

Informing a carbon-led tree planting strategy for the White Rose Forest

Interim report for the
Directors of Development
11th December 2020

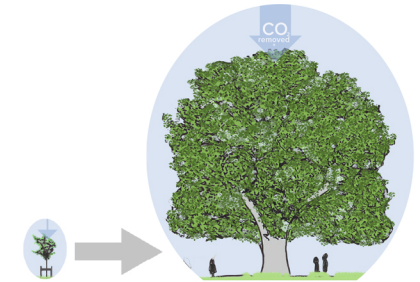


What is the potential contribution of woodland creation in your area to meeting net-zero?



Project aim:

To help the local authorities in the White Rose Forest understand the potential for carbon sequestration through woodland creation and to estimate the carbon contribution of existing trees outside woodlands.
To provide local authorities with evidence to help set carbon-led ambitions for 2050 tree canopy expansion targets.



Key results:

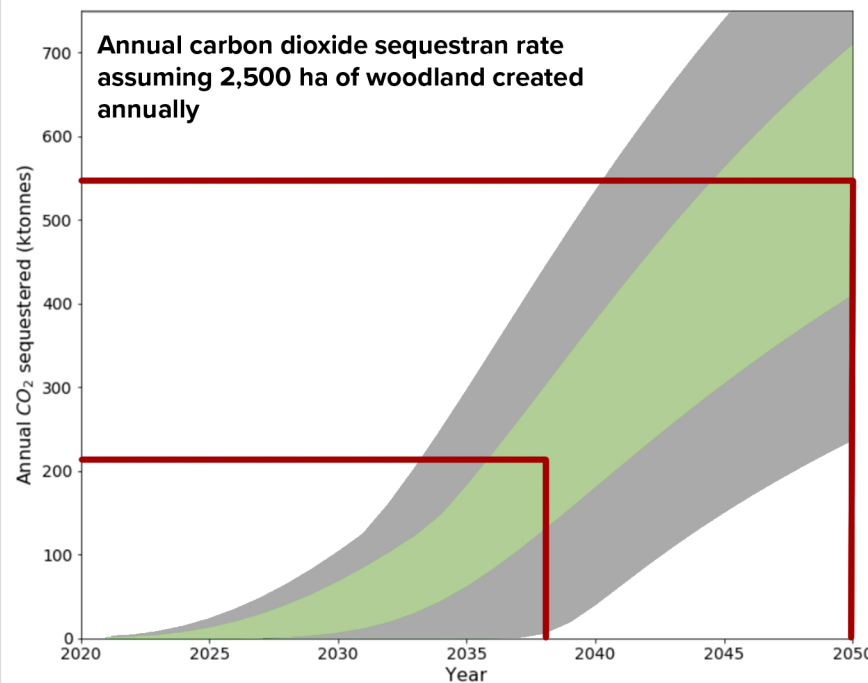
Using tree growth rates specific to each local authority¹, the United Bank of Carbon modelled the potential sequestration benefits of woodland creation.

This interim report demonstrates potential carbon sequestration rates across the White Rose Forest under different planting rate assumptions. A tailored calculation for each local authority requires key additional information such as available areas for woodland creation, and local emission reduction pathways.

Example scenario 1:

Planting 2,500 hectares of woodland per year across the White Rose Forest region leads to an estimated annual sequestration rate in 2038 that is equivalent to 3-12% of the region's residual emissions if the emission reduction pathway is followed². By 2050, this sequestration rate rises to between 58-100% of residual emissions³.

1. Growth rates of trees based on Forest Research's Ecological Site Classification for 4 species mixes. Carbon sequestration rates based on Woodland Carbon Code Calculator v2.3, 2020.
2. Tackling the Climate Emergency: Emissions Reductions Pathway Report, 2020. WYCA. Assuming residual emissions in 2038 are 18-27% of 2018 emissions.



Green shaded area represents average growth rates across a range of woodland mixtures.
Grey shaded area represents minimum and maximum expected growth rates.

The benefits of trees:

Trees provide the most cost effective method for removing carbon dioxide from the atmosphere. The graph illustrates that the benefits of newly created woodlands increases over time.

While the newly planted trees are growing, the existing canopy provides us with ongoing carbon sequestration. We estimated that trees outside woodlands⁴ provide nearly half of the total canopy cover which is not fully accounted for in the national inventory of emissions.

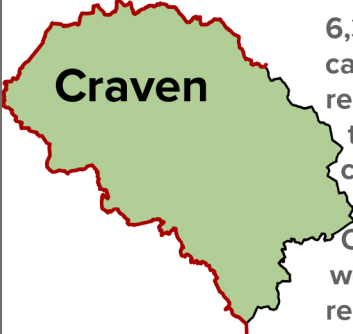
Protection of the existing trees and a step change in woodland creation rates is required for the short-term and long-term mitigation of climate change.

3. Assuming that the region's emissions continue to decline and reach 5% of the 2018 value by 2050. The UK Local Authority Carbon Dioxide Emissions, Department for Business, Energy and Industrial Strategy 2018.

4. Trees mapping provided by Blue Sky National Tree Map™ dataset. Woodland defined as >0.5 ha based on the National Forest Inventory Woodland England 2018, Forestry Commission




What does it mean for your local authority?



Craven

6,327 hectares of tree canopy cover¹ which represents 5.4% of the total area. 42% of canopy cover is made up of trees outside woodlands². CO₂ emissions in 2018³ were 349 ktCO₂ which represents 0.1% of UK total.

Planting example: 100 ha of tree planting every year will result in the annual removal of 6-19% of the estimated residual emissions in 2038 (assuming emissions reduction pathway followed⁴), rising to 92-160% of residual emissions in 2050⁵.




Harrogate

13,797 hectares of tree canopy cover¹ which represents 10.5% of total area. 41% of canopy cover is made up of trees outside woodlands².

CO₂ emissions in 2018³ were 1,081 ktCO₂ which represents 0.3% of UK total.

Planting example: 100 ha of tree planting every year will result in the annual removal of 2-6% of the estimated residual emissions in 2038 (assuming emissions reduction pathway followed⁴), rising to 30-52% of residual emissions in 2050⁵.




York

2,926 hectares of tree canopy cover¹ which represents 10.8% of the total area. 60% of canopy cover is made up of trees outside woodlands²

CO₂ emissions in 2018³ were 821 ktCO₂ which represents 0.2% of UK total.

Planting example: 100 ha of tree planting every year will result in the annual removal of 2-8% of the estimated residual emissions in 2038 (assuming emissions reduction pathway followed⁴), rising to 39-68% of residual emissions in 2050⁵.




Bradford

4,647 hectares of tree canopy cover¹ which represents 12.7% of total area. 58% of canopy cover is made up of trees outside woodlands².

CO₂ emissions in 2018³ were 2,036 ktCO₂ which represents 0.6% of UK total.

Planting example: 100 ha of tree planting every year will result in the annual removal of 1-3% of the estimated residual emissions in 2038 (assuming emissions reduction pathway followed⁴), rising to 16-28% of residual emissions in 2050⁵.




Leeds

9,468 hectares of tree canopy cover¹ which represents 17.2% of total area. 49% of canopy cover is made up of trees outside woodlands².

CO₂ emissions in 2018³ were 3,905 ktCO₂ which represents 1.1% of UK total.

Planting example: 100 ha of tree planting every year will result in the annual removal of 0-2% of the estimated residual emissions in 2038 (assuming emissions reduction pathway followed⁴), rising to 8-14% of residual emissions in 2050⁵.



Selby

5,988 hectares of tree canopy cover¹ which represents 9.9% of total area. 45% of canopy cover is made up of trees outside woodlands².

CO₂ emissions in 2018³ were 930 ktCO₂ which represents 0.3% of UK total.


Planting example: 100 ha of tree planting every year will result in the annual removal of 2-7% of the estimated residual emissions in 2038 (assuming emissions reduction pathway followed⁴), rising to 34-60% of residual emissions in 2050⁵.

1. Canopy cover estimate from Blue Sky National Tree Map™ dataset.
 2. Woodland defined as >0.5 ha based on the National Forest Inventory Woodland England 2018, Forestry Commission.
 3. UK Local Authority Carbon Dioxide Emissions, Department for Business, Energy and Industrial Strategy 2018.



4. Tackling the Climate Emergency: Emissions Reduction Pathway Report, 2020. West Yorkshire Combined Authority. Assuming residual emissions in 2038 are 18-27% of 2018 emissions.
 5. Assuming that the region's emissions continue to decline and reach 5% of the 2018 value by 2050.


What does it mean for your local authority?



Calderdale 4,336 hectares of tree canopy cover¹ which represents 11.9% of total area. 48% of canopy cover is made up of trees outside woodlands².

CO₂ emissions in 2018³ were 1,039 ktCO₂ which represents 0.3% of UK total.


Planting example: 100 ha of tree planting every year will result in the annual removal of 2-6% of the estimated residual emissions in 2038 (assuming emissions reduction pathway followed⁴), rising to 31-54% of residual emissions in 2050⁵.



Kirklees 6,199 hectares of tree canopy cover¹ which represents 15.2% of total area. 51% of canopy cover is made up of trees outside woodlands².

CO₂ emissions in 2018³ were 1,910 ktCO₂ which represents 0.6% of UK total.

Planting example: 100 ha of tree planting every year will result in the annual removal of 1-3% of the estimated residual emissions in 2038, (assuming emissions reduction pathway followed⁴), rising to 17-29% of residual emissions in 2050⁵.



Wakefield 4,778 hectares of tree canopy cover¹ which represents 14.1% of total area. 56% of canopy cover is made up of trees outside woodlands².

CO₂ emissions in 2018³ were 2,073 ktCO₂ which represents 0.6% of UK total.

Planting example: 100 ha of tree planting every year will result in annual removal of 1-3% of the estimated residual emissions (assuming emissions reduction pathway followed⁴), rising to 15-27% of residual emissions in 2050⁵.

Next steps

1 Each local authority White Rose Forest Group to complete internal discussions and make its recommendations for respective Director of Development sign off by end January 2021.

2 Remaining areas of North Yorkshire to be analysed and integrated into existing study, with North Yorkshire County Council signing off recommendations.

3 By end of February 2021, the White Rose Forest Steering Group approves final White Rose Forest Carbon Group recommendations as our first working target for increasing tree canopy cover by 2050.

4 White Rose Forest Plan presented to the Yorkshire Regional Leaders' Group in Spring or Early Summer 2021 (with existing invitation from Dan Jarvis).

5 Publish and launch White Rose Forest Plan on 1st August 2021.

1. Canopy cover mapping from Blue Sky National Tree Map™ dataset.

2. Woodland defined as >0.5 ha based on the National Forest Inventory Woodland England 2018, Forestry Commission

3. UK Local Authority Carbon Dioxide Emissions, Department for Business, Energy and Industrial Strategy 2018.

4. Tackling the Climate Emergency: Emissions Reduction Pathway Report, 2020. West Yorkshire Combined Authority. Assuming residual emissions in 2038 are 18-27% of 2018 emissions.

5. Assuming that the region's emissions continue to decline and reach 5% of the 2018 value by 2050.

