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# Nature-based Solutions

Feature

# Clyst Canopy: A Local Test of CIEEM Carbon-offsetting Principles

Figure 1. Aerial view of the Clyst Valley 2019 with Cranbrook top, Ashclyst Forest top right, Percy Wakley Woodland Trust middle left and the Whimple orchards lower right. Photo credit: Still Imaging.

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East Devon District Council has an ambitious target for tree cover in the Clyst Valley, just east of Exeter, Devon. A grant has been secured through the Natural Environment Investment Readiness Fund to establish whether private investment can be stacked alongside Woodland Carbon and Biodiversity Net Gain credits to reach a financial tipping point and persuade landowners to convert from crops and livestock to trees. In this article I explore whether this can be achieved while upholding the CIEEM carbon-offsetting principles.

## Local context

Exeter and the 'west end' of East Devon is experiencing considerable growth. Working across boundaries, local authorities generated a Green Infrastructure strategy which first set out the concept of a Regional Park, a major green/blue space centred on the flood-plain and river of the Clyst (Figure 1). East Devon's Local Plan safeguards land for this park that is equivalent to half the size of Exeter.

All the land is in private ownership, so landowners must be persuaded to change land use practices, leading to "more, bigger, better and joined up" priority habitat as advocated in *Making Space for Nature* (Lawton *et al*. 2010). The 25 year Clyst Valley Regional Park master plan guides the work of partners and won the 2021 south west regional Royal Town Planning Institute award for planning excellence.

The Clyst Valley is characterised by much pastoral land grazed predominantly by dairy cattle. The river itself is little more than a stream for most of its length, but floods on to extensive plains south of Broadclyst before entering the Exe

Estuary Special Protection Area at Topsham. Woodland cover presently stands at 9%, well below the UK average of 12%. The most substantial block is Ashclyst Forest, created in the 19th century. Much of the National Trust Killerton estate is within the Regional Park and supports an impressive 1200 ancient and veteran trees in parklands, fields and hedgerows.

## Projects underway

Drawing on Green Recovery Funds, the National Trust has an exciting programme of habitat creation and restoration underway: 18 ha of woodland and 40 ha of wood pasture creation, recreating 4 km of lost hedges, establishing 5 ha of agroforestry and river restoration on the River Culm (the latter is funded through Interreg). Using Heritage Lottery funds, between 2017 and 2019, East Devon District Council (EDDC) ran its Great Trees project, resulting in 1.5 ha of new woodland planting, 5 ha of parkland restoration and the creation of two new orchards and 100 m of new hedgerow. More than 300 trees were added to the Ancient Tree Inventory by volunteers, including one oak estimated to be 700 years old, situated on an old parish road (Figure 2).

Figure 2. Volunteers learning how to record ancient and veteran trees for the Woodland Trust's inventory. Photo credit: Jenny Steer.

However, it was after watching the last episode of *A Perfect Planet*, Sir David Attenborough's latest BBC film, that the author decided to re-treble efforts to tackle the twin climate and nature emergency. Among partners there was agreement that an ambitious long-term target for 30% tree cover in the Clyst Valley was achievable. We are beginning to hear a softening of attitude towards nature conservation from some dairy farmers. In large part this is due to Arla Food's policy that 10% of land on farms supplying milk to its cooperative should be managed for biodiversity.

Figure 3. The upper Clyst valley landscape at Whimple, with traditional orchards and hedgerow trees in between pastoral meadows. Photo credit: Simon Bates.

## Clyst Canopy: a project to deliver 30% tree cover

EDDC led a successful bid to the Natural Environment Investment Readiness Fund, a programme designed to scale up private investment in nature. Our goal is to explore whether an Environmental Impact Bond (EIB) can deliver green infrastructure. An EIB is a mechanism for raising up-front capital that provides a financial, social *and environmental* return on investment. In our project, we're mostly interested in creation of riparian woodland habitat, the associated improvements in water quality and the demonstrable health benefits accruing from public access. However, our first milestone is to calculate the revenue that would be required to persuade farmers to convert land to trees, the so-called tipping point. Can this be achieved by blending cash from publicly funded grant schemes with private finance from Woodland Carbon and Biodiversity Net Gain credits, and additional capital for public goods?

## The CIEEM principles for carbon offsetting

The CIEEM principles for carbon offsetting were developed to guide CIEEM's own selection of offsetting projects and to take account of PAS 2060 (the international standard for the quantification, reduction and offsetting of greenhouse gas emissions), the Oxford Offsetting Principles and the recent Environment Agency review of offsetting approaches. How does the Clyst Canopy project potentially stack up against all of the CIEEM principles?

**Principle 1: Additional – it is fundamental that offsetting funds do not pay for work that would have happened anyway**

There is no problem here: the land is in private hands and without our intervention is likely to remain in productive agricultural enterprises. However, in order to claim a carbon offset credit it is essential to demonstrate that the greenhouse gas reductions would *not* have occurred in the absence of a market for offset credits (see www.offsetguide.org/high-quality-offsets/additionality/). Specifically, for the Woodland Carbon Code (WCC), at least 15% of the project costs must comprise Woodland Carbon Units.

**"By focusing woodland creation in the riparian and flood-plain zone we should see an improvement in water quality, as suspended sediment is prevented from reaching and causing pollution of the watercourses."**

**Principle 2: Verifiable – verification and certification of the $CO_2$ offsetting in a transparent and accountable process**

The WCC is the voluntary standard for UK woodland creation projects and is accredited by the International Carbon Reduction and Offset Alliance (ICROA). Independent validation and verification to this standard provides assurance and clarity about the carbon savings of these sustainably managed woodlands where there is a permanent land-use change to woodland. A Woodland Carbon Unit is a tonne of $CO_2$ that has been sequestered in a WCC-verified woodland.

**Principle 3: Remove $CO_2$ from the atmosphere – nature-based solutions that create new habitats and restore existing habitats and ecosystems that will help to address the biodiversity crisis and deliver ecosystem services**

The 30% canopy goal is to be achieved through (1) ensuring our existing old growth trees are in sustainable management, (2) new woodland planting and natural regeneration, (3) wood pasture/parkland restoration, (4) shelterbelt/hedges and (5) agro-forestry.

Clyst means 'clear water' in Old English, but sadly the River Clyst often runs red with soil from the catchment. The Environment Agency has assessed that water bodies within the catchment are currently failing to meet Good Ecological Status/Potential under the Water Environment (WFD) Regulations 2017. The whole of the catchment is covered by a Nitrate Vulnerable Zone because the permeable soils do not protect the underlying aquifer from nitrate pollution. By focusing woodland creation in the riparian and flood-plain zone we should see an improvement in water quality, as suspended sediment is prevented from reaching and causing pollution of the watercourses. Woodland buffer strips need to be a minimum of 12 m wide (Environment Agency 2020). Once settled, the soil-associated fungi and bacteria help to safely lock up nitrates and phosphate, agricultural chemicals and hydrocarbons, thereby stopping them entering the watercourse.

**Principle 4: Permanent – the $CO_2$ removed from the atmosphere should not be released in the future except through natural processes**

Although our priority is to deliver new broadleaved woodland through natural regeneration, much will need to be managed. Do we have a problem here?

Harvesting timber is essential in the fight to reduce our greenhouse gas emissions. The UK 6th Carbon budget highlights that twice as much land would need to be afforested if we do not use the timber to replace carbon-heavy building materials. Timber could be in use for generations, ensuring that the carbon is locked up more permanently than if it is left to decay. Faster-growing species sequester carbon sooner, and time is a luxury we no longer have.

Our most valuable ancient woodlands have been managed, and lack of management is a cause of condition failures, giving rise to dense shade, poor herb layers and inadequate recruitment of trees and shrubs. Some habitats have a long history of regular and routine management by humans, often with domestic animals, for example woodlands, hedges, grasslands, heathlands, reed swamps and ponds. Such habitat management is as much a natural process that disrupts part of an ecosystem as a major storm creating a swathe of felled trees in a woodland (such as the great storm of 1987), a major flood covering riverine meadows in silts, a frontal sand dune system being remodelled by a severe storm or an infestation by an insect such as heather beetle or a disease like ash dieback.

The intention of this principle is to exclude projects that would result in a permanent loss of sequestered carbon, for example the conversion of permanent grassland to arable or built development. The intention is not to exclude those habitats that are

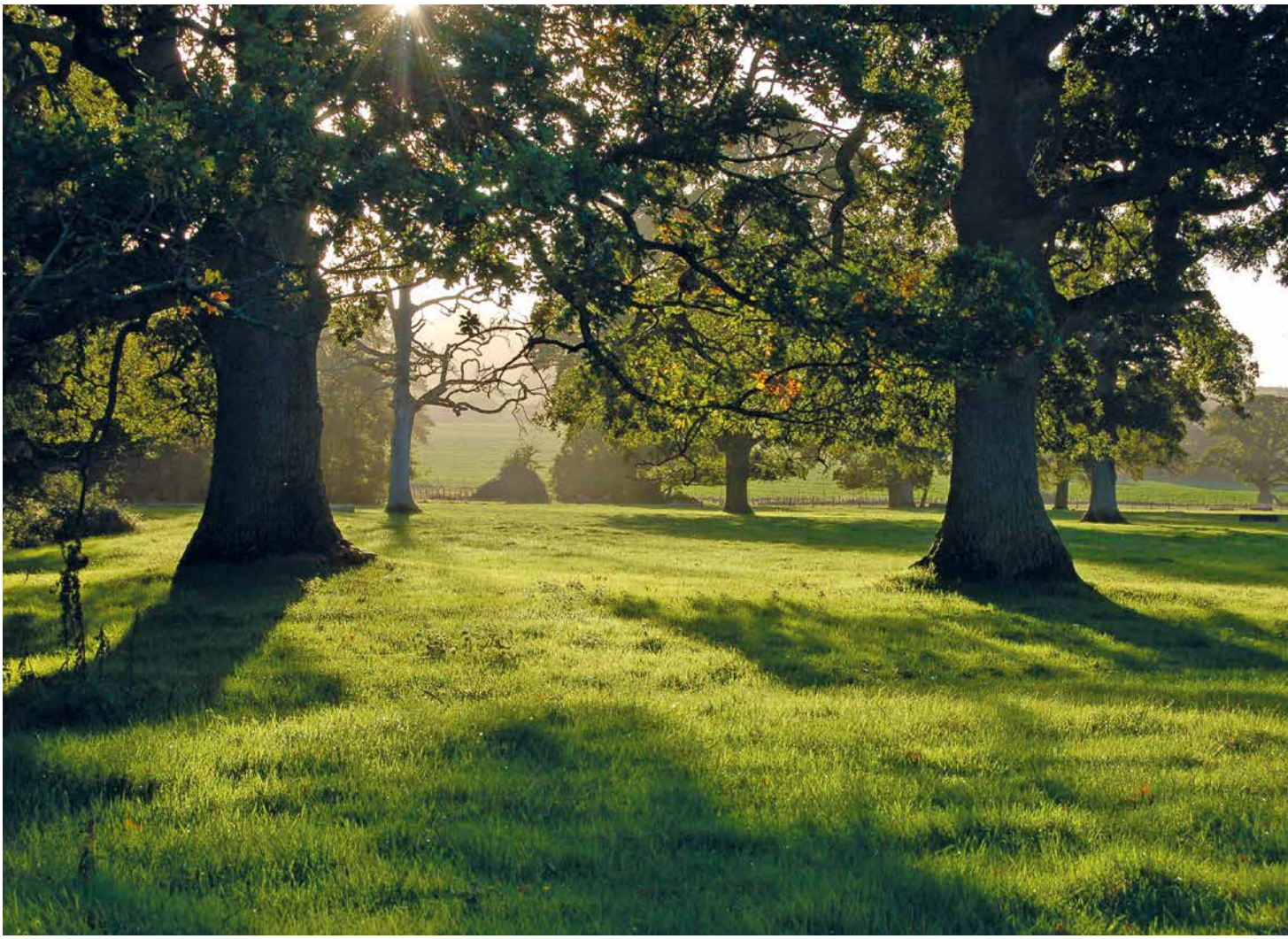

Figure 4. A shadow of its former self: parkland at Poltimore is now being restored. Photo credit: Simon Bates.

managed in ways where sequestered carbon is temporarily converted to $CO_2$ and lost from the habitat. The WCC is very conservative in this respect. For example, soil carbon sequestration can only be claimed for projects on a mineral soil where the previous land use was arable or rotational grass and the woodland will be managed as minimum intervention.

Therefore, I would like to propose a change to this principle as follows: Permanent – the $CO_2$ removed from the atmosphere should not be released in the future except through natural processes *and habitat management*.

**Principle 5: Undertaken in real time – $CO_2$ emissions should be offset simultaneously with their generation or over a defined short period of time**

The principle of simultaneous offsetting is more demanding. New $CO_2$ emissions will accumulate in the atmosphere and nature-based schemes should be removing $CO_2$ from the atmosphere at the same time and at the same rate as it is being added by the operations and activities of the organisation seeking the offset.

John Box has likened the present global situation to an overflowing bath, with water as a metaphor for $CO_2$ (Box, 2021). The bath is full and the overflow pipes (the natural sinks of vegetation and the oceanic environment) are overwhelmed. The house is collapsing under the weight of water. The taps need to be turned down and the overflow pipes widened!

It would be ideal for us to tie specific investors to specific woodland creation schemes. In fact, we're hoping that companies will pay more for 'Clyst carbon' precisely because they can see the project from their window! If that investor demonstrated a verifiable programme of emissions reduction, as a company, then in a sense offset would proceed hand in hand with reduction. Carbon sequestered under a WCC project is calculated in 5 year intervals and varies between time periods, with less sequestered in the early years of the overall 100 year timespan. However, as long as the carbon is emitted in the 5 year assessment period, then it can be offset by woodland carbon.

**Principle 6: Based locally – offsetting schemes should ideally be based in Britain or the island of Ireland**

Again, there is no problem here. Indeed, verified using the WCC we will market Clyst carbon to Exeter-based businesses aiming to offset their carbon. We will aim for a £5 uplift on the average price of UK Woodland Carbon Units. This could yield revenue of £3.15 million in the next 25 years. We hope investors agree that woodland carbon is attractively under-priced at the moment.

> **The next steps are to calculate the financial, social and environmental tipping points needed to persuade farmers to create more habitat featuring trees.**

**Principle 7: Avoid negative impacts – offsetting schemes should have a very low risk of creating unintended consequences for people or the environment**

We are absolutely alive to the recent issues where existing non-woodland habitat has been damaged by tree planting caused by an over-reliance on remotely analysed habitat data. WCC projects must conform to the UK Forestry Standard and compliance is checked at validation and verification. EDDC has recently appointed a district ecologist with experience in habitat identification and assessment.

Every potential woodland creation site that comes forward, regardless of size, will be surveyed on the ground by an ecologist that meets the competency level of 'accomplished' for habitat identification and evaluation (CIEEM 2021). Field survey methods and reporting would follow the *Guidelines for Preliminary Ecological Appraisal* (CIEEM 2017). The aim would be to generate a habitat map to UK Habitat Classification Level 5 (see www.ukhab.org.uk). This would then inform which sites are suitable for natural regeneration towards broadleaved scrub and woodland and/or planting to woodland, parkland, orchard or other habitat with trees. It would also inform where non-tree habitat restoration or creation should take priority.

The greater challenge is likely to come from the farming community. With our Grade 1 and 2 agricultural soils, many argue that food production on the doorstep of a growing population should take precedent, especially given disruptions in global food trade as a result of the war in Ukraine. We presently import about 40% of our food and 80% of our timber. We believe it is feasible to treble the tree canopy without reducing home food production by targeting woodland creation on flood-plains in particular, bringing a host of other environmental, social and economic benefits.

## Conclusions

Our work looking in detail at 10 farms representative of the range found in the Clyst Valley has started to illuminate some of the challenges we will need to overcome. We've learned that Biodiversity Metric 3.0 does not favour conversion of flood-plain grazing marsh to woodland, even if that marsh is actually improved grassland with poor botanical value. This is principally due to the fact that Natural England has removed the 'accelerated succession' factor for woodland. In my opinion this is a mistake: early succession woodland supports greater insect biodiversity and abundance, which has benefits for wildlife further up the food chain.

The next steps in this project are to calculate the tipping points that we need to exceed to persuade farmers to create more habitat featuring trees. These tipping points are both financial/social, for example attitudes to risk and to the value of trees, and environmental. Delivering woodland creation in early 2023, ideally on an intensively managed farm, may be crucial in winning support from other farmers and also potential investors.

The CIEEM offsetting principles are essential to ensure that, at this important time, projects demonstrably and robustly alleviate both the nature and climate emergencies. I have tested them against our local Clyst Canopy project, and vice versa. I suggest one modification to the principle of permanency. The principles have helped me to identify risks and weaknesses in our project before we get stuck into delivery. I recommend that CIEEM members use them routinely in their project management.


## Acknowledgements

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