

Plastic Free Woodlands

Impact Report

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YORKSHIRE DALES
MILLENNIUM TRUST



Plastic Free Woodlands

Thanks to the European Outdoor Conservation Association (EOCA) we have made real progress in removing redundant plastic tree shelters from the Yorkshire Dales landscape, championing alternatives and highlighting the issue of plastics in forestry nationally over the last 18 months.

The project has removed an estimated 38,000 shelters for recycling through Tubex. We have brought volunteers, community groups and landowners together to tackle the issue.

In 18 months we have achieved a phenomenal amount. Alternative shelters have been installed at nine sites across the Yorkshire Dales and Nidderdale as we aim to reduce the use of plastic in forestry.

Central collection points have been established, as has a hub for the re-use of shelters, and we have worked with a number of groups and organisations including the National Trust, Nidderdale AONB and Yorkshire Dales National Park Authority, as well as local environmental groups.

We have also helped to formulate best practice with the Environment Agency and share it across the industry as this is the first UK tree shelter recycling scheme to be established.

The legacy of the project will continue. We are committed to two central collections over the course of 2022/23, will host a conference

to update on progress of plastic in woodland creation and engage more communities in understanding the issue of plastic in our landscape.

Nationally, the Forest Plastic Working Group (FPWG) will continue to advocate and facilitate good practice around the use of plastic in forestry, research and share information on tree shelter alternatives, and promote the environmental benefits that result from forestry and forest management.

This couldn't have happened without your support - we are proud to work with EOCA and of the legacy we have developed together.

Please enjoy this Impact Report, which also includes early conclusions from our alternative shelter trials. Thank you.

Together, we have achieved:

Collections - 38,000 shelters have been collected from three sites at Skipton, Appersett and Beamsley.

Volunteering - More than **200** volunteers have taken part over **14** days. They have cleared an estimated **4,000** shelters, with an additional **400** set to be reused.

Woodlands - We have planted **11,430** trees over **nine** hectares. Each site has a variety of alternative shelters.

Forest Plastic Working Group - The group is meeting quarterly, sharing best practice and is producing a guidance document, field trips and case studies.

Michael Briggs from the Yorkshire Dales National Park said: "Team work makes the dream work and what an improvement we've seen in the landscape. Our Young Rangers worked on a site in Arkengarthdale where the July 2019 storm had devastated 100s of tree shelters. The local Beavers, Cubs and Scouts have been out too and their work has prevented plastic tree shelters, some of which are 20-years-old, washing into Shaw Beck and then floating down via the Arkle Beck, Swale, Ure, Ouse and Humber into the North Sea. We're pleased to have been part of the project and will continue to collect shelters for recycling well into the future."



Shelter Removal

Plastic Free Woodlands has already seen a vast number of shelters removed from the region's woodlands.

- We have worked with more than 10 groups and partners to remove plastic for recycling.
- The central collection points at Craven Auction Mart and Appersett saw more than 33,000 shelters dropped off over three days. These have been recycled by project partner Tubex.
- An additional 5,000 were collected at Beamsley in a pilot scheme.

Together, we have achieved:

- **14** volunteering days have taken place to remove plastic from woodlands.
- **4,000+** shelters are estimated to have been removed by volunteers.
- **200+** people have been involved including young people and children experiencing vulnerabilities, alongside community groups.
- **400+** shelters held at a special hub for reuse by the public thanks to a partnership with the Yorkshire Dales National Park.
- **Policy** - our project has helped find best practice when recycling tree shelters.



We have established a central collection point for shelters that can be reused.

Establishing change in redundant shelter recycling

Creating an environment for the easy recycling of redundant tree shelters has begun thanks to the Plastic Free Woodlands project.

Historically, the options for the recycling of old shelters were limited, with some ending up in landfill or removed as part of agricultural waste services.

Plastic Free Woodlands worked with Tubex to pilot a scheme where shelters could be collected from the 'farm gate' before being sent for recycling at a specialist plant in south Wales.

From there, having established the economics, we set up two central collection points where landowners could drop off their shelters for recycling. This removed the cost of the 'farm gate' collection and meant more plastic could be

recycled into new products or, in some cases, reused by the community in their small planting schemes.

We worked with the Environment Agency to ensure best practice in waste regulation, not only for the storage of shelters at the collection points, but the process of removing them from commercial property. This has formed the basis of national regulation framework for central collections and shelter recycling going forward.

The project has shown that recycling is a real cost-effective option provided there is significant resource available to landowners to remove shelters. We had the luxury of using local communities to remove the shelters and that is essential as we look to step up the project in the years to come. Without that support, many shelters may have been left to degrade in the landscape.



Creation

We have planted new woodlands across the Dales and Nidderdale trialling alternative tree shelters.

- Since 2020, 11,430 trees have been planted over nine hectares.
- Each site has a variety of alternative shelters including cardboard, biopolymer, and other types of material.
- We now have nine trial sites that feature alternative shelters.

Together, we have achieved:

- **1,500+** alternative shelters have been planted in the landscape alongside traditional silvicultural methods.
- **New shelters** - the project is helping to develop new shelters and products thanks to our research and feedback.
- **National Trials** - Plastic Free Woodlands is feeding into Forest Research's national trials at Aviemore and Tunstall Forest. At these sites, more than 15 alternative shelters will be analysed over the next six years. We have also helped Forest Canopy and other organisations with their trials and provided advice to other landowners.



You have helped us to plant woodland to the equivalent of 12 football pitches.



Finding an alternative shelter ... what next?

The project aimed to research alternative tree shelters and feed the results into the national trial that Forest Research is undertaking on behalf of the FPWG.

We originally identified six sites to trial shelters - five in the Yorkshire Dales and one in Nidderdale - but have since added three more as the number of alternative products available to aid woodland creation increased.

The original six woodlands were chosen to give a mix of differing landscapes - upland, lowland and riparian - whilst an additional three allowed us to test shelters in other situations.

Each were planted with alternative types, alongside normal Tubex and Suregreen shelters. We asked landowners, their volunteers and contractors, to plant

50/50 with oak and rowan to establish a fair trial. This didn't occur on all sites, but we tried to ensure consistency in planting with the shelters used.

Standard commercially available 0.6m shelters were selected. Two were cardboard, and a third cardboard type had a vegetable coating. There was one compostable plastic spiral, one bioplastic shelter and one that contained sheep's wool and resin.

In the newer sites, we used plant based natural fibre shelters and spirals, a differing type of bioplastic, and another shorter cardboard shelter. We will continue to infill with any new products that become available.

You can read about the trials, and some early conclusions, over the next few pages.

Methodology

We trialled alternative shelters following the same method to ensure consistency in monitoring:

- Each site was given up to six trial shelters - and bamboo stakes.
- We asked for them to be planted 50/50 with oak and rowan.
- Each site was monitored monthly.
- Planted between Dec 20 & Mar 21, with new sites Nov 21 to March 22.

In practice ... some observations:

- Planting consistency was mixed. Some sites used contractors, whilst others planted themselves or used volunteers.
- At the monthly visits, we checked the shelters for signs of wear, browsing, weed ingress, and general growth of the tree. One site suffered from browsing and possible livestock damage early in the trial and that made subsequent monitoring difficult.
- We continued to maintain the sites to ensure proficient growth of trees - this included weeding and straightening of shelters.
- All trial sites had three significant storms to contend with.
- Some of the original products used were superseded by newer versions. EarthBoard was a developing product and therefore we replaced nearly all on our sites after the first year.

The shelters at installation:



Ezee Tree Guard

Cardboard shelter



EarthBoard Tree Guard

Cardboard shelter



Greentech Greenguard

Cardboard shelter



Tubex Nature

Bio-based shelter



Treebio Spiral Guard

Bio-based shelter



NexGen Tree Shelter

Sheep's wool and resin

Site 1

Location: Lancashire, 229ft above sea level, grazed.

- **Trial areas** - Grazed section but fenced, existing young woodland area, field margins (fenced), short hedging.
- **Treatments** - Tubex Nature, Greentech Greenguard, Ezee Tree, Treebio Spiral Guard, EarthBoard Tree Guard.
- **Browsing** - No sign on site throughout trial, possible in existing woodland area.
- **Notes** - Planted by students in March 2021, variety of species within shelters, replaced EarthBoard Tree Guard with new version of existing shelter in early 2022 as well as BMP Tree Hugger.



May 2022 Update:



Tubex Nature - not shown signs of degrading and is stable within the planting. The tops have started to fray slightly.

EarthBoard - most of the shelters failed after 12 months but have been replaced with updated versions.

Treebio Spiral - no issue but do need constant maintenance when using hawthorn as whip will grow through sides.

Greentech Greenguard - shelter has flaked and some losses in young woodland area. These are double staked.

Ezee Tree - some losses in young woodland area but not in others. Shelter seems to be robust on this site.

Site 2

Location: Yorkshire Dales, 703ft above sea level, ungrazed.

- **Trial area** - Former quarry spoil area, around 10ft above river, unfenced on all sides.
- **Treatments** - EarthBoard Tree Guard.
- **Browsing** - Deer are known to browse the area.
- **Notes** - Planted by volunteers in December 2020. Site had issue of stakes being taken out of the shelters and used, possibly, by campers in the area. Used 'version one' of the EarthBoard Tree Guard and these were replaced by BMP Tree Hugger in March 2022.



May 2022 Update:



The **EarthBoard** (version one) remained on this site until March 2022 when the decision was taken to replace it as we increased the number of our monitoring sites. It performed well for 15 months, considering how exposed the site is to the weather and browsing. There's no doubt that the newer EarthBoard would last on this site for considerably longer.



BMP Tree Hugger - these shelters are derived from renewable resin tapped from pine trees blended with a plant based natural fibre. These will be monitored going forward on a quarterly basis.

Site 3

Location: Yorkshire Dales, 784ft above sea level, riparian, formerly grazed.

- **Trial area** - True left bank above river that occasionally floods drastically. Water in underground stream. Site is fenced.
- **Treatments** - Greentech Greenguard, Ezee Tree, Treebio Spiral Guard, EarthBoard Tree Guard.
- **Browsing** - Deer are known to browse the area.
- **Notes** - Planted by contractor in January 2021. Limited replacement of shelters to date.



May 2022 Update:



Ezee Tree - have 'cured' on site. There has been two losses from the original planting through vole browsing and exposure to the elements.



Treebio Spiral - needs some maintenance but have performed well. Originally, these replaced PVC spirals, which were planted in error.



Greentech Greenguard - six losses on site due to cattle, weathering and some browsing. Those that remain are doing well but now show signs of wear.



Several original **EarthBoard** remain with four replaced with the newer version. Those that remain are holding up well but will need replacing soon.

Site 4

Location: Yorkshire Dales, 1048ft above sea level, upland, formerly grazed.

- **Trial area** - Exposed upland site, with beck running through that does flood. Site is fenced on three sides and walled on the fourth.
- **Treatments** - Tubex Nature, Greentech Greenguard, Ezee Tree, Treebio Spiral Guard, EarthBoard Tree Guard, NexGen Tree Shelter.
- **Browsing** - Deer are known to browse the area.
- **Notes** - Planted by volunteers in March 2021. Some shelter replacement has begun. Rowan eaten by caterpillar.



May 2022 Update:



Ezee Tree - losses through browsing and weathering. Has held on in tough environment.



Treebio Spiral - needs maintenance and we lost some to cattle but no real issues on this site.



Earthboard - have replaced around 15 with the new version and some alternative guards.



Tubex Nature - two damaged by cattle movement and tops are starting to fray.



Greentech Greenguard - started to replace several as they weathered and have started to collapse.



NexGen Tree Shelter - using two on site. One was damaged in storm and had to be re-tied.

Site 5

Location: Nidderdale, 879ft above sea level, upland.

- **Trial area** - Very exposed and rocky 'scar like' upland site. Site is fenced on all sides.
- **Treatments** - Tubex Nature, Greentech Greenguard, Ezee Tree, EarthBoard Tree Guard.
- **Browsing** - Heavily rabbit browsed - they eat the ties on the shelters too. Possible occasional deer.
- **Notes** - Planted by landowner in January 2021. Site is very windy and exposed, but well maintained.



May 2022 Update:



Ezee Tree - have been nibbled at the top and bottom by rabbits meaning they have access to the trees. Most will need replacing in late 2022.



Tubex Nature - brown version used on site with only one tie to the stake. All seem fine but portray slight flaking on the top of the shelter.



Greentech Greenguard - all but two remain intact after heavy browsing and exposure to the elements. Have begun to replace with alternatives.



Only two original **EarthBoard** remain with 18 replaced with a newer version. These are already showing signs of wear in this exposed location.

Site 6

Location: Lancashire, 774ft above sea level, lowland, formerly grazed.

- **Trial area** - Short hedgerow as well as small planting on slope near river. Fenced along length, walled on other.
- **Treatments** - Tubex Nature, Greentech Greenguard, Ezee Tree, Treebio Spiral Guard.
- **Browsing** - Possible occasional deer as well as livestock damage in early part of trial.
- **Notes** - Planted by landowner in March 2021. Has been maintained.



May 2022 Update:



Ezee Tree - small amount used on planting. Single application has stood the trial period, double application has done very well for growth.

Tubex Nature - several have been damaged and are already starting to flake. Trees seem fine in the ones that are slightly damaged.

Greentech Greenguard - lost all but one to possible browsing early in trial. Replaced shelters in February 2022 and trees are returning.

Treebio Spiral - installed in small hedge area. Doing well until cattle browsing. Need maintenance to make sure hawthorn stays within shelter.

Other sites

We have increased our trial sites to nine to take advantage of new products and different geographical conditions:

- Westmorland Dales, agricultural, fenced, 475ft. Tubex Nature (new version).
- Yorkshire Dales, public site, fenced, 289ft. BMP Tree Hugger (spiral) and Grown Green cardboard tree shelter (below).
- Yorkshire Dales, upland within existing planting, browsed by deer and partly fenced, 901ft. Variety of shelters including EarthBoard, Hy-tex Eco-Haven Tree Guards (top right), Sure-green Vigilis and Tubex Nature.



A note on bioplastics

In line with the UK Government's 2018 Resources and Waste Strategy, it is clear we need to make better use of our resources, keeping them in circulation for longer and moving towards a circular economy.

In April last year, Defra published their response to the call for evidence on the need for standards for bio-based, biodegradable, and compostable plastics (biopolymers).

Repeated and strong concerns were raised regarding the extent to which

plastics marketed as biodegradable or compostable actually degrade in the open environment. Defra also heard from waste processors of the challenges that biodegradable and compostable plastics present in contaminating recycling streams. Biodegradable and compostable plastics are also inherently single use.

With a lack of independent knowledge of the impact of these materials, the FPWG is working with UCL and other universities to understand what happens to bioplastics / biopolymers and polylactic acid (PLA) shelters in the environment.

Conclusions

It is possible to draw some conclusions from the 18-month trial, but it's clear further study is needed.

Some questions to ponder...

- What happens to bioplastics when they degrade in the soil?
- Will the public tolerate cardboard littering in the countryside?
- Can we stomach more browser control, including increased culling?
- Can the woodland creation sector react before legislation forces them to?
- Is plastic still the best option where protection is needed - provided a plan is in place for shelters to be removed and recycled at the end of their purpose?



One size doesn't fit all and a mix of solutions is likely to be needed.

Summary of findings from the Plastic Free Woodlands trial

It is clear that spirals and bioplastic shelters are a useful alternative shelter on most sites if they are looked after. There are questions around what happens to bioplastics when they degrade, and they are inherently single use too, but they do work and protect young saplings.

From our trial, the life of cardboard products depends on the site and weather conditions. They are an option if the landowner does not mind replacing them every 12-18 months. At sites one, three, and possibly four, they can last too.

Other cardboard products are likely to only be effective on lowland sites - and they need to be double staked to ensure they are sturdy enough. Ezee Tree is a robust shelter, and our trial has proved it can last 15 months or more on most sites.

It is too early to report on BMP Europe's Tree Hugger and the other shelters on our newer sites.

If a site is grazed it needs fencing whatever alternative shelter used. Keeping cattle out is vital as trees establish. With that in mind, regular

maintenance is key if planting is to be successful, especially in the establishment phase.

It is likely you will need to use shelters on upland sites unless completely browser secure - including the use of vole guards.

One size doesn't fit all. If you want to plant trees consider a mixture of alternatives alongside fencing, and also consider the future if you use plastic. Not every landowner can call on 200 volunteers as Plastic Free Woodlands has done!

Influencing

Plastic Free Woodlands is helping to change the narrative on woodland creation and best practice.

- Forest Plastics Working Group has been established.
- Strong press coverage already including BBC Look North, Farming Today and Sky News Climate Show.
- Bringing together organisations across the forestry spectrum such as Tubex, the Forestry Commission and DEFRA.

Together, we have achieved:

- **Forest Plastic Working Group** is meeting quarterly with a wide number of national organisations including government agencies, tree nurseries and leading charities.
- **22** pieces of significant press coverage highlighting plastic free woodlands.
- **Campaigning** - working with organisations such as Friends of the Dales and Countryside Landowners Association.
- **National Conference** - building on the success of the project is planned for late 2022.



Plastic Free Woodlands has highlighted the need for change in woodland creation.



Challenging the woodland sector to change course

The partnership with European Outdoor Conservation Association has allowed us to talk about the use of plastic in woodland creation beyond the sphere of the sector and create an appetite for change.

There has been significant interest in Plastic Free Woodlands since it was launched with a continuous stream of media opportunities and interested parties wanting to know more - and get involved.

The biggest impact has been the formation of the Forest Plastic Working Group and how it is already changing attitudes within the woodland and amenity sector.

Dissemination of information and best practice across member organisations and promotion of the Waste Management Hierarchy has been important, as has group

members and their respective organisations raising almost £250,000 for an independent field trial of shelter products that are made from alternatives.

The group is researching the use of other plastic products in woodlands such as signage and plastic tree bags - and has been working with UCL and other universities to understand what happens to bioplastics / biopolymers and polylactic acid (PLA) shelters in a variety of environments.

The group is also in the process of producing a guidance document on plastics use in woodland establishment alongside best practice case studies, and is preparing to host a conference in autumn and provide relevant field trips. Without the involvement of EOCA, this progress would have been limited.



The future of Plastic Free Woodlands

Thanks to the success of the partnership and the project, we are able to continue Plastic Free Woodlands in 2022/23.

We will organise two more central collections in the Dales, aiming to collect another 33,000 shelters.

To aid this, we will help more people remove redundant shelters at varying sites across the Dales - using community groups, our partners and other volunteers. It is crucial we engage communities in this work and provide a resource - alongside guidance on the latest regulations - for landowners to recycle their shelters effectively.

We will continue to monitor our trial sites and plant more trees with alternatives and others with no protection at all. We will update on the progress of these trials in a yearly impact report.

We will continue to be a lead partner of the Forest Plastic Working Group. It will continue to push for change within the sector, produce updated guidance and help for woodland creation, as well as relevant case studies and field trips.

And with thanks to EOCA, we will hold a conference in late 2022 to discuss best practice in woodland creation.

Project Target Progress

Objective	Achievement v Target
<p>5 volunteering days clearing four hectares of plastic from our woodlands - delivered by Summer 2021</p> <p>5 volunteering days clearing four hectares of plastic from our woodlands - delivered by Summer 2022</p>	<p>14 days. Difficult to estimate hectares & shelters but estimated shelter clearance to date – 4,000. An additional 400 will be reused.</p>
<p>Clearance and recycling days delivered with 150-200 volunteers</p>	<p>More than 200 volunteers engaged with the project. Includes those that have attended more than one session.</p>
<p>5 new woodlands planted with 7,000 trees in Winter 2020 and Winter 2021 - each site will trial alternative tree tubes, working with partners such as Forest Research to ensure consistent trials.</p>	<p>We planted 11,165 trees over 8.6 hectares. Each site has a variety of alternative shelters.</p>
<p>2 tree tube collection points established for recycling trials at central locations. Collection points set up in Summer 2021 and Summer 2022</p>	<p>Over summer and autumn 2021, 33,000 shelters were collected at Craven Auction Mart and Appersett. Additional collection at Beamsley has seen 5,000 shelters collected.</p> <p>Another collection is planned at Craven Auction Mart over June 23 - 28, 2022 and at Appersett in autumn 2022.</p>
<p>1 Forest Plastic Group set up and active in influencing the industry, sharing advice and best practice nationally. Terms of reference established and first meeting set to take place by November 2020. Regular quarterly meetings set up and new participants invited – Winter 2020</p>	<p>Group established. Terms of reference agreed. Quarterly Meetings taking place and significant progress being made.</p>
<p>1 impact report produced with conclusion of trials and recommendations disseminated nationally through the Forestry Plastic Group. Summer 2022</p>	<p>Contained within.</p>

Thank You!

