CFA Newsletter

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Contents:

CFA Newsletter
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High-speed rail project in the UK due to destroy ancient woodlands

Crackley Wood in Warwickshire where 0.9ha will be destroyed (Credit: Phil Formby/Woodland Trust)

Home to myth and legend, where folk tales began, ancient woodland fuelled our ancestors and has grown and adapted to provide a home for thousands of species. Yet ancient woodland accounts for just 2.4 per cent of land cover in the UK.

Up and down the country ancient woods and trees are at risk from development with the biggest single threat being HS2, the high speed train line between London, Birmingham, Crewe, Manchester and Leeds.

Some 108 woods are living on borrowed time, with 63 facing direct loss totalling almost 58 hectares, and a further 47 being damaged.

Despite the project being the subject of a Government review ordered by Boris Johnson soon after becoming Prime Minister, preparation work is underway for the first phase between London and Birmingham which threatens to smash through 34 ancient woods. Twenty-nine will suffer secondary effects such as disturbance, noise and pollution.

Through determined behind the scenes lobbying and a recent public campaign which has seen more than 40,000 people call for a halt to the advance works, the Woodland Trust recently managed to get these sites a temporary stay of execution until after the outcome of the review at least. It's not the first win for the Trust either. It has also successfully campaigned to have a tunnel extended to save one site, and through ongoing discussions and giving evidence at Parliamentary Select Committees has influenced HS2 Ltd to not rip up woods and standalone ancient or veteran trees to make way for temporary works.

Ancient oak woodland will be destroyed and lost forever by the construction of the high-speed rail link (Credit: Phil Formby/Woodland Trust)

Trust ecologist Luci Ryan said:

> "Ancient woodland is one of our most precious natural habitats. It cannot be moved. It cannot be replaced and we may well lose many of our greatest national assets and habitats – assets that can never be replaced – to a scheme that might not even happen.
> "The fact we are losing ancient woodland at all is terrible. To lose it needlessly would be the real travesty."

Ancient woods are areas of woodland dating back to at least 1600 in England and Wales, and 1750 in Scotland. This is when maps started to be reasonably accurate so we can tell that these areas have had tree cover for hundreds of years. But it isn't just about trees. It's also the vegetation, the soils and the wildlife that makes ancient woodland a special irreplaceable habitat. They are relatively undisturbed by human development and as a result are unique and complex communities of plants, fungi, insects and other microorganisms.

They are our richest and most complex terrestrial habitat in the UK and they are home to more threatened species than any other. Centuries of undisturbed soils and accumulated decaying wood have created the perfect territory for a myriad of species, some of which rely on ancient woodlands for their very being such as Bechsteins bats, dormice, white letter hairstreaks and barn owls.

HS2 will render these species – and more – homeless. Rare birds such as the lesser spotted woodpecker, the willow tit and the wood warbler, bats, butterflies, dormice, otters, badgers and hedgehogs are also threatened.

Bulldozers will move in, bringing trees crashing down, forcing wildlife to flee. Some might not manage it, and for those that do there often isn't suitable habitat for them to move into as they are not adapted to live in woodland with young trees.

If the outcome of the review, led by former HS2 chair Douglas Oakervee, is not good news for ancient woodlands and preparatory work on Phase 1 restarts, HS2 Ltd will attempt to translocate some of the sites along the route.

Translocation of ancient woodland involves moving soils and sometimes coppiced stumps to a receptor site in the hope some habitat is salvageable, but there is very little evidence of its success.

Luci explains:

> "The beauty, structure and full biodiversity of ancient woodland cannot be moved from place to place by a bulldozer, expecting all of the thousands of interactions between plants and animals to resume as if nothing had happened."

> "The word translocation is often used in a way that implies ancient woodland can effectively be removed from a site and re-established elsewhere. However, as far back as 2012 Natural England has stated that ancient woodland as a system cannot be moved. The complex communities found in ancient woodland are a product of the interaction between unique geographical and historical factors, which cannot be replicated."

One ancient woodland under threat is South Cubbington Wood, which forms part of the Princethorpe Woods complex – the largest concentration of semi-natural ancient woodland in Warwickshire.

A particular rarity of the site is the presence of wild service trees, which only tend to be found in ancient woodland. Seven species of bats have been recorded at South Cubbington – common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Leisler's, Noctule, Daubenton's and brown long-eared. A spectacular carpet of wood anemones appears each spring. Grasslands between the wood and the River Leam are home to numerous butterflies and ground-nesting skylarks.

Other ancient woods in the area are remnants of the old Forest of Arden, where Shakespeare famously set As You Like It.

HS2 Ltd is always keen to point out it will be planting millions of trees along the route to compensate for what will be lost. But as ancient woodland is irreplaceable, no amount of new planting, even at the Woodland Trust's desired 30:1 ratio, can make up for the catastrophic effect destruction of this precious habitat will have on the environment.

Luci adds:

"This is akin to smashing a ming vase and replacing it with bargain basement crockery.
Planting new trees is all well and good, but it's no substitute for what will be lost. Their plans – which let's not forget are a condition of the scheme, not being delivered out of the goodness of their hearts – fall woefully short of replacing what will be lost on something being touted as a green infrastructure project.
"We are all for green transport and initiatives which take cars off the road and reduce emissions but HS2 in its current form cannot be called green by any stretch of the imagination."

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Forest Scenes

Agroforestry is moving up the agenda in the UK

Will this become a more familiar sight in the UK?. (Credit: Organic Research Centre)

Commonwealth Forestry Association readers will be very familiar with the benefits of agroforestry, which is a widely practised land use in many countries around the world. However perhaps what readers might be less aware of, is the growing interest in agroforestry in the UK. After several previous false starts, it does now feel like we are on the cusp of this most integrated of land uses, moving from the leading edge, to becoming more of a mainstream movement.

So, what is driving this interest? Well on one-level, there is a recognition from policymakers that to achieve ambitious tree planting targets for the UK, that we need more of a strategy than

to just hope that farmers stop farming, so that more land will become available for forestry. Instead we need a farmer-led tree planting revolution, where farmers are actively involved in planting more trees and deriving both agroecological and financial benefits from the management of these trees.

But it's not just policymakers appreciating these benefits, there is also a groundswell of interest from farmers themselves. Seeing this growing curiosity in agroforestry, the Soil Association partnered with the Woodland Trust and Royal Forestry Society to convene an Agroforestry conference in 2017 and more recently with the Farm Woodland Forum, to publish the Agroforestry Handbook in September 2019. This publication is now the most downloaded 'book' in the Soil Associations near 75-year history, and with the free hardcopies that have been issued, more than 5000 people have hopefully learnt more about the benefits of this integrated approach to delivering both public and farm-level benefits, from tree planting. Even more recently, evidence from the interest in any session at the Oxford Real Farming Conference in January 2020 focused on agroforestry, or even just trees, would suggest that increasingly the farming audience is getting on board.

In the handbook, we deliberately set out a wide definition for agroforestry as a starting point. But to then help communicate the potential benefits, we cite the more detailed definition from the AGFORWARD EU funded research project, namely that agroforestry systems are 'the practice of deliberately integrating woody vegetation (trees & shrubs) with crop or animal systems, to benefit from the ecological and economic interactions.'

The handbook then goes on to set out the benefits and provide practical advice for the implementation of the following systems:

- Silvopastoral agroforestry: the combination of trees and livestock
- Silvoarable agroforestry: the combination of trees and crops
- Hedgerows, shelterbelts and riparian buffer strips

As with the whole continuum of trees in the farmed landscape, agroforestry systems can provide ecosystem services to society – the so-called public goods – and at a farm enterprise level, through benefits to the farmer. Very often, these goods and benefits are provided in a non-exclusive manner, to both the public and the producer at the same time. For example, trees that help with percolation and slow down water flow, can reduce the risk of flooding on-farm, as well as public spaces downstream.

Economic benefits from agroforestry systems at the farm-level are generated in two main ways, in the shape of indirect, or agroecological benefits and direct, or market, benefits.

1. Agroecological (Indirect) Benefits – the integration of woody vegetation with crop or animal systems can result in interactions that ultimately lead to higher outputs through improved soil health, reduction in wind exposure impact to crops and livestock, reduction in heat stress to crops and livestock, reduced incidence of pests and diseases and supplementing livestock diet.

The concepts of modulation, synthesis and partitioning are important in delivering many of these agroecological benefits.

Modulation – where one component manages or modulates the physical environment of another component, for example trees acting as a windbreak may reduce the heat loss of sheltering livestock and give higher profit based on better live weight gain per unit of feed.

Synthesis – where one component changes the chemical environment of another component, for example a shrub or tree may fix nitrogen that then becomes available through leaf loss to the adjacent non-nitrogen fixing crop.

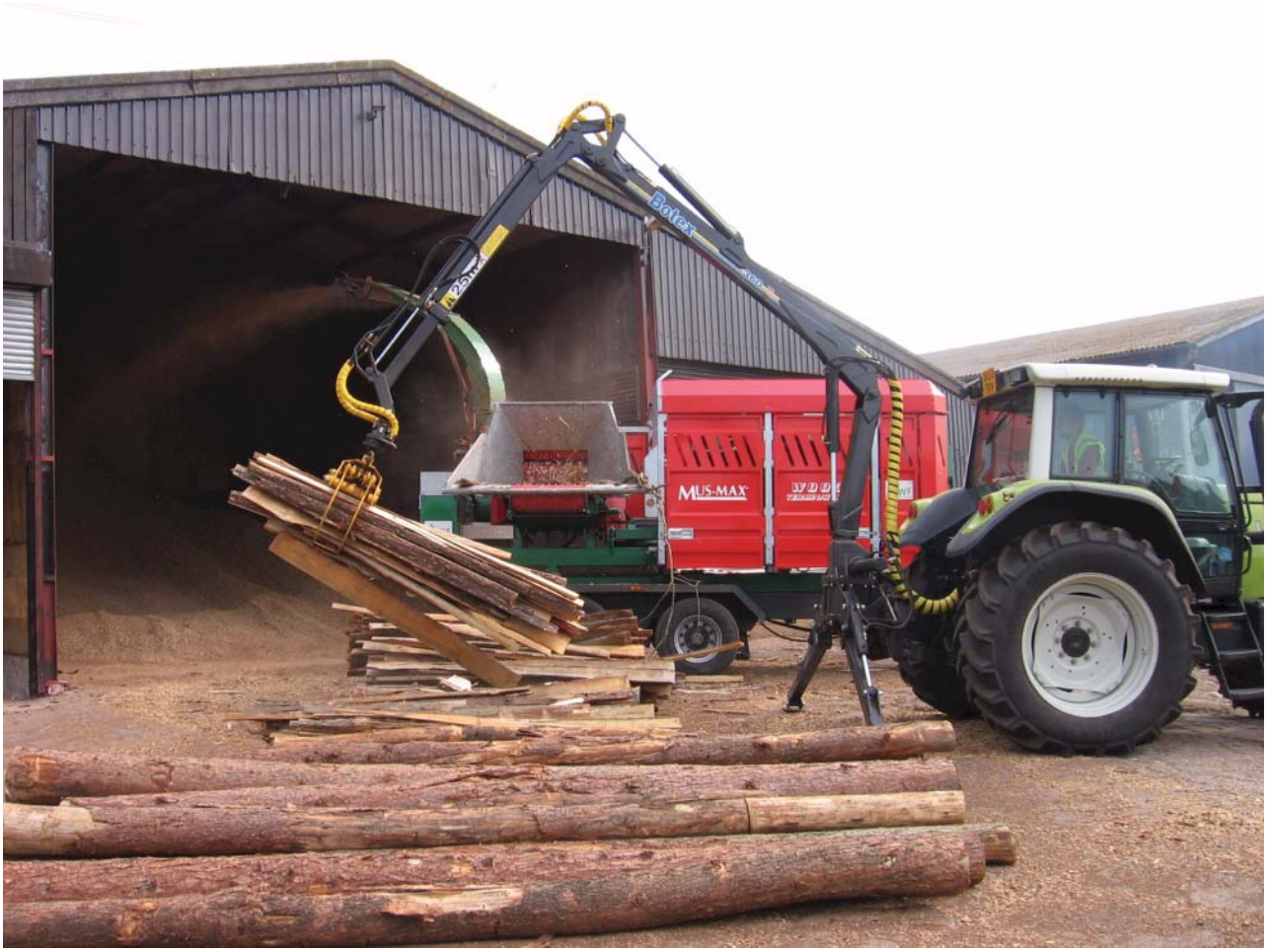
Partitioning or Sharing – can happen in space or time. For example, deep rooting trees can access phosphate from a depth below which the adjacent crop can access, so utilising available nutrients on a site more effectively. Or a tall tree accesses light that is not be available to ground level crops due to aspect/orientation, so utilising available light on a site more effectively.

2. Market (Direct) Benefits – the combined market sale and on-farm substitution opportunities from both the woody vegetation component and the crop or livestock component, can be greater than from either a conventional agricultural or forestry system. In this context, substitution means the on-farm use of production, for example fence posts, wood fuel, and fruit and nuts for food can all be produced from trees grown on the farm and thereby avoid a financial outlay. An agroforestry system therefore makes sense at a farm enterprise level to the farmer, if these market sale and substitution opportunities, generate a greater level of farm income than the alternatives.

These economic benefits, both agroecological and market, from agroforestry systems at a farm level are vital to long-term sustainability and mainstream take-up, rather than relying solely on incentives to reward the provision of the public goods from the systems. Although these economic benefits operate primarily at the farm-level, the wider rural economy can also benefit from a more economically resilient farming sector. Given the potential to provide this greater farm enterprise economic resilience, as well as deliver public goods such as reductions in flood incidence, the capture and storage of carbon and the enhancing of biodiversity, the Soil Association believes there is a compelling case for agroforestry to be clearly defined as a policy option for all UK farmers, supported by appropriate incentives and legislation.

The policy context needs to clarify that agroforestry is a distinct land use option and a new set of regulations should be developed that recognise the temporal nature of many agroforestry systems and the benefits of rotation for farm enterprise economic resilience. The Soil Association believes this supportive policy context should be ambitious: it should aim to achieve a target that 50% of farms should be implementing some form of agroforestry by 2030, with at least 5% – approximately 1.2 million hectares – of the farmed landscape to be under an agroforestry system by 2040.

Alongside incentives to implement agroforestry systems, there needs to be investment in establishing an agroforestry and farm woodland economy in the UK. As well as extension support and technical advice, farmers will need confidence that the market and substitution benefits, can be realised from their investment in the trees on their farms. Market development, supply chains and supply chain services will need to be incentivised to adapt to the more sporadic nature of supply and small-scale working. Mechanisms such as cooperatives, group schemes and machinery sharing for harvesting/processing, all have the potential to mitigate small scale working on individual farm enterprises, to ensure profitability and economic resilience.



The benefits of agroforestry in the UK could lead to its expansion. (Credit: Soil Association)

These are exciting times for agroforestry in the UK and perhaps in years to come, we will become known as an agroforestry nation and join those enlightened Commonwealth countries that practise this approach to integrated land use as routine.

Box out: The benefits of agroforestry:

- Increase agricultural productivity
- Offer new market and on-farm substitution opportunities from tree outputs
- Capture and store carbon
- Reduce soil erosion
- Manage water flow and reduce flooding incidence
- Remove pollutants from run off, enhancing river health and reducing clean-up costs
- Enhance biodiversity abundance
- Improve animal welfare outcomes
- Improve landscape character
- It can help meet UK tree planting targets by unlocking planting land that would not be available for more traditional woodland or forestry plantings and has great potential to be a farmer led route to increasing trees in the farmed landscape.

You can download your copy of the Agroforestry Handbook from https://www.soilassociation.org/farmers-growers/technical information/agroforestry-handbook/

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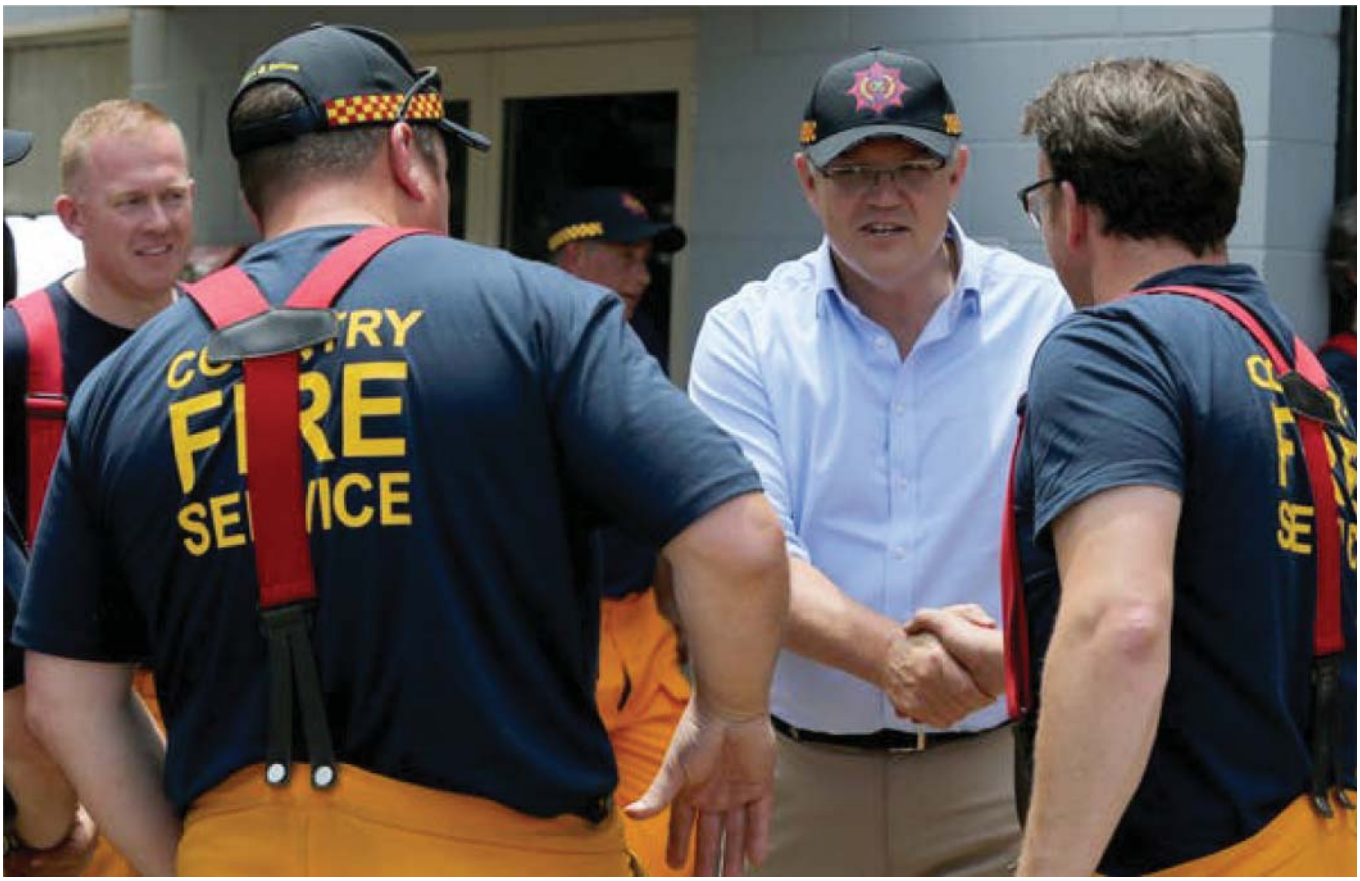
'Soil Association is a membership charity, formed in 1946 by a group of farmers, scientists, doctors and nutritionists who were determined to pioneer a world where we can live in health and in harmony with nature. Our mission is to restore nature, health and a safe climate from the ground up. We do this by supporting a farming and land use transition to agroecology and sustainable forest management, as well as a transition to healthy and sustainable diets for all, with a radically reduced fashion and forest footprint. Today, the Soil Association works to develop, innovate and scale-up solutions for sustainable food, farming and forestry – by collaborating with organic and non-organic farmers, foresters, retailers, processors, and food procurers from schools to hospitals to restaurant chains. Through our trading subsidiary, Soil Association Certification, we work with over 6,000 businesses including organic farmers and growers, caterers, food processors and manufacturers, and certify over 17 million hectares of sustainably managed forest globally, as well as certifying over 2000 chain of custody enterprises, across more than 50 countries.'

There's only one way to make bushfires less powerful: take out the stuff that burns



Prime Minister Scott Morrison, meeting South Australian firefighters, says bushfire management is a state responsibility. (AAP/Kelly Barnes)

As monstrous blazes overwhelm Australia's south-east, the need for a national bushfire policy has never been more urgent. Active land management such as hazard-reduction burning and forest thinning must lie at the core of any such policy.

Done well, controlled burning limits a bushfire's spread and makes suppression easier, by reducing the amount of flammable material. Clearing or thinning vegetation on roadsides and other areas also helps maintain fuel breaks, allowing firefighters access to forests in an emergency.

As former fire chiefs recently pointed out, of all factors driving a fire's severity – temperature, wind speed, topography, fuel moisture and fuel load – fuel load is the only one humans can influence.

The royal commission into Victoria's Black Saturday bushfires identified serious shortcomings in land and fuel management, primarily the domain of the states. Ten years ago I also called for a national approach to bushfires, including vegetation management.

Relatively little has changed since. It is as though Australia suffers collective and institutional amnesia when it comes to bushfire preparedness. But the threat will only escalate. Australia must have a sustained commitment to better land management.

The three pillars of dealing with bushfires

Bushfire management comprises three planks: preparation, response and recovery.

Preparation involves managing fuel loads and vegetation, maintaining access to tracks and fire breaks, planning fire response and ensuring sufficient human capacity and resources to respond to worst-case scenarios.

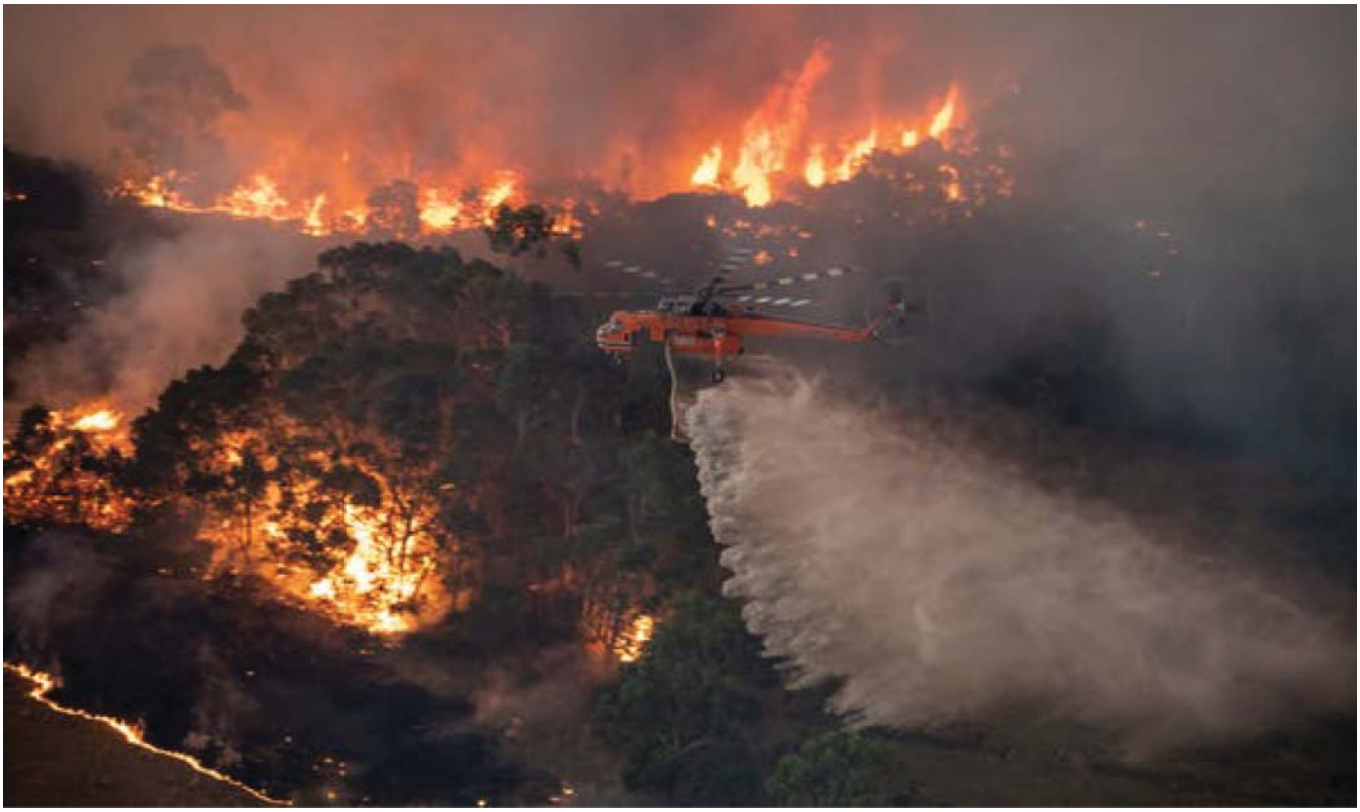
Response involves deploying aircraft, fire trucks and fire-fighting personnel, and recovery requires social, financial and institutional support.

The federal government mostly focuses on bushfire response and recovery, which now falls under the Department of Home Affairs and the responsible Minister for Natural Disaster and Emergency Management, David Littleproud.

After major fire events in the 2000s, the Commonwealth committed significant resources to response. This included contributing to the cost of more fire-fighting planes and helicopters, and research funding.

But what about fire preparation?

Prescribed burning is considered a key element of bushfire preparation. While there is some debate over its effect on a fire's



A helicopter tackling a bushfire in Victoria's East Gippsland. (Victorian government)

impact, the Victorian bushfire royal commission concluded fuel modification at a sufficient scale can reduce the impact of even high-intensity fires.

Other management actions include thinning dense forest areas, reducing the shrub layer mechanically where burning is not possible and maintaining fire breaks. As the climate changes, we may consider changing the tree species mix.

The newly merged Department of Agriculture, Water and the Environment is the federal agency with most interest in land management. However other agencies such as the Department of Industry, Science, Energy and Resources share some responsibilities.

Federal funding for land management deals with single issues such as weeds, feral animals, threatened species or water quality. Funding is often piecemeal, doled out to government bodies or community groups with little coordination. As federal programs are implemented, states often withdraw funding.

Former NSW Fire and Rescue commissioner Greg Mullins and other experts have warned fuel reduction burning is "constrained by a shortage of resources in some states and territories", as well as by warmer, drier weather which reduces the number of days burning can be undertaken.

At state level, since the major fires of the 2000s, funding for fire management has increased and coordination between fire response and land management agencies has improved.

However, the focus of the two groups remains divided, which can thwart progress. Fire services prioritise protecting lives and property once fires are going, while forest and land management agencies focus on reducing fire risk, and must consider a wider range of natural and community values.

In a rapidly changing climate, land management requires a long-term adaptive strategy, underpinned by sound analysis and research, supporting laws and policies, with sufficient funding and human resources. Bipartisan political support and leadership continuity is needed to sustain it.

A national approach

State agencies cannot carry the full financial burden for fire preparedness. With fire events happening in almost all states and territories, it is clear we need a national approach.

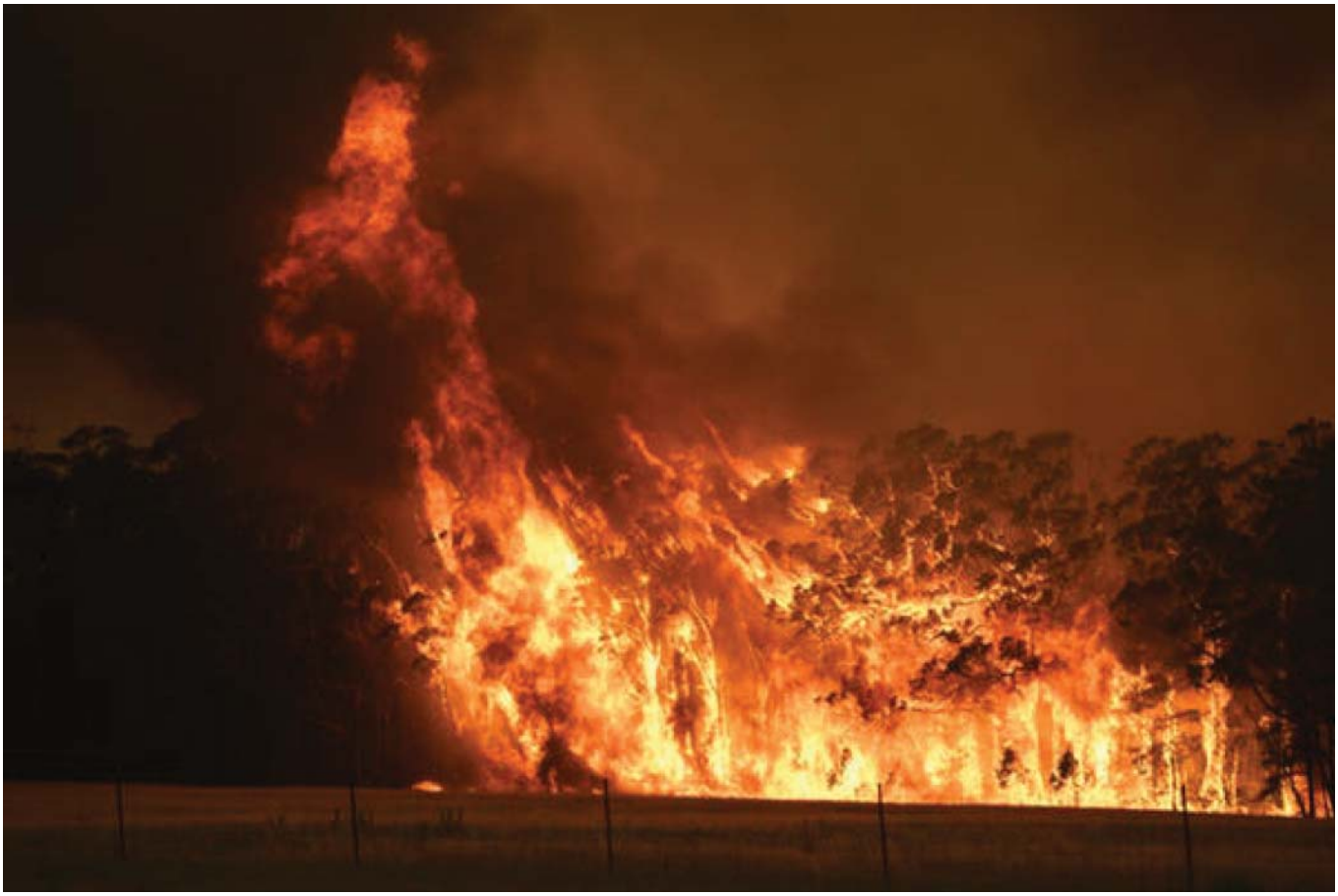
The federal government collects most tax revenue and should contribute a greater share of the costs of prescribed burning, maintaining access, fire detection, and rapid firefighting response.

Federal spending on land management can be better integrated to engage and protect communities, conserve biodiversity, maintain water quality, manage forest carbon emissions and improve forest resilience to future fires. Recent federal investments in savannah burning in northern Australia are a good example of this.

A federal bureau of bushfire and land management could support national policy and coordinate investment, including monitoring and reporting on forest and land condition. State agencies, local authorities and private landowners could continue to provide management to meet national targets.

Commitment to public education is also critical. Many people do not understand the need for appropriate human interventions, such as prescribed burning or thinning, to protect the forests we all enjoy. We must also learn from traditional owners about how to live in our country and manage land with fire.

In December, the federal government initiated an inquiry into the efficacy of vegetation and land management and bushfires. This inquiry needs to be expanded, avoiding the simplified



The Gospers Mountain Fire at Bilpin, NSW. (DAN HIMBRECHTS/AAP)

debates of the past, and bring together all parties to identify solutions.

As one of the most urbanised countries on Earth, there are few votes to be gained in more spending on rural land management. Hazard reduction is a sometimes risky, labour-intensive measure, and tensions between reducing fuel loads and conserving the environment must be managed.

However after the grief, anger and recriminations from these fires have passed, it's time for an urgent national rethink – and the Morrison government must lead the way.

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Tree pests and diseases – how can biosecurity be improved?

The cultural, economic and environmental importance of trees is now widely acknowledged. They improve biodiversity, reduce air pollution, intercept rainfall, provide shade and reduce heat absorption by man-made surfaces. The cultural benefits provided by trees are also significant, offering both physical and mental health benefits. Trees also play a central role in the mitigation of climate change because carbon sequestration is one of the most significant ecosystem services they provide, with total carbon stocks in UK forests (including soil) calculated at 800 megatons, that's twice the annual UK's emissions of CO_2 (Natural England, 2012).

Despite these benefits, our treed landscapes are being permanently altered due the almost constant introduction of new and severe pests, diseases and invasive species. For example, it is believed that around 267 non-native invertebrate plant pests became established in Great Britain between 1970 and 2013 (Smith, *et al.*, 2018). This study also showed that this has accelerated from 4 new introductions per year in the 1980s to a rate of nine species per year more recently. This is just invertebrate plant pests, many new tree diseases and invasive species have also arrived.

The evidence of the impacts of pests and diseases is now clear to see in woodlands and the wider landscape. Dead and dying ash trees can now be seen throughout the country due to ash dieback, caused by the fungus *Hymenoscyphus fraxineus*. This disease could well have blown into the south east of England through natural dispersal but there is no doubt that the importation of infected ash trees for planting speeded up the spread of the disease.

Newly imported mature olive trees in the UK (Photo: WTPL)

So, given how many new introductions there have been and the impact they have had, it is clear that the UK approach to biosecurity is not working. Perhaps the best example of this is Oak processionary moth (OPM). OPM caterpillars have hairs which cause allergic reactions and as such, they require management by woodland owners. They were first imported in 2005 on oak trees for planting and, due to delays in its management, it subsequently spread throughout London. OPM has been subject to a government-led programme of survey and control to minimise its population, spread and impacts around Greater London. New import legislation was also brought in in 2019. However, despite knowledge of the dangers of the pest and increased legislation, it continues to be imported with recent discoveries of OPM on several batches of imported oak trees from Holland which had been planted across the UK in 2018/19. The latest from Forest Research reveals that over 70 cases have been identified on recently imported oak trees across GB (Forest Research, 2020a).

OPM shows that the biosecurity approach is the wrong way round. Currently, plants can be imported freely with "light touch" checks at points of entry. If a potential problem is identified, such as a new disease, measures are brought in. These measures rarely ban the movement of plants, they more often subject the effected species to more frequent checks. However, experience over the last 30 years has shown us that these checks aren't sufficient and quite often the pest or disease has already arrived before measures are brought in, or the measures are just not strong enough (Brasier, 2008). For example, if the import of oak had been restricted in 2005 the tax payer and private landowners would not have needed to spend millions of pounds managing OPM.

A more current example which shows that lessons have not necessarily been learned is *Xylella fastidiosa*. *Xylella* is a serious bacterial pathogen which has led to the loss of many ancient olive groves in Italy. It has subsequently been found in France, Spain (including Corsica and the Balearic Islands) and Portugal. This pathogen has many hosts but nine have been identified as particularly high risk including Lavender, Olive, *Prunus* and Rosemary (Forest Research, 2020b). However, despite the risk being identified and the potential impact being great, these hosts are not subjected to any movement restrictions beyond Plant Passports (which are just a means of traceability). You can still find directly imported olive and lavender plants for sale in your local supermarket. This is made even more worrying given that recent research has shown that plants infected with *Xylella* remain symptom free for up to two years therefore making visual diagnosis through inspection very difficult (Fierro, *et al.*, 2019).

OPM Caterpillars (Photo: WTPL)

A different way to approach biosecurity is taken in a number of countries. New Zealand for example doesn't import any plants unless they are shown to be low risk. Any species that pose a risk are simply not imported and anyone found importing restricted items is likely to be prosecuted. To simplify this they don't distinguish between pests, diseases and invasive species, they instead refer to "all unwanted organisms". This greatly simplifies legislation and makes management of an outbreak more straight forward. New Zealand's new and progressive Biosecurity Strategy 2025 states that all citizens have a role to play in keeping unwanted species out of the country (NZ, 2020). Of course, New Zealand is geographically more isolated than the UK, but given that most of the pests, diseases and invasive species that are causing damage in the UK have been imported, there is no reason why we couldn't take a similar approach. In addition, reducing our reliance on imported plants and growing more within the UK would benefit everyone, reduce risk and allow the increase in the export of healthy plants to the rest of the world.

One of the key steps has already been taken in that an assurance scheme for buying UK Sourced and Grown (UKSG) trees already exists (WT, 2020). This means that specifiers can ask for trees that they know won't have been imported with pests or diseases. In addition, the horticulture sector is working on a Plant Health Assurance Scheme to improve the traceability and health of horticultural plants for sale (Plant Healthy, 2020). However, the government needs to do more to improve its approach to biosecurity. Far more inspectors are needed to thoroughly check consignments and firm action needs to be taken when a risk is identified. This needs to happen quickly because the government themselves have identified 127 high risk plant pests and diseases that need to be prevented from entering the UK (Defra, 2020).

Brexit could perhaps offer the UK an opportunity to take more control of what is imported into the country but that will take political will and is probably some years away. In the meantime, it is important that the highest priority is given to safe plant procurement by everyone who specifies for, or procures plants, whether it's thousands of trees for planting, an old olive tree for a garden design or a small number of plants from a garden centre. Preventing the next pest, disease or invasive species is up to us all.

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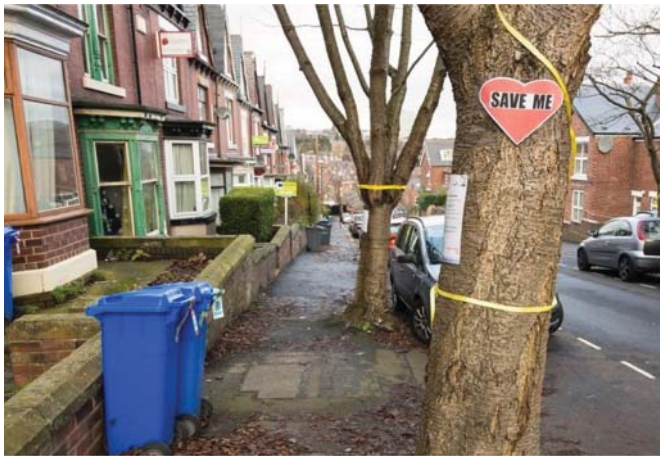
Mapping our urban trees: Treezilla

Urban trees provide many benefits to the more than 80% of the UK population that live in towns and cities. Recent studies show that increased urban tree canopy cover is associated with lower levels of overweight/obese individuals, better social cohesion, and lower levels of type 2 diabetes, high blood pressure and asthma[1]. Furthermore, higher tree canopy cover has also been found to reduce levels of inner-city violence[2]. This growing body of evidence on wellbeing effects has not only prompted a growth in the level of research and investment in 'urban greening' but has accelerated the rate of 'green prescription' services i.e. health practitioners prescribing nature-based solutions to health problems.

Bosco Verticale: a pair of residential towers in Milan, Italy planted out with more than 900 trees on apartment terraces. (Image credit: Chris Barbalis on Unsplash)

In addition to the well demonstrated wellbeing impacts, urban trees reduce levels of air pollution, reduce flood-risk by increasing the evaporation of rain and channeling of water into the soil, and reduce the 'urban heat island' effect making cities cooler in the heat. A recent study[3] found that a global tree planting effort aimed at increasing tree cover by 0.9 billion hectares could help to remove two-thirds of all human-produced carbon dioxide. As such, trees have become an important tool for tackling climate change and have featured heavily in recent UK media as political parties try to outdo each other on tree planting pledges.

But amid the clamour for more trees, for the many people involved in looking after urban forests the overriding concern is that not enough is being done to look after the existing tree stock: this is particularly true for urban trees. Dwindling resources have been cited as one of the major reasons behind the insufficient maintenance of the urban tree stock meaning that many trees are felled simply because they're too expensive to maintain. Furthermore, a lack of resources has hampered critical research meaning that we still don't know whether urban tree canopy is increasing or decreasing[4]. What is known is that the average lifespan of an urban tree is substantially less than its rural counterpart, and urban tree-felling in some places greatly exceeds the recommended rate often triggering public protests.



One of the trees in Sharrow, Sheffield under threat from the 'Streets Ahead' tree felling programme. Between 2012 and 2018, 5,474 street trees were removed sparking mass public protests. (Image credit: Jason Batterham on iStock)

Insufficient urban tree data often reflects issues with land ownership, (two thirds of all urban trees are privately owned and therefore not routinely monitored), and inconsistent data collection methods used by tree officers across local authorities. Furthermore, many local authorities lack comprehensive tree

[1] Ulmer et al. (2016) Multiple health benefits of urban tree canopy: The mounting evidence for a green prescription. Health and Place. Vol 42, pp. 54–62.

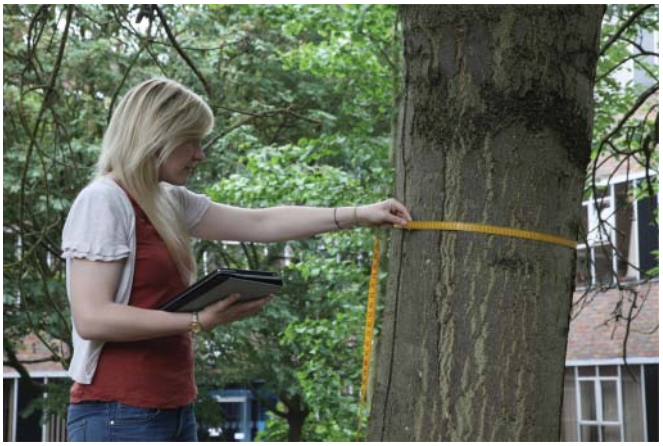
[2] Kuo, FE and Sullivan, WC, (2001) Environment and Crime in the Inner City. Does Vegetation Reduce Crime [in] Environment and Behaviour. Vol 33 (3), pp. 343–367.

[3] Bastin et al. (2019) The global tree restoration potential. Vol. 365 (6448) pp. 76–79.

[4] https://www.charteredforesters.org/wp-content/uploads/2019/01/Doick-et-al_Canopy-Cover-of-Englands-Towns-and-Cities_revised220317_combined.pdf.

inventories, of those that do exist a small fraction are publicly-available.

In response to the growing deficiency of urban tree data Treezilla (www.treezilla.org) was created, the world's biggest, open, online map of UK trees with data generated by everyone from citizen scientists, to experienced tree officers. The platform was designed to support critical tree education, outreach, research, inventory and biological surveillance. Using either the app or website users can record key tree data which generates annual financial estimates of ecosystem services such as air-quality improved, stormwater filtered, energy conserved and carbon dioxide removal.



Citizen scientists contribute a significant proportion of the data to the Treezilla database. The platform provides them with training resources on how to ID common urban tree species, and how to take industry-standard measurements.

Treezilla now celebrates its eighth year. During this time as the project team have worked hard at amalgamating datasets, it has become clear that inconsistent data collection procedures hamper data sharing across the various tree communities. So, in June 2019, with funding from the Geospatial Commission, members of the Treezilla team at the Open University, along with partners Forest Research, Treework Environmental Practice and Natural Apptitude, embarked on project COMMUNITREE with the aim of developing a new standard for individual tree data collection to enable easier sharing of tree data across sectors and communities. Following two workshops in 2019, the standard is now in the consultation phase with the plan to have it finalised by April 2020.

To date Treezilla has engaged over one thousand data contributors and in November 2019 saw the entry of its one millionth tree record demonstrating annual ecosystem service benefits worth £95 million[5]. Of course, the wider value of a tree is much more than the physical processes. As project partners develop the tools on the site they're incorporating methods for assessing the amenity value of a tree, based upon the widely adopted CAVAT tool[6]. But there will always remain other intangible values that are more difficult to quantify: the meaning of the local children's favourite climbing tree, or an ancient oak on a village green. Perhaps it is these values that should be the real motivation for protecting, maintaining and enhancing urban trees. And to do that we must start by mapping them!

To help build the Monster Map of Trees, visit the Treezilla website: www.treezilla.org. Look out for the new, quicker, slicker website and app in time for tree mapping in spring/summer 2020! If your organisation has data you might like to add to the site, or if you are involved in collecting data on urban trees and are interested in contributing to the data standards consultation contact treezilla@open.ac.uk.

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[5] This calculation is based on data from approximately 335,000 trees as the remainder of the dataset had insufficient data for ecosystem service economic benefit calculations. We are working to address this data gap.

[6] Doick et al. (2019) CAVAT (Capital Asset Value for Amenity Trees): valuing amenity trees as public assets. Arboricultural Journal. Vol 40 (2), pp 67–91.

Violence escalates as Romania cracks down on illegal timber trade

In the hamlet of Deia, nestled in the forested hills of Suceava county in northern Romania, Ilie Bucșă and his brother Dumitru have become pariahs. Recently an angry mob attacked the brothers, leaving Ilie with concussion and wounds all over his body. Old friends cross the road to avoid the brothers, having been warned to stay away or face losing their jobs. One night, someone even poured anti-freeze into the brothers' fish pond, killing half their fish.

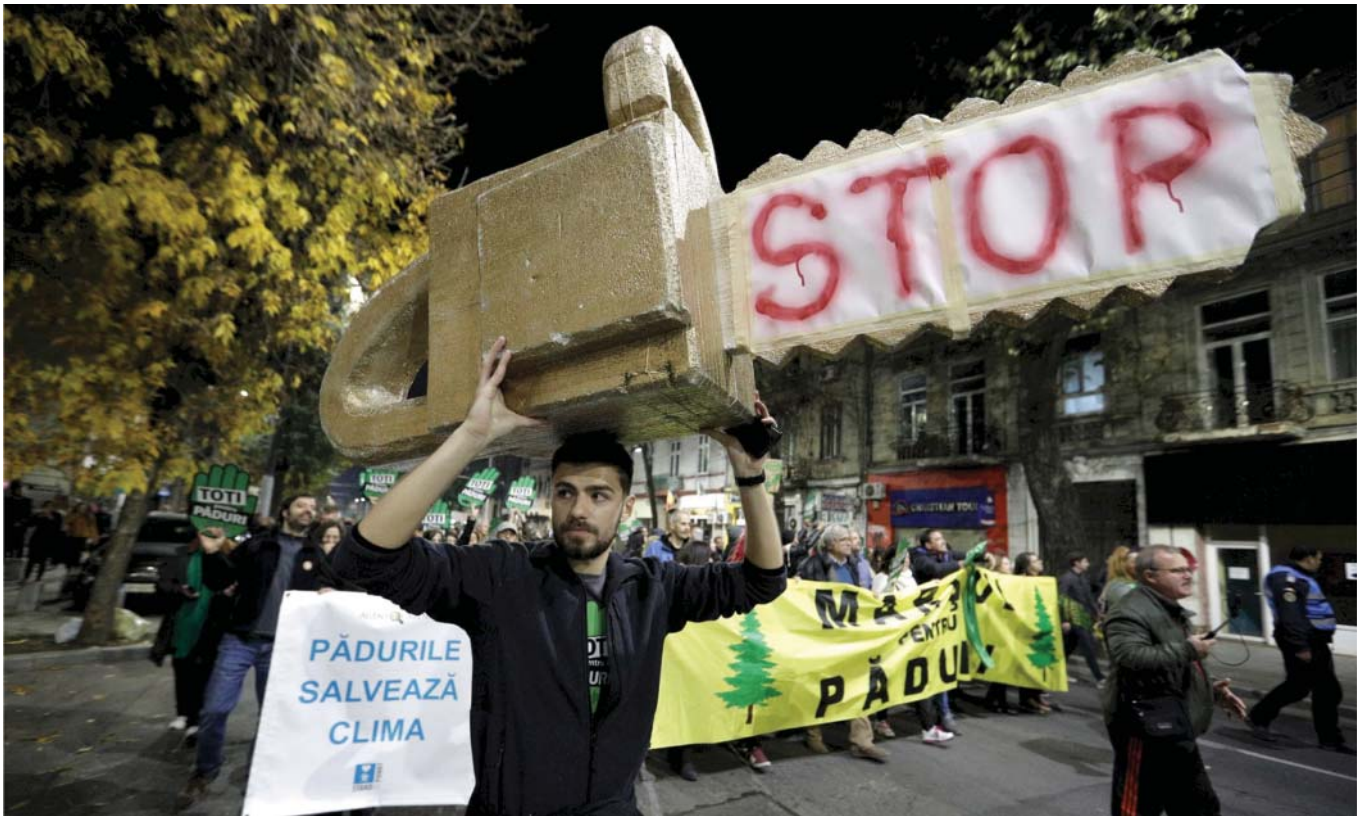
Their sin? They have been methodically filing complaints about illegal logging in the area.

Timber theft is commonplace in much of rural Romania. The logging business is one of the main sources of income for swathes of the population, and for years authorities have turned a blind eye to illegal trade.

Violence and intimidation against those who oppose it is nothing new. Since 2014, six forest rangers have been killed and 184 cases of violence against rangers have been logged. But over the past year it has become harder to steal, partly owing to a government crackdown. As profits become harder to come by, things have got even nastier.

Two of the six ranger murders were in the past three months, prompting Romania's parliament to pass a law allowing all rangers to carry weapons. Attacks on the few people trying to report illegal activity – such as the Bucșă brothers – have intensified as the trade comes under threat.

In October Crețu Ionuț, a ranger in a privately owned forest in central Romania, was threatened by a group of men logging on a neighbouring plot who thought he was spying on them.



A protest in Bucharest against illegal logging. (Photograph: Robert Ghement/EPA)

"They tried to drag me out of the car and told me they would burn my house down and kill my family," he said.

Since then he has begun carrying a weapon, and he tries to patrol with a partner rather than alone. Many rangers have similar stories.

Beyond the threats, violence and corruption, what is at stake is the sustainability of the forest itself. Romania's forests contain 30% of all large carnivores in Europe, with big populations of bears, wolves and lynx. The ancient pedigree of the forests makes them particularly valuable.

"Large parts are still natural forest, unchanged by human intervention. In most of Europe that's not the case. These are very important in the fight against climate change: natural forests have more resistance than planted monocultures," said Mihai Zotta, of Conservation Carpathia.

While there has been outrage over the attacks on rangers, environmental activists say the story is more complicated than one of brave rangers protecting the trees from evil attackers. "Some of them are heroes who are fighting and dying for the forests, but there are also those who are buying new houses and cars they couldn't possibly afford on their salaries," said Zotta.

One ranger who asked to remain anonymous laughed when asked if he knew of colleagues complicit in illegal activities. "Absolutely everyone is at it," he said, adding that he had got into trouble in the workplace for reporting suspicious activity among colleagues and superiors.

In Suceava county, Gheorghe Oblezniuc explained the scheme. A burly forester who worked for a number of small, private logging companies in the area, he was open about his participation in illegal activity in the past. He said he was regularly asked to cut more than the papers showed, for which he was given a bonus of around 30 lei (£5.30) per cubic metre.

"There was one shipment where we had permission to cut 400 cubic metres, and we actually cut 2,400. The owners were hand in hand with the local authorities and the foresters. Everybody got a cut," said Oblezniuc.

He said he initially began to speak out about the practices because he felt he was not getting his fair share of the profits, and later continued out of a sense of justice. Along with the Bucșă brothers and a handful of others, he is one of a few people trying to shed light on the problem in the area.

Oblezniuc met the Guardian in a side room of a petrol station, and glanced nervously at the cars passing outside the window. "There are spies everywhere here," he said, adding that he had received a number of death threats by phone.

Recently it has become harder to steal the logs. A new app allows any curious onlookers to check the licence plates of trucks carrying timber and see whether they have a permit for the wood they are carrying. The brazen, big illegal cuts of a few years ago are now much harder to pull off.

But still, a report commissioned by the government said 20m cubic metres of timber is disappearing from the forests each year, a number bigger than the total amount of legal logging, signifying both a huge hole in the government budget and a potential climate disaster.

"The situation is out of the control of the central authorities. They don't know what's happening in these forests. They don't use satellite images, they don't use smart tools," said Ciprian Găluşcă, of Greenpeace Romania.

The newly appointed environment minister, Costel Alexe, said he was working on the premise that the 20m figure was correct, after several years of the government dismissing it as fake, and he promised a joined-up approach from all government ministries to save the forest.

"Everybody loses: we are losing the forest, we lose as citizens and the budget loses a huge amount of money," Alexe told the Guardian in an interview in Bucharest. One new policy he is keen to implement, which has long been pushed by green activists, is to sell wood directly as timber, rather than the current antiquated system where companies bid for sections of forest that they can then log in.

But Alexe grimaced and sighed when asked whether he had the tools to make a real difference. After all, stopping illegal logging is not just about identifying a few criminal bosses. The network sustains whole communities, with people on each level taking their own cut, from state forestry bosses to local rangers, right down to impoverished villagers with a horse and cart, who gain cheaper firewood for their homes in winter.

"It is essentially a bribe that is given to the local communities: you go ahead and manage the forest as you wish because you're not receiving enough money from us centrally," said Gălușcă.

He said the recent change of government rhetoric was encouraging, and there were signs that prosecutors were taking logging cases more seriously. Previously, just 2% of cases ended in any kind of sanction.

Last month, Ilie Bucşă was called to Bucharest and asked to give evidence to the prosecutor's office on organised crime, the first time this had happened, he said. On Tuesday, prosecutors in northern Romania announced they were opening a criminal case against a ranger for stealing 2.5m lei (£445,000) worth of timber.

Others remain sceptical that real change is on the way. "More rangers will have to die before politicians put a stop to the illegal and chaotic logging," said Sorin Jiva, a ranger from Arad county in western Romania who was shot by illegal loggers in 2017 and spent a year recovering from the wounds.

"We need tougher laws for thieves and criminals firing weapons. Nobody is thinking about the forest. Nobody is thinking about our air."

Shaun Walker *with additional reporting by Laurentiu Colintineanu*
theguardian.com

Invitation to join the revived International Society of Tropical Foresters

The ***International Society of Tropical Foresters*** (ISTF) has been reactivated after a five-year hiatus. The new ISTF offers a quarterly electronic newsletter (in collaboration with International Forestry Working Group of the Society of American Foresters), the more frequent ISTF Update, and the ISTF Infolinks, a periodic guide to current internet resources.

ISTF was founded in the 1950s "in response to a worldwide concern for the fate of tropical and subtropical forests, ISTF is committed to the protection, wise management and rational use of the world's tropical forests". So far, about 1500 people from around the world have joined. For now, the organization will be dues free, for simplicity and to encourage broad participation (although this is under discussion). ISTF now has a member-elected board and chapters are being formed in various countries. The most recent new chapter was approved for Rwanda.

For more information on ISTF and its resources, or if you would like to join, please contact Sheila Ward, ISTF Coordinator at **tropicalforesters@gmail.com**

Around the World

Australia: Incredible, secret firefighting mission saves famous 'dinosaur trees'

Desperate efforts by firefighters on the ground and in the air have saved the only known natural grove of the world-famous Wollemi pines from destruction during the record-breaking bushfires in NSW.

The rescue mission involved water-bombing aircraft and large air tankers dropping fire retardant. Helicopters also winched specialist firefighters into the remote gorge to set up an irrigation system to increase the moisture content of the ground fuels to slow the advance of any fire.

"It was like a military-style operation," NSW Environment and Energy Minister Matt Kean told the *Herald*. "We just had to do everything."

While most of the Wollemi National Park has been burnt by the huge Gospers Mountain fire north-west of Sydney, specialist remote-area fire crews managed to ensure the so-called "dinosaur trees" survived.

"Wollemi National Park is the only place in the world where these trees are found in the wild and, with less than 200 left, we knew we needed to do everything we could to save them," Mr Kean said. The National Parks and Wildlife Service, backed by the Rural Fire Service, kept their efforts largely a secret to avoid revealing the location of the Wollemi pines. Contamination from pathogens brought in by visitors could devastate the remaining populations.

"When the pines were discovered in 1994, you might as well have found a living dinosaur," Mr Kean said. Cris Brack, an associate professor at the Australian National University, said fossil evidence indicates that the trees existed between 200 and 100 million years ago and were once present across the whole of Australia. "I knew the [grove] was exceedingly threatened by the fires," he said.

Ageing the current crop is difficult because they may be cloned from only a few trees or even a single individual. As such, the plants could be as old as 100,000 years, Professor Brack said.

Video footage captured by cameras shows fires approaching the pines, with some becoming charred.

As the fires neared, a NPWS crew was again dropped into the area to operate the irrigation system, with helicopters also called in to drop water on the fire edge to reduce any impact on the pines.

Mr Kean said the threat peaked towards the end of last year, including a period of about four days when it was unclear if the pines had been spared. "We just waited with bated breath," Mr Kean said, adding visibility remained very poor for days afterwards before experts could tell the outcome. While one population of a couple of trees was lost, the remaining 200 made it.

Richard Kingsford, director of the Centre for Ecosystem Science at the University of NSW, said the preservation of the original stands of the pines was "fundamentally important". "This is such a remarkable species in terms of ecology and evolution . . . and only found in Australia," Professor Kingsford said. "It's something like the Opera House of the natural world," he added. "Losing it would have added to the catastrophe we have seen elsewhere."

Professor Brack said evidence from researchers who have visited the trees' secret location suggests the pines were able to withstand fires in the past. That said, "these fires have been abnormally hot and large", he added. Saving the area was not only important for preserving the pines, which have now been propagated by nurseries at home and abroad since their discovery a quarter of a century ago. "The entire ecosystem may be as old and as amazing as the Wollemi pines themselves," Professor Brack said.

The Gospers Mountain fire alone burnt through more than 512,000 hectares before crews contained the blaze in recent days. Started by lightning on October 26, the fire may be assessed as the largest ever fire known to have started from a single source, the *Herald* reported last month. All up, fires in NSW have scorched about 5.2 million hectares, with estimates of national wildlife losses from this season's bushfires topping one billion animals nationally.

smh.com.au

Amazon: Secondary forests provide deforestation buffer for old-growth primary forests

Currently, re-growing forests comprise roughly 21% of previously deforested areas in the Brazilian Amazon. However, these forests, referred to as secondary vegetation, have been little studied, despite occupying a total area similar to that of the United Kingdom.

Now, researchers led by the University of Leeds, the Brazilian National Institute for Space Research (INPE), and Brazilian Agricultural Research Corporation (EMBRAPA) have examined 14 years of data on secondary vegetation formation and cutting in the Brazilian Amazon based on the TerraClass Amazon mapping project.

Their study, published in *Nature Sustainability*, has found that secondary forests account for an increasing proportion of overall forest loss in the Brazilian Amazon, rising from 32% of total deforestation in 2000 to 72% in 2014.

However, while secondary forest cutting has increased in recent years, deforestation of old-growth primary forests in the Brazilian Amazon remained stable. This suggests that secondary forest loss has eased deforestation pressure on primary forests and their irreplaceable biodiversity and carbon storage.

Study lead author Yunxia Wang, from the School of Geography said: "There in an ongoing demand for new pasture and agricultural land in Brazil. Our study shows that this demand has increasingly been met by secondary forests, providing a buffer that has stalled deforestation of primary forests.

"But the strength of this buffer depends on the area of secondary forest available. The limited legal protection means that secondary forest loss is largely unregulated.

"Not only would easing the strain on secondary forests help Brazil meet climate change targets, as they accumulate carbon very rapidly, but future deforestation would likely lead to increased loss of primary forests once easily accessible secondary forests are diminished."

Brazil has committed to restore 120,000 km2 of forest land by 2030 as part of its Nationally Determined Contribution for the Paris Agreement. The authors suggest that a cost-effective way to do this would be to allow part of its existing Amazonian secondary forest area to recover naturally.

Study co-author Dr David Galbraith, Associate Professor in Earth System Dynamics at Leeds said: "Managing this ecosystem sustainably to maximize the conservation value of these forests, while not intensifying pressure on primary forests, requires an integrated strategy that includes active monitoring of secondary forests in Amazonia and strengthening of their governance in Brazilian law."

eurekalert.org

Canada: Wildfire and Carbon – Increasing the resilience of BC's forests to climate change

Researchers from Canada and the United States want to de-escalate the devastating forest wildfires that are increasingly occurring due to climate change, while strengthening development of a forest-based bioeconomy in British Columbia (BC), boosting carbon uptake and reducing emissions.

These goals are part of a $1 million, four-year Theme Partnership project called "Wildfire and Carbon" announced today by the Pacific Institute for Climate Solutions (PICS), which is hosted and led by the University of Victoria. The project team includes scientists from the Canadian Forest Service, the University of British Columbia (UBC), and the USDA Forest Service.

Judi Beck, director general of Natural Resources Canada's Pacific Forestry Centre, explains that managing forests to achieve emissions reductions involves many complex trade-offs. For example, wildfire risk reduction activities – such as controlled burning to reduce fuel loading and create fire breaks – release greenhouse gases and smoke which contribute to climate change and affect human health.

"For example, can short-term increases in emissions from fuel reduction treatments, bioenergy use and creation of fire breaks be justified given the expected emission reductions from less severe wildfires in the future?" adds Beck. "These are the questions we are looking to answer."

Werner Kurz, Natural Resources Canada senior research scientist and principal investigator (PI) of the Wildfire and Carbon project, says wildfires can quickly wipe out the carbon uptake and storage provided by living forests. "For example, direct emissions from British Columbia's 2017 and 2018 wildfires were each more than three times those of all BC's sectors combined," he says.

Kurz says the project will investigate opportunities to reduce future emissions through proactive landscape management, including fuel reduction that makes use of the biomass in a bioeconomy. Biomass derived from thinning, the creation of fire breaks or from wood left after harvest that is currently burned in slash piles could instead be used in long-lived wood products such as building materials, which store carbon and are a substitute for emissions-intensive steel or concrete, he says.

Lori Daniels, a co-PI and professor with UBC's Department of Forest and Conservation Sciences, says the project is aiming for transformative change.

"We envisage a future where the goals of fire risk reduction, bioeconomy, emissions reduction and increased resilience of the forests to climate change, can be quantified, evaluated, managed, and achieved," she says. "Being able to share our Canadian and US expertise, analytical tools and data is incredibly important for ensuring the resilience of our Pacific Northwest forests, including the coastal, mountain and boreal forest landscapes."

"This project affords us opportunities to merge simulation of wildfire and forest successional dynamics with carbon accounting. Wildfires create 'landscape "memories' that influence future fire severity and extent. By getting the fire on fire interactions right, we hope to improve carbon accounting under current and future climates," says co-PI Paul Hessburg, a US Forest Service senior research scientist.

This new project will also build on past research by the PICS Forest Carbon Management Project, which enables forest carbon dynamics to be simulated down to the single hectare, for nearly all forested areas in BC.

PICS Executive Director, Sybil Seitzinger, says Wildfire and Carbon is one of the institute's flagship Theme Partnership projects, which tackle complex and critically important climate mitigation and adaptation challenges. She says this project also aims to have a positive spinoff for the forestry sector, with the potential development of new bioeconomy opportunities and jobs.

The four-year project begins this month. For more details visit **https://pics.uvic.ca/projects/wildfire-and-carbon**

France: New French public buildings must be made 50% from wood

The government of France is set to require that all new public buildings must be made at least 50% from wood or other sustainable materials from 2022 as it pushes for sustainable urban development.

The local government in Paris had already pledged a greater use of natural materials such as wood, straw and hemp, and any buildings higher than eight storeys built for the 2024 Paris Olympics must be made entirely of timber.

"If it is possible for the Olympics, it should be possible for ordinary buildings," said Julien Denormandie, minister for cities and housing, on 5 February. "I am imposing on all public bodies that manage development to construct their buildings with material that is at least 50% wood or other bio-sourced material."

The minister also called for the creation of 100 urban farms, with the first 30 to be selected by this summer. "As a father, I prefer that what is on my children's plates come from the local area, rather than being imported on a plane," he said.

Finally, he announced the objective of low-carbon cities that can adapt to heat waves and floods. This will involve the building of 90 "eco-neighbourhoods", to be organised by the a new body called "France Ville Durable", chaired by Patrice Vergriete, mayor of Dunkirk.

In 2016, it was announced that the city of Bordeaux would acquire France's first timber towers. The Hyperion towers (pictured), will be 50m and 57m in height. They are being developed by Bordeaux Euratlantique, a public body involved in modernising the city. The project is due to be completed later this year.

globalconstructionreview.com

Amazon: Deforested parts of Amazon 'emitting more CO2 than they absorb'

Up to one fifth of the Amazon rainforest is emitting more CO2 than it absorbs, new research suggests. Results from a decade-long study of greenhouse gases over the Amazon basin appear to show around 20% of the total area has become a net source of carbon dioxide in the atmosphere.

One of the main causes is deforestation. While trees are growing they absorb carbon dioxide from the atmosphere; dead trees release it again. Millions of trees have been lost to logging and fires in recent years.

The results of the study, which have not yet been published, have implications for the effort to combat climate change. They suggest that the Amazon rainforest – a vital carbon store, or "sink", that slows the pace of global warming – may be turning into a carbon source faster than previously thought.

Every two weeks for the past 10 years, a team of scientists led by Prof Luciana Gatti, a researcher at Brazil's National Institute for Space Research (INPE), has been measuring greenhouse gases by flying aircraft fitted with sensors over different parts of the Amazon basin.

What the group found was startling: while most of the rainforest still retains its ability to absorb large quantities of carbon dioxide – especially in wetter years – one portion of the forest, which is especially heavily deforested, appears to have lost that capacity.

Gatti's research suggests this south-eastern part of the forest, about 20% of the total area, has become a carbon source. "Each year is worse," she told *Newsnight*. "We observed that this area in the south-east is an important source of carbon. And it doesn't matter whether it is a wet year or a dry year. 2017–18 was a wet year, but it didn't make any difference."

A forest can become a source of carbon rather than a store, or sink, when trees die and emit carbon into the atmosphere. Areas of deforestation also contribute to the Amazon's inability to absorb carbon.

Carlos Nobre, who co-authored Prof Gatti's study, called the observation "very worrying" because "it could be showing the beginnings of a major tipping point". He believes the new findings suggest that in the next 30 years, more than half of the Amazon could transform from rainforest into savanna.

For decades, scientists have warned of an "Amazon tipping-point": the point at which the forest loses its ability to renew itself and begins to emit more carbon than it absorbs. "[The Amazon] used to be, in the 1980s and 90s, a very strong carbon sink, perhaps extracting two billion tonnes of carbon dioxide a year from the atmosphere," says Prof Nobre, who is also a researcher at the University of Sao Paulo's Institute for Advanced Studies and Brazil's leading expert on the Amazon.

"Today, that strength is reduced perhaps to 1–1.2bn tonnes of carbon dioxide a year."

To put that in context, a billion tonnes of carbon dioxide is almost three times what the UK said it officially emitted in 2018. But that figure does not take into account the amount of carbon dioxide released through deforestation and forest fires.

And after almost a decade going down, deforestation in the Amazon has increased significantly in recent years. 2019 was a particularly bad year. Between July and September last year, destruction was above 1,000 sq km (386 sq mi) per month.

"In our calculations, if we exceed that 20–25% of deforestation, and global warming continues unabated with high emission scenarios, then the tipping point would be reached," says Prof Nobre, one of the first proponents of the tipping point theory. "Today we are at about 17%," he adds.

Opinions on when this tipping point could occur differs among scientists. "Some people think that it won't be until three-degrees warming – so towards the end of the century, whereas other people think that we could get [it with] deforestation up above 20% or so and that might happen in the next decade or two. So it's really, really uncertain," explained Simon Lewis, professor of global change science at UCL.

However Prof Lewis called the results of Nobre's research "shocking". "It says to me that perhaps this is more near-term than perhaps I was initially thinking." Prof Nobre's theory was based on climate models. The new study is based on real-life observations, which produce more accurate results. Prof Gatti told *Newsnight* she wanted to see a moratorium on deforestation in the Amazon to establish whether the trend could be reversed. But that looks unlikely.

Brazil's president has made his priority for the rainforest very clear: development over conservation. Saving the Amazon is, for now, a question of political choice. But the science suggests that choice may not be on offer for very much longer.

bbc.co.uk

Vietnam: Quang Tri to plant 60,000ha of forests by 2030

The central province of Quang Tri had over 110,000ha of forests for production as of early this month, 22,000ha of which have received Forest Stewardship Council (FSC) forest management certifications.

Quang Tri is one of the top localities nationwide in terms of forestation certified by the FSC. The province targets developing at least 60,000 ha of FSC-certified forests by 2030, tripling that in 2019.

Forest planting in Quang Tri generates 800,000 – 1 million cu.m of wood per year, helping its wood processing and export industry rank second nationwide.

Its wood products have gained a firm foothold and been exported to demanding markets such as the US, the EU, Japan and the Republic of Korea, among others.

This year, Quang Tri will plant 6,000ha of concentrated forests and 2.5 million scattered trees, thus raising the forest coverage to over 50 percent.

en.vietnamplus.vn

European green deal offers hope for the future of forests

The European Commission, now headed by former German defence minister Ursula von der Leyen, has published its long awaited proposal for a European Green Deal. It contains two standalone forest initiatives as well as some wording that opens the door to promising policies for both European and global forests.

At the international level, the Commission states that it will take regulatory measures to support deforestation-free value chains, starting in 2020. This is an evolution from last July's landmark communication on stepping up EU action to protect the world's forests, adopted under the Juncker Commission, that committed to assessing the need for such measures.

At the European level, the Commission acknowledges that the "EU's forested area needs to improve, both in quality and quantity, for the EU to reach climate neutrality and a healthy environment". It states it will "identify measures to improve and restore degraded ecosystems" through the EU biodiversity strategy in 2020 and produce the laws to implement these goals in 2021. It will also consider a "natural restoration plan" accompanied by funding and commits to revising "relevant legislative measures to deliver on the increased climate ambition".

In a statement, Fern welcomed the proposed Green Deal saying it could be a springboard for ambitious forest action. But several hard choices lie ahead as the Commission turns its words into action.

The Commission doesn't mention what type of regulation it will use to tackle the international forest footprint stemming from its consumption of agricultural commodities. NGOs, Members of the European Parliament and most recently companies have specifically called for a regulation ensuring companies trading in the EU monitor, address and mitigate the negative impacts of their supply chains on forests and human rights.

The Commission also commits to being a global climate leader but makes no mention of championing international action against deforestation. To succeed, the EU must fully integrate forests into its wider climate and development plans and negotiate strong and equal partnership agreements with forested countries. Such agreements must have the support of organisations representing forest-dependent people, in order to tackle the root cause of deforestation, such as poor governance.

At the European level, the EU will also need to do a reality check on its current climate policies.

Their 2050 carbon neutrality goal can only be met if they also have legislation to restore forests, wetlands and peatlands which play a crucial role in removing carbon dioxide from the atmosphere. Fern calls on the Commission to adopt binding targets to restore land and forests so that they return to the kind of healthy ecosystems that store more carbon, are more resilient to climate change and provide crucial services such as water filtering.

European forests cannot be restored unless current EU laws are revised to discourage burning trees for energy generation. This is urgently needed since in the last five years, however, EU forests have dramatically decreased their ability to absorb carbon dioxide. This is due to increased harvesting, a trend that started after 2009 when the EU encouraged countries to subsidise burning wood to produce energy. In its statement, Fern argues that when revising the current climate and energy package, the European Commission should phase out bioenergy subsidies and end the myth that burning wood is carbon neutral.

fern.org

Congo: Subsistence farming topples forests near commercial operations

- *A new study has found that deforestation for subsistence agriculture often occurs nearby commercial logging, mining and agriculture operations in the Democratic Republic of Congo.*
- *Shifting cultivation, which sustains most of the DRC's farmers and their families, continues to drive much of the forest loss in the country.*
- *Commercial operations accounted for relatively little forest loss in the DRC between 2000 and 2015.*
- *But the study showed that around 12% of the forest lost as the area used for shifting agriculture expanded occurred within 5 kilometers (3.1 miles) of these large-scale ventures.*

The effects of commercial logging, mining and farming can ripple beyond the boundaries of the operations, leading to the substantial loss and degradation of nearby forest for subsistence agriculture, a new study on the Democratic Republic of Congo (DRC) has found.

The finding, reported Jan. 16 in the journal *Land*, wasn't surprising, said lead author and geospatial scientist Giuseppe Molinario in an interview. Once such operations are established, the people employed by them and their families often resort to shifting cultivation to support themselves, and other studies have noted the "contagious forest loss and degradation" that tends to crop up around big plantations.

The research represents "the first time that anybody has quantified it on the national scale," added Molinario, who recently completed his Ph.D. at the University of Maryland.

He and his colleagues began with maps of the rural complex in the DRC – that is, the mix of farmland and fallows in the subsistence agriculture cycle on which most of the country's farmers depend. They then chose hundreds of random points in areas where the rural complex had expanded between 2000 and 2015, as well as distinct "perforations" in the forest where bursts of deforestation appeared beyond the complex.

The team used a similar technique in previous studies and found that between 90% and 92% of forest loss in the DRC stems

from this cyclical pattern of agriculture. Across the Congo Basin, shifting cultivation accounted for 84%. Those figures are much lower in many of the world's other forests, Molinario said.

"As we get more fertilization and mechanization and infrastructure, there are more means to have a different type of agriculture which is more efficient and less resource-intensive," he said. Vast soy fields and cattle pastures are driving much of the forest loss in Brazil, for example. In Southeast Asia, commercial oil palm plantations continue to supplant rainforest.

Those industrial operations don't play as big a role in the DRC, though Molinario and his colleagues say that they are expanding. As the rural complex ballooned between 2000 and 2015, it ate up nearly 47,000 square kilometers (18,000 square miles) of the DRC's forest, according to the team's analysis. Isolated perforations accounted for more than 25,000 km2 (9,600 mi2). Together, that's an area of mostly primary forest about the size of the West African country of Sierra Leone.

For the current study, the researchers also drew a buffer around each sampled point and searched for any large-scale logging, mining or farming within that band.

Their analysis showed that these commercial operations on their own accounted for a very small amount of the expansion of the rural complex and those forest perforations in the DRC – no more than 0.5% – between 2000 and 2015.

But when they looked at that buffer around the sampled points, they found that nearly 12% of the expansion and 9% of the perforations during the 15-year study period occurred within 5 km (3.1 mi) of large-scale logging, mining or agriculture – strong evidence that workers on these industrial operations and their families are clearing forest for their farms. What's more, Molinario said, analyses boiling down the deforestation caused by these operations in their immediate vicinities are "very limited and probably inaccurate because they don't take into consideration this broader dynamic."

The stage is set for this forest loss to continue. Bedeviled by extreme poverty and paltry infrastructure, ongoing conflict and unrest, and a growing population, the country's 85 million people have few alternatives.

"It seems like shifting cultivation is the only way possible to survive, to make a living for you and your family and your communities," Molinario said.

By his colleagues' calculations, the DRC's bank of tropical forest – the second-largest in the world, behind Brazil's – could be just a memory by 2100.

"Shifting cultivation is still rising," Molinario added, "and it will rise together with all these commercial land uses until basically all of the forest is just completely degraded or eaten up."

news.mongabay.com

Global: As forests burn around the world, drinking water is at risk

In Australia's national capital of Canberra, where a state of emergency was declared on Friday because of an out-of-control forest fire to its south, authorities are hoping a new water treatment plant and other measures will prevent a repeat of water quality problems and disruption that followed deadly wildfires 17 years ago.

There have not yet been major impacts on drinking water systems in southeast Australia from the intense fires that have burned more than 40,000 square miles (104,000 square kilometers) since September. But authorities know from experience that the biggest risks will come with repeated rains over many months or years while the damaged watersheds, or catchment areas, recover.

And because of the size and intensity of the fires, the potential impacts are not clear yet.

"The forest area burned in Australia within a single fire season is just staggering," said Stefan Doerr, a professor at Swansea University in Wales who studies the effects of forest fires on sediment and ash runoff. "We haven't seen anything like it in recorded history."

The situation in Australia illustrates a growing global concern: Forests, grasslands and other areas that supply drinking water to hundreds of millions of people are increasingly vulnerable to fire due in large part to hotter, drier weather that has extended fire seasons, and more people moving into those areas, where they can accidentally set fires.

More than 60% of the water supply for the world's 100 largest cities originates in fire-prone watersheds – and countless smaller communities also rely on surface water in vulnerable areas, researchers say.

When rain does fall, it can be intense, dumping a lot of water in a short period of time, which can quickly erode denuded slopes and wash huge volumes of ash, sediment and debris into crucial waterways and reservoirs. Besides reducing the amount of water available, the runoff also can introduce pollutants, as well as nutrients that create algae blooms.

What's more, the area that burns each year in many forest ecosystems has increased in recent decades, and that expansion likely will continue through the century because of a warmer climate, experts say.

Most of the more than 25,000 square miles (64,000 square kilometers) that have burned in Victoria and New South Wales have been forest, including rainforests, according to scientists in New South Wales and the Victorian government. Some believe that high temperatures, drought and more frequent fires may make it impossible for some areas to be fully restored.

Very hot fires burn organic matter and topsoil needed for trees and other vegetation to regenerate, leaving nothing to absorb water. The heat also can seal and harden the ground, causing water to run off quickly, carrying everything in its path.

That in turn can clog streams, killing fish, plants and other aquatic life necessary for high-quality water before it reaches reservoirs. Already, thunderstorms in southeast Australia in recent weeks have caused debris flows and fish kills in some rivers, though fires continue to burn.

"You potentially get this feedback cycle," where vegetation can't recolonize an area, which intensifies erosion of any remaining soil, said Joel Sankey, research geologist for the U.S. Geological Survey

The role of climate change is often difficult to pin down in specific wildfires, said Gary Sheridan, a researcher at the

University of Melbourne. But he said the drying effects of wildfire – combined with hotter weather and less rainfall in much of Australia, even as more rain falls in the northern part of the country – mean that "we should expect more fires."

But climate change has affected areas such as Alaska and northern Canada, where average annual temperatures have risen by about 4 degrees (2.2 degrees Celsius) since the 1960s compared with 1.6 degrees (0.88 degrees Celsius) globally. As a result, the forested area burned annually has more than doubled over the past 20 to 30 years, said Doerr, from Swansea University.

Although there might be fewer cities and towns in the path of runoff in those areas, problems do occur. In Canada's Fort McMurray, Alberta, the cost of treating ash-tainted water in its drinking-water system increased dramatically after a 2016 wildfire.

In the Western U.S., 65% of all surface water supplies originate in forested watersheds where the risk of wildfires is growing – including in the historically wet Pacific Northwest. By mid-century almost 90% of them will experience an increase – doubling in some – in post-fire sedimentation that could affect drinking water supplies, according to a federally funded 2017 study.

"The results are striking and alarming," said Sankey, the USGS geologist, who helped lead the study. "But a lot of communities are working to address these issues," he added. "It's not all doom and gloom because there are a lot of opportunities to reduce risks."

Denver Water, which serves 1.4 million customers, discovered "the high cost of being reactive" after ash and sediment runoff from two large, high-intensity fires, in 1996 and 2002, clogged a reservoir that handles 80% of the water for its 1.4 million customers, said Christina Burri, a watershed scientist for the utility.

It spent about $28 million to recover, mostly to dredge 1 million cubic yards (765,555 cubic meters) of sediment from the reservoir.

Since then, the utility has spent tens of millions more to protect the forests, partnering with the U.S. Forest Service and others to protect the watershed and proactively battle future fires, including by clearing some trees and controlling vegetation in populated areas.

Utilities also can treat slopes with wood chips and other cover and install barriers to slow ash runoff. They purposely burn vegetation when fire danger is low to get rid of undergrowth.

Canberra's water utility has built in redundancies in case of fire, such as collecting water from three watersheds instead of two, and it can switch among sources if necessary, said Kristy Wilson, a spokeswoman for Icon Water, which operates the system. Water can be withdrawn from eight different levels within the largest dam to ensure the best-quality water, even if there is some sediment, she said.

That is paired with simpler measures such as using straw bales, sediment traps and booms with curtains to control silt, and physically removing vegetation around reservoirs and in watersheds to reduce fire fuel, she said.

Eventually, some communities might need to switch their water sources because of fires and drought. Perth, on the western coast, has turned to groundwater and systems that treat saltwater because rainfall has decreased significantly since the early 1970s, said Sheridan of University of Melbourne.

But, for now, millions of people will continue to drink water that originates in increasingly fire-prone forests.

apnews.com

Malaysia: Use technology to save forests, says palm oil group

Malaysian palm oil producers must use technology to improve yield and compensate for restrictions on land use, as the industry wrestles with concerns about sustainability, the chairman of the Malaysian Palm Oil Council (MPOC) said.

Malaysia, the world's second biggest palm oil producer, has set a cap of 6.5 million hectares on the area under palm oil cultivation. In 2019, the total area planted with oil palm was about 5.9 million hectares.

Given the restrictions on expanding into new land, MPOC chairman Lee Yeow Chor said, companies should look at other options to increase output.

"The emphasis for the palm oil industry should be looking at how to increase the utilisation of technology in order to improve yields," Lee told Reuters today.

He said the industry was also increasing mechanisation to cut reliance on foreign labour, and seeking to use tissue culture and genomics to make plants deliver more.

Apart from the land issue, frequent droughts and replanting in Sabah, the biggest Malaysian state producing palm oil, will hit output, he said. It takes between three and four years for a plant to produce fruit.

Mohamad Nageeb Abdul Wahab, chief executive of the Malaysian Palm Oil Association – a group representing growers – told Reuters separately the bigger producers were focusing on yield expansion using genome-sequencing.

Palm oil is used in a wide range of products, from snack foods and cosmetics to biodiesel. The commodity is under scrutiny because the producers in Indonesia and Malaysia have in the past cleared forests to make way for oil palm cultivation.

The European Union last year legislated to phase out palm oil in renewable fuel by 2030 because of concerns about deforestation.

Lee said he expected palm oil to come under greater scrutiny because of the European Green Deal, a proposal by the European Commission to make the EU climate neutral by 2050.

"The best way to overcome the bad perception is consistency and continuous improvement. The Malaysian palm oil industry has a good track record in doing that," he said.

He said he expects the benchmark Malaysian palm oil price to range between RM2,800 and RM3,100 per tonne in the next two months, higher than today's close of RM2,759, because of limited supplies.

freemalaysiatoday.com

USA: We're destroying virgin forests for toilet paper – What are the alternatives?

The vast majority of the tissue products found in our homes are made from wood pulp, the use of which drives the degradation of forests around the world. Their everyday consumption facilitates a "tree-to-toilet pipeline," according to the ***NRDC***. Think of it. Trees that sprouted when your great-great-great grandparents were born are chopped down, converted into tissue pulp, rolled into perforated sheets or stuffed into boxes, and flushed or thrown away.

On average, a person in the US can be expected to get through 141 rolls of the stuff annually, equating to roughly 12.7 kilograms, according to **Statista**. Tissue is big business in the US, as it generates $31 billion in revenue every year. People in the US comprise about 4% of the world's population but consume over 20% of global tissue.

Much of the tissue pulp in the US comes from the boreal forest of Canada. This vast landscape of coniferous, birch, and aspen trees contains some of the last of the world's remaining intact forests. It's home to over 600 Indigenous communities, as well as boreal caribou, pine marten, and billions of songbirds.

Yet industrial logging for paper products like toilet paper claims more than a million acres of virgin boreal forest every year. Isn't it time we accept our responsibility to choose sustainably sourced personal paper products?

Cultural Shifts are Difficult: But Virgin Forests for TP? Really?

I must admit it: when I traveled in Europe and the MidEast, I didn't know how to use a bidet. So I didn't, continuing the practice common in the US of relying on toilet paper during my bathroom visits. But now I've learned that the manufacture of soft, gentle, fluffy bathroom tissue is one of the most environmentally destructive processes on the planet. Isn't it time for the US to accept a cultural shift and install bidets in our residences?

Some people consider squirty bidets to be a key green technology because they eliminate the use of toilet paper. They're much less stressful on the environment than using toilet paper. If you argue that a bidet uses too much water, **Biolife Technologies**, manufacturer of the high-end line of Coco bidets, says the amount of water used by a typical bidet is about 1/8th of a gallon, with the average toilet using about four gallons per flush.

Some of our most personal time is spent in the bathroom, right? And you deserve the best when it's all about you, true? Yet the choices we make for the paper products we use in the bathroom have environmental consequences. When you flush toilet paper with that's oh-so-soft, you're likely flushing away a regal old-growth tree. Our satisfaction in gentle paper is taking a toll on virgin boreal forests, which generally offer some **very special features**.

A 2019 report from the NRDC titled "**The Issue With Tissue**" describes how most major household toilet paper brands, including Charmin, Cottonelle, and Angel Soft, are made from virgin forest fiber. In our recent *CleanTechnica* research, it seems like not much has changed in the year since the report was originally released. There are options and alternatives, of course, to relying on virgin boreal forests for paper supplies, but major companies decry their use.

Sustainable alternatives to toilet paper exist – major brands simply choose not to use them.

The Big 3 Tissue Companies & Their Tired Excuses

- Many of the leading tissue companies in the US refuse to reconsider virgin fiber pulp in their name brands rather than investing in existing consumer alternatives. Commercial tissue products from the big producers have undergone some transitions, but the 3 companies with the largest market shares in the residential tissue sector, Procter & Gamble, Kimberly-Clark, and Georgia-Pacific, still rely almost exclusively on virgin pulp.
- **P&G** offers a simple reason for not using recycled wood pulp: They argue it doesn't make for good toilet paper. "Have you tried recycled toilet paper yourself?" a P&G spokesperson **asked** *CBS MoneyWatch*. She pointed to Charmin as a superior product. "I promise you'll enjoy it much more," adding that P&G's experience making recycled tissue products shows that "a significant amount of recycled fibers ends up as solid waste sludge going to landfill." Excuses?
- **Kimberly-Clark** is one of the **biggest suppliers** of toilet tissue worldwide. The proportion of recycled wood pulp used by the company has fallen over the years from just under **30% in 2011 to 23.5% by 2017**. The growing trend – which is corporate driven – for "luxury" 4-ply and quilted toilet roll is inspiring Kimberly-Clark to create the softest possible product, which points the conglomerate to virgin pulp.

Georgia-Pacific boasts, "Our products are manufactured using recycled and virgin fiber, and our mills have chain of custody and fiber sourcing certifications from recognized third-party groups, including the Sustainable Forestry Initiative® (SFI®) and Forest Stewardship Council™ (FSC®)." **Fiber sourcing standards** set mandatory practice requirements for the responsible procurement of all fiber sourced directly from the forest, whether the forest is certified or not. What's less clear, however, is why Georgia-Pacific insists on virgin boreal forests for their virgin fibers when so many alternatives exist. Indeed, there is no reason to make single-use tissue products from wood, according to the **NRDC**, and FSC certification simply isn't as beneficial to forests as avoiding the use of trees in these products altogether.

Alternatives to TP

Fortunately, solutions to the tree-to-toilet pipeline already exist. Instead of relying on virgin pulp, tissue companies can use recycled content or sustainably sourced alternative fibers such as wheat straw and bamboo. Use of these materials to create tissue can dramatically reduce our destructive impact on the boreal and other forests around the world. Some companies have already begun incorporating these far more sustainable materials into their products.

Alternative fibers include both virgin fibers from rapidly renewable sources (hemp, flax, Arundo donax, bamboo, kenaf) and agricultural residues (wheat straw and bagasse). And let's not forget the hygenic and practical bidet.

The NRDC acknowledges that many people in the United States are reluctant to stop using their tissue products. For those who don't want to make the switch, the best thing to do is follow the sustainability guide and buy only tissue products made from recycled materials.

cleantechnica.com

Russia: Clones of trees will help restore forests – Russian scientists increase the survival rate of seedlings for after-fire reforestation

Scientists from the National University of Science and Technology MISIS (NUST MISIS) and Tambov State University (TSU) presented a new technology to increase the survival rate of microclonal seedlings planted for reforestation after massive fires. The use of nanopreparations allowed obtaining seedlings of deciduous and coniferous trees with an increased survival rate (10–28% higher) in the open ground. They have already been used to create experimental forest plantations in the Central Black Earth Region of Russia.

According to the Federal Forestry Agency (FFA, Russia), in 2019 economic damage from forest fires in Russia is 14.4 billion rubles. During the fire season in a number of Russian regions, the fire covered more than 10 million hectares of forest. One of Australia's largest banks, Westpac, has estimated that direct losses to the Australian economy after the wildfires will be about $ 3.5 billion.

To restore forest resources, burned areas are sown with seedlings grown in special laboratory conditions using the method of microclonal reproduction. The method is based on the ability of a plant cell to give rise to an entire plant organism under favorable conditions. Tree microclones can be reproduced 3–4 times faster than conventional seedlings, while they are genetically homogeneous.

However, during adaptation to the soil, there is a high probability of their death, which reduces the effectiveness of the technology as a whole. To solve this problem, a team of scientists from NUST MISIS and TSU obtained experimental samples of unique nanopreparations for microclonal reproduction of trees based on colloidal solutions of nanoparticles.

"The obtained nanopreparations are the basis of the nutrient medium. They protect the microclonal seedlings of trees from infections. These are mostly microscopic phytopathogenic fungi, which at this stage kill about 30% of seedlings, – said the Project Manager, Director of the TSU Ecology and Biotechnology Research Institute Alexander Gusev. – Infections are especially dangerous when sprouts are transferred from laboratory test tubes to the non-sterile environment of the greenhouse, where they grow to become seedlings that can be planted in open ground."

The experiments in the framework of the project have shown that nanopreparations in a nutrient medium ensure the death of about 90–95% of pathogenic microorganisms.

"The active substance of the preparations is nanocomposites of the graphene oxide-silver and graphene oxide-copper oxide composition. In this case, silver or copper oxide nanoparticles are located on the surface of the graphene oxide sheets, – said the representative of the nanocomposite developers and the Head of the NUST MISIS Department of Functional Nanosystems and High-Temperature Materials Denis Kuznetsov. Graphene oxide serves as a bioactive nanoparticles carrier and a colloidal systems stabilizer, and silver and copper oxide act as non-toxic wide spectrum of action fungicides for plants." As a result of the project, stimulators of growth and phytoimmunity of tree crops, which have no analogs, were created. They are intended for use as components of cultivation media for microclonal sprouts and for treating plants in a greenhouse during growing in the closed ground.

The development of Russian scientists has export potential since it can be in demand in countries where the majority of planting material is produced by microclonal propagation laboratories – the USA, Canada, Spain, Italy, Portugal, Poland, Germany, Latvia, Belgium, and Holland.

prnewswire.com

New Zealand: Forestry company might retire some plantations on steep land

The biggest forestry business in the top of South Island is considering retiring pine plantations on steep land at high risk of landslides, which threaten communities downstream. Nelson Forests Ltd said it had identified around 5500 hectares, of its 60,000 ha of productive forest in Nelson, Marlborough and Tasman district, that was in an area "considered to be at the highest risk" of landslide.

Forests estate value manager, Andrew Karalus, said research that the company commissioned Landcare Research to carry out, divided the estate, into "very high landslide susceptibility on the basis of slope and geology", down to low susceptibility. Rainfall data would be used to assess the likelihood of a rain event that would trigger a landslide in those areas, to decide which catchments to examine first, to see what was at risk downstream.

"What we're trying to establish is, where have we got that risk to our downstream neighbours. Immediately we can use history and say the areas we've experienced this problem is in what we call the Wangapeka Glenrae area [near Tapawera], and Onomalutu [near Blenheim]."

It was perhaps unsurprising that the research identified Wangapeka as one of the highest risk areas, he said. The land was "granite country", similar to that near Abel Tasman national park where multiple slips occurred around homes during ex-cyclone Gita in February 2018.

Residents in the Motueka catchment have been calling for tighter rules around forestry for decades due to damage caused by flooding and debris in heavy rain events. A company facilitator had talked to people living in the Tapawera area, and was

about to start discussions with them about how to manage the risk.

"That might be us retreating from some areas, it might be houses building structures around them," Karalus said. "We might be able to get most of the gain with actually not a lot of retreat, but a lot of different practice." Such changes could include pulling less forestry material over gulleys, or having higher standard of removing forestry slash, he said.

Karalus questioned whether, if the forestry company left high risk areas, it would solve the problem. "Even relatively stable [non forestry] land can landslide . . . if you had a big enough storm."

The community needed to consider, as well as the landowner, how best to use the land if it was retired from forestry, Karalus said. Letting it revegetate into native bush would expose the land to landslides for longer than if replanted, and there was a question mark over who would pay deforestation liability, if the land was not going to be replanted, he said.

"An analogy is . . . roads and houses on the coastal fringe. "Somewhere, someone is going to make a decision that retreat is the right answer. As much as you might have the view that, well I chose to live in a low risk area, so why should I pay? I think you'll find that we'll all end up paying, because it's the only practical way that we're going to implement that."

The research was part of a $500,000 sedimentation research fund, announced by Australian owners of Nelson Forests Ltd, OneFortyOne, in September 2018.

It came after a NIWA study in April that year showed a link between pine forests and damaging fine sediment in Waimea, Moutere estuaries. That study relied on a qualitative method, that was "open to error and overlap", Karalus maintained. Information from Landcare Research showed landslides were considered to be the biggest contributor of sediment, he said.

Nelson Forests had been "more specific" however about how it controlled water that left its harvested sites, Karalus said. "This year, we're setting up a paired catchment study, two catchments side by side, one with no [such] work in it, one with harvesting under our new controls, to measure what amount of sediment leaves."

Lees Seymour, managing director of Nelson Forest's management company, Nelson Management Ltd, said clear felling (the practice of harvesting blocks of plantation forests in one go) in smaller areas, wouldn't necessarily reduce the risk of landslides, and therefore sediment. "You can have multiple small blocks harvested across your whole estate, or you can have larger blocks in less parts of your estate.

"The single biggest determinant of landslide is the rainfall, so if you increase your exposure to rainfall events, then you might have more landslides."

stuff.co.nz

USA: 'This is not how sequoias die. It's supposed to stand for another 500 years'

The fable of the giant sequoia tree is an enduring tale of America's fortitude. Standing quietly on the western slopes of the Sierra Nevada, the Californian giants can survive almost anything – fire, disease, insect attack, cold years, hot years, drought – so the story goes.

The largest living organisms on the planet can grow over 90 metres (300ft) tall. When they do die after 3,000 years or so, the oldest trees, known as monarchs, usually succumb to their own size and collapse. Their giant trunks will rest on the forest floor for another millennium.

But the miraculous story of the near-indestructible giant trees that millions of Americans tell their children is no longer true. For the first time in recorded history, tiny bark beetles emboldened by the climate crisis have started to kill giant sequoia trees, according to a joint National Park Service and US Geological Survey study set to be published later this year. Twenty-eight have gone since 2014. The combination of drought stress and fire damage appears to make the largest sequoias susceptible to deadly insect infestations that they would usually withstand.

One of the 28 is the optimistically named Lazarus, which stands in the Giant Forest in Sequoia national park, surrounded by other sequoias and a handful of cedars and pines that died in California's great drought.

When Dr Christy Brigham, who is responsible for the welfare of the ecosystems in Sequoia and Kings Canyon national parks, saw Lazarus for the first time, all she could do was weep.

"This is a tree that has lived through 2,000 years of fires, other droughts, wet years, dry years, hot years, cold years. It's been here longer than Europeans have been in this country and it's dead. And it shouldn't be dead. This is not how giant sequoias die. It's supposed to stand there for another 500 years with all its needles on it, this quirky, persistent, impressive, amazing thing, and then fall over. It's not supposed to have all of its needles fall off from the top to the bottom and then stand there like that. That's not how giant sequoias die," she says, standing next to the skeletal Lazarus as the occasional tourist wanders past.

Even as tens of millions of trees died around them in California's historic drought, reassuringly the vast majority of giant sequoias appeared to stand strong, as they had always done. But in 2017, Dr Nathan Stephenson, a forest ecologist with the US Geological Survey, noticed a dead branch showing signs of beetle damage had fallen from a giant sequoia. Trees had died standing since 2014, but the fallen branches were the first indication of what might be going on. Other researchers took samples of live branches from the top of sequoias that were dying from the top down and incubated the branches for further research.

"Hundreds of beetles came out of these pieces of branch. We went back the next spring and that part of the tree that had been sampled was now dead," he recalls, detailing how the giant sequoia faded to its death from the top down. Stephenson emphasises that there is still further research to do on how bark beetles are killing giant sequoias but he is clear on one thing.

"I think beyond reasonable doubt in the limited set of circumstances, which was the most severe drought on record and all the trees had had a recent fire at their base, you can weaken giant sequoias to the point that bark beetles can kill them."

theguardian.com

France: President Macron says he cares about forests – but will he put France's money where his mouth is?

French President Emmanuel Macron wants to be seen as global climate champion. He dubbed the fires that devastated the Amazon last summer an "international crisis" and led global efforts to raise funds, as well as a number of other forest preservation initiatives.

With apocalyptic Australian fires ushering in the new decade, his words ring truer than ever. But they will ring hollow until he tackles the problem in his own backyard.

Agribusiness plays a critical role in the deforestation of tropical rainforests like the Amazon, as President Macron stressed at the UN General Assembly: "predatory agricultural activities [are] not compatible with biodiversity and the forest."

He's right – and he should take a closer look at the financial institutions that make this possible. Global Witness has found that between 2013 and 2019 French financial institutions have backed some of the most damaging agribusiness companies across the globe to the tune of almost €2 billion euros. Through their production of goods like palm oil, beef, and rubber, these companies are aiding the destruction in the world's largest tropical rainforests. This makes France the second-largest source of funds backing deforestation in the EU over that period.

The irony is that France is one of the few countries that has recognised the role of its consumption and investments in fuelling deforestation and pledged to act. A national strategy to tackle imported deforestation, agreed in 2018, sets out to incentivise financial actors to incorporate the fight against deforestation into their investment policies and strategies. It also extends to the deforestation risks of their financing and investments.

France has also led the way with the adoption of its landmark 'Duty of Vigilance' law in 2017. It requires French companies, including banks, of a certain size to identify, mitigate and prevent human rights abuses and environmental harm throughout their supply chain and financing operations. They have to report annually on these risks, as well as on measures put in place to mitigate them.

These commitments look good on paper, but they need enforcement. In 2020, they must be followed with urgent and bold action to shift corporate behaviour and unlock real progress. As our investigations have revealed, money is still freely flowing to companies destroying tropical forests to produce commodities like palm oil, beef, and rubber.

Our new analysis highlights that since the adoption of the Duty of Vigilance law nearly three years ago, major French banks BNP Paribas, Crédit Agricole and Natixis have all financially backed global agribusinesses with operations linked to deforestation in the Amazon and the Congo Basin, despite having adopted environmental and forests policies.

Not only are French banks financing companies associated with deforestation, a recent report from Friends of the Earth France and Oxfam France revealed the biggest French banks – BNP Paribas, Société Générale, Crédit Agricole, Banque Populaire and Caisse d'Epargne – have financed or invested in the fossil fuel industry, whose emissions reached more than 2 billion tonnes of CO2 equivalent in 2018. That's 4.5 times France's own emissions generated in 2018.

As things stand, French banks' behaviour will continue to undermine France's global climate commitments. President Macron has the tools to stop this happening. To cement his position as a global leader on climate, he must deliver radical, transformative change at home *and* rally international efforts to help save our forests. There's no time to lose.

globalwitness.org

Amazon: Area of Amazon affected by wildfires predicted to grow by 2050

Amazon wildfires are predicted to worsen, doubling the amount of an important region of forest affected by 2050. The result could be to convert the Amazon from a carbon sink into a net source of carbon dioxide emissions. Paulo Brando at the University of California, Irvine and his colleagues developed a model to predict how climate change and deforestation in the southern Brazilian Amazon, a wildfire hotspot, are likely to influence wildfires and their associated greenhouse gas emissions.

The model predicts a doubling in the area burned by wildfires from approximately 3.4 million hectares across the 2000s to about 6.8 million hectares in the 2040s, in the worst case scenario of deforestation and rapid climate change. By 2050, the total area burned is predicted to reach 23 million hectares – 16 per cent of the existing forests in that part of Brazil.

"We have to reduce deforestation to tackle the biggest problem," says Brando. In Brazil, 100 per cent of wildfires are started by people, often as part of agricultural practices, he says. "We can do better than we are doing right now."

"Unlike Australia where bushfires can propagate, in the Amazon they only propagate to a few hundred metres because the forest is very wet," says Carlos Nobre at the University of São Paulo in Brazil, who wasn't involved in the study. But it is getting hotter and drier due to climate change and other factors, which means the Amazon is likely to become more vulnerable to spreading wildfires in future, says Nobre.

The Amazon removes between one and two billion tonnes of carbon dioxide from the atmosphere each year, equivalent to 2.5 to 5 per cent of global emissions. If wildfires increase, eventually the total emissions resulting from fire will exceed 2 billion tonnes, turning the Amazon into a net carbon source.

www.newscientist.com