

Carbon losses from the proposed Rotary wood felling and compensation options

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Summary

In this report we summarise the effect on carbon loss of the proposed removal of woodland to make way for Harrogate Spring Water's bottling plant extension combined with their proposed woodland compensation scheme.¹ The best outcome for both climate change and biodiversity is to leave the existing woodland and let it grow to maturity on public land to create affectively permanent carbon storage. If removal were to occur, we recommend, as a minimum, that enough new woodland is planted to achieve carbon parity with the existing woodland by 2038, the date of Harrogate Borough Council's zero emissions target. Our calculations show that over five hectares of additional planting with careful management would be needed to achieve parity by 2038. This is around five times as much new woodland as currently proposed by way of compensation. The new planting further needs to guarantee as much permanence as planting on public land would achieve. We therefore recommend a land-purchase route. Ideally the land purchase would border the pinewoods to ensure both biodiversity and public amenity values are preserved.

Introduction

Trees are the most cost-effective method of removing unavoidable emissions of carbon dioxide (CO₂) from the atmosphere by taking it from the air and storing carbon as they grow. This process takes time and the rate of CO₂ uptake from the atmosphere (known as sequestration) and the total carbon stored vary over a tree's lifetime².

The UK Government has set a target of reaching next zero carbon emissions in 2050 and halving emissions in 2030³. Harrogate Borough Council have set more ambitious target of reaching net zero emissions in 2038.

What are the consequences of losing Rotary wood?

It is important to note that the carbon impacts of the proposed extension are much wider than just the loss of trees. The expansion of the bottling plant will increase CO₂ emissions through extra plastic bottle production and waste, transport emissions from distributing the bottled water, energy running the plant and the construction of the extension itself. Further, the carbon sequestration by trees in Rotary wood is just one aspect of the value of this greenspace. The woodland's public access, its commemorative significance, and its ecological benefits, are equally important.

What are the losses of carbon in Rotary trees?

The Woodland Carbon Code⁴ has been created by the Forestry Commission and others to provide a UK Government approved methods for calculating carbon benefits for woodlands. The Woodland Carbon Code allows for organisations to offset unavoidable emissions and have them officially included in their accounts. To the north of Rotary wood is Iron Gates wood (see Figure 1). Iron Gates is an example of a carbon offsetting scheme for the unavoidable emissions of Harrogate Conference Centre.

BOTTLING PLANT EXTENSION

Figure 8 Habitat lost / retained



Figure 1 Extract from Biodiversity Net Gain proposals illustrating habitat lost and retained⁵

We have used the Woodland Carbon Code to estimate the compensation requirements for the carbon stored in the trees in Rotary wood. These requirements consider the existing age of the woods, compared to the carbon value of replanting. The areas employed in the analysis were taken from the ecological report submitted as part of the application.

Using Harrogate Borough Council's net zero target date of 2038, the removal of 1.64 ha of Rotary woods and the proposed compensation by planting of new woodland will result in an estimated short fall of over 474 tonnes of CO₂ by 2038 (see below). The shortfall results from losing the existing 15 years' worth of carbon built up in the existing trees and an overall decrease in the woodland area.

This shortfall of CO₂ in 2038 can be compensated for by planting over 5.2 hectares of new woodland in the 2021 / 2022 planting season. The longer planting is delayed the more trees will be needed to make up for the lost time.

Compensation for the shortfall could be achieved sooner, for example in five years (2027). In this case a much larger area of planting (about 62 hectares) would be required to mitigate for the estimated 362 tonnes of CO₂ that the existing wood would have absorbed by this date. In the 5-year case the new woodland will have to make up the shortfall in carbon sequestration more quickly. The difference between the areas needed for parity in 2027 compared to parity in 2038 illustrates the importance of the existing wood for reducing near-term carbon emissions.

Another important factor for carbon sequestration of woodland is its permanence. It is only in near-permanent woodland that the sequestration benefits can be guaranteed. We therefore recommend that land is purchased for woodland planting to ensure as much guarantee of permanence as the existing Pinewoods. The purchased land would be best able to meet other ecological, biodiversity and amenity benefits if it is adjacent to the Pinewoods and has public accessibility. These factors are not addressed in our report, which focuses on carbon accounting only.

Comparing carbon losses and gains

The proposed woodland area that would be removed consists of 0.88 ha of Type 1 woodland (other mixed woodland) planted around 2002. As well as 0.76 ha of Type 2 woodland (young woodland), planted over 2005-2011⁵. Added to this is remanet area that is not planned for removal. This is a conservative estimate that assumes no trees were on site before 2002. The proposed compensation scheme plans planting both on the existing site and a new site (see Table 1).

Rotary wood - site baseline			
Habitat type	A-1 Woodland and forest - Other woodland mixed	A-1 Woodland and forest - Other woodland young trees planted	
Approx. planting date	2002	2005-2011	
Area (hectares)	0.88	0.76	
Rotary wood - developed site			
Habitat type	A-4 Woodland and forest - Succession of remaining woodland	A-2 Site habitat creation Urban woodland	A-4 Site habitat succession - scrub planted as woodland
Approx. planting date	2005-2011	2022	2022
Area (hectares)	0.08	0.01	0.07
Off site habitat enhancement			
Habitat type	D-2 Proposed Habitat: Woodland and forest - Other woodland broadleaved	D-4 Offsite habitat succession Woodland and forest - Other woodland broadleaved	
Approx. planting date	2022	2022	
Area (hectares)	0.11	0.86	

Table 1 shows the areas of woodland in Rotary wood now, after development and woodland in off site mitigation, as defined by the ecology report (excluding the orchard).⁵

Figure 2 shows the carbon sequestration potential from the existing wood. The black line in Figure 2 shows the total sequestration summed over the different areas. This indicates that by the end of 2020 Rotary wood had already sequestered more than 237 tonnes of CO₂. By 2027 the wood will have sequestered over 362 tonnes of CO₂. By 2038, the wood will have sequestered over 620 tonnes of CO₂.

In contrast Figure 3 shows the sequestration if the planned felling of the Rotary wood occurs in 2021 and there is a planting compensation scheme as outlined in the ecological report.

The proposed compensation planting both on site and at the new site amounts to 1.05 ha. This, together with the remnants of the Rotary wood could sequester 146 tonnes of CO₂ by 2038. The new planting sequestering 120 tonnes of this total. So, if the Rotary wood were felled, there would be a 474 tonnes of CO₂ shortfall in 2038. This would be a debt to Harrogate's carbon account. To meet the shortfall would require over 5.2 hectares of additional compensation woodland to be planted. This is around 5 times larger than the currently proposed area for compensation.

By 2027 the new planting would only have sequestered about 6 tonnes of CO₂. This would lead to a shortfall of over 342 tonnes in 2027, compared to the existing woodland. So, to compensate for the loss within five years would require a very large area of woodland to be planted, about 62 hectares.

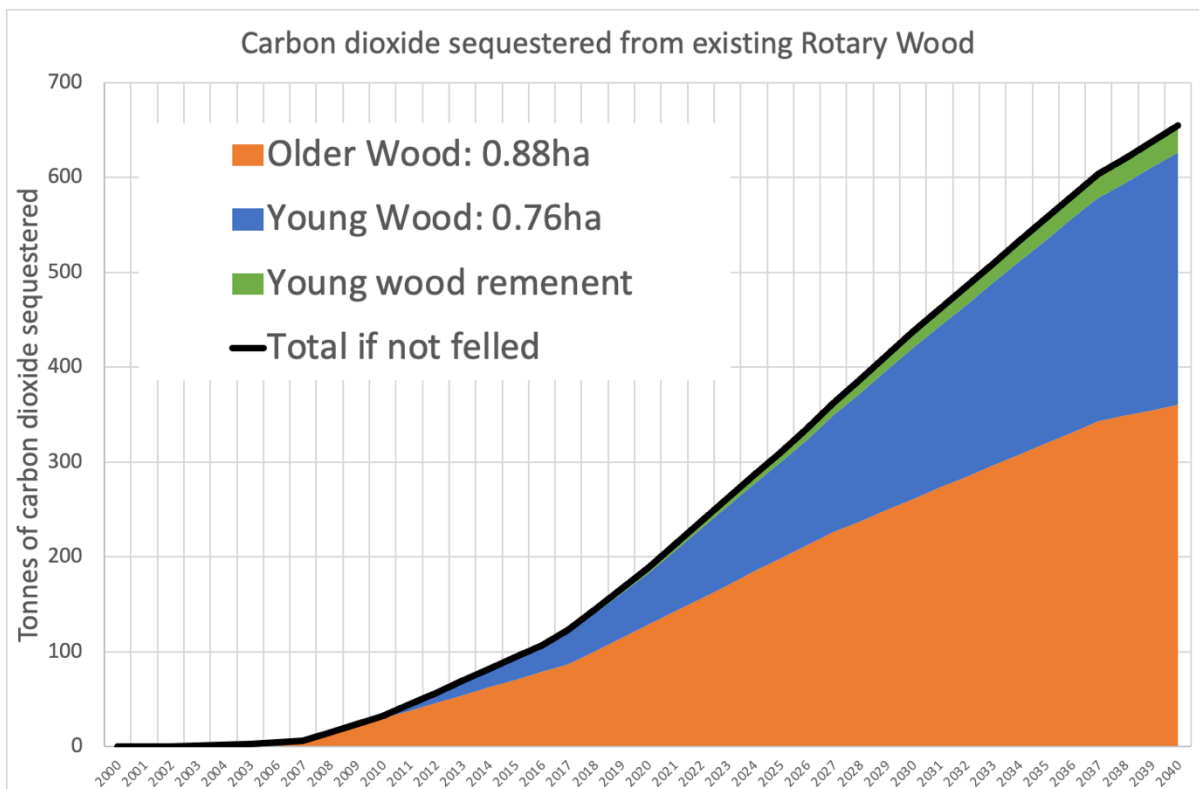


Figure 2 Shows the carbon sequestered by the existing Rotary woodland, split by different woodland areas, see Table 1. Calculations are based on the UK Woodland Carbon Code⁴.

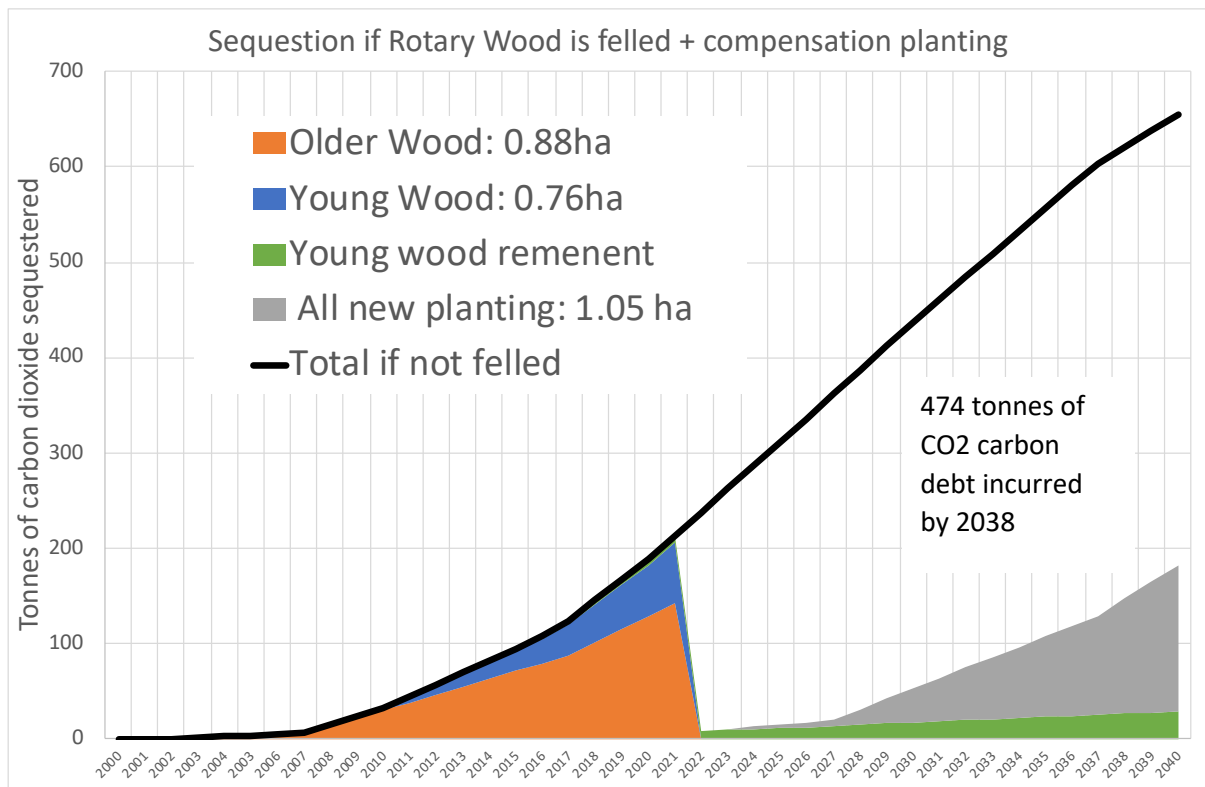


Figure 3 shows the carbon sequestered if the majority of the existing Rotary wood is felled in 2021 and there is 1.05 ha of replacement planting as described in the currently proposed compensation scheme (off site and on existing site). The black line shows the total carbon sequestered if the wood is not felled for comparison. This assumes that the new wood is planted in the 2021/22 winter season.

References

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