearby traffic, they welcome large numbers of people without seeming crowded and they offer a range of activities from gentle to vigorous, including walking, cycling, horse-riding, nature trails, picnics and mountain biking. It's nature's playground.

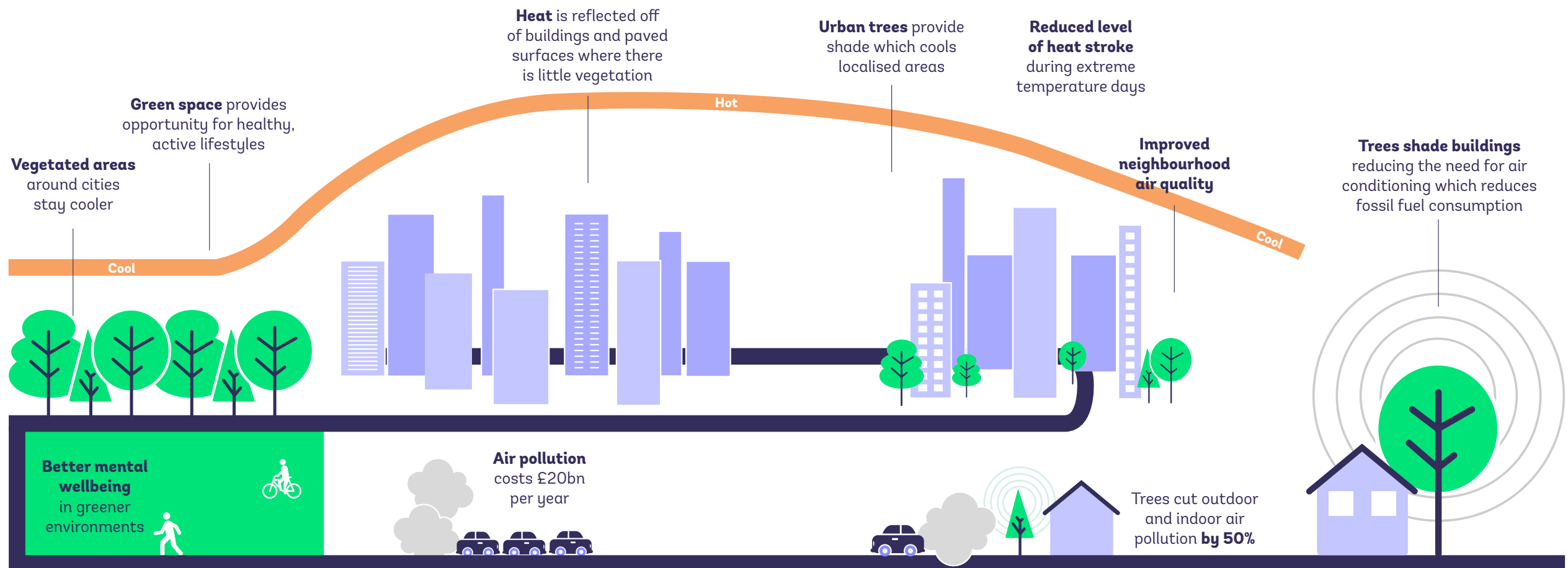
Getting people active by greening their environment has to be a clear priority. Over the last two decades, obesity amongst adult men has increased from 13% to 27% of the

population. The figures are similar for women. By 2050 the forecast is for 60% of men, 50% of women and 25% of children to be officially classed as obese. The accompanying cost of this massive health problem has been forecast at £50 billion, and so any measures that can get people moving and losing weight will be hugely beneficial to public coffers and the wider economy.⁸

Greening our towns and cities, and achieving a culture shift where more people, particularly in deprived communities, feel motivated to get out and get active in a woodland

setting, is a well-established strategy throughout the community forests movement, but more needs to be done. 28 million people in England live within 4km (a cycle ride) of a publicly accessible woodland, yet there are still barriers to people enjoying them, with people feeling that woodlands aren't genuinely accessible or are too far away. In addition a lack of knowledge about the facilities on offer or simple safety concerns can all play a part in people not taking advantage of them. From mental health and physical activity to the safety of the air we breathe, trees have a clear and urgent role to play in

helping address a problem which has so profound a social and economic impact. As mentioned previously, the Royal College of Physicians estimated that ambient air pollution causes approximately 40,000 premature deaths at an estimated social cost of £22.6 billion per year.⁹ When this figure is proportionately distributed for population, that could mean 2,000 premature deaths in Greater Manchester and 2,500 in Yorkshire due to air pollution. The sooner we replicate Lancaster University's experiment and line every street with trees, the quicker we'll reap the very tangible benefits.







Cooling the canopy

Climate change, urban
resilience and slowing the flow

As humankind strives to keep global temperatures below a 2°C rise, a new Northern Forest could be a fundamental contributor to our efforts. Fifty million more trees planted from Liverpool to Hull will absorb hundreds of thousands of tonnes of carbon every year. Those trees could also help to keep our cities and towns cool and shaded, and play a real part in reducing the risk of floods.

Play it cool, plant a tree.

Forests in the UK hold around 150 million tonnes of carbon in their biomass and 640 million tonnes of carbon in their soil. Each year they soak up a further 10 million tonnes.¹ One rotation of conifer forest across just half a hectare is, very roughly, able to soak up as much carbon as an average driver generates in an entire lifetime of motoring.

So if we increased the North's canopy cover significantly, the carbon impact would be profound. For example, our target of 50 million trees includes an identification of 3 million trees that are 'outside woodland', so urban trees and hedgerows. 47 million trees, then, equates to 24,000 hectares, allowing for 25% open space (paths, ponds, other habitat, landscape design, and so on). And 24,000 hectares, based on the nature at work scenario, has the potential to lock up 7.5m tonnes of carbon.

Better management of woodland for fuel and timber can also reduce carbon emissions, as wood fuel is carbon neutral and timber can replace more carbon-intensive products, such as building materials like steel.²

In fact if you look at our low woodland cover compared to our European neighbours, our entire landscape is a carbon sink waiting to be filled. The UK's overall woodland cover stands at just 13% of our land area.³ By comparison Germany boasts a level of cover at 33%; France is 31%; Italy is 32% and if you move north to, for example Sweden, 68% of their land area is forest.⁴ If we planted enough new woodland to come to even half of Germany's, at 16% of our land area, it would be enough to absorb 10% of our overall greenhouse gas emissions by 2050.⁵

Overall woodland cover



Worryingly though, we've been planting fewer trees and not more, in recent years. Figures for woodland creation in England in 2016/17 put the amount of woodland created at just 525 hectares. That's the lowest rate of woodland creation in a generation and just 10% of what we need to achieve according to the government's own planting targets set in 2013. Almost all of that woodland creation is broadleaves too. Whilst broadleaves are extremely valuable, we need to better balance the scale between broadleaves and conifers to reap maximum rewards.

A sustained regime of woodland creation, as we're proposing across the North of England, would offer a huge 'debit' against our carbon account over the years ahead, with differing levels of carbon reduction offered depending on whether the end-use of the woodland created was mixed use, timber production or energy. By creating a sustained campaign facilitated by community forest partnerships, hand in hand with city regions and metro mayors, we can also reduce the complexity that has dogged new woodland grants.

As a strategy for carbon removal, woodland creation offers a great return on investment too. According to the Forestry Commission's own Read Report on the role forestry can play in our efforts to combat climate change, an affordable cost per tonne of CO₂ is considered to be anything below £100. Depending upon the

type of woodland created, the cost per tonne of locking up CO₂ through woodland creation ranges from £75 for broadleaf farm woodland to a negative cost – i.e. a positive economic gain – of £50 per tonne for forests producing energy crops.⁵

A resilient Northern landscape

From over-grazed uplands to our flood-prone towns and cities, trees can help us adapt to climate change as well as to reduce our carbon emissions; in fact, their role in helping us cope with the impacts of climate change could be critical.

And the need for climate adaptation is an inevitability. Even if we achieve, against some stiff odds, a zero carbon economy later on this century, the gases we've already emitted will remain in the atmosphere for the full duration of our lifetimes. A significant level of warming will occur, regardless of our actions. In fact, we're already seeing the start of the climate shift in year-on-year hikes in average temperatures and an increasing regularity of extreme weather events.

We're steering into the skid of unavoidable climate change and a major programme of greening and planting will be needed to lessen the impact and reduce the harm caused. This is the second key way in which trees play a critical part in responding to climate change.

Trees work in a few different ways to reduce climate impact. First of all they are nature's air conditioning units through the process of evapotranspiration, where water evaporates from the surface of a tree's leaves, into the atmosphere. They also provide shading in the warmer months, which provides relief in particular for more vulnerable groups of people and reduces air conditioning costs. Trees also help to 'slow the flow' of rainwater, particularly in upland areas, and their roots can help to stabilise soils and reduce runoff.

Conversely, a 10% decrease in urban greening would increase the maximum surface temperature by up to 7°C in high density residential areas.⁶

Green infrastructure (trees, parklands, gardens and green spaces) lowers temperatures in urban areas significantly. Grassed surfaces in tree shade can be 15-20°C cooler than hot, sun-drenched tarmac and the air temperature in tree shade can be 4-7°C lower than in the sun.⁷ Urban parks with dense vegetation are on average 1°C cooler than built up areas during the day.⁸

With the triple headline benefits of managing temperatures, surface water and air quality, urban trees are a vital part of our response to climate change. Large canopies offer the most significant benefits and it is important that the right species are selected, so as not to increase urban ozone or increase water stress. There are also perceived concerns around windthrow and subsidence which need to be overcome.

Delivering 'city cooling' and climate change adaptation through increased levels of tree cover is a vital part of our new prospectus for a Northern Forest. However, a critical starting point has to be a comprehensive and up to date survey of current levels of urban tree cover, and a mechanism for carefully monitoring those levels, ensuring that any losses in cover are taken into account and that clearer guidelines are established to encourage increased levels of tree cover in town centres and high density residential areas.

As events in some of our Northern cities have shown, it is far too easy to see major tree removal programmes occurring, without any coherent plan for replacement or amelioration of the impact this will have on urban climate change.

If Greater Manchester was to increase its tree cover by 10%, it would neutralise the heat island effect.

In short if you had to design a carbon-absorbing, shade giving, aesthetically pleasing cool air machine that also reduced flood risk, you'd pretty much come up with a tree.

The benefits have been quantified. In our towns and cities there is a phenomenon known as the 'heat island' effect, where denser, more built up districts experience higher temperatures than city outskirts or rural areas.

A study conducted by the University of Manchester examined what trees might mean for this effect, wider global warming trends, and the urban environment. The research team found that if Greater Manchester was to increase its tree cover by 10%, it would neutralise the heat island effect, stabilising temperature levels at or below the 1961-1990 baseline average through evapotranspiration (as well as through providing shade).

**In 2016/17
England
created 525
hectares of
woodland,
just 10% of
what we need
to achieve
our planting
targets.**

Slow the flow, weather the storm

After the sun, comes the rain. Climate change scenarios for the North of England show a hike in both summer and winter temperatures over the course of the coming century, but they also reveal a change in likely rainfall patterns too. The weather is becoming much more unpredictable but current projections are that our summers could be up to 40% drier by the 2080s while our winters could be up to 30% wetter, particularly to the west of the British Isles.⁹

And when it does rain, it's set to be heavier. By the 2080s, intense winter precipitation events (that's snow as well as rain) that are experienced generally once every two years on average, may become between 5-20% heavier each time.¹⁰ UK climate predictions are for a fivefold increase in rainfall intensity this century – an extenuation of drought periods.¹¹

When all that rain hits a hardened landscape, trodden by hooves and denuded of trees, the water runs off, takes some topsoil with it, and can become a flood risk further down the catchment. In addition, if the water's not held in the landscape long enough, aquifers may become insufficiently recharged for our ongoing water supplies.

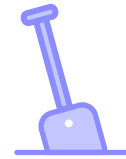
The Northern Forest has real potential to help address these problems. Well designed areas of planting have the potential to 'slow the flow' and help reduce flood risk. While hard measures such as flood defences and barriers in our towns and cities may well be needed, natural water retention further upstream and holding water in the landscape is an investment worth making too.¹²

Planting 50 million trees across the North will have a significant impact on water management and quality. The rivers of the new Northern Forest drain the conurbations of Liverpool, Manchester, Leeds, Sheffield and Hull with vast catchments at 2,030km² for the Mersey, 1,932km² for the Aire, 818km² for the Warfe and 1,256km² for the Don.¹³

Along riversides in particular – so called 'riparian forest' – planting trees can make a major difference. Research shows that strategically planting trees can be effective at reducing peak flood flows. In one study, restoring riparian forest cover over 20-40% of one catchment area reduced flood peak magnitude by over 19%.¹⁴

On rural pasture, reforestation of previously grazed sheep pasture could increase infiltration of rain into the soil by 67 times, and reduce surface runoff volume by up to 78%.¹⁵ Urban catchment forests could be used to combat surface water flooding; interception by leaves and stems can reduce the amount of rainfall reaching the ground by as much 45%.¹⁶ Grass and tree pits can slow the flow further, reducing runoff by 99% and 60% compared to tarmac.¹⁷ Tree pits accelerate infiltration of water too, whilst grasses are effective at slowing sheet overland flow. Interception slows the rate in which dry deposition of surface pollutants are washed off highways, whilst the aggregates that are used in tree pits can filter out fine sediment that can smother fish spawning beds.

This secondary benefit in terms of filtering out pollution from water is worth noting too. Only 22% of waterbodies across the North are at good ecological health status¹⁸, and rainwater draining from hardstanding carries pollutants including grit, bacteria, oils and detergents, which is part of the problem.



The best time to plant a tree was a generation ago. The second best time is now.

Green infrastructure intercepts, infiltrates, stores and evaporates rainwater, thereby reducing the rate and volume of water entering drains and limiting the risk of them being overwhelmed during extreme rainfall. Runoff can be reduced by 60% by trees over hard surfaces and by nearly 100% by grassland.¹⁹ A hectare of grassland and broadleaved woodland in the UK can evaporate, respectively, 3.4 and 4.0 million litres of water per precipitation event.

Modelling conducted on Manchester shows that adding 10% of green space can reduce runoff by 5-6%, and adding green roofs to all buildings in densely built-up areas could reduce runoff by 17-20%.

Across the Northern Forest, in our towns and cities, thousands of homes remain at risk of flooding. Whilst trees can't hold back the floodwaters, they can be part of a smart solution for making a river catchment less prone to flooding, and they can boost the quality of our water too.

Dig in, make it happen

The best time to plant a tree was a generation ago, but the second best time is now. Climate change represents the most significant danger to the long-term health of global ecosystems as well as our very way of life and, currently, humankind's efforts to curb our collective carbon emissions are not delivering fast enough.

The latest calls from scientists and climate experts are for us to aim for a 'zero carbon' Britain by the middle of this century. To achieve that we need to accelerate our tree planting to absorb more emissions, boost our use of wood as a fuel and building resource, and we need to fully deploy trees and green infrastructure as a central strategy for adapting to the climate changes that will come our way.

Tree planting for flood management

Location: Upper Calder catchment

Partners: Treesresponsibility, Environment Agency, Woodland Trust, Suma, Calderdale Council, Slow the Flow Calderdale, National Trust, Yorkshire Water, Pennine Prospects



Science of Floods – Schools Workshop
Organised by South Pennines Local Nature Partnership

The SOURCE partnership was established back in 2010 with community activists and long-standing White Rose Forest partner, Treesresponsibility. An experienced and well-oiled community tree planting group, they reached out to other groups and organisations in the Upper Calder Valley to inspire a genuine community approach to catchment management. They aim to minimize the risk of flash flooding in the Upper Calder Valley through: appropriately sited tree-planting and moorland management; treating damaged land and controlling erosion; improving the quality of the River Calder; and undertaking educational activities and encouraging volunteering so that people of all ages and from all walks of life become aware of the value of our rivers and uplands.

Since Boxing Day 2015, Treesresponsibility has planted over 15,500 trees and nearly a kilometre of hedge with the help of 1,200 volunteers, many of them children from local schools.





Resourcing the future

More wood, more timber
and green-collar jobs

It's a source of shade, a carbon store and an object of beauty. It's a wildlife habitat, grows fruit and can stabilise soils. For some, it's just there to climb. A tree is many things but it's also a low carbon resource that can create beautiful buildings, be a source of renewable energy, and underpin many thousands of jobs. For the Northern Forest, wood will be the pivotal resource for the future.

The thing about the forestry industry is that the more active it is as a sector, the more economic, social and environmental benefits it produces. More, and better managed, forests protect flora and fauna, become places for people to play and escape to, produce more timber products, create more jobs and lock up more carbon.¹ And it's this ability to create jobs that is key. Quite simply, there are opportunities to be had through planting and maintaining our trees and woodland.

In England alone, the forestry sector supports around 80,000 jobs and is worth £2 billion to the UK economy every year.² Hardly insignificant, and a sector with the capacity to grow and stimulate the economy even further.

So what are these 'green-collar' jobs? What are the people working in the forestry sector actually doing? From the fundamental job of growing trees, through to woodland owners and estate managers, the contractors who maintain, harvest and buy the timber, and on to the people who run

sawmills and timber processing plants and then the producers of products and wood chips for fuel, the forestry sector is truly vast.

It's important to note that many of these people are employed in small, family-run businesses, providing secure jobs in rural areas where there are few alternative options. And it's also worth noting that these are increasingly in innovative businesses that offer sustainable products and services.

Let's take a look at Cumbria. The UK's largest sawmill is BSW in Carlisle, where it employs 140 people. Every year, BSW spends £15 million on logs and processes 320,000m³ of timber, which results in an annual turnover of £32 million. Up the road in Workington, Iggesund makes paperboard products, employs 500 people and has an annual turnover of £144 million. And in Penrith, A W Jenkinson is a timber products and by-products merchant employing 350 people and boasting an annual turnover of £150 million.³



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The future is timber

Wood is also a critical resource in the green economy. We've explored its role in creating jobs, but it's also a resource in its own right. Timber frames, furniture, flooring, fuel and paper are all products we can create from wood. So what is the potential for the Northern Forest to contribute to this green economy?

Take the environmental impact of using timber as a resource. Concrete uses five times as much energy to produce as timber; steel six times. In terms of construction, switching to a timber frame could save four tonnes of carbon dioxide per house. There are 650,000 new homes planned across the Northern Forest area in the next 20 years; switching to timber could save over two million tonnes of carbon dioxide. Just think about that: over two million tonnes. That's equal to the annual carbon footprint of over 200,000 UK citizens.

And that's not all. Timber is organic, it enhances biodiversity, it's recyclable, and it doesn't leave great extraction scars across the landscape. All in all, it's the ultimate sustainable construction material. One of the oldest building materials in the world clearly has a place in our modern landscape.

Sustainable, award-winning

Of course, over in Hull, they know exactly how remarkable timber can be.

Hull History Centre is on the North-eastern edge of the city centre, on a key route between the city centre and the River Hull. The brief was to create a highly visible landmark to house a library, search room, lecture theatre,

studios and offices, as well as the archives and local studies collections of Hull City Council and the University of Hull. It was to be a focal point for the community, and an architectural beacon for the city.

A new public arcade runs the full length of the building – an arcade constructed from glue laminated timber (or 'glulam'). Timber was the perfect solution for the structure, with its smooth, sweeping curves cocooning the walk beneath.

There was also a heritage reason behind the timber. As a trading port, Hull was the gateway for the import of Baltic timber into the UK. The timber used on this project is a European whitewood, manufactured by the Kingston Craftsmen in their workshop, a mere hop, step and jump from the History Centre's new location.

And to top it all off, the History Centre was the Structural Award Winner at the Wood Awards in 2010.⁴

The potential exists

Plans for the Northern Forest are unique. There's no comparable forest scheme in the UK that comes close to the proposed 50 million trees to be planted from Liverpool to Hull, taking in Manchester, Chester, Leeds and Sheffield.

But there is the National Forest in the Midlands. In 2016, the National Forest celebrated its 25th anniversary. During that time, over 8.5 million trees have been planted, increasing forest cover from 6% to 20%. To date, the Forest has delivered £140m of net public benefit, secured 333 jobs in forestry, farm diversification and woodland businesses and has nine wood fuel installations using wood as a resource for renewable energy.⁵

By 2030, wood fuel from the National Forest is expected to produce enough energy to supply electricity to 26,900 homes. That's the equivalent to a town around the size of Loughborough.



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If that's what planting 8.5 million trees can do, the Northern Forest, with a planned 50 million trees, could make a huge – and critical – impact on employment rates and the forestry sector right across the North of England.

And the type of timber matters. Softwood is the 'bread and butter' of the timber industry. At a time when restocking of productive forests is not happening at sustainable levels, the careful planning and management of softwood forests is key. Only 50% of felled woodland is being restocked with softwood. In terms of new planting, whilst 52,200 hectares of new forests have been planted, just 12,100 hectares are conifers needed for the industry.⁷

Fuelling the fire

Alongside timber for construction, wood fuel is a key growth area. Gone are the days when we ripped out our old wood burning stoves for, let's face it, a gas or electric imitation; now we're seeking out wood and multi-fuel burning stoves. Sales have more than doubled since 2005, and this

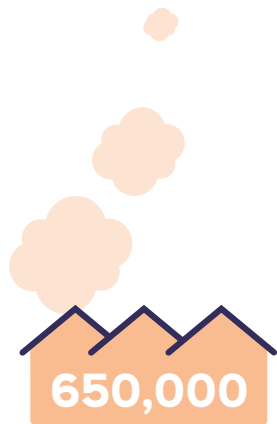
has led to increasing demand for wood fuel.⁸ It's estimated that the wood fuel supply chain could generate £1bn GVA (Gross Value Added) and over 15,000 jobs to the UK economy by 2020.⁹

The Northern Forest is primed to take advantage of this growth.

Essential investment

Trees are unequivocally interconnected to the way we lead our daily lives. They can provide jobs, homes and energy. It's because of this that there are calls to remove the public forest estate from the electoral cycle. Trees have lifecycles of several decades or even centuries. Decisions being made now will be seen much, much further down the line. Policy changes every five years due to changes in government will never allow our forests to reach their full potential to create jobs and skills, resource and income.

No matter how you look at it, trees are an essential resource. Yes, there are alternatives, but a healthy, vibrant and commercially viable forestry sector is essential to the health of the UK economy. And across the key towns, cities and rural areas of the Northern Forest, the investment in natural capital could signal a new chapter of prosperity.



new homes planned across the Northern Forest area in the next 20 years; switching to timber could save over two million tonnes of carbon dioxide.

Wood allotments

Location: Merseyside

Partners: The Mersey Forest, Friends of Anderton and Marbury, Cheshire West and Chester Council



Wood allotments is a new scheme developed in The Mersey Forest which enables woodland owners to engage local communities and manage their woods at the same time.

The concept is simple. Local wood burning stove and fire owners pay a small fee to the landowner for the chance to harvest logs from carefully marked trees within a young woodland. They get fresh air, exercise and a cheap, locally sourced renewable fuel, while the woodland receives important thinning to ensure its future health.

Following a very successful pilot with Cheshire West and Chester Council and Friends of Anderton and Marbury, many more local authorities are now developing woodland allotments of their own. In addition, The Mersey Forest team is developing an online hub for wood allotments in the region, woodallotments.com, where potential "allotmenters" will be able to browse existing allotments, contact the landowner, or suggest where they would like to see new allotments.

Cheshire Rural Biomass (CheRuB)

Location: Trafford, Cheshire

Partners: The European Agricultural Fund for Rural Development, Department for Environment, Food and Rural Affairs, The Mersey Forest

With the price of fossil fuels constantly rising – particularly for those living in rural areas – wood fuel systems provide a modern, reliable heating system alternative to their gas and oil counterparts. The systems are carbon-neutral, and in certain cases have been proven to reduce carbon emissions by 90% compared to electricity-powered equivalents. The Cheshire Rural Biomass project helped people and organisations to benefit

from wood-fueled heating systems. The project trained both operators of wood fuel systems and existing heating engineers in modern wood fuel systems. The programme installed biomass boilers of three varieties across key locations in Trafford. These were a batch-log system at Trafford Mill, a wood pellet-fired boiler with a district heating network at Trafford Mill, and a wood pellet air heater at The Grange Farm. Five heating engineers were part-funded to take a conversion course from gas and oil systems to wood fuel systems. 25 participants also took part in an Easy Deployment training course. By installing these biomass boilers The Mersey Forest and partners were able to create a localized supply chain, in turn stimulating local economies.





It's in your nature

Habitats, biodiversity, a natural connection, natural capital

While we discuss the benefits of trees to our lives, let's not forget the fundamental role they play in ecosystems, for biodiversity and as habitats. They provide places for our wildlife to roam, and spaces for us to explore, relax and play. Our natural environment is not simply 'nice to have', it's essential to life on Earth.

Biodiversity is key to the survival of all life on Earth. From the tallest tree to the smallest insect and far beyond, biodiversity encompasses everything that's alive on our planet. If we lose biodiversity, we lose food, water, fresh air.¹ Protecting it is not a choice. We need to conserve, enhance and create the conditions for our ecosystems to thrive.

It's something that's been taken seriously in the UK for many years. We were the first country to produce a national biodiversity action plan. That was back in 1994, and the strategies and action plans that have been created in its wake aim to conserve, protect and enhance biological diversity.

Losing habitats means losing species. A report from the International Union for Conservation of Nature (IUCN) stated that the single biggest threat to European

butterflies was habitat loss.² The situation is so severe that it could lead to the extinction of many species. If we're not careful, this could be the start of a dangerous trend.

The decisions we make today will impact on the future for generations to come. It's important we get it right.

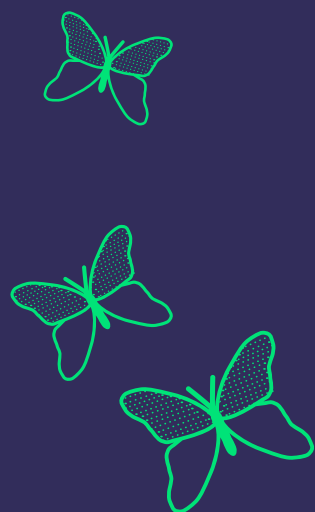
The ecological value of woodland is a given. Whether it's an ancient woodland or a city park, the presence of trees has a huge impact on biodiversity. A study in Merseyside found that the amount of green spaces – and particularly trees – such as parks, gardens and cemeteries, had the greatest influence on an area's ecology.³ If there's enough, you may even find rare and endangered species. That's plants, flowers, birds, butterflies, mammals... it's about creating and protecting the right habitats for the natural world to thrive.

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Natural connections

And it's not just about surviving in one area. There's a need for connectivity; to overcome fragmentation and create the 'stepping stones' between tree, park and forest. These ecological networks are high quality sites, with the diverse habitats needed for an array of species to live in and move between.⁴ In the Northern Forest, it's about wildlife being able to move seamlessly from Liverpool to Hull.

The concept of natural corridors is tried and tested. When Birmingham developed its wildlife conservation strategy back in 1997, it was built around the notion of corridors. In London, the South East London Green Chain links 300 open spaces over 40 miles.⁵ The Northern Forest can do the same, albeit on a much larger scale across the North of England.

We can't forget the connections between people and nature. It's something explored earlier in this prospectus, but the opportunity to be in, and connect with, our natural environment means happier and healthier communities.⁶

Natural capital matters

The Government's Conservation Strategy was published in October 2016. Time will tell if it survives, but the ideas it sets out hold true: "In order to reverse biodiversity loss, sustain distinctive landscapes and enhance engagement with nature, we need a new approach."⁷

It's an approach known as 'natural capital', defined by the Natural Capital Committee as 'the elements of nature that produce value (directly and indirectly) to people, such as the stock of forests, rivers, land, minerals and oceans.'⁸ Of course, we already have a wealth of natural capital in England. National Parks, forests, parks, farm land, woodland – all have been shaped, conserved and harmed in varying measure over the years.

However, natural capital is already under pressure. With an extra nine million people living in England by 2040⁹, the demand for

new housing, facilities and infrastructure will undoubtedly impact on our habitats, ecosystems and biodiversity. Of course, the services that our natural capital provides – clean air, water, food, fuel, medicines and resources – will also be in much higher demand.

But this concept of natural capital is a powerful tool that can help us all understand everything that we get from the natural world. It puts environmental planning at the heart of decision making, recognising that enhancing the quantity, quality, location and accessibility of natural capital can enhance investment, wellbeing and sense of place.¹⁰ Crucially, it's about long-term planning rather than the 'quick fixes', with the emphasis firmly on the added value that a healthy natural environment can bring, both now and in the future.

The aptly-named Local Nature Partnerships (LNP) are key to this. Bringing together organisations, businesses and individuals from a whole range of sectors, their aim is to put the environment at the very heart of decision making. It's an aim that has been charged by government and means taking a strategic, long-term view of opportunities and challenges in order to plan and manage the natural environment for the benefit of people, nature and the economy.

The Northern Forest supports this approach, and will play a critical role; a large-scale, cross-country woodland creation programme that sets out to enhance the economy, environment and quality of life in the North of England. It's a long-term ambition, involving numerous partners and securing social, economic and environmental benefits.

Quite simply, we need to create and conserve natural capital to sustain human life. As The Lawton Review states: "The essence of what needs to be done to enhance the resilience and coherence of England's ecological network can be summarised in four words: more, bigger, better and joined."⁴ Enter, the Northern Forest...

Delivering the Northern Forest

The Northern Forest is a programme, a vision and a bold glimpse of what trees can deliver for the North and for the United Kingdom as a whole. The critical question is, how can it be delivered?

The Woodland Trust and community forests

The partnership that has fostered this vision and worked hard on the evidence base that underpins it will be central to its delivery. The community forests in the north – The Mersey Forest, White Rose Forest, City of Trees and HEYwoods – have been working with the Woodland Trust to take the Northern Forest from concept to reality. They all have a long and successful history of working together and combine over a century of environmental regeneration and green infrastructure experience.

To ensure resilience and durability of the project throughout the 25-year period, funding and support will come from a range of sources. The community forests and the Woodland Trust will lead an approach to combine existing and novel funding mechanisms, bringing public and private sector funding together.

500m 
of investment over **25** years

Government support

In January 2018 the Northern Forest plans took a significant leap forward when the Prime Minister announced the Government's support for our vision, and that the Northern Forest would be included in Defra's new 25-year plan for the environment in the UK; she also announced that there would be £5.7 million of funding made available to start work towards the goal of planting 50 million trees across 25 years.

A growing partnership

Working with a growing range of partners, the Northern Forest will secure funding not only through traditional methods such as charitable trusts, sponsorship and grants, but also by contributing to carbon reduction schemes, creating natural capital bonds and aligning to the planned investment in housing and transport.

The Northern Forest will add environmental sustainability to the predicted economic growth across the North. It will work with local councils, communities and the government, with private organisations, schools and individuals, house builders and transport planners, with Natural England, Wildlife Trusts and conservation organisations, all to deliver a forest that will benefit our health, happiness, economy and future.

Local and major projects

The Northern Forest is the tree on your local street, it's the park in your town or city, it's the regenerated woodland on the edge of the city, and it's the vast landscape from Liverpool to Hull.

As discussed in this prospectus, enhanced tree canopy cover can raise property values, enhance character and positive perceptions, and help deliver major investment opportunities. Well-planned trees can support resilient urban landscapes and counter the heat island effect, which means people stay longer and spend more in our urban centres. In terms of the places we live, greener streets enhance existing residential areas and are essential in the delivery of new communities. We understand all of this, and so the Northern Forest will support major new developments that deliver significant new woodland planting and bring existing woodlands into management.

Major projects will also allow for the scale of new woodland planting to support the wider forestry and timber production industries. The Northern Forest is keen to work with Confor and the forestry industry to create new business opportunities through supporting the demand for UK sourced timber products and services and playing a part in the supply of timber in the future.

Once established, the re-investment in new woodland creation and harvesting will see considerable areas of land managed for economic and environmental benefit, resulting in millions in new investment. At the same time, a large portion of our delivery programme will also focus on the importance of a landscape 'mosaic', and how the Northern Forest can buffer and connect existing threatened habitats.

The footprint of the forest

Delivering a better quality of life is a central aim of the Northern Forest mission. As such, tree planting will target areas where it will have the biggest impact on health and wellbeing. The Northern Forest partners have used advanced mapping techniques to assess where trees can deliver the maximum benefits for air quality, water, health, recreation and biodiversity.

The main focus for the five community forests involved are the main city regions of Liverpool, Chester, Manchester, Leeds, Hull and Sheffield. The boundaries of the Northern Forest include a core area of community forest and community forestry initiatives. These have boundaries that have been agreed through local consultation.

However, there is still plenty of scope for including action in the wider North, such as Lancashire, North Yorkshire, Chester and Cheshire East and our mapping work to identify the best sites for planting has included these areas. Beyond the core area of the Northern Forest there is a "halo" of areas, which are not in community forests, but where delivery of new woodland, as part of a Northern Forest, would be beneficial.

Funding the forest

The funding for the Northern Forest is not yet secured, and we need support from a very wide range of sources to deliver this ambition. A business plan is being drawn up to explore these in more detail, and to set out the ways in which different partners and supporters can get involved.

We will look to develop opportunities for investment and other finance models – within which those long term benefits that will arise from the Northern Forest are recognised. We will also look to access direct funding; agri-forestry schemes; farming support payments; development levy payments; major donations and philanthropy; corporate sponsorship and individual donations. We also want to engage people in a range of activities that will contribute to the building of the Forest vision.

At current prices it is estimated that the Northern Forest will require £500 million in funding. Set alongside other major infrastructure schemes this is a modest, generational investment offering an unbeatable return. In terms of social, economic and environmental benefits it is estimated that the Northern Forest will generate £2.5bn of positive outcomes - a return of around five times on investment.

If you would like to get involved and be part of delivering the Northern Forest – whether as a financial supporter, landowner, partner, or in any other way – please email enquiries@woodlandtrust.org.uk

Our Northern Forest, our legacy

We started this prospectus with the notion that we live in a time where almost anything could happen. But what of the future? What will that hold for the next generation? What will our actions, our decisions and our priorities leave as an inheritance?

The Northern Forest is a plan to plant 50 million trees in and around the northern cities of Liverpool, Manchester, Leeds, Sheffield and Hull. Today, this area accounts for 13 million people and a woodland cover that's lower than the England average. But there are 650,000 new homes planned, £75 billion of infrastructure in the pipeline and, in many areas, new powers being exercised through devolution. Devolution provides an opportunity to better manage woodlands and tree planting initiatives in a much more localised way, tailoring programmes and projects to the areas' specific needs.

The time to create a Northern Forest is now.

Our plans for a Northern Forest is inspired by the belief that we can leave a better, richer, more varied and more productive natural environment to our children, and their children. An environment we can be proud to pass on; somewhere that we have nurtured, respected and derived true value from.

And the 50 million trees that form the Northern Forest would come in all shapes, sizes and scales.

It could be something as simple as opening your front door to a tree-lined street and pointing out the different leaves of the oak and ash, the helicopters of the sycamore and the conkers of the horse chestnut on the way to school.

Or weekends away in the great outdoors... which isn't all that far from home. Take your first camping trip with the family, pitch up under the trees, cook

on the campfire and explore nature at first hand. Or if a night under canvas isn't your style, check into one of the local B&Bs that have set up thanks to farm and landowner diversification. Go for a romp in the woods, den building, bird watching or wildflower spotting followed by a hearty meal in the local pub. Live a life where beautiful and accessible woodland is part of growing up. Where children learn to appreciate the value of nature and the importance of trees, and are hardwired to protect it.

In the face of a changing climate and more extreme weather events, these trees will play a critical role in the lives of our children. Reducing flood risk, cooling the urban environment, cleaning the air they breathe — it's all about creating a healthier, stronger, better place to be.

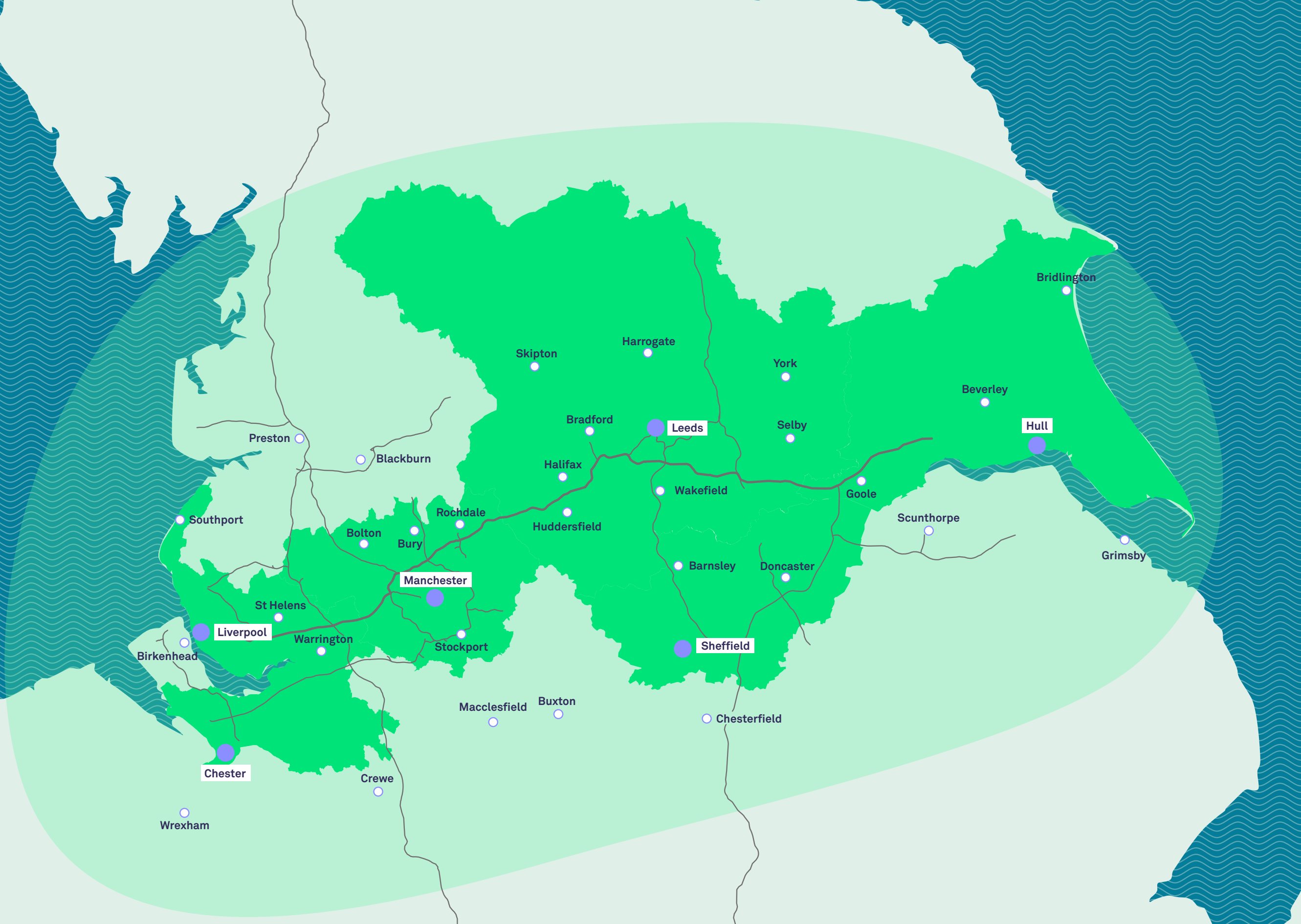
In this prospectus we have outlined the fundamental role the Northern Forest could play in terms of benefitting our economy, industry, employment, health, wellbeing, sense of place, biodiversity and climate. And all of these are critical reasons to make our plans a reality.

But the real success comes many, many years down the line. When the Northern Forest is delivering its full potential, and generations to come will have somewhere beautiful and resilient in which to live, work, explore, learn and play.

The Northern Forest can be this legacy.

The time to create a Northern Forest is now

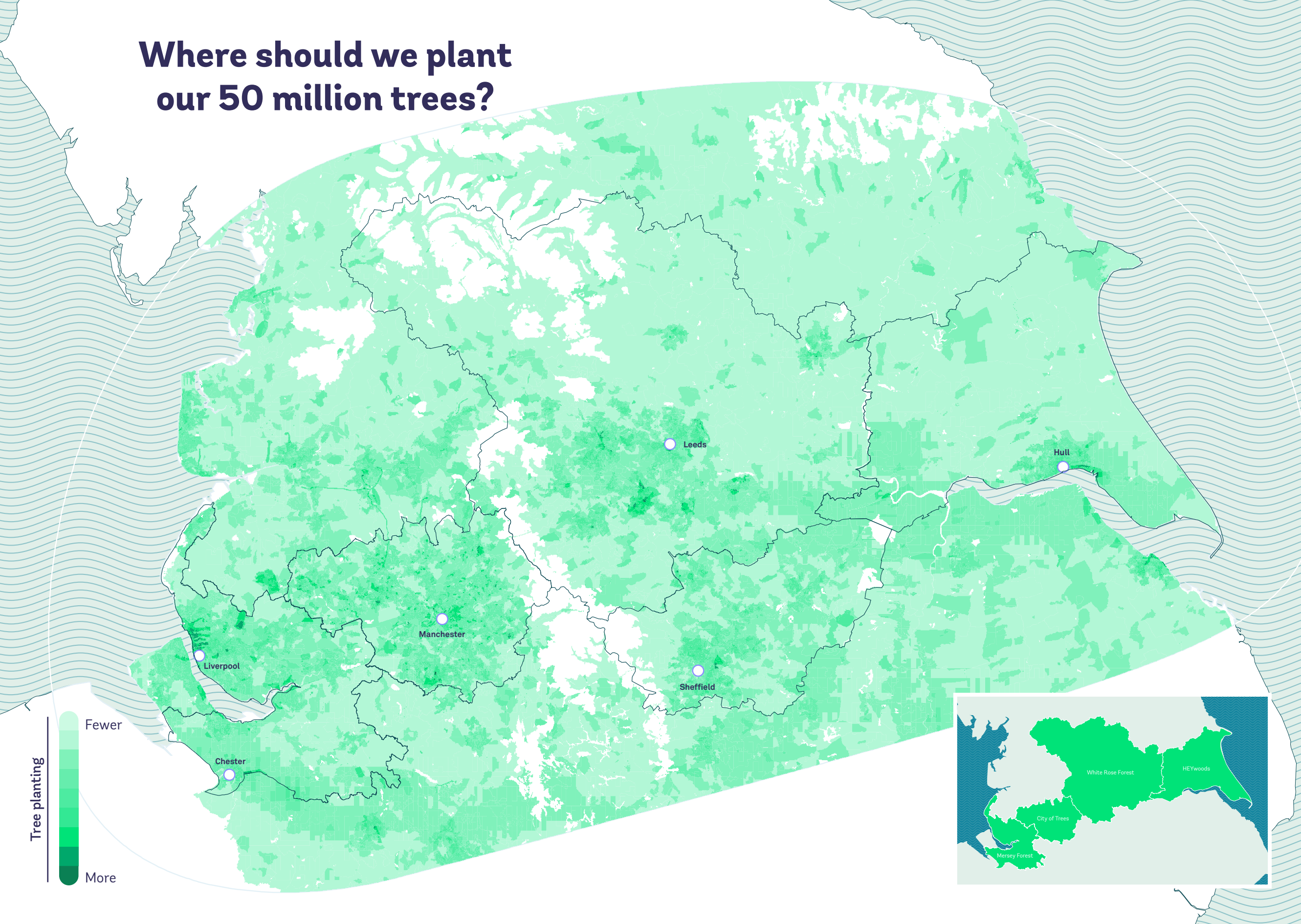




Map labels (clockwise from top-left):

- Preston
- Blackburn
- Southport
- Bolton
- Bury
- Rochdale
- Manchester
- St Helens
- Warrington
- Birkenhead
- Liverpool
- Stockport
- Crewe
- Wrexham
- Macclesfield
- Buxton
- Chesterfield
- Skipton
- Harrogate
- Bradford
- Halifax
- Huddersfield
- Wakefield
- Barnsley
- Doncaster
- Leeds
- York
- Selby
- Goole
- Sheffield
- Sheff Hallam
- Beverley
- Hull

Where should we plant our 50 million trees?



Panta Rhei – everything flows

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- Calculations taken from local planning documents at the time this document was written (2017). For full calculations please see the Northern Forest evidence base.
- Calculations based on strategic investment projections from multiple sources including: LEP Plans, Growth Strategy, HS2/3, Transport for the North, Atlantic Gateway and other planning documents. For full calculations please see the Northern Forest evidence base.

As beauty meets prosperity

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