

The Use of Plastics in Woodlands

This report outlines the details of the Plastics, Trees and Woodlands conference in Leeds which took place on 2nd November 2022. The conference was hosted by Yorkshire Dales Millennium Trust and Forest Plastics Working Group (which was established in 2018 and consists of over 15 organisations). The aim of the conference was to discuss the opinions of plastic tree shelters and what progress is being made to find suitable alternatives. In the interest of Richmondshire District Council, I attended the conference to make notes for any tree planting schemes we are running, as well as may be running going into North Yorkshire Council. I also wanted to find out information and advice about what to do with the plastic tree guards currently distributed across Richmondshire.

The conference consisted of speakers from The Forest Plastics Working Group, The Wildlife Trusts¹, University of Plymouth², University College London³, Forestry Commission⁴, Tilhill⁵, and Woodland Trust⁶. Throughout the conference, the speakers touched on topics including:

- How much the sector has changed, especially within the last three years
- What impacts plastic and alternatives have on the environment
- The uses of plastics in woodland creation and current alternatives
- Whether woodland creation could ever be plastic free

The Wildlife Trusts (Keynote Speech)

The Wildlife Trusts have invested £500,000 into a tree shelter trail whereby they are investigating best practices. This is with the assistance of the Waste Hierarchy (see Appendix 1), whereby they are investigating whether prevention and reusing can be used above the three least preferred options. The Trust explained that whilst we know about the plastic breakdown and how it impacts soil, waters and air, we are still not fully aware of the impacts which plastic have on our environment. The Trust reiterated that plastic is made from fossil fuels and currently makes up 4% of fossil fuel productions. It has been further estimated that by 2050, this could be increased to 33.3% worth of production with other uses being decreased (due to the works for alternatives in climate change).

The Trust explained that at the moment, many groups are focused on the planting of trees without looking at the bigger picture; the eco system is currently out of balance, and we need to take on the responsibility of helping it rebalance. This can be done by not just planting individual trees, but by planting to create woodland spaces. This work of creating wildlife corridors can be further supported by rewilding, which is supporting the ecosystem to thrive again. Another proposal was that we reintroduce predators. Whilst this may appear to be the adverse of supporting the ecosystem, the Trust justified this by saying that this would encourage landscapes to thrive as herbivores would avoid certain areas for survival, and the ecosystem would be more balanced as it was traditionally.

The Trust also posed an example whereby tree guards have been ineffective; the A14 in Suffolk was re-laid and a better route created. As part of this project, which was completed in May 2020, 1 million trees were planted alongside the roads for noise cancellation purposes as well as to prevent

¹ <https://www.wildlifetrusts.org/>

² <https://www.plymouth.ac.uk/>

³ <https://www.ucl.ac.uk/>

⁴ <https://www.gov.uk/government/organisations/forestry-commission>

⁵ <https://www.tilhill.com/>

⁶ <https://www.woodlandtrust.org.uk/>

flooding. Whilst all the trees were 'protected' by tree guards, it has been confirmed that only half of these survive to date.

The Impact Plastics and Alternatives have on the Environment

The University of Plymouth gave a presentation about biodegradable plastics. They explained that plastic tree guards were invented in 1979. Previous to this, Victorians used wrought iron, wire and wooden guards. Furthermore, 0.2 million tonnes of plastic are produced per annum across the globe, however this is set to increase with tree planting. The purpose of a guard is to protect the tree sapling from browsing herbivores and other dangers (such as weather). The speaker went on to explain that not all alternatives are what they 'say on the tin' – bio-based products and biodegradable products are not synonymous (see Appendix 2). Biodegradable alternatives can be fossil-based, and non-biodegradable options can be bio-based. This confusion has led many consumers to believe that when buying a biodegradable tree shelter, it is automatically produced using renewable sources, and that non-biodegradable shelters are only fossil based, and this is not the case. This is a call for consumers to investigate the products manufactured before purchasing what they believe to be a wholly environmentally-friendly product.

The University went on to explain that plastics have three main impacts: physical; chemical; biological (see Appendix 3). Whilst we are aware of the physical impacts, such as the damage to sea creatures, many overlook the chemical impacts plastic have on the earth, for example the fact that it can interfere with plant roots and their growth. This means that whilst a tree shelter may be protecting the sapling from predators and weather, it may be adversely affecting the tree in other ways. The Bio-Plastic-Risk project⁷ is set to bring together a number of bodies together to establish the future of biodegradable bioplastics, their effect on organisms and ecosystem function and develop environmental risk assessments.

University College London complimented Plymouth by explaining their life cycle assessment study⁸ which investigates whether plastic guards should be used. It was disclosed that at the moment, 13% of the UK is woodland, and that the objective is to raise this to 17-19%. The life cycle assessment study covers the whole life cycle of products (see Appendix 4). Furthermore, trees have a 5-year establishment period whereby the tree guards are used and are emitting chemicals into the soil.

The Uses of Plastics in Woodlands and Current Alternatives

The Forestry Commission discussed the advantages and disadvantages to plastic tree guards (see Appendix 5). Whilst a tree guard is cheaper than other techniques and is a visual for passers-by, these are not viable reasons for a plastic tree guard to be used when comparing to the disadvantages:

If a plant has growth in the shoot rather than the root, then the plant is not established in the soil to absorb moisture and nutrients⁹. Dense tree spacing is prominent near buildings where a tree's growth is not considered when planting but can also occur near other trees. This is because it is disregarded how deep and expansive the roots grow over a tree's lifetime. Plastic pollution and biodegradability have both been mentioned previously.

⁷ <https://www.plymouth.ac.uk/research/marine-litter/bio-plastic-risk>

⁸ <https://www.ucl.ac.uk/events/events/2021/dec/towards-net-zero-life-cycle-assessment-decision-making-tool-low-carbon-solutions>

⁹ <https://www.woodlandtrust.org.uk/blog/2021/03/plant-life-cycle-seeds-shoots-roots/>

Forest Research have started a 5-year study, 2022 being year 1, looking to investigate several techniques and shelters¹⁰. The sites include:

- Glenmore Forest (Scotland) – fully established. This site has already experienced ‘testing’ conditions with Storm Arwen.
- Tunstall Forest (Suffolk) – partially established.

2 more sites across the UK are due to be established as part of this project. As part of this project, techniques and shelters being investigated include:

Conventional Tree Guard	A plastic tree guard
Wire Guard	Wire which circulates the tree similar to a conventional guard
Tubex¹¹ Nature	A standard shelter by the company Tubex
Tubex¹¹ Recycled Shelter	A recycled shelter by the company Tubex
Vigilis¹² Bio	A biodegradable shelter by the company Vigilis
Earthboard Guard	A water-resistant guard
BMP Tree Hugger¹³	A sustainable shelter by the company Tree Hugger
Trico¹⁴ Repellent	Deer repellent made from sheep fat, by the company Trico
Sheep Wool	Sheep wool glued to the sapling to suppress weeds and retain moisture, used on fruit trees
Protective Thorny Shrubs	Thorny shrubs to deter wildlife
Biowit Klimawit Light	A biodegradable shelter by German company Witasek ¹⁵
harrogate Temporary Fencing	Temporary fencing surrounding saplings

Due to the project being in the early stages, there have been no formal assessments to date.

Woodland Creation and Becoming Plastic-Free

The Woodland Trust has called the change necessary for the following reasons: the audience of the Trust; environmental carbon, cost, and practice. The audience of the Trust includes all visitors across all 1,000+ woods, and the Trust refers to environmental carbon as all carbon emissions in the atmosphere. The Trust can purchase a tree for £0.55 and can buy a shelter and stake for £2.70, which is nearly 5 times the price of the tree. This means that for every 100 trees planted, whilst £55 would be spent on trees, £270 would have been spent on protection rather than planting a further 490 saplings. The Trust gave two comments:

- *“Perhaps the best replacement for a plastic tree shelter is no tree shelter at all.”*
- *“Using a tree shelter should be the conscious decision, rather than not using one.”*

Tilhill is a company that offers forest and woodland management services across the UK. One employee who is familiar with German forestry spoke. They explained that over 35% of Germany is tree coverage. This is approximately three times the size of the UK’s woodland (which is 13%). The speaker went on to explain that there are several ‘issues’ with their planting due to deer and boar, and how these animals get trapped in wildlife spaces across the country. As a result, the animals

¹⁰ <https://www.forestresearch.gov.uk/about-us/core-research-programmes-2021-26/>

¹¹ <https://tubex.com/>

¹² <https://vigilistreesshelters.com/>

¹³ <https://www.bmptreehugger.com/>

¹⁴ https://trico-repellent.com/en_US

¹⁵ <https://www.witasek.com/shop/en/tree-protection/biowit-tree-protection/492/biowit-klimawit-light-220-protection-height-120-cm-tree-protector-tube>

only have a designated space to forage for food (such as tree saplings among other plants), and even with tree guards, the animals can still access the trees as they grow beyond the shelter. This is similar to problems the UK is facing, and these animals are trapped in the spaces and are also territorial species. This is reiterated further in the report with more details. The speaker also explained that there is a project called The Forest Cleanup¹⁶ which is a project aiming to collect illegally disposed of items such as glass, household appliances, roofing materials, polystyrene and plastic. The UK has a series of clean-up groups including Keep Britain Tidy¹⁷ and CleanupUK¹⁸, although no groups to note that focus on forest clean-up specifically. This may be because of size of woodland and this being incorporated into general groups and other projects.

Open Panel Discussion

In the afternoon, there was an open panel for questions. Those that sat on the panel were representatives from Tilhill⁵; Birchfield Forest Rewilding¹⁹; Natural Resources Wales²⁰; Yorkshire Dales Millennium Trust²¹, and United Bank of Carbon²².

One of the biggest concerns raised was about the wildlife problem. The representative from Birchfield Forest Rewilding made the observation that our ancestors have created the ‘wildlife problem’ which is the unbalanced ecosystem. Many people have identified deer as a problem to tree planting, however it has been noted that deer have been accidentally fenced into large sites and subsequently, despite efforts to drive them out and encourage them out by lowering fences, deer are territorial and won’t leave as desired by landowners. Additionally, the representative made the consideration that there are 22 million sheep, and whether they should be seen as another complication. Despite tree guards protecting saplings as long as they are growing within the height of the guard, deer can cut the trees once they grow beyond this. This means that despite the trees being protected for some time, eventually, the deer can access and still feed from the tree. Some projects are making efforts to evaluate repellent sprays, which sees a spray focused directly on the sapling as well as near it, however wildlife needs to be considered. They are part of the ecosystem which we need to be supporting, and the woodland is their habitat. Forest Research have a paper on wildlife management²³.

Within the panel, there was also a call for further regulation surrounding not just the delegation of tree shelters, but also the collection. The Forestry Commission has a paper on the use of tree shelters²⁴ which poses a series of questions to try and ensure tree shelters are only used when required:

- Is tree protection required for successful establishment?
- What does the tree need protection from?
- Can browsing by wild mammals be reduced to a level that does not affect the establishment of the trees?

¹⁶ <https://www.foresttoplate.com/new-page-3>

¹⁷ <https://www.keepbritaintidy.org/>

¹⁸ <https://www.cleanupuk.org.uk/>

¹⁹ <https://birchfieldhighlands.org/about-us/>

²⁰ <https://naturalresources.wales/?lang=en>

²¹ <https://www.ydmt.org/>

²² <https://www.uboc.co.uk/>

²³ https://cdn.forestresearch.gov.uk/2022/02/lru_bpg12.pdf

²⁴ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/896121/Tree_shelters_guide.pdf

- Can fencing provide protection?
- Is further protection from voles required?
- Is further protection through a tree guard required?
- Does the silviculture of tree species (the branch of forestry) to be protected benefit from a tree guard?
- Does your woodland creation plan address the life time use of plastics?

Following from these questions, advice is given about reducing the use of plastic, re-using shelters and recycling the materials. There is currently no clear legislation surrounding the collection of tree shelters.

Finally, it was stated that a pledge has been signed to ban the use of tree guards across National Park Societies, following from a commitment made from The Woodland Trust to stop using plastic guards from the end of 2021. There were 11 of 12 signatures for the pledge, including: Friends of the Dales, Friends of the South Downs, Snowdonia Society, North York Moors Association, Exmoor Society, Brecon Beacons Park Society, Friends of the Pembrokeshire Coast National Park, Friends of the New Forest, The Broads Society, Friends of the Peak District, Dartmoor Preservation Association and Campaign for National Parks

Conclusion

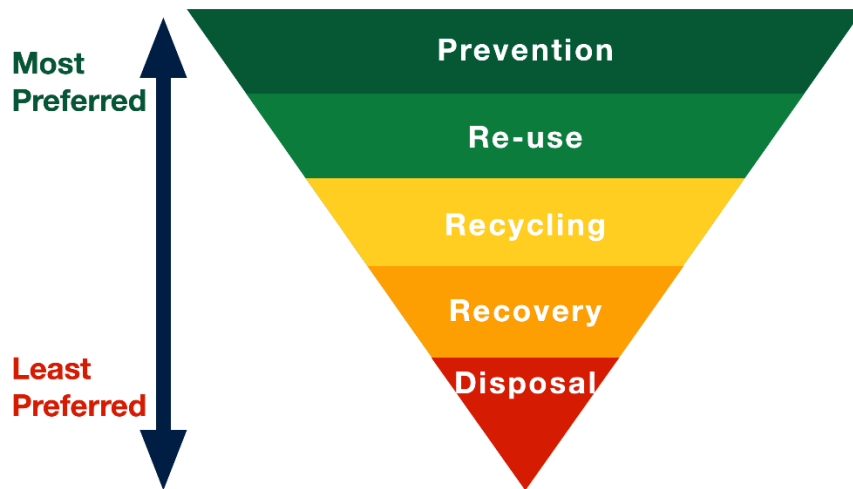
This conference was last held three years ago in 2019. At this conference, it was concluded that tree guards were needed. Now, many are turning away from this idea. Whilst many trials are still in progress (so comments cannot formally be made on specific products which are preferred) over alternative tree guards and shelters, where possible, many are recommending that planting without tree guards is preferable where possible. After attending this conference, I believe that fences may be a suitable alternative (for now) where large planting projects are taking place. In smaller planting projects, tree guards may not be necessary, biodegradable or otherwise.

With this in mind, the current community tree planting scheme, Communitree may see few tree shelters distributed. This is due to some proposals facilitating a large number of trees where fencing is more suitable, or other proposals where shelters may be deemed unnecessary due to location.

In regard to shelters across Richmondshire to date, it is imperative to remember the 5-year establishment period whereby a tree guard may be supporting a sapling. In this instance, after these 5 years, guards should be removed and either reused with other projects, or disposed of as per The Forestry Commission's advice²⁴.

Appendix 1

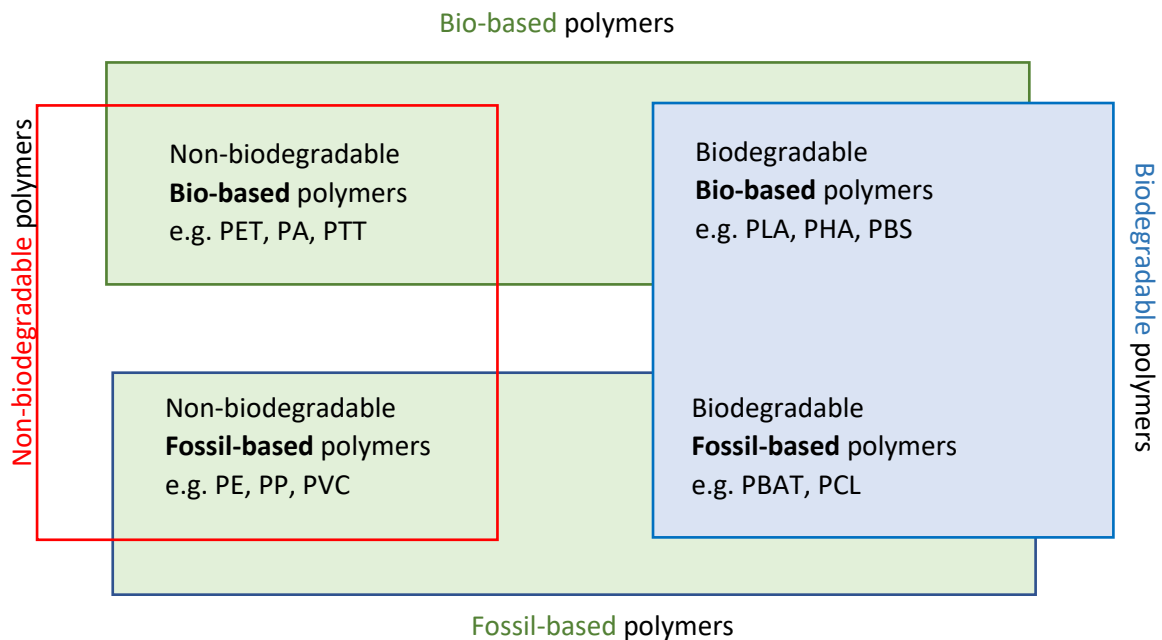
The Waste Hierarchy



<https://ismwaste.co.uk/help/what-is-the-waste-hierarchy>

Appendix 2

The Definition of Plastics Diagram



Forest Plastics Working Group

Appendix 3

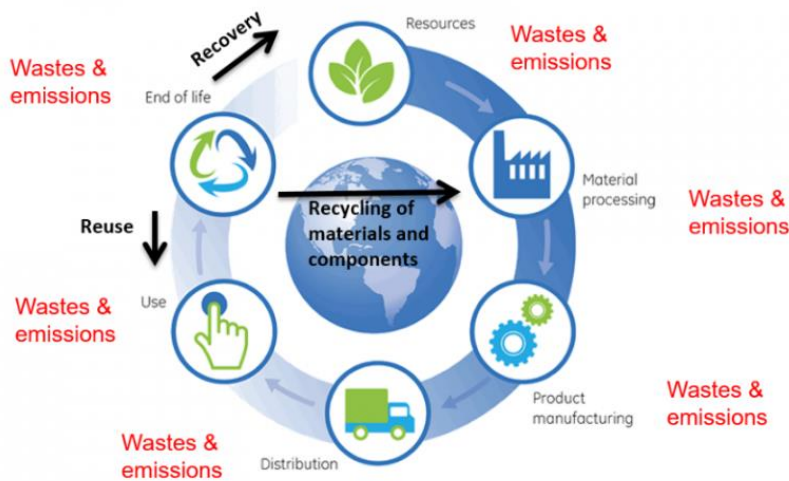
The Main Impacts of Plastics

Physical	Chemical	Biological
<ul style="list-style-type: none"> • Entanglement • Ingestion • Occlusion 	<ul style="list-style-type: none"> • Additives • Degradation products 	<ul style="list-style-type: none"> • Impact organisms • Impede plant roots and growth • Pathogen adherence • Alterations to microbial communities • Impacts on nitrogen and carbon cycling

University of Plymouth

Appendix 4

The Life Cycle of Products



University College London

Appendix 5

The Advantages and Disadvantages of Plastic Tree Guards

Advantages	Disadvantages
<ul style="list-style-type: none"> • Cheapest way of protecting • Easier to weed • Improve survival and growth • Visible activity on site 	<ul style="list-style-type: none"> • Encourage shoot growth rather than root growth • Discourage dense tree spacing which causes poor tree form • If not collected, is a source of plastic pollution at the end of their life • Manufacturers have developed shelters they claim can be left to biodegrade

The Forestry Commission