

Purbeck Forest Design Plan Heathland Restoration Proposals (2012-2026)

Environmental Statement Addendum: Carbon Assessment

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Introduction

- 1.1 **Chapter 9** of the Environmental Statement (ES) considers the carbon balance of the proposed heathland restoration proposals. The assessment quantifies the change in the carbon balance associated with:
 - a) the restoration of the heathland areas between 2012-2026 as proposed in the revised Purbeck FDP, compared with:
 - b) the restocking of conifer woodland within the areas proposed for heathland restoration (i.e. the 'do-nothing scenario').
- 1.2 Following further discussions with Forest Services, it was requested that the assessment should be extended to consider the **long-term** impacts on the carbon balance resulting from the land use change – i.e. covering a 100 year period, rather than the period from 2012-2026.
- 1.3 It was also requested that the assessment should consider the potential loss of carbon emissions savings associated with the use of the felled trees for other purposes (e.g. biomass fuel) in place of fossil fuel products.
- 1.4 This addendum sets out the results of these two additional assessments.

Assessment Methodology

Long-term Carbon Balance

- 1.5 The carbon balance assessment presented in the ES considered the period 2012-2026.
- 1.6 This addendum uses the same assessment approach to examine the potential changes to the carbon balance that could occur as a consequence of the change in woodland land use between the 'do-nothing scenario' and the revised Purbeck FDP as set out in paragraphs 9.11-9.18 of the main ES. However, calculations have been extended to consider a 100 year period (2012 – 2111).
- 1.7 As with the earlier assessment, the change in land-use type between the two scenarios was compared, taking in to account the change in the revised felling programme. However, given the length of the assessment period, a second felling has been incorporated within the calculations and has been assumed to occur 50 years after the first felling exercise.

Carbon Associated with Felled Wood

- 1.8 The Forestry Commission (FC) acknowledges within its Grants and Regulations Operations Note 032 – *Carbon Assessment in Environmental Statements Relating to Deforestation* (July 2013) that 'The ability of harvested wood products to mitigate greenhouse gas emission by either storing carbon directly or substituting for materials or fuels with higher levels of embodied energy/carbon is difficult to quantify because of the nature of the harvested wood products, their destination,

use, time in use and method of disposal are all uncertain'. However, within the Note the FC provides indicative factors for the estimation of the theoretical reduction in carbon storage in harvested wood products.

- 1.9 The factors, calculated over a 100 year time period, are described by the FC as being based on the highly conservative assumption (in terms of carbon savings) that all biomass is used as a substitute for coal in electricity production. The factors also allow the mitigation potential of the restored open habitat to be included in the calculation.
- 1.10 The tonnes of carbon dioxide equivalent per hectare (tCO₂e/ha) factors have been used in conjunction with available data relating to land use change and the area of forest affected to estimate the total tonnes CO₂e emissions potential.
- 1.11 This assessment only considers the revised Purbeck FDP (Project Case) and not the 'Do-nothing scenario' (Base Case) as it seeks to assess the potential carbon savings that may be lost due to the change from wood producing forest to heathland.

Impact Assessment

Long-term Carbon Balance

- 1.12 **Table 1.1** presents the total sequestration (in tCO₂e) associated with each of the forest blocks for the two scenarios for the 100 year period between 2012-2111.

Table 1.1: Total Sequestration (tCO₂e) for Each Block, up to 100 Years (2012-2111)

Forest Block	Base Case	Project Case
	Do-nothing scenario	Revised Purbeck FDP
Affpuddle	14923	2891
Gore Heath	2722	534
Hethfelton	936	302
Moreton	3422	677
Puddletown	4509	848
Purbeck	11992	5973
Wareham	12023	2524
Total	50525	13750

- 1.13 The results in **Table 1.1** show that for the 100 year period between 2012-2111, there is a decrease in the calculated amount of sequestered carbon between the Base Case (Do-nothing scenario) and the revised Purbeck FDP.
- 1.14 These results differ from those in the ES where total sequestration was similar between the two scenarios (and lower in the 'do-nothing scenario'). This is because the highest sequestration rates occur for pine species aged 30-45, and these rates have been captured within the much longer 100 year assessment period.
- 1.15 Results of this assessment show that the impact of the carbon balance is **adverse** in the timeframe considered but actual emissions will depend upon the long term management of the areas considered.

Carbon Associated with Felled Wood

- 1.16 Based on the FC's factors and project data, the estimated carbon stock which will be lost as mitigation potential (ie will not be able to be used as a fossil fuel substitute) as a result of the change in land use from pine and native woodland to lowland heathland (felling of wood) is 122,828 tCO₂e. This means that if the forest areas that are proposed for heathland restoration were restocked and the wood from the felled trees used as a fossil fuel substitute, this would equate to 122,828 tCO₂e of carbon savings.
- 1.17 This is a 'worse case' estimate as it assumes that all biomass is used as a substitute for coal in electricity production. In reality the loss of carbon savings will lie somewhere in the range zero (ie if the wood is used in products) to 122,828 tCO₂e (if the wood is used a fossil fuel substitute). A much smaller proportion of the felled wood is likely to be used as a fossil fuel substitute than is assumed in this simplistic assessment.
- 1.18 **Table 1.2** presents the likely split of timber usage, based on existing contracts and assumptions relating to timber quality among other factors. Forest Enterprise will not have control of the end use of wood sold to timber merchants and, therefore, further analysis is not appropriate. It is also not possible to accurately predict the potential end use of the wood over a 100 year period.

Table 1.2: Likely End Use of Timber Felled

Likely End Use of Timber Felled	Percentage of Total
Fencing (posts, rails, featheredge and panels)	33%
Chipboard (either as retailers' kitchen or flooring grade)	30%
'Industrial' fuelwood (sawmill co-products sold on)	25%
Bagged firewood	5%
Pallets	3%
Race horse gallops	2%
Fuelwood woodchips used in sawmill (e.g. burned to heat kilns)	2%

Proposed Mitigation

- 1.19 No additional mitigation measures are required over and above what is set out in the ES.
- 1.20 It is not possible to mitigate for the loss of carbon saving potential associated with the use of the wood as a fossil fuel as the Forestry Commission do not have control over the end use of the timber.

Residual Impacts

- 1.21 Results of this assessment show that the impact of the carbon balance of biomass is **adverse or negative** in the 100 year timeframe considered.
- 1.22 The loss of the potential carbon savings from the use of the wood as a fossil fuel substitute is also **adverse**, however, this assessment is highly conservative and simplistic. In reality the carbon saving potential is likely to significantly less if current uses of the felled timber as set out in **Table 1.2** continue in the future.

Further Survey Requirements and Monitoring

1.23 This assessment has not identified the need to undertake any surveys or monitoring.

Summary of Impacts

1.24 **Table 1.3** summarises the predicted impacts of the proposed heathland restoration proposals.

Table 1.3: Summary of Impacts

Predicted Impact	Significance	Mitigation	Significance of Residual Impact
Change in carbon balance from biomass stock in the assessment period	Adverse	Management and maintenance activities as listed within the ES	Adverse – there will be an estimated net reduction in carbon sequestration during the assessment period
Loss of carbon savings potential from use of felled timber as a fossil fuel substitute	Adverse	Management and maintenance activities as listed within the ES	Adverse there will be a loss in carbon saving potential

Appendix

Table A.1: Assumptions

Aspect of Assessment	Assumptions
Long-term carbon balance	Second felling exercise occurs 50 years after first felling for all species and blocks in the 'do-nothing scenario'
Carbon associated with felled wood	All pine species assigned Scots pine emissions factor. Birch scrub and alder have been assigned native woodland emissions factor.