

Environmental Audit Committee

Oral evidence: Sustainable timber and deforestation , HC 637

Wednesday 7 December 2022

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Members present: Philip Dunne (Chair); James Gray; Ian Levy; Jerome Mayhew; John McNally; and Claudia Webbe.

Questions 115 to 196

Witnesses

I: Graham Clark, Senior Land Use Policy Adviser, Country Land and Business Association, Ben Goh, Commercial Manager, Maelor Forest Nurseries, David Hopkins, Chief Executive, Timber Development UK, and Justin Mumford, Chartered forester and representative, Institute of Chartered Foresters

II: Professor David Coomes, Professor of Forest Ecology and Conservation, University of Cambridge, Dr Mike Morecroft, Principal Specialist, Climate Change, Natural England, Dr Andrew Weatherall, Principal Policy Officer for Woodlands and Forestry, Royal Society for the Protection of Birds (RSPB).

Written evidence from witnesses:

[Timber Development UK / Timber Trade Federation](#)

[RSPB](#)

[Royal Society for the Protection of Birds, Wildlife and Countryside Link, MCS Charitable Foundation, and Soil Association](#)

Examination of witnesses

Witnesses: Graham Clark, Ben Goh, David Hopkins and Justin Mumford.

Q115 **Chair:** Good afternoon and welcome to the Environmental Audit Committee for a hearing on our inquiry on sustainable timber. I am pleased that our first panel provides us with expertise from those engaged in the practical business of growing trees, including for timber, across the UK. I would like to start by inviting you to introduce yourselves and explain the relevance of your role to this inquiry, starting with Graham from the Country Land and Business Association.

Graham Clark: I am with the Country Land and Business Association, the CLA, which is a membership organisation for rural businesses and rural landowners in England and Wales. We have about 27,000 members nowadays, roughly responsible for about half of rural land, much of which is forestry. I cover forestry policy and energy policy for the CLA.

Ben Goh: I am the commercial manager at Maelor Forest Nurseries. We are a tree nursery, growing about 35 million trees a year for woodland and forestry creation and restocking. We are part of the Confor Nursery Producers' Group, which represents about 90% of the tree-growing capacity in the UK.

David Hopkins: Timber Development UK is the largest trade association for timber producers and suppliers. We were formerly the Timber Trade Federation and TRADA, which was the technical body. We recently merged the two over the course of this past year. Our members are responsible for about 80% to 90% of the timber that is put into commercial use.

Justin Mumford: Good afternoon, everybody. I am a director of Nicholsons Lockhart Garratt. We are a forestry management company based in England, managing approximately 15,000 hectares. I am here today in my capacity as a chartered forester, representing the Institute of Chartered Foresters.

Q116 **Chair:** Thank you. I should start by just reminding the Committee of my register of interests. I partner in a farming business that has forestry. We have woodlands, which we manage, and we also have a bit of land that is let on a very long lease to the Forestry Commission.

Can we kick off with a general view from you all, please, on the Government's tree-planting strategy and how that is likely to provide sufficient clarity for those people engaged in the timber business at large to be able to achieve Government ambition and for members of your associations to be able to conduct your business satisfactorily? Would you just like to give us an overview, perhaps starting with you, Graham?

Graham Clark: I think bits of the tree strategy are clear. They set a clear direction and a clear target. They obviously want a lot more people to plant a lot more trees, more woodlands, but as far as timber supply is



concerned, I think the main scheme that is in place to achieve that in England is probably perceived by most people as one that favours or wants people to do broadleaf planting rather than productive timber.

In theory, I think the scheme can do both, all sorts of forestry. It can do productive forestry, but the way that the scheme is set up and promoted doesn't sing off the page as something that is for productive forestry. I think it is more public benefits and wildlife benefits, biodiversity and climate change addressing issues, rather than timber production.

Q117 Chair: Would you like to see the Government's target broken down into sections so that they can be clearer about how much land should be given over to amenity and how much to timber production?

Graham Clark: That would help. The amount of woodland that has been created in the past year or so—and the scheme has been in place a little over a year—is broadly similar to the acreages made the previous year and the few years after that, so I think it would help if the Government were clearer as to what they wanted out of that scheme and what kind of woodlands they would like. Maybe they could consider a target for more productive woodlands, yes.

Q118 Chair: Ben, if you are planting the nursery capacity for the woodlands of tomorrow, is there clarity in the signals being given to your sector as to what kind of trees you should be planting from seed?

Ben Goh: There are two elements to it. There is what species and how much of each species that need to be grown. For the nursery sector, we tend to have quite long lead times on what we are growing. We are typically making decisions a year, two years ahead before we put seed in the ground because we have to procure seed, collect seed, put seed in treatment, allocate land for it, and then the trees might have a year, two-year, three-year growing cycle. It can comfortably be four or five years between deciding what we are going to grow and those trees being available to plant.

In the meantime there can be a lot of changes, but the issue is that trees have a limited field life/shelf life and window of saleability. If the implementation or the process is such that there are interruptions or changes in direction in the meantime, then those trees can't be carried over. A proportion can be, but most of them can't. You will have a situation where, without clear direction, commitment and an implementation that aligns with that direction, you will end up with not the trees you want, so you will have a shortage, and then you will end up with lots of trees that you don't want. You will have a long position. You will be in both positions and that is not achieving what we are trying to do.

For nurseries, there has always been that risk around the species selection and the mix that you plant, but it has always been on the assumption that there will be a fairly balanced sort of demand between



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nature recovery, amenity requirements and forestry and timber production, carbon as well. When what is being planted veers to one side or the other, then we end up with lots of trees that are not suitable.

Q119 Chair: We have just heard from Graham and our brief suggests that the area being planted each year has averaged between 13,000 and 14,000 hectares for each of the last four years, so that seems to be very stable. Of course, that is way under what the Government are intending to achieve, which is 30,000 by 2025, I think. If we are less than half, it suggests that that target is not being reached. Has the balance of planting as between softwoods and hardwoods changed much over that period? Can you give us a sense, Ben, from your business and the sector as a whole what the balance of types of species are?

Ben Goh: It is worth saying that for the UK as a whole, planting is dominated by what is happening in Scotland and the mix there has been fairly consistent. In England and Wales there has been a big relative increase in the demand for broadleaves and that has led to perceived shortages in specific species, but overall the mix for the UK has probably increased in terms of broadleaf requirement. Of course, as I say, there is a lag in terms of how we can respond to that. Nurseries have responded to it, but it is probably going to be next year or the year after before that starts to come through.

Q120 Chair: What is the proportion of softwood and hardwood at the nursery level?

Ben Goh: If you take out restock, so we are just looking at woodland creation, it is about 50:50.

Justin Mumford: It would be safe to say that is across the whole of the UK. In England, it is very much predominantly broadleaves and I would put that percentage at probably 80% to 85% broadleaves to 15% conifer. That is very much dictated by the grant structure, where we are looking to achieve the requirements to plant.

Q121 Chair: That is driven by Government policy?

Justin Mumford: Government policy, then the requirements under the grant regulations that we need to meet to secure that funding.

Q122 Chair: How has that changed over time?

Justin Mumford: Ever since 1985 we have been working under the broadleaf policy, so all our grant structures have favoured a very high percentage of broadleaves, with only a small percentage of conifer allowed within the mix as part of the final agreement.

Q123 Chair: David, in terms of the timber industry, to what extent is there demand for broadleaf from a timber point of view domestically?

David Hopkins: Very little. The market is dominated by softwoods. With any industry, you want the products to be standardised and regular, and



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conifer trees, softwood production, obviously achieves that. Hardwood trees, there is much more variety and variability in the trees that come through. They take far longer to reach maturity and to reach a kind of commercial level and they are much more on the decorative and luxury items, I would say. There is still a good market for it.

We have a lot of good hardwood traders, they do good business and their markets are still robust, but in terms of volumes of wood going into the market, it is still very small. It is small amounts, high margins, because they are luxury goods. The softwoods are the utility products for all other forms of construction; less beautiful in their appearance but much more versatile and much more useful, if you like.

Q124 **Chair:** By luxury, you mean the hardwoods are going into furniture, that kind of thing?

David Hopkins: Yes. It is much more to do with appearance and visual aesthetics rather than a functional construction utility, if you like. All the carcassing, the floor joists, the floorboards and so on that you would have in a standard house are going to be made from softwoods. You will get, in certain areas, luxury expensive hardwood floors and fittings and skirtings and doors and cabinetry behind you, but it is a sign of quality, if you like, or higher-end markets, which are smaller, by definition.

Q125 **Chair:** What proportion? We heard that overall over 80% of our timber is imported. Can you characterise that as between softwood and hardwood?

David Hopkins: The overall balance, if you look at all markets, if it is not just about construction, it is about 60:40. It has remained around 60:40 all the time. That includes fencing, pallets, packaging and all sorts of other products. When you look at construction, it is about 80:20 in favour of imports over domestic production. When you look and you break down the rest of the mix between softwood and hardwoods, hardwoods is probably between 5% and 10%, depending on any given year of the wood volume mix. The value of it can change and the different species can have higher values, but in terms of actual volumes it is much smaller.

Q126 **Chair:** Is it fair then to characterise the woodland grant scheme and the initiatives being taken by DEFRA as designed solely with amenity in mind, if you say 85% of that is for hardwoods, for which there is very little timber demand domestically?

Justin Mumford: That would be a fair reflection in terms of the mix of species as well. To put that into context, as a country we milled approximately 1 million tonnes in 1980 of hardwood timber. By 2021 that was down to 700,000 cubic metres, so in effect we have reduced considerably our volume of hardwood milling over the last 30 years.

The difficulty we have is that some of the early hardwood plantations that we put in were designed for amenity. By that, I mean they were planted at too wide a spacing to grow good quality straight timber lengths and there was poor ongoing management on those woodlands once they had



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been planted. We need to make sure of that continued management on pruning to give clean stems but, most importantly, that good management with regards to pest control—in particular, grey squirrel and deer—is undertaken to allow us to have good, clean, straight timber lengths to then sell on into the future.

Q127 **Chair:** Can you also characterise the difference between the Forestry Commission, so public landlord, and private landlords in their interest in planting either hardwoods or softwoods?

Justin Mumford: Ben, are you selling many conifers through to Forestry England at the moment?

Ben Goh: No is the very short answer. We do supply the public estate in Scotland, Wales and England and there is a very different species requirement there. In Scotland, there is a balance between conifers and broadleaves. We supply some volume, but it is not a huge amount of conifer into the English public estate.

Q128 **Chair:** Graham, most of your members in England are interested in hardwood plantings for woodland creation for amenity purposes or for carbon sequestration purposes or for what?

Graham Clark: I think they are more interested in timber than perhaps the figures would reveal. As we have already heard, the grant system tends to favour broadleaf planting and most woodland planting, if it is done for amenity purposes, is going to require a grant because it is quite an expensive thing to do. It is capital intensive at the beginning, so you are going to go for a grant and grant tends to favour the broadleaf outcomes, so that tends to be what people do.

But if the scheme is also built into their rules or the outcomes that they want to see more overtly and that productive timber, whether it be hard or softwood, was something that that scheme wanted to buy and was an outcome they wanted to see, then I think more people would do it. I think there is the interest there. I wouldn't like to say that my members only want to do broadleaf planting because I do not think that is the case. I think they would do it but they are being shepherded down that way by the design of the scheme.

Q129 **Chair:** We are going to come on now with James Gray to talk about the grant funding scheme, but before we do, the milling statistics that you gave, was that across the UK?

Justin Mumford: Could I just stand corrected on that? In 1980 we were milling 1 million cubic metres of hardwood timber and by 2020 that was down to 70,000, not 700,000, so 7% of the figure.

Q130 **Chair:** Is that across the UK?

Justin Mumford: That is across the UK, yes. That is hardwood milling only, so it has become a very niche market. There is only a small handful of mills that we are personally selling into in the UK and when we are



selling to them, it tends to sit alongside a large pile of French oak and Polish oak that they are bringing in as well. There is a lot to be said for that, in that the quality of the French oak is greater than ours due to the length and the good long-term management that they have given to their oak forests over the years. We can learn from that—the consistency of management that has delivered a very good, strong crop.

Ben Goh: If I could just add to that, the quality of European hardwoods is the result of long-term breeding programmes that we haven't had so much in the UK. There is some broadleaf breeding that happens under the guise of the Future Trees Trust, so there is improved birch and sycamore, there is work ongoing in terms of oak and other species, but one of the reasons that our softwood timber production is so successful is naturally softwoods lend themselves. They have a shorter growing cycle, but a lot of time and effort has been invested into the breeding programme, particularly for Sitka spruce. That is what we are seeing when we are yielding higher outputs of timber per hectare per year. That is as a result of a 60-year breeding programme, so the lead times to develop timber production are longer than just putting the seed in the ground; they can run into decades.

Q131 **James Gray:** Before we move on to financial incentives, which is what I am supposed to be asking about, this question of the 80% of softwood that we import is very much borne out, incidentally, by a friend of mine who is the timber buyer for a major agricultural retailer. He tells me he buys everything from Norway. Is that a product of the availability or a product of the price? I suppose the two may be a function of each other.

David Hopkins: Both. We don't have enough timber to meet demand in this country. People will buy from the best available source and they have a lot of different options. Scandinavia has a very good and long-established industry there in forestry, the growing, the quality of the species that come through, the quality of the product that comes through and the ease of shipping on to the east coast here; it is just straight across.

Q132 **James Gray:** If that is the case, is there not at least an argument that can be made that that will always be the case? Norway, Sweden and Finland have vast acreages of first-class timber. There is always going to be lots more of it and a lot cheaper and, therefore, no matter what the Government do with regard to money it is going to be very hard to compete with the Scandinavians.

David Hopkins: Absolutely, but it is not about competing with them or to try to say that we are ever going to achieve 100% production from this country. Our consumption will always be mixed and it will be a mixture of home-grown and imported goods. I don't think, whether it is timber or food or a lot of other different markets, that we are ever going to be self-sufficient in all our goods. That is not an argument to say, though, that we should not be improving and encouraging growth within this country. You could argue if you planted to the maximum targets you could set for



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yourself, you would still be running to standstill because demand is going to grow and the demand for timber from Scandinavia will increase, not just from this country but from other countries as well.

When you look at a lot of the forecasts at the moment, demand is going to probably outstrip supply in a lot of places and the demand for wood is going to increase. We want to make as much as we can here, and it is not just for timber purposes; there are a whole range of other benefits around that. You are right: we are not going to be self-sufficient, I don't think, any time soon or perhaps any time, but that is not an argument to say we should not be making all effort.

- Q133 **James Gray:** Do we want to? Harking back to the Chair's line of questioning about the split between hardwood, broadleaf and softwood, is there not an argument that would say that we want to have these things that are environmentally or from an amenity standpoint more attractive? Why are we covering our countryside with fir trees, which you can buy much more cheaply from Norway? What is the point? Why should we be seeking to compete with the Norwegians?

David Hopkins: If we want to encourage the take-up of materials, whether you are encouraging the use of softwoods, hardwoods, whatever—Justin made the point about not milling as much hardwood. Partly it is because you could start to buy from other places, but I think that there is an argument to say we will make use of the resources that we have around us if we grow them for productive use. You could be—as the argument was made just now—growing those hardwoods for productive use and we would mill more of them if there was more available. There is an argument there to say we need a lot of mixture in our land use beyond just a monoculture, but I do think that is also what is happening within forestry.

- Q134 **James Gray:** Maybe other panel members would like to answer the following. Can I broaden the question out a little bit? There is great pressure at the moment to give up otherwise productive agricultural land, 3b land, for forestry. If you can buy it cheaply from Norway, at a time like this with food shortages because of Ukraine and for other reasons, surely we ought to be encouraging productive agricultural use of our land rather than forestry. I am being a little bit provocative; I like being provocative.

Justin Mumford: I would argue we are able to do both. I think there are opportunities to do more planting. I agree: good agricultural land shouldn't have trees on it, but there is a lot of land out there that will grow trees well. There is a lot of vacant and derelict land, ex-landfill, land that currently isn't growing an agricultural crop. We have been doing some work on that and there is up to 2% across England, coming up to about 8,000 hectares, that could take trees and would grow trees well, so we need to look at the best use of land for food or for growing trees. I don't think we do enough planning on where we should be growing trees and we need to be able to inform landowners as to where that might be.



Q135 **James Gray:** The CLA members, do they prefer wheat or trees?

Graham Clark: I don't think it is as binary as that.

James Gray: I know it is not. I am just being a bit naughty, really.

Graham Clark: Fair enough. I also think most people with good quality agricultural land, 1, 2 and 3a grades, would be reluctant to put it under trees for very good reasons. They would grow good trees, but you could probably grow good trees on lesser quality land. I think there is an argument that, yes, there is a food security issue and we have an energy security issue. There is also a timber security issue.

As a country, we don't want to be entirely dependent on imported supply of whatever it may be because those supplies, for whatever reason, could be cut off in the future, so some kind of security of our own supply of food, but also timber and wise use of land, is the way to go. The agricultural land classification system is a very good thing that we need to bear in mind in all this. There is wise use of land and there is unwise use.

Q136 **James Gray:** Therefore, acting on the presumption that HMG are keen to encourage forestry on land that is suitable for forestry—I would not want that to be misunderstood; my constituents would not understand why I was not speaking up for wheat, which is why I went down that particular track—let's imagine HMG wants to encourage productive forestry growth. The current financial incentives provided, are they well targeted and are they sufficient? Are they the right way of trying to persuade landowners to grow trees on the less productive land, as Justin suggested? Tell me about the financial structure and also what you want to see in ELMS and how it is going to change once ELMS comes in.

Graham Clark: The grants are the main scheme in play in England at the moment; it is called the England Woodland Creation Offer. As I mentioned earlier on, it tends to favour broadleaf planting. It doesn't rule out productive forestry, but if you look at the publicity for it, it hardly mentions timber production, so it is mostly about broadleaf and the public benefits from those sorts of plantings.

To get the maximum levels of grant, you need to be doing the kinds of woodland planting that give you those public benefits, which tend to be the broadleaf mixtures. It is definitely weighted in that regard.

Q137 **James Gray:** Perhaps one of the others could answer the particular question about EWCO. Do landowners and farmers by and large have the technical capabilities and the skills to fulfil the regulation that was laid down with regard to being eligible for EWCO? It is quite a technical and difficult business, isn't it?

Justin Mumford: This is where our members would come in. As chartered foresters, we are able to provide that advice, but I won't lie to



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you: it is very complex and it is a time-consuming process. That on its own can create time lags in submitting applications.

We are talking to Ben about his window of five years of having to develop a seed source to lifting the plants out of the nursery. We would add another two years potentially on to that with regards to planning, designing and then administering not just the England Woodland Creation Offer, but also the Woodland Creation Planning Grant process, which is a two-stage planning process, which involves considerable consultation in order to develop a remit and develop an evidence base against the EIA, the environmental regulations that we need to plant a forest under the regulations. It is a very long process.

As a result, it is time consuming and we do find that momentum and morale is lost over that time, particularly with commodity prices on the land use alternatives, such as wheat, changing so rapidly. We had a lot of landowners very interested in tree-planting coming out of last winter into the spring, but as soon as wheat prices started to reach the heady heights of £350 a tonne, landowners immediately started, understandably, to lose interest. A quicker, more succinct administration process for those grants would be very important.

The second point would be that we need to remember that when a landowner plants trees, he loses the ability to generate income from that for the first 20 years of that woodland's life, and that is a huge difference in comparison to his arable crop. Ongoing support, although it has been greatly improved this year, is still probably inadequate to encourage landowners financially to plant trees as an opportunity cost against other plants.

Q138 James Gray: Yes, it is that point about incentive and "momentum", which I think was the word you used. For your average landowner who has a patch of land that is former landfill, or somebody else mentioned various other types of land, are the grants big enough to make it worth their while to get through all that admin and all that bureaucracy? They are also under pressure anyhow. They don't have enough people working for them and they are having a very difficult time in many respects. It needs a kick to make them do it, doesn't it?

Justin Mumford: The answer is no. I think the planting figures that we have seen over the last two years have probably demonstrated that. We are just coming into our second planting season for the England Woodland Creation Offer and over that time we have not necessarily seen a marked increase in land going in under trees. Our calculations are that a standard hectare of land to plant up with trees and maintain and establish it to 20 years, which would be considered the first intervention, would be around £18,000 per hectare. The current grant payments are just over half that, probably.

Yes, we are still quite a long way to financially incentivising landowners to plant trees under the grant structure. We need to be able to rely on other



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potential private income to sit alongside that, through the sale of carbon, through being able to enter into agreements through potential biodiversity net gain arrangements as well and being able to stack those payments alongside the grants as well.

Q139 James Gray: My final question refers back to our previous conversation. The Government are talking about various incentive schemes to increase demand for timber in some means or another. As a simple creature, I can't imagine how that would occur because the demand presumably is natural. How can the Government stimulate greater demand for timber?

David Hopkins: Housebuilding. It is probably the biggest market for timber. There is a timber and construction working group at the moment looking at how we get more timber in. The Climate Change Committee wrote the report looking at how we decarbonise various sectors of the economy. When it came to construction, the answer that it put loud and clear was, "Use more timber". The Government are looking at that, particularly as a means of then pulling through planting and productive planting as well.

Q140 James Gray: It is a side product of the Government's 300,000 houses target, whether or not they are likely to achieve that. More timber is a side product of that, but surely that is rather different to coming up with a scheme specifically designed to increase demand. Certainly, if we build loads of houses, that is going to be good for timber, that is true, but that of itself is not an incentive-based scheme, is it?

David Hopkins: Unless you are building them with timber construction systems, which is a big growth area for manufacturing and investment in the UK. There is a lot of money going into that to make more energy-efficient homes, which are made out of a lower carbon material. The trees absorb the carbon at the forest level and it is stored as wood. It takes far lower energy demand than to manufacture homes within a factory setting. You get higher quality, better airtightness, better energy efficiency and they can be erected far quicker onsite. You have a much lower energy and lower carbon system, providing very high performance, high-value goods at the other end.

That is our pitch at the moment, to look at how we increase the uptake of those systems. There is a lot of money going in. A lot of volume housebuilders like Barratts and Persimmon and others have timber frame factories under their ownership that are producing a percentage of their homes. What we are looking at is how we increase that percentage of their output through those means.

James Gray: I think I have strayed off-piste enough, Chair.

Q141 Ian Levy: First of all, just for clarity, I would like to inform the Committee that I come from a family of tenant farmers in Northumberland. We farm about 450 acres of arable land.

Following on from what David said, I visited Barratt Homes in my



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constituency and in the summer I am going to visit one of the factories that you are talking about because it is amazing to see the construction of these timber-framed homes, how quickly and safely they did it. We talked about airtightness. Even the way they constructed the roof, they constructed the roof on the floor and then lifted the roof on with a crane in one piece. It was absolutely amazing to see.

That aside, Graham, if I could ask you, please: the Forestry Commission assumes that tree-planting can be achieved through planting on low-grade-quality agricultural land. What sort of feeling are you getting from that? Are landowners happy with that or how do the public feel about that?

Justin Mumford: When we say low grade, we need to make sure that we look at all the constraints on that. Low-grade land can also have environmental constraints and can have archaeological constraints as well, so we would need to make sure that we scope those out, but when I talk about low-grade agricultural land, we are talking of land that is currently in production, grade 3b, grade 4, and we are talking about grass potentially on the middle ground.

Yes, landowners are looking for a return on that land and they are seeing tree-planting as an opportunity, particularly with regards to the additional payment for carbon that we are seeing. A well-designed scheme that is well maintained and managed is not only attractive in the landscape, but we need to be getting away from how some of the plantations of the 1970s and 1980s were put into that particular landscape. That has very much moved on from there.

We are looking to blend it much more sympathetically within the landscape; we are looking to use a mix of broadleaves and open space to be able to complement our commercial planting as well. Yes, with all those in mind, it does offer a good return to the landowner, which is what they are looking for.

Q142 **Ian Levy:** As tenant farmers, for my family, how does that affect the tenancy agreements that the tenant farmers have with the landowner if they say, "We want to take a certain part of the farm and turn it into forestry"? Is there normally a bit of a kickback on that, should we say?

Justin Mumford: Yes, it is difficult. Graham might be able to answer this more from a landowner representative point of view. Out of our client base, we haven't had many clients who have had to, in effect, evict a tenant from that particular piece of land. The only times it has happened we have had to do it with mutual consent, because the way that the grants are structured we can't have a contested notice to quit on any land that then goes forward into the grant package. Graham, you might be able to answer more on that from your members.

Graham Clark: Yes. First, there are a lot of tenant safeguards built into the legislation. I am not an expert in this, but there is a section in the Agricultural Holdings Act that sets a process whereby if there is provision



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within the tenancy and planning permission for a development is in place, then a notice to quit can be served, but that is for development. That doesn't cover tree planting. I believe there is another part of that legislation where you might be able to achieve that, but it is quite a difficult thing legally should you want to go down that road. It is quite a difficult thing to achieve. I think if the impetus for tree planting on tenanted land was there, from the landowner's point of view, then it would be a sort of negotiation, if it was to come up at all.

But you get back to the land use and the return that you would get from the land. That would obviously change the nature of the land from agricultural, so agricultural income would be lost, rent would be lost and replaced with trees, which have a very long, delayed income, if at all, and the permanency of that change. It is something that I don't think has happened very much, to my knowledge, mainly because it is quite a difficult thing to achieve. It comes back to this permanent land use change issue and the loss of annual income.

Q143 Ian Levy: If I could go back to Justin, you talked earlier about growing forest, growing trees, and the way that they are grown. In France, they seem to be grown in a more structured way, should we say, and they have been managed better over the years. We have problems here with squirrel and deer and pruning, but if we look at the pests and disease aspect of it, what support do landowners get and foresters need in growing those quality hardwoods? Is there any support out there, whether it is advice or financial? I don't know if you can expand on that a little bit more.

Justin Mumford: Yes, certainly. As I alluded to, the main issue for growing good quality hardwood is the grey squirrel. The grey squirrel will browse the bark of many of our high-quality hardwoods, including oak, beech and sycamore, for example. Within the last eight months, the Forestry Commission has offered new grant support to control both grey squirrel and deer in this country. That grant package is just coming through as we speak. We haven't implemented it yet. That will all be coming through as of 1 January next year. We wait to see, but those figures that have been offered are encouraging and they will allow landowners to put serious resource into controlling those pests.

I still think we need to work closely on a landscape scale to ensure that neighbouring landowners are working alongside each other on an approved management plan, because what we tend to find, particularly on grey squirrels, is that an isolated patch of control will only create a vacuum after a while and bring it in from the surrounding landscape, so we do need to work on a landscape scale. But the new grants that have come through are very encouraging and we look forward to putting those into place under our new stewardship agreements, which go live on 1 January next year.

Q144 Ian Levy: It is very good to hear you say that they are encouraging, but do you feel that we could do more? If so, in what sort of areas?



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Justin Mumford: Particularly with deer management, I think we can look to develop a better market for the venison trade. There is a huge potential for wild venison and it was mentioned in the recent Dimbleby report as a potential for good, high-quality, free-range lean meat.

With squirrels there is the opportunity for a much wider regime of control through the introduction of contraception and some early progress in gene editing as well, which would make a fundamental difference to that population. I see considerable issues with regards to winning over the wider general public to accept and understand that, but for what is considered relatively modest research costs of between £10 million and £12 million, we could be saving up to—rough figures—£12 million to £15 million worth of timber damage per year, so the investment is very small compared to the potential we would have in a better timber crop at the end of it.

Ian Levy: That is lovely, thank you. Back to you, Chair.

Q145 **Chair:** How far are we away from having a contraceptive?

Justin Mumford: My understanding of the contraceptive is that it is currently just reaching field trials. The last time I was reading literature on it, I think we were between four and five years away from that being launched. As I understand it, the complexities are with administering it into the squirrels. It needs to be through a pollen grain and that is what they are working on at the moment, but yes, I think it is at field trial stage at the moment.

Q146 **Chair:** Which agency is running it, do you know?

Justin Mumford: I forget. Do you know, Graham?

Graham Clark: It is the Animal and Plant Health Agency, I think.

Justin Mumford: There is a base up in York, I think. I will be able to provide further information.

Chair: That would be helpful. We might ask the Minister when the Minister comes before us. Very good, thank you.

Q147 **John McNally:** My questions are for Ben. Basically, they are on nursery capacity, which we touched on a wee bit earlier, and the challenges faced by the nursery sector of supply, diversity and biosecurity. How clear or unclear is it to the nursery sector which tree species your sector should be growing to meet the future demands, given the UK Government's tree-planting targets and their ambition to increase timber production? Following on from that, how well supported are the UK nurseries to meet the increase in demand for the tree stock resulting from the Government's targets that have been set?

Ben Goh: I said earlier there is a difference between policy that has been communicated previously, a couple of years ago, and the schemes that are being approved and the planting that is happening now. There is



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already a mismatch between the guidance we received when we sowed the trees and the orders that are being placed now.

In addition, one of the other considerations, not just around species, is around provenance. Great Britain is split into 24 native or seed zones for native broadleaves and if those are—

John McNally: Native or what, sorry?

Ben Goh: Seed zones. If you are planting in, let's say the West Midlands, for example, that might be region 403 or seed zone 403 and if that is overly specified whereby you are required to only plant material that has come from 403, from that region, then that means that is another constraint on top of what we are sowing. For each of the native species we may be in a situation where we have to sow 24 different batches of that. That is another reason that you could end up having the wrong kind of stock available at the end of the year.

We talked about the timing element of it as well. That is crucial. Following on from a point that Justin was making in terms of lags and delays in schemes being approved, quite often those are notified quite late. It may be that a landowner has a scheme, an application, they order the trees for that and then for whatever reason there is a change to the process, there is a requirement to do an additional survey, and they are not in a position to plant those trees in that season. That means that those trees, at that point late in the season, cannot be rehomed. They have this limited shelf life so they will end up being destroyed. They will not then be available for the next season. There is quite an important timing element there.

On your second point in terms of support for the nurseries, it is important to bear some regard to where nurseries have been over the past few decades. Up until as recently as five or 10 years ago there was a massive decline in tree planting over two or three decades and that meant that there had been very little investment in nurseries for 20 or 30 years. I am told stories that we were driving tractors that were 25 years old and the maintenance budget would not cover half of those tractors.

Where we are with support and where the sector is today is that it has made a huge amount of investment to mend the roof, if you like, after that period, but there is still quite a lot to do in modernising the sector to grow the trees that we need for the future. There is still quite a lot that needs to be done.

Q148 **John McNally:** That brings me on to my last question. I, probably like most other people, need to hear—there is a lot of uncertainty around customer demand that presents problems to nurseries as you have just described and the lead-in times you have just described as well. You cannot just go and plant a tree. Could you explain in a bit more detail about where most of your demand comes from? We will come on to you in a minute, David, but I would like to hear from Ben about the variety of



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demands that are out there.

Ben Goh: The types of customer?

John McNally: Yes, the whole range of people and businesses that you have to deal with or supply.

Ben Goh: We supply to the public estate, which is quite a big customer, in the devolved nations. A lot of our customers are forestry management companies so they are managing a forestry planting scheme on behalf of a landowner. We deal with landowners and estates who are managing the schemes themselves or maybe restocking a harvested site. They are probably the two main markets with woodland creation and restocking. There is also planting for amenity, there is on-farm planting, there is hedge planting—landscaping of motorways, for example. All those have different requirements in terms of volume and species but the largest ones are around restocking and woodland creation.

Q149 **John McNally:** In a previous life when I was a councillor we used to hear quite a lot about inappropriate vegetation that had been planted a long time ago, was overgrown and caused all sorts of problems beside roads, beside trees in the winter time especially. I had never heard the term “inappropriate vegetation”. I did not think such a thing existed.

What you are describing about having that knowledge to know where you are going with these things seems particularly problematic to me. I do not know how you get the certainty of that. One thing that James Gray was describing earlier on was about importing from the Scandi countries. They seem to know what they are doing but they maybe have a particular angle that they are working all the time. I am curious about that. Do you have any more comments to make about that before I move on to David?

Ben Goh: As I talked about, there is a long timescale with the types of species that you are planting. Referring to the Scandinavian countries, going back to tree breeding, they have long-term tree-breeding programmes. They are on second, third, fourth generations of improvement of certain species but that requires a very long-term support for tree breeding, which we are doing in the country. That is a point that I did want to make, which is that we talk about land pressure, we talk about food security; I think an underlying issue is that we have timber security issues, we have timber pressures, and both timber and food come from land.

One of the benefits that tree breeding offers is it can give you better timber, more timber per hectare of land, and that goes in the direction of addressing those two competing requirements for land usage.

Q150 **John McNally:** I will move on to the question on the role of timber imports and achieving sustainable timber supplies. David, you touched on this earlier on. Given the projected increases that we heard earlier on about the demand for timber and the currently high levels of import, do



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you think it is realistic for the UK to reduce timber imports significantly at all? Is that achievable?

David Hopkins: Only if you reduce consumption overall. There is always going to be a balance. We can certainly increase the value proposition of UK grown timber and we can increase the amount that we are using, but in the overall mix I would see that overall mix also growing, the overall consumption pattern growing, so that will always require whatever we produce here to be either topped up or balanced out with imports. I have never seen that as a bad thing.

As everyone has said, this is about improving our timber security and improving our own productive land use, our own industries and so on. That does not mean we will not still be buying stuff from abroad.

Q151 **John McNally:** You think they complement each other in many ways.

David Hopkins: Yes, absolutely, and I think you can see that. A lot of the UK sawmills still cut timber from other countries so a lot of their income comes from cutting other imported goods and other different graded goods. That adds a different level of income to their overall income mix.

Q152 **John McNally:** I know that in my own area in Falkirk we had some strongholds that we lost and they were substantial businesses over a long period of time. Knowing the families involved in these things, it is quite heart-wrenching.

However, my last question is: how can the UK exert any positive influence on the sustainability of the overseas forest governance through its import market and the regulatory framework? Can we exert anything now? We are no longer in the European Union and this transition seems to be getting more complicated by the week.

David Hopkins: It does, yes, and we have to deal with it quite often. Yes, we can, is the answer. We are still the second biggest importer of timber in the world and that gives us, as an important customer, a very big voice in what happens in other countries. The regulations we have in place, the UK timber regulations in particular, govern what you can and cannot place on the market. It forces an obligation on the importer to check their supply chains and only be buying from legal and sustainable sources.

We have a policy for all our members, which accounts for somewhere between 80% and 90% of all the timber coming on to the UK market. It is a responsible purchasing policy. It forces a due diligence process on all our members. They all have to be third party audited to check those supply chains. It means that they start buying only from those areas that have management plans in place, good governance that they can show all the legal paperwork all the way through, and our members have to collect all that to demonstrate it. It starts to exert a positive influence.



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When you look at the bulk suppliers at the moment—you mentioned Scandinavian countries—they already have their own national policies in place. There are European-wide policies in place. By and large, all the stuff going into construction comes from certified sources because of our procurement policies at the front end from contractors, developers and others.

John McNally: You have peace of mind in all cases by the way they are supplying—

David Hopkins: Yes. Then on a wider scale, one thing I would like to raise on this very point is that there is an excellent Government Department initiative within what used to be the Department for International Development, now part of FCDO, called the Forest Governance Markets and Climates Initiative, dealing with tropical forestry and trying to put in place good governance throughout the tropical belt.

If you look at a European level, the demand for timber has increased enormously, the value of timber has increased enormously, and the land under management for forests has also increased as a result of that demand. The demand has led to an increase in the land under management for forests. The forests have grown by about 25% since 1990 so it is a big growth. You would imagine that under normal circumstances the demand would lead to a decrease in forest area, but it has increased the amount of forest available.

The same is true in North America, the forests have grown. Why? Because they have very good governance in place around what you can do with land, the management procedures that you can put in place, the laws you have to abide by; then, conversely, on the demand side, the procurement and placing of the market regulations.

Where all that is not true is in the tropical belt. We think it should be. That is one of the most important areas we should be focused on. That is a Government initiative, which needs a lot more credit and a lot more support, I would argue. We get a grant funded with that, and I will declare that right now as I sing its praises. We do a lot of work there to encourage good governance, good management. As an organisation we try to train the trade associations in those areas and so on. I think you can look at the examples across Europe and North America where the forests are growing, and so is demand and use, and see if we can then put in place a similar proposition across the tropical belt.

John McNally: It is reassuring to hear that these standards are being maintained.

Q153 **Chair:** I should perhaps have started this session by confirming to Mr Clark that I am a member of the CLA. Mr Goh, I have a feeling that I may have bought some saplings from you. Did you have a contract to supply HS2?



Ben Goh: Quite possibly. I will confirm for you.

Chair: You do not need to confirm it. I can confirm to you that I bought some oak trees, which I believe you notified were going to have to be mulched because HS2 had cancelled a contract for 30,000 saplings. Rather than mulch them I bought some very cheaply from you during lockdown, which I am about to plant now.

I am going to conclude the panel by thanking our guests, Graham Clark, Ben Goh, Justin Mumford and David Hopkins. Thank you very much.

Examination of witnesses

Witnesses: Professor David Coomes, Dr Mike Morecroft and Dr Andrew Weatherall.

Q154 **Chair:** I would like to welcome our second panel now. We have Professor David Coomes from Cambridge University. I would just like you to briefly introduce what you do at Cambridge that is relevant to our inquiry.

Professor Coomes: I am a professor of forest ecology and conservation and I am also the director of the Conservation Research Institute. That is a collaboration between the university and 11 international conservation organisations all housed in the David Attenborough Building.

Dr Morecroft: I am the principal specialist for climate change at Natural England. I am a scientist with expertise around resilience to climate change and mitigation of climate change through carbon storage and sequestration, with a particular interest in woodlands and forestry. I should also say that I am one of the lead authors for the Intergovernmental Panel on Climate Change and I am also on the Trees and Woodlands Science Advisory Group for DEFRA. I have a slightly broader remit beyond Natural England as well.

Q155 **Chair:** Thank you both very much for joining us. We are expecting Dr Andrew Weatherall from the RSPB to join us. He has been caught up in some incidents on his train journey. I expect he will come and join us during the course of this panel. I am sure he can catch up.

You were present for the previous session and I would like to start by inviting you to give us your perspective on the extent to which biodiversity—this is the focus of this panel in particular—is compatible with monoculture timber growing in this country or not. Perhaps we will start with you, Professor.

Professor Coomes: It depends very much where monoculture timber is planted and also the management of that timber after it has been put in the plantations. We heard in the previous session that there are opportunities to plant large areas of plantations over some of the poor agricultural land species, poor grasslands, grazing land, which is not



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particularly profitable or productive. If we plant in those areas we are planting into something that does not have a lot of biodiversity in the first place.

Provided that we are very careful in avoiding priority habitats for conservation, there are large areas of the UK where we could put conifers. We are planting something of low initial diversity with something else, which is not particularly good for biodiversity.

The problem with conifer plantations is particularly after about 20 years they become incredibly dense. That is part of the reason they are so productive, they are capturing huge amounts of light. They are evergreen so they are not letting light through to the forest floor and they produce some acid needles, which are not easy to decompose. For all those reasons you do not get much biodiversity in those systems. Over time if they are allowed to thin, they are opened up and some of the trees are allowed to get larger, then biodiversity does get into those systems. Indeed, there are some interesting birds and animals that can get introduced into the conifers.

The issue is if you plant on agriculturally poor land without much biodiversity in the first place, then conifers can be no worse, even slightly better over time, than what you already have there. That is quite different, for example, to planting conifers into lowland ancient woodlands, which has happened in the past. There you are taking land that could be used by our native biodiversity and replacing it with a species-poor conifer area. It depends very much on context and management.

Q156 Chair: I am a parliamentary species champion, I am proud to say, for the—I have forgotten which one. It is a white butterfly. It will come to me. It has very few habitats left in the UK, but one of the breeding sites for this particular species of butterfly happens to be along the rides within Forestry Commission sites along the Welsh Marches, which I represent. It is in habitats where, as you say, there are mature woodlands where rides for wood extraction or traction tracks have been established over some time. *[Interruption.]* The wood white butterfly it is called, thank you very much. It has the right environment for these butterflies and they are thriving there, against expectation from the naturalists who would normally assume that the monoculture would prevent that. Is that very unusual?

Professor Coomes: There are several examples of that. You are quite right: nature has a cunning way of establishing wherever it can. There are these interesting examples like the one you have just given.

Q157 Chair: Dr Morecroft, is there anything you would like to add? Do you have a different point of view?

Dr Morecroft: I would like to say that woodlands of all types do have value but they can be rather different values and it is not a binary



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monoculture conifer versus multispecies broadleaf woodlands in many cases. There is no doubt from the evidence that mixed species, native woodland, mostly broadleaf, are more biodiverse. They do support species you will not find in a conifer plantation.

A particularly good example might be some of what are sometimes called the rainforests of Britain with some of the bryophytes, some of the mosses and also some of the lichens, for example, that occur in some of those old oak woods. There are others as well. There is no doubt that the best biodiversity is in the broadleaf native woodlands as a general rule.

There is a range of woodlands and not all plantations are monoculture conifer, things like you mentioned yourself about the management of rides. There is a lot you can do and we would certainly welcome that where you can improve the biodiversity of a productive forest. For many reasons diversifying the stand improves resilience of timber as well as for biodiversity by increasing the species range. We certainly support those more mixed production forests but they are not a replacement for the biodiversity-rich native woodland.

Q158 Chair: Given your responsibilities for climate change within Natural England, are you doing work or are you aware of work being done by other bodies looking at species that are going to be capable of withstanding changes in climate and temperature across the UK in the future? Where does someone who is thinking of planting a woodland go to decide what species will be best equipped to cope with rises in temperature?

Dr Morecroft: It is a very good point. We certainly do work on that. Our colleagues in forest research do more, it is fair to say, on the trees specifically, but we certainly work with them a lot and we have produced things like our climate change adaptation manual jointly with the RSPB where we do go into some of those details around that from a nature conservation perspective.

There is no doubt that the suitability of different species will change in different places. For example, it is quite a well-known example that beech trees in the south of England are quite prone to drought. We know that drought is more likely so they will become less suitable in the south of England. They are likely to survive but probably will grow less well, whereas they may do better further north.

There are some native species that will do reasonably well in the climate change. The small-leaved lime, whose distribution is currently limited by temperature, is growing quite well in the UK now—well, in England—and will do better. Hornbeam is another one that does reasonably well under our projected change in climate. Yes, across ourselves, particularly from the conservation perspective, but also some of the Forestry Commission and Forest Research, output is available there to help people.

Q159 Chair: Do you have a view on species at all?



Professor Coomes: I think one thing we will need to rethink is the planting of species, given our very dry springs and summers in this part of the country. In particular, close to where I live we have the A14 redevelopment. They planted hundreds of thousands of trees along the side of that. We had a dry spring and over 90% died. We planted quite a few saplings in a local nature reserve where I live last year and most of those have died. We do need to rethink that first year of life in the ground for these trees because climate change is affecting that early regeneration stage.

The second thing that is affecting it that we may not think about is the distribution of diseases and pests. That is very much seen in continental Europe with fir trees that previously in Scandinavia were not affected very often by bark beetle outbreaks but now, with the warming climate, the bark beetle are moving much further north and killing hundreds of thousands of trees. It is not just the trees themselves; it is what is happening with the pests and pathogens as well to think about.

Q160 **Jerome Mayhew:** I am just going to make two references, not to my register of interest but just to highlight that as a Parliamentary Private Secretary for DEFRA I am not going to be asking any questions or receiving any answers about policy. Other members of the Committee will. With an abundance of caution, I just want to highlight a longstanding commercial relationship I had in my former employment with the Forestry Commission. Right, got that out of the way.

I am going to ask you two sets of questions. The first one is about the potential for forest expansion and increased use of timber products to contribute to our climate change mitigation and our fightback on this. Let's start with a bit of education. Can you outline, Dr Morecroft, the factors that affect the potential of a woodland to store carbon? There is lots of discussion about whether it should be coniferous or deciduous. One is quicker at storing carbon, the other one stores more and for longer, arguably. I would also like you to touch on soil carbon as well. We are told that 70% of the carbon is stored in the soil. Can you give us that overview of why trees are good for storing carbon, if they are?

Dr Morecroft: Yes. We did produce a report that was published last year on carbon storage and sequestration by different habitats. Forest Research has also recently produced a summary report and a full one is coming, I understand, probably next week even. We have built up quite a good evidence base now and I think it is a matter that all woodlands have value but the value is different, as you touched upon. Let's say right up front—it has become a cliché but it is a good one—it is about the right tree in the right place and what makes sense in one location may not be the optimal solution in a different one.

Let's take broadleaves first. Generally speaking, yes, they grow slowly but they do grow steadily. Compared to all our other semi-natural habitats they do take up more carbon than anything else does, the actual rate of uptake. It builds up slowly over decades and we can still see



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ancient woodlands that have not been actively managed for perhaps 100 years still sequestering carbon. We have the data on that from Wytham Woods, where I have done work in the past.

It is also fair to say that sometimes there is an assumption that productivity in terms of timber volumes scales linearly with carbon storage but because hardwood timber is denser, because there are more branches—

- Q161 **Jerome Mayhew:** Can I just butt in there? If you look at, let's say, an oak tree, sapling to juvenile, to mature, to over mature, to decline and fall, is there a curve of carbon sequestration and a point at peak carbon beyond which it is a declining factor?

Dr Morecroft: Yes, it will go up to a plateau and it will very slowly decline. We do not have enough woods that old in Britain to be able to tell exactly that turning point there.

- Q162 **Jerome Mayhew:** I represent a rural constituency. There are lots of oak trees that are going back. Once a tree is going back, is it still sequestering carbon or has it stopped at that stage?

Dr Morecroft: There comes a point when it isn't, when it is clearly dying, but a woodland is a bit different to an individual tree, and there will be younger trees and natural regeneration happening in a healthy wood. Although, yes, obviously when it is dying there comes a point where it will certainly turn, that does not mean the whole wood is if it is healthy and there are trees growing back.

- Q163 **Jerome Mayhew:** I interrupted you. Carry on your education.

Dr Morecroft: If we compare that with conifers, there is no doubt that in the right conditions some of the conifers, like Sitka spruce particularly, will grow quicker and in the first few decades you can get faster growth rates. That growth is only realised or the difference is only maximised in the right climatic conditions, which tend to be the cooler and damper ones. Hence, Scottish forestry is very good for conifer as the climatic conditions are suitable. Over a lot of England, the difference is much smaller because of the dryer conditions.

You also must factor in the soil. The classic bad example is planting on peat, where the emissions can outweigh the sequestration of carbon. Even on highly organic soils that are not peat-based you do have emissions, particularly in the early stages of disturbance, which has to be factored in, which does tend to do it. In the best conditions, you can get higher yields from conifer in terms of carbon. The big thing then is what you do with it, and if it goes into structural timber you have a long-term store. If not, you haven't.

- Q164 **Jerome Mayhew:** Taking Sitka as the example, it is a much more useful timber for the trade, isn't it, than beech or other hardwoods, as we grow them in woods in this country anyway? Would you agree with that?



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Dr Morecroft: As things are at the moment that is unquestionably true. It is not my expertise but it is clearly the case.

Q165 **Jerome Mayhew:** In what circumstances can woodlands planted or managed for timber production contribute to carbon storage? We are focussing primarily on coniferous woodlands here.

Dr Morecroft: A lot depends on planting them in places that are not on highly organic soil to maximise the carbon uptake, but it is about what happens when it is harvested.

Q166 **Jerome Mayhew:** My understanding is that in deciduous woodlands there is a lot of sequestration of carbon in the soil. Is that true for coniferous woodlands and, if so, is it to the same extent? Is there a difference there?

Dr Morecroft: I think a lot is site-specific. You run the risk of losing carbon in many highly organic soils, so I would not want to generalise too much. I know Forestry Research has done a series of projects on that, but there is also a question of the long-term stability of carbon in the soil. It probably needs some more research, but in general, in both deciduous and coniferous forests, you will see a substantial amount of build-up of carbon in the soil. I would not want to generalise too much.

Q167 **Jerome Mayhew:** After felling, let's say there is a clear fell, does the carbon currently established within the soil stay there or does it break down in the period after? Once it is sequestered, does it stay sequestered?

Dr Morecroft: Typically, when there is any disturbance, including felling and planting, there will be a pulse of release of carbon from the soil. That does not mean it will all go, though. Some will certainly stay there. It also depends on things like what you do with the brash. For example, we might look in the future at using that in bioenergy. That would seem quite a good use of it.

Q168 **Jerome Mayhew:** Going slightly off topic, it is a question of scale, isn't it? Forestry in southern England is largely non-economic in terms of large contracts to provide bioenergy, for example. You have Kielder that is worth it, and Thetford, which is about 50,000 acres, as well that is worth it. Beyond that in England it is all a bit piecemeal, isn't it? How do you get over that to start using this facility, like brash, for example, using it commercially in a way that does not release carbon or releases it in a way that may be captured and restored?

Dr Morecroft: I have not personally looked at that specifically, but I recognise the point you are making and it requires some development.

Chair: Before you go into the next one, we would like to welcome Dr Andrew Weatherall, who is the Principal Policy Officer for Woodlands for the RSPB. I know you have come down from Penrith to be with us today. I am sorry you have had such a difficult journey and I am very pleased



you have been able to join us.

Dr Weatherall: Thank you very much for the invitation and thanks to your support staff because they have been excellent today in helping me get here.

Q169 **Jerome Mayhew:** Welcome from me as well. You will be pleased to know the RSPB catchphrase, "The right tree in the right place", has already been raised in your absence.

I will come straight to you to make the trip worthwhile. In our briefings we have learned that 70% of forest carbon is associated with the soil. Dr Morecroft has touched on the difficulties of soil disturbance in planting and felling, and presumably of management techniques as well. You get a harvester on the land and it tears it up, with soil-based carbon emissions. Are there forestry techniques that can minimise that, and can you explain what they might be? Then I will hand over to the Chair.

Dr Weatherall: I agree, and there are forestry techniques that can minimise things. We are trying to work with the forestry industry across the board on what good commercial forestry looks like, every way we can get forest management to deliver for climate and nature. Because we agree we need a domestic timber supply, so it is about quality rather than quantity.

Good examples through the forest cycle would be at the beginning, minimising establishment techniques using natural colonisation, for example, around ancient woodlands. In productive systems, you would lay the brash in front of the harvesting machine to minimise compaction. A lot of these things are standard practices. Or you could choose the time of year you are harvesting to minimise the disturbance to the soil, but also thinking about breeding birds.

Thinning can be a good thing to do in forests to bring more light down to the floor, but you need to be sensitive at that point to damaging the existing trees, so thinning in a way that always benefits the remaining trees rather than thinking about the amount you are extracting. That benefit could be to future timber quality, but also for nature and carbon as well.

Q170 **Jerome Mayhew:** That last point would be standard forestry practice now, wouldn't it?

Dr Weatherall: Yes. This is what I am saying. There is a balance. Some things are standard forestry practices and some things can be improved. We should look internationally as well for best examples of what we can do.

Q171 **Jerome Mayhew:** Do either of you want to come in on that in terms of practice and how we can make it work better?

Professor Coomes: One thing is how much carbon in a forest is in the soil, and I think that 70% is a slight reflection on quite how much



peatland had been planted up with forest since the Second World War rather than our broadleaf forests in this part of the country, which would have a much lower percentage of carbon.

Q172 **Jerome Mayhew:** Roughly what, in your estimate?

Professor Coomes: I think it is nearer 40%. Quite a lot of the carbon in our broadleaf forests would be in root biomass below ground, and when you clear the trees there is nothing you can do to stop those roots rotting away and respiring and putting the CO₂ into the atmosphere.

Some interesting research from the past decade is how different types of carbon decompose after you clear a forest. It used to be thought it was lignin and cellulose and things that make up wood that are broken down, but now there is a much greater recognition of fungi, and trees are absolutely reliant on fungi to get their nutrients up.

Q173 **Jerome Mayhew:** Is this the mycorrhizal?

Professor Coomes: Mycorrhizal fungi, and those fungi and other fungi in the soil can take a very long time to decompose, so there is nothing very concrete at this point to present you with, but there may be interesting ways we can modify how the soil breaks down.

Jerome Mayhew: Biomass may be significant.

Professor Coomes: I hope so, but it is early days on that research.

Q174 **Chair:** In relation to forestry techniques, are there any specific policy initiatives currently being promoted by DEFRA or through the Forestry Commission to encourage practitioners to either plant in a particular way to maximise soil carbon, as there is more interest in carbon credits for some land owners, to stimulate them to create woodland? What are the policy drivers here that could be helpful?

Dr Weatherall: It is fair to say the drive to net zero is driving a lot of things around forest management practices at the moment, and that includes afforestation and woodland creation. I would add a caveat that climate change has two facets, the adaptation as well as the mitigation, so it is resilience that is the important thing to implement as part of that forest technique.

It is choices around species diversity, structural diversity, whether you go for a clear fell and restock system or continuous cover approaches. That is important because of rising pests and diseases—in the last 20 years we can see good examples of that—but also the abiotic threats like drought and flooding. Even wildfire is on the increase.

We need forests that will continue to mitigate for the climate and produce timber in the long term, so the danger is forest management that relies on large, contiguous blocks of single species. All trees are vulnerable to pests and diseases. We do not know what is coming next, but we know if you have a single species block you have a far greater risk of it all being



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lost than some of it in a mixed woodland. Intimate mixtures of species are harder to manage.

Nobody is saying that the nature and climate emergency will be easy to solve in any of its facets, but there are other alternatives. You can have smaller single species blocks. If you have a matrix of different species, different ages, you have resilience across a landscape, even though an individual stand might be at risk. It is about those techniques that give us resilience for long-term climate mitigation.

Q175 Chair: The UK Forestry Standard has a role to play here in spreading best practice. Is it subject to any kind of enforcement?

Dr Weatherall: That is a good question because the UK Forestry Standard is out for review and the consultation ends tomorrow. I am finishing off the RSPB's response to that.

When it came in in 1998, it is fair to say the UK Forestry Standard was a ground-breaking thing, a global standard for forest management, and it is being improved with each iteration. It goes through a five-yearly review. In a nature and climate emergency, perhaps it would be nice to see a faster rate of change to address the issues that we were talking about so much 24 years ago when it first came out. It has an important role to play in terms of compliance testing because it is used in grant funding afforestation and woodland creation. I would say it is pretty well used and checked in that first five years of establishment of a stand or a new scheme. What goes on in the middle of the cycle is less easy to have compliance with.

We have another standard in the UK. It is a voluntary standard called the UK Woodland Assurance Standard, and that gives the Forest Stewardship Council branding that you see on timber. Those who are in the scheme get a premium price for their timber. They would argue it is not enough of a premium price but there is a premium price now, and that has much more regular compliance testing that your management is truly sustainable forest management. The RSPB, for example, has its woodlands accredited through that scheme to show our commitment to sustainable forest management.

Q176 Jerome Mayhew: I am glad to see I am not the only person who leaves their homework until the last minute. We will be up all night. It is an all-nighter.

To finish off on this, we talked about the right tree in the right place. Where, as a landowner, do you get the information needed to understand what is the right tree in your place?

Dr Weatherall: That is a good question and I was not here for the earlier discussion, so from my point of view I prefer to think of right place first because you need to think about whether it is a peat soil or if it is high conservation value or if it is highly productive farmland, so sometimes we might say no.



Having established the place is appropriate, we then want to think about the best reasons for putting trees on the site, and that might be climate mitigation, timber production, conservation of biodiversity, or recreation. Then you start to get to the trees and you choose that tree cover type. Is it native woodland? Is it productive woodland? Is it something in the middle, like productive native broadleaves for some of the hardwoods that have been used in this wonderful building?

Then you come down to the trees. The trees is the easy bit. There are a multitude of experts through the Institute of Chartered Foresters that you can find to give expert advice on that, but Forest Research also has an excellent tool called ecological site classification. With a tiny bit of field survey, and it is not onerous, you can come up with recommendations for the most productive species, the climate suitability for the future, and what would be the kind of native woodland that would be most appropriate.

Recently, Forest Research has done some work to bring the idea of mixtures—they call them forest development types—into that as well. The trees bit can be done. It is deciding where and why is the challenge.

Q177 Jerome Mayhew: I will move the conversation on now to resilience. We have talked about pests and disease. I was thinking in my lifetime or even while I have been in operations, first, Dutch elm disease, that I remember as a child. You have horse chestnut leaf miner; that is prevalent in East Anglia. Sudden oak death, which is *Phytophthora ramorum*, as well. You have *Phytophthora ramorum* for larch, Japanese larch in particular. You have it in sweet chestnut as a host now, in the south-west. You have *chalara fraxinia*, ash dieback.

Will we have any trees left in 50 years? As a scene set-up, why have we had so much so quickly? I probably missed a few. That was just in a couple of minutes. Who would like to put their hand up?

Dr Weatherall: I have come in hogging things but making up for lost time. First, Dutch elm disease is the one we all think about as people of a certain age and come back to. With Dutch elm disease it is important to remember that an awful lot of elm trees were lost and that was a disaster for both species, that biodiversity specific to elm. But elm woods were not lost because they had other tree species in them, that diversity, so something else took over. You are right to be concerned that we will not have any trees left. We have 36 native tree species and an awful lot of whitebeams that are being discovered by genetic analysis.

There is a climate change component. The beetle that transferred Dutch elm disease flew at 22° centigrade, so the more warm days you have, the quicker it spreads. International trade is a big challenge as well, and trying to tighten up our biosecurity. You had Nick Phillips from the Woodland Trust here before and he probably spoke better than I can about some of those issues, trying to make sure that we grow close to where we are planting so we minimise the risk of diseases.



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The unfortunate fact is that we are not very far away from the continent. That sounds terrible, doesn't it? *[Laughter.]* I rescind that. The fact is we are not very far away and things can blow across. We know that ash dieback came in on nursery stock and blew over as well.

Jerome Mayhew: Yes, we knew that right from the start. I was on the panel.

Dr Weatherall: Yes, you could see on the maps that it was coming. The latest one is a pest, the larger eight-toothed spruce bark beetle, *Ips typographus*, that blew in in 2021 and again in 2022, and we have now a big demarcation zone through south-east England.

Jerome Mayhew: My previous job was directly affected by that, by trees becoming unviable because of that. It was really serious.

Dr Weatherall: To a certain extent, worrying about the trees is the wrong thing because pests and diseases will come in. It is about building the resilience.

Q178 **Jerome Mayhew:** How resilient are our native species?

Dr Weatherall: They are more resilient because not just are they in mixtures but they are grown on the site. I do not want to get too technical, but there is a much wider expanse of genetic variability within a population of oak in a location that has been there for thousands of years. In a tree that has been bred for certain traits and planted, the extreme example of this would be the planting of paulownia as a single clone in eastern England at the moment, so there is no genetic variability there at all. If we find it does not like something, it will be the whole crop that does not like an early frost or a late frost or drought.

Q179 **Jerome Mayhew:** Remind me, is paulownia very fast growing?

Dr Weatherall: It is very fast growing, which is why it is attractive for people to grow. Biomass, there are questions about its suitability as a timber crop.

Q180 **Jerome Mayhew:** We have talked about disease. Apart from the beetle we have not talked about resilience to pests.

Dr Weatherall: *Ips typographus* is a pest and the two go hand in hand. Generally, you are talking about stressed trees that are susceptible to these in the first instance but then it can spread. In bark beetles, for example, we talk about mass attack conditions.

Jerome Mayhew: A stressed tree then becomes more vulnerable to another disease. That is what will kill it.

Dr Weatherall: Exactly.

Q181 **Jerome Mayhew:** Can we talk about climate change briefly? Dr Morecroft, the potential consequence of climate change for our future



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domestic timber production, paulownia, so nature-based solutions, can you expand on your concerns, if any, and what we should do about it?

Dr Morecroft: To follow up things I started saying at the beginning, we are looking at a situation with warmer temperatures but also the hotter, dryer summer drought scenario is important and sometimes coming with that, wildfire risk.

I sometimes tell people you are not just adapting to a particular climate; you are adapting to uncertainty. It is managing for uncertainty, the pests and diseases, for example. It will not make different ones come here but they may survive or disperse differently as a result of climate change, so that is part of it. It is partly about hedging your bets by having a diversity of species of trees.

Q182 **Jerome Mayhew:** Importantly, that is in any one block, so a compartment. The idea of having monoculture, while commercially attractive, is that your risk register would say we are keeping a lot of eggs in one basket. There is a biodiversity argument that you can mitigate in part through thinning, but it is a risk that by dispersal, by having multiple species, you will have a more likely product at the end of it.

Dr Morecroft: You can see that at a number of scales within the stand or blocks within a stand. If you have very large blocks, you have missed the point a little bit, but at a smaller scale. There are also things around the size of the patch. Expanding existing woodlands will tend to create a more resilient block of woodland. You tend to lose more water at the forest edge so in drought conditions there is more chance of things drying out at the forest edge, so you create more of that forest microclimate.

If you have a clear-fell approach, and for some forestry purposes it is efficient, if you can maintain the forest canopy you will have less of those edge effects by maintaining more of a forest microclimate that can support tree growth. Continuous cover forestry is to some extent untested in this country for whether it does build drought resilience, but there is reason to think it could be a beneficial technique to explore.

There is something about exploring different silvicultural techniques. It is another hedging of your bets. If we all have some uniform conformity and everything does the same thing everywhere, we will not learn those lessons. There is a point here about monitoring and evaluating how different strategies are playing out as climate change is going forward, and now is the moment to put those things into place.

Q183 **Jerome Mayhew:** Is that a pitch for funding for forest research?

Dr Morecroft: Not necessarily with a capital F, capital R, just to be clear, good though they are.

Dr Weatherall: David would like some, too.



Q184 **Jerome Mayhew:** Professor Coomes, you no doubt have something to add.

Professor Coomes: I have rather little to add, but there is plenty of evidence from the ecology field that mixing species closely together makes systems more resilient, so there is no question about that. The challenge is meeting the requirements of foresters to produce nice, straight poles and everything working for their machinery and what is functional for them, and completely mixing up different species in the same patch can be quite difficult.

Q185 **Jerome Mayhew:** We need to do that because we want forest products, we need to have more timber security and we are already in a position where we have small forests, relatively speaking, in this country that makes them economically questionable. Does anyone have a solution to that conundrum?

Dr Weatherall: The small forest thing is true, but if you look at the patterns of forest ownership across Europe, Austria, for example, you have lots more small-scale forestry. It is hard to change, but there is no reason why smaller forest units cannot be economic producing timber, co-operatives as well. It is a barrier, but it can be overcome.

Q186 **John McNally:** My questions are fairly brief and straightforward. Bringing woodlands back into the management as a source of timber, this is to you, Dr Weatherall and Dr Morecroft. At present, around 42% of the UK woodlands are not actively managed, which can have a negative impact on their resilience and the biodiversity they contain as well as the productiveness of these woodlands.

The Committee on Climate Change also recommends selective harvesting of neglected native woodlands. I am not sure what "neglected native woodlands" means. They have a finer knowledge than I have into that but that term concerns me. Talking about harvesting of native woodlands to produce fuel wood and other products is a contentious issue. What are the potential benefits and what are the risks of bringing more woodlands into more management?

Dr Weatherall: It is a good question. At 42% unmanaged, there is still a space to bring more into management without them all necessarily coming in. We need all kinds of solutions. I have been involved in some work on bats, for example, that showed that thinning improved conditions for some species but not others, so we do not want all woodlands to look the same. I think "neglected" is just a reference to whether they are in a management plan or how long since management intervention has been in those woodlands. I think there is a resource there that can be used and can have good conservation outcomes because more light coming down to the forest floor can improve the ground floor and insect life and other species.

There is a good argument for it. As we were talking about thinning earlier, it should be done not for the profit of what is coming out but for



the benefit of what is staying there. As long as you go in with that mindset that we want this to be a resource for the future, for biodiversity, recreation, carbon, timber, you can do it in a sensitive way that makes it some benefits now and some public good for the future as well.

Dr Morecroft: First of all, it is important to say that there is a world of difference between “neglected” and a conscious strategy for minimum intervention. I think that there is a place for leaving woods unmanaged in terms of silviculture—not all woods, but there are some. Particularly from a biodiversity point of view, old trees are a unique habitat that cannot be duplicated by young trees. It takes time. We do not want to lose those really old trees. Equally, though, they will still probably require management, for example, to get on top of pests—deer is the obvious one—and to allow the woodland to regenerate naturally.

Yes, there are reasons why unmanaged woods should be brought back into management in some places, sometimes for conservation alone, sometimes for allowing demanding species on the forest floor to prosper and to diversify stands, for example—we have been talking about that—and, in the right circumstances, yes, to produce some sort of timber crop. It is likely to be wood fuel and the issue there is that that is not long-term storage. It is replacing fossil fuel burning, essentially. As we decarbonise the electricity supply and hopefully in time domestic heating and so on, the value of the wood fuel for that purpose in terms of carbon starts to fall.

I think that there is definitely a need for more management of many woods but it does, again, need to be the right action in the right place. It needs to be for the right reason.

Q187 **John McNally:** I will have a follow-on question to that. Would you like to come in on that, Professor Coomes?

Professor Coomes: There are 42,000 ancient woodlands in the UK, and ancient is over 400 years that they have been on the spot in parts of the UK, apart from Scotland where it is 250 years. They have been there a long time and they accumulate biodiversity over time. There is immense value in doing everything we can to maintain the biodiversity in those woodlands. Planting new woodlands is going to take a very long time to get the biodiversity you are seeing in these ancient woodlands. Some of that will be leaving them as they are, but in other places active management is valuable for opening up the canopies and allowing more light.

Q188 **John McNally:** It brings me back to the storms that we have had. If you are going through Scotland at the moment the wind that came in just felled trees all in a certain direction in a certain area. It was absolutely unique to look at and still is unique to look at because so many have been brought down.

I will just finish on this before we move on. Dr Weatherall, do you think



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that there are sufficient safeguards in the UK and the regulations as they are at the moment to ensure that woodlands are not going to be overexploited through overactive management? That is a follow-on to what you have just commented on.

Dr Weatherall: That is the question that is hardest to answer because, as I said earlier, we do not have that compliance testing going on all the way through. There are safeguards within the UK Forestry Standard, especially if it is in certified woodlands, but there are always the possibilities for bad practices as well. The more support that the Forestry Commission can have in England, Scottish Forestry in Scotland, or the NRW, to be able to have the agency to test or check regularly—it would have to be a sample, I think, because of resources—how things are being undertaken and then have the genuine ability to do something about it afterwards is what is needed as well.

The UK Forestry Standard is a very well-intentioned document. It has the legal requirements in it so people have ease of access to them, but everything else is couched around terminology like “should” or “aim to” or “ought to” and that leaves a big grey area where people can—and a lot of forest managers and consultants—

Q189 **John McNally:** Are you saying that people could deliberately misunderstand?

Dr Weatherall: Yes—or do the very minimum. I am not saying that that is standard practice. I know that a lot of forest managers love their biodiversity and care about contributing to climate change and doing the right thing, but there is that potential in there. Stronger language would really help. I think that it would help the Forestry Commission as well to be able to say, “You cannot do this”, not, “You ought not do this”.

John McNally: Thank you. I have members of my own family working in that business and they have genuine concerns like you have just spoken about.

Q190 **Chair:** The Forestry Commission where I represent is undertaking a policy of clear felling mature stands of conifer and then allowing natural regeneration for the replanting. What is your view about the ecological value of that and the climate change value of such a policy?

Dr Morecroft: In general, we are very keen to explore more the possibilities for natural regeneration in all different woodlands. It has the advantage we have mentioned already about not disturbing the soil. It can also foster the potential for local genetic variation to be exploited and natural selection to take place about what grows best. In principle, I think it is a good possibility.

It still comes subject to the need to ensure that the impacts of deer, for example, are managed to allow any new tree to grow. It will not be right everywhere. Sometimes if you want to diversify a stand you will need to



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bring things in. We would like to see it being used more and learning the lessons about where it can work and in what circumstances.

Q191 **Chair:** What contribution will it make to timber production?

Dr Morecroft: I am probably not the best person to answer that one.

Chair: Would it be fair to say none?

Dr Weatherall: I can come in on that. It depends how it is managed. You talked about the removal of conifers and that could be for two reasons. It could be that natural colonisation by native species has been allowed for the next rotation, or it could be that it is conifers that are self-seeding into that area, which can be a good thing within a forest management unit but if it is on to other habitats, deep peats, for example, or into ancient woodlands, it can be an issue.

There are ways you can supplement it. You could do broadcasting of seed into the area as well to try to get the density up to a level if your objective was timber production there. It is worth thinking about oak silviculture, for example. People used to think that three-by-three-metre spacing across an area was the best way to do it. Now we tend to think about having a patchy area where you have clusters. Where it is most tightly spaced will be where you get your future 30 big oak standards per hectare that you want.

It does not have to be what we tend to think of as what plantation forestry looks like, evenly spaced across. If we are thinking about silviculture, we want those final trees. If you can identify them early and keep them so they are not branching too much, then you can get productive native broadleaves in that way instead. It is possible. It is harder.

Professor Coomes: I think that natural regeneration is definitely the way to go for biodiversity conservation and expanding around our ancient woodlands, for example, by allowing natural regeneration. It would be beneficial for nature in those ancient woodlands.

For forestry, in the continent there is a mixture of planting and natural regeneration. It is not just all planting. It is not in our mindset for the forestry industry here, I don't think, but we do not have to travel too far across the continent to find it happening over there.

Q192 **Chair:** I will bring in Claudia in a second, but you mentioned 42,000 ancient woodlands. Was that 42,000 hectares or 42,000 woods?

Professor Coomes: Some 42,000, predominantly less than five hectares in size; I think that the mean is about five hectares. They are mostly very small. They were left on the agricultural landscapes in medieval times because they were valuable for timber. People needed trees for making fences and all sorts, so they kept them on the landscape.



Q193 **Chair:** Do we have a statistic for what the acreage or the hectareage is covered? Do we multiply it by five?

Professor Coomes: We could get a better number than that, but that would be 200,000, wouldn't it?

Q194 **Claudia Webbe:** We have been talking broadly about timber production. I want to move us on to draw on some of your expertise around global forest ecology and what your views are about deforestation, the importance of combatting deforestation, and what that means in terms of what the UK can do to help to combat that.

It is often said that the world is losing in area of forest something like the equivalent of the size of the UK every single year. In fact, if tropical deforestation was a country, it probably ranks third among the scale of emissions. That is what is often said. The Committee has previously heard evidence on the drivers for tropical deforestation, including the contribution of agricultural commodity imports. I want to know what your thoughts are and whether you can outline for us the consequences of tropical deforestation and why it is so important to be tackled, to get that broad picture first.

Dr Morecroft: I will say a little bit from the IPCC perspective. Something like 11% of greenhouse gas emissions come from land use, land use change and forestry. The large part of that is from deforestation. It is comparable, up there with some elements of fossil fuel use. It is not as big but, as you were suggesting, it is not trivial by any means. It is an important source of emissions.

It is also worth saying that there is more carbon in the world's peatlands forests and permafrost than there are fossil fuel reserves, so it is important that it stays there. There is a problem in that climate change interacts with deforestation and other forms of land degradation to make the loss of that carbon and the loss of biodiversity much worse.

The protection of natural forests globally is a top priority at the intersection of biodiversity and climate policy. Obviously, what we do in the UK is only a small contribution to it, but we want to be on the right side of that. The Government have consistently given leadership on those issues and have recognised them. I think that is important.

There are two elements. One is obviously reducing our impact on those through supply chains and so on. It has to be said that we also have to lead by example. Looking after our own forests and our own biodiversity is important. From a global perspective it may not be such a globally significant resource; nevertheless, it is very hard to make the case for other people to look after their biodiversity when we don't. I think there is something about leadership there. Although we want to grow more of our timber, we still want to look after our forest biodiversity.

That is the big picture. It is essential and we did find in our IPCC report on impacts and adaptation that at a global scale something like 30% to



50% of the earth's surface, and that includes sea as well as land, does need to be effectively conserved just to maintain the resilience of the whole earth system. It sounds rather grand, and it is. There are all sorts of things that can go wrong: flooding, carbon loss that we have talked about, as well as all the services that biodiversity provides to people.

Q195 **Claudia Webbe:** I want to bring in Professor Coomes on the consequences of tropical deforestation and the importance of combatting it.

Professor Coomes: One thing to add is that intact tropical forests have been an important carbon sink. They have been increasing the amount of carbon they store and drawing it out of the atmosphere, so it is not only that when you deforest you are losing that carbon to the atmosphere, you are losing that carbon sink. That is declining with climate change, it would appear, across all three continents of the world.

From a biodiversity perspective, there is no question but that the rainforests are where the biodiversity is at. A single hectare of tropical rainforest will contain more species, typically, of tree than we have across the entire United Kingdom and much of Europe. At a small scale, a loss of a hectare of tropical rainforest has an enormous consequence.

We are also seeing consequences for local climate as well, the lack of a rapid transpiration of water leaving the canopy then having a downstream influence on rainfall patterns across regions like the Amazon and parts of Africa. For all sorts of reasons, we want to protect those tropical forests.

Q196 **Claudia Webbe:** We have so far heard quite a bit about the UK's effort to reduce its contribution to deforestation through the agricultural community supply chains, but given the global scale of what we are talking about, one of the reasons we are talking quite directly about tropical deforestation is because that forms the largest part of the problems around deforestation globally. In what other ways can the UK best contribute to combatting deforestation?

Professor Coomes: Twenty years ago there was a lot of excitement in the UK Parliament about the opportunities for carbon finance to protect tropical forests. There was the Eliasch report and the Stern report, which both pointed the way to protecting tropical forests being a very cost-effective way of reducing global emissions of CO₂.

I suppose that all these years later it has not been as effective as people hoped. I think that is the brief answer to what has been happening. There are many reasons why that is the case, but I do not think that we should be throwing the baby out with the bathwater at this point but thinking about how we can scale up protection of tropical forests through carbon markets, so offsetting carbon emissions in the tropics. It is a very complicated area. We could spend several hours discussing that alone, but I think it is a pivotal moment, with COP26 and COP27 and the



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developments there. How it is going to play out in the tropics is a pivotal moment in our decision making as an international community.

Dr Morecroft: Can I just add one thing on that? Part of the failure to deliver on that in the past has been examples where it has been poorly implemented and it has been—sorry to go back—the wrong tree in the wrong place. For example, planting trees in savannahs that are naturally much more open and sparsely wooded, it does a lot of harm there, and doing things without the consent and engagement of the local community.

The standards for nature-based solutions for climate change and driving up standards is something where the UK can have a big role to play, with a strong evidenced science base, learning by experience here, but also our role as climate and biodiversity leaders, hopefully, around the world. The driving up of standards to make sure it is good carbon finance can be an important priority for us.

Claudia Webbe: Dr Weatherall, do you want to add anything at all?

Dr Weatherall: I am quite happy to defer to these two gentlemen on this.

Claudia Webbe: Okay. Chair, that is all from me.

Chair: That draws our panel to a conclusion. Thank you very much indeed, Professor Coomes, Dr Morecroft and Dr Weatherall. Thank you all for joining us and thank you to Emma Wilding for preparing our brief.