Critique of the 2024 report commissioned by the Royal Society of Edinburgh (RSE) 'Inquiry into public financial support for tree planting and forestry'

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Introduction

1. The Royal Society of Edinburgh (RSE) (https://rse.org.uk/expert-advice/inquiries/tree-planting-inquiry/) published a report (referred to as 'the report' in this document) in February 2024 challenging the use of public money by the Scottish Government for forest expansion. The report sourced information through the combination of an online open public call and 'targeted invitations' resulting in 45 responses. The main conclusion was that the Scottish Government should discontinue subsidising commercial conifer planting stating that it has failed to deliver wider public benefits. Public financing instead should be on native broadleaved tree planting claiming that this will provide long term carbon sequestration, biodiversity, and public benefits.
2. How public money is spent is an important and recurring issue. Evaluation of public expenditure, however, needs to be undertaken objectively and rigorously to provide taxpayers with accurate information required to determine whether publicly funded developments are value for money. The RSE report falls well short on both objectivity and rigour with significant concerns regarding the methodology and highly selective use of the literature that undermines the validity of findings. These concerns are considered in the following sections.

The methodology (pp 12-14)

3. The report's terms of reference are framed as follows: '*…the committee considered the range of objectives that tree planting is intended to fulfil, as described in Scottish and UK policy commitments…these objectives fell into one of three categories: carbon sequestration, biodiversity and other environmental and community benefits.*' (p12, para 26). There is no explanation of the process to select the three categories of objectives, and what other choices were available within the 'range of objectives.' Since the purpose of the inquiry was to examine public financial support for tree planting and forestry, the lack of the economic role of forestry through timber production in the terms of reference is highly concerning. It is also at variance with the Scottish Government's 'Scotland's Forestry Strategy 2019-2029': '*Forestry makes a substantial contribution to the economy at both national and local levels…through the production of timber…*' (Scottish Government, 2019, p9) that contributes over £1 Billion Gross Value Added annually to the Scottish economy.
4. The survey method used by RSE to collate information is flawed. The survey was based on an online open public call and targeted invitations that attracted views from 45 respondents comprising organisations and individuals (p13, para 30). While open online surveys are widely

used due to their low cost and relative ease of setting up, statisticians warn of the bias associated with this survey method due to the tendency of self-selecting individuals critical of the subject of interest rather than those who are supportive. This was demonstrated in a pivotal study based on three different wildlife research projects using two survey approaches—one using an open online method and the other by random sampling (Duda and Nobile, 2010). Diametrically opposite outcomes were arrived at with the open online method attracting a disproportionate number of respondents with strong negative views whereas random sampling returned favourable outcomes.

5. It is not surprising, therefore, that the RSE survey based on a statistically very small, non-random, self-selected sample revealed strong negativity towards commercial forestry. By way of contrast, Forestry and Land Scotland (FLS) (Government agency responsible for managing Scotland's national forests and land) commissioned a survey by Censuswide on productive forest expansion (FLS, 2021) where a random sample of 1,000 people in Scotland were questioned using internationally recognised statistical sampling methods (Censuswide abides by and employs members of the Market Research Society based on the European Society for Opinion and Marketing Research principles). Results showed that 90% of the sampled population were in favour of expanding productive forests.
6. The RSE survey was based on '*standardised consultation questions*' (p14, para 33); however, no explanation is provided on how these questions were drafted or 'standardised', or whether the questions were tested using polling industry benchmark methodologies in opinion surveys to ensure clarity and impartiality (e.g. Shiraev and Sobel, 2016).
7. A comprehensive and balanced synthesis of the literature is entirely missing. Respondents were requested to provide sources of evidence to supplement their answers (p14, para 33); however, the methods adopted to search for and select the cited publications are very unclear. In many cases, choice of supporting literature (48% of references relate to climate and environment, only 5% relate to the commercial forestry sector) seems to be based on the support it gives to the statements made in the narrative of the report. In only a few cases does the report quote the actual quantitative evidence provided by the cited research studies, or the important context or caveats that are attached to their findings. This creates a high risk of bias in comparison with the standards required for formal systematic review as set out by the Collaboration for Environmental Evidence (2025). It is crucial that such formal methods are used to distinguish more objective research-based evidence from subjective opinion. This will be further considered in the sections below.

History and nature of tree planting in Scotland (pp 22-24)

8. This section begins with an ascetic history of tree planting in Scotland and how the various grant schemes and tax incentives changed over time to address evolving policy (pp22-23, paras 69-72). While critics of productive tree planting insist on highlighting past mistakes associated with insensitive planting related to tax breaks (e.g. the Flow country), there was also much good afforestation across Scotland at the time that has matured into productive, diverse, multi-purpose forests.
9. Moving on to the present era, the report states that around 60% of forest holdings in '*other European countries*' (countries not stated) are less than 1 ha whereas in Scotland only 6% are in this category (p23, para 73). Many Continental European forests, some originating back to post glacial times, have a long history of ownership (and tendency to be sub-divided down the generations) unlike the situation in Scotland where the increase in forest cover is relatively

recent. The report implies that numerous very small forest plots under different ownerships is a good thing, whereas a more thorough review of the literature would have shown that this pattern of ownership has led to large areas of forest being abandoned/neglected since it is not cost-effective to manage such small plots (e.g. Schwarzbauer et al., 2010; Hatcher et al., 2013; Butler et al., 2021).

10. While the report highlights that most of the grant payments for tree planting goes to private landowners (p23, para 74), it fails to point out that grant payments do not, and were never intended to, cover all the costs of forest establishment and instead require landowners to make significant financial contributions (estimated at ~40-50% of costs). Also not mentioned is that planting grants for native broadleafs are currently 27% higher than for productive spruce highlighting a greater financial commitment to productive conifer afforestation.
11. The report points out that most new planting in Scotland is based on non-native conifers whereas in the rest of the UK more broadleafs are planted by proportion (p23, para 75). There are two issues here. First, a silviculturist on the inquiry committee would have highlighted that the geographic location of Scotland has affected a climate and site types less suitable for productive broadleaved tree species than more southerly latitudes. Second, there is the implication that broadleaved tree planting in Scotland is losing out to conifers. Data show that productive coniferous new planting in Scotland over the last 25 years has only increased by 2.8% (1.2% over the last 10 years), whereas the expansion of broadleafs over the same period (albeit from a lower base) has increased by 41% (15% over the last 10 years) (Forest Research, 2024).

Current schemes and potential reform of financial support (pp 26-29)

12. This section of the report highlights the '*gross government expenditure on grants*…' for tree planting at £41.2 M in 2022-2023 (p26, para 78 and Table 2) but fails to elaborate that it comprises less than 0.001% of the Scottish budget (for an industry worth over £1 Billion to the Scottish economy) or how it compares with the level of subsidies that go to agriculture (currently £660 M) (also see para 22 below).
13. The lack of a comprehensive synthesis of the scientific literature in this section has led to several flawed conclusions. The sub-section on 'market failure' (p27, para 85) overlooks the fact that there is practically no other private endeavour where you invest money and may never live to see or financially benefit from the final product. Forestry by its nature is an altruistic activity where the current generation benefits from the efforts of previous generations while investing for the benefit of future generations. Without financial incentives, it would be difficult to encourage private investment in productive forestry given the longevity of the business, and this would have serious consequences for the national economy.
14. Furthermore, the long timescales involved in growing trees for timber could leave Britain (world's second biggest net importer of wood products) highly vulnerable to global crises risking timber imports. It would likely require half a century or more to even come close to meeting its timber demand from domestic resources and through major forest expansion.
15. The RSE has used a publication from 1957 (Zuckerman report on ending need for a strategic reserve of timber) to support its narrative on the lack of need for state support for a commercial forestry sector (p28, para 85 sub-section on state necessity). The world has radically changed since the early post-war era with population growth having more than doubled and a corresponding doubling of wood demand. The World Bank estimates that current global demand for timber is set to quadruple by 2050 (World Bank Group, 2021). The need to maintain a

domestic productive forestry sector has never been more important due to the uncertainties of world trade.

16. The report fails to address the global nature of timber trade. With worldwide demand for timber increasing at around 4% per annum, global wood supply/demand balances are anticipated to change from surplus to deficit by the middle of this century, which will inevitably precipitate an expansion of logging (often illegal) in natural/semi-natural forests (Sedjo & Botkin, 1997; Churkina & Running, 2000; Indufor, 2012; Barua et al., 2014; Wiebe & Wilcove, 2025).
17. Key environmental agencies such as the British Ecological Society (BES), Royal Society for the Protection of Birds (RSPB), Friends of the Earth (FoE), and Worldwide Fund for Nature (WWF) have all recognised the role of the commercial forestry sector in reducing both demand for imported timber products particularly from high-risk countries, and the associated environmental footprint (House of Commons, 2023). Productive 'plantation' forests use land efficiently—covering only 3% of the total global forest area yet produce one third of the world's industrial timber.
18. There is no discussion on the environmental consequences of 'offshoring' our timber needs. The report acknowledges that poor forestry and environmental practices are prevalent in some countries and proposes a solution that '*…proper control of supply chains by importers and timber industries.*' (p28, para 85 section on import substitution) is needed. However, this has never been achieved at a global level. Wood from countries actively involved in illegal logging of primary forests regularly finds its way into the international marketplace (e.g. Nellemann et al., 2018). While forest certification is widely acknowledged for its positive impacts on sustainable forest management, most of the world's certified forests are in developed countries (87% in Europe and North America) with limited uptake in developing countries making it difficult to control exploitation (Xu and Lu, 2021).
19. The report states that imported sources of wood products are readily available from countries with '*good environmental standards*' (p28, para 85 sub-section on import substitution), mainly from Central and Northern Europe. There is no acknowledgement, however, that current availability of imported timber may not continue in the future through rising global demand and increasing levels of climate-induced damage (e.g. Popkin, 2021; Forzieri, 2021). A combination of drought stress and insect attack has resulted in many European countries revising down their production forecasts and that situation is likely to become worse (Forest Europe, 2020). The recent paper in New Scientist 'Europe's forests are in crisis' (Cuff, 2025) makes alarming reading given the UKs dependency on European forests for most of its timber imports. In addition, countries in the EU are being encouraged to reduce the harvesting of forests for timber exports to artificially increase the carbon locked up in forests ahead of the EU's 2050 Net Zero target. In the face of rising global demand for timber, climate change, tree pests and diseases, and political conflict, we cannot reasonably expect the supply of imported timber to continue as we have become used to. While this predicament is mentioned in the summary and recommendations of the report (Tew et al.2023, p56 para 162), there is no wider discussion on how to resolve this issue.
20. The main recommendation of the RSE report (to end financial aid for commercial coniferous tree planting and funding reallocated to increase biodiversity, carbon capture and community benefits [p5]) overlooks the environmental costs of using more of our land on environmental tree planting while 'offshoring' our timber supplies. Recent research has shown that timber consumption in wealthy nations such as Britain—the second biggest net importer of timber products in the world—is responsible for 13% of global forest loss beyond their borders (Wiebe & Wilcove, 2025). These countries cause a loss of biodiversity outside their borders through demand for timber

(and agricultural) products grown in other countries. As a result, wealthy countries are in effect 'exporting extinction' by destroying more biodiversity globally than they are creating within their own borders (Wiebe & Wilcove, 2025).

21. The assertion in the report that the demand for planting land is pricing some farmers out of the market (pp28-29, para 87) lacks deeper analysis. While there is a steady demand for land for productive tree planting, the report fails to mention that the increase in demand for planting land is partly driven by rewilding projects that have increased exponentially since 2010 (O'Connell & Prudhomme, 2024). Entire mixed-land-use estates in Scotland are being bought by investment houses and multinational corporations for the objective of large-scale rewilding financed by generous native broadleaf planting grants and the prospect of trading carbon credits. Given that the RSE report favours redirecting tree planting subsidies toward environmental planting and associated public benefits (p29, recommendation 2), studies have cast significant doubts on whether rewilding based on native planting delivers the social, economic and environmental benefits expounded by its proponents (e.g. Nogués-Bravo et al., 2016). In terms of increasing community benefits (a key recommendation of the RSE report [p5]), many people who live and work in rural Scotland view rewilding as an 'example of territorialisation by conservation actors' (Dolton-Thornton, 2021).
22. The report fails to highlight the contrasting economics of forestry and agriculture in upland areas relating to land value and taxation benefits/subsidies (pp28-29, para 870). A study in southern Scotland where the costs of maintaining hill sheep farming in Less Favoured Areas (LFA) (defined by combination of poor climate, soils and terrain, lower yields, higher production, and transportation costs) was found to require a direct payment subsidy of around 60% of output for survival, while productive forestry on the same land received a small grant contribution of around 3% of output (SAC Consulting, 2014). The Climate Change Committee (2025) highlighted the decline in meat consumption in the UK 'releasing' land from agriculture that can be used to create new forests, presumably without impacting on food security.

Timber industry (pp 31-32)

23. The employment figures presented in the report are ten years out of date (2013-14) and only for the timber processing sector (p31, para 93 and Table 3) ignoring the current level of employment in the productive forestry sector in Scotland of around 25,000 (Skills Development Scotland, 2025).
24. For a document primarily about public financing of productive tree planting and forestry, it is surprising that the section on the commercial timber industry is one of the shortest in the report and supported by *only three references*. There is a complete lack of peer-reviewed research to support the statements made. The authors use a reference from a committee (Construction Leadership Forum, 2023) stating that '*Timber processing in Scotland is largely restricted to short-life and low value products that in turn produce limited added value'* (p31, para 94). Effective research would have shown that around 72% of softwood deliveries goes to sawmills (60%) and panel manufactures (12%), both supply the high value construction sector (Forest Research, 2023) and the pallets sector which is vital for the movement of goods of all types.
25. Building houses with a high content of timber is a well-established construction method in Scotland and is well ahead of the rest of the UK in timber frame designs with over 80% of new houses built using this method (STA, 2018). Given the lifetime expectation of 50-100 years, use of

timber products in house construction cannot be described as 'short-life and low value.' There is no mention in the report of the potential reduction in carbon emissions possible by substituting timber for masonry (20%) and concrete (60%) in building construction (Spear et al., 2019).

26. The report proposes the development of technologies to convert sawn timber into higher specification, added-value products (e.g. glulam, cross laminated timber, veneer laminated timber) (p31, para 95). The use of advanced timber products in construction has been increasing in recent decades; however, there remains the issue of convincing architects and builders to use more of these products over traditional materials (e.g. Wilson, 2007). Further, given the very large investment of tens of millions of pounds required to establish a Scottish-based facility for these products, there will have to be a large and sustained increase in demand to underpin the financial viability of Scottish-based manufacturing of advanced timber products.
27. The report mentions the recreation associated with forestry (p31, para 93), but does not point out the vast majority of the estimated 123 million forest visits annually in Scotland are to productively managed forests (Forest Research, 2024). Studies on the specific attributes of a valued recreational experience in British forests found that well managed access via timber roads and walking/cycling tracks was critical to overall value (e.g. Willis et al., 2003; Hill et al., 2003). These studies found that tree species and structure were less important although the public are understandably averse to large-scale clear felling–a practise driven by single-aged forests established last century and which are being replaced where conditions allow by smaller-scaled felling coupes.

Carbon capture by trees (pp 34-35)

28. Coverage of carbon capture by trees (pp34-35) is surprisingly brief for one of the three central themes of the report (p10, para 26). This section is supported by only five references, and these are exclusively on soils, ignoring the extensive body of literature on the role of productive forests as carbon sinks.
29. The report acknowledges that fast-growing species such as Sitka spruce sequester carbon more quickly than native broadleaved species; however, it goes on to assert that natural forests store more carbon than plantations (p34, para 98) based on a single reference (Waring et al., 2020). A more detailed reading of this paper shows that the authors go on to conclude that '*Total carbon capture associated with afforestation and reforestation can be enhanced by substituting long-lived harvested wood products for steel, cement, and aluminium…*' (Waring et al., 2020. p1). This point was emphasised in a study showing that greenhouse gas mitigation potential of forests depends on the capacity to lock up carbon in the harvested wood. When accounting for both forest growth and use of the wood, productive forests over two harvests support up to 269% more greenhouse gas mitigation potential than planted broadleaf conservation forests (Forster et al., 2021).
30. High productivity of plantation forests is a significant factor in greenhouse gas mitigation (Doelman et al., 2020; Waring et al., 2020; Forster et al., 2021) and is consistent with other studies indicating that expansion of the forest area using fast-growing coniferous species is the most cost-effective way to sequester carbon (e.g. Stern, 2007; Nijnik, 2010). Studies also show that coniferous 'plantation' species are associated with a larger accumulation of soil carbon compared with broadleaved species (Vesterdal & Raulund-Rasmussen, 1998; Vesterdal at al., 2006; Vesterdal et al., 2013).

31. Newly created productive forests will lock up the greatest quantity of carbon between now and Scotland's policy important 2045 Net Zero target date. Productive forests will continue to deliver carbon mitigation long into the future when environmental forests will have reached their peak capacity (Forster et al., 2021), a point not covered in the paper by Waring et al. (2020). Indeed, the growth potential of productive forests is likely to be maintained or even increased as the climate changes highlighting the importance of these forests as significant carbon sinks (Jarvis and Linder, 2007).
32. While the report correctly points out that soil carbon can be lost at planting and that it can take several years before a net carbon sink is established (p34, para 100), there is a complete lack of analysis of literature on the role of cultivation and soil carbon fluxes. Ground preparation causes a short-term, proportionally small loss of soil C in the five years following ground preparation, followed by a gradual recovery with a net gain in C evident from around 30 years onwards (e.g. Paul et al., 2002; Li et al., 2012; Bárcena et al., 2014). In a review by Paul et al. (2002), soil C loss up to 30 cm depth averaged 0.63% per year (~0.14 t C ha^{-1} yr^{-1}) during the first five years following afforestation, with C gradually recovering to previous levels at around age 30, then increasing at around 0.86% per year (~0.19 t C ha^{-1} yr^{-1}). Therefore, even with relatively short rotations of 40-50 years, soils in planted forests become net sinks. The increase in soil C continues into the reforestation phase in subsequent rotations (Zerva et al., 2005).
33. The point raised about afforestation on carbon rich soils (pp34-35, para100) is an important one but lacks any synthesis of the literature to recommend that '*Scottish Forestry should prohibit planting with mechanical disturbance on carbon-rich soils*' (p35, para 102). Concerns over the impact of commercial afforestation on organic-rich peatlands has resulted in the practice ending in many countries, primarily due to the extensive drainage needed to lower the water table increasing CO_2 emissions (Sloan et al., 2019). However, arguments that afforestation of organic rich soils will lead to a net loss of soil carbon are not borne out by the empirical evidence showing that after 30 years drained and afforested peatlands became a net C sink (significantly more C enters the soil organic matter than is decomposed heterotrophically) (e.g. Hermans et al., 2022). Nevertheless, the risk of damage to important wetland habitats (e.g. Bragg & Lindsay 2003, Friggens et al. 2020) will unlikely see future tree planting on deep peats (>50 cm deep) with afforestation focusing on predominately mineral and organic mineral soils.
34. The report states that direct planting is less destructive than both deep ploughing (which is no longer done) and mounding (pp34-35, para 100) without any supporting literature to justify this claim. Mixing the upper organic/mineral layers with deeper mineral layers (such as with inverted mounding) may allow soil C to move down the profile and be stored at depth (Swain et al., 2010). This is the reason why the depth to which measurements are made is important, since what may seem like a significant reduction in soil C in shallow horizons (typically <15 cm) following afforestation (e.g. Sanaullah et al., 2011; Casado et al., 2022) may in fact be very small when soil C content is measured to a depth of 1m (Prescott et al., 2017). In addition, limiting C sampling to the uppermost soil layer tends to exaggerate the impact of disturbance, since this is most evident on the forest floor (Piirainen et al., 2015). The recommendation in the report favouring minimal soil disturbance (screefing) over deeper cultivation methods (p35, para 102) comes with risks since attempting planting on uncultivated sites often leads to high losses resulting in the costly replacement of dead plants and control of competing vegetation (e.g. Nyland, 1996), plus a delay to the process of sequestering carbon in the trees that fail.
35. On clear-felled and replanted sites where the harvesting residues are retained, an initial short-term soil C loss also occurs through a combination of soil warming and ground preparation, before reverting to a gradual accumulation of C and net gain over a similar period found with new

planting sites. The increase in above-ground C accumulation is large in comparison with short-term soil C losses, rapidly negating the effect of soil disturbance on soil C content through increased tree growth, which in turn increases C input into the soil over time (e.g. Jandl et al., 2007; Mjöfors et al., 2017). Even if relatively short rotations of say 40 or so years are used, soil carbon stocks (and a large proportion of nutrients) at harvesting are replenished if most of the residues (e.g. branches, offcuts, tree stumps) are retained on site (Jarvis & Linder, 2007), which is standard operational practice.

36. The inference that deeper cultivation is 'destructive' (p35, para 100) is not borne out by the evidence that shows that the link between soil C decreases and forest establishment is largely an effect of lack of plant growth and therefore C input to the soil, rather than soil disturbance due to site preparation (Paul et al., 2002). This is supported by an experiment in Sweden that showed that after ten years following deep soil cultivation, soil C content in the upper 50 cm of the profile did not differ from manual surface screefing (Nordborg et al., 2006).
37. Furthermore, a re-evaluation of establishment methods with the aim of increasing rooting depth has been taking place in Europe as a consequence of the greater frequency and severity of windstorms (e.g. Bengtsson et al., 2006; Della-Marta et al., 2009; Patacca et al., 2023) and droughts (e.g. Meehl & Tebaldi, 2004; Bréda et al., 2006; Allen et al., 2010; Schuldt et al., 2020) in recent decades influenced by climate change. Deeper cultivation may enhance above and below ground C pools through deeper rooting improving stability (e.g. Nicoll et al., 2008) allowing longer rotations.
38. Deep root systems are also critical to drought resilience, since soil dries in a progressively downwards direction, restricting soil water uptake by tree roots to deeper layers, and aids tree survival, even if only a small proportion of fine roots are available at deeper levels (Sperry et al., 2002; Bréda et al., 2006; Pichler & Oberhuber, 2007; Lebourgeois et al., 2010). Even the moderately drought-tolerant Scots pine (*Pinus sylvestris* L.) reaches its limit of hydraulic capacity where rooting is restricted (Oberhuber, 2001). Trees weakened by drought can succumb to secondary damage by pathogens and insect attack (Desprez-Loustau et al., 2006; Rouault et al., 2006; Green & Ray, 2009) leading to mortality and C loss. Deeper cultivation in low-rainfall areas has been recommended, to improve water infiltration into the soil and root development (Querejeta et al., 2001). Deeper cultivation is usually only required once, with the benefits of deeper rooting continuing into subsequent rotations.

Biodiversity (pp 37-43)

39. The section on biodiversity is the longest in the report. The narrative is primarily based around a comparison between commercial forests/monocultures (illustrated by austere photographs of dark understoreys and linear planting [p37]) versus native broadleaved woodland (illustrated by a sunny woodland glade [p42]). However, determining biodiversity or 'species richness' within forest ecosystems is complicated by numerous factors such as number and rarity of species, scale of the forest over which the study is done, tree species composition, and state of forest development (from recently planted/regenerated to 'old growth').
40. The report makes no attempt to examine the biodiversity associated with productive forests and the many changes to forest management that have taken place over decades to support wildlife conservation (e.g. Grant et al., 2012). The jumbled narrative of paragraph 106 makes a stark comparison between the establishment and management of commercial forests with old-growth open-grown trees, then goes on to imply that old Caledonian pines are killed off by non-native conifers. As with most critics of productive forestry, the report tends to look back to the early

post war era of poor environmental awareness to defend their views, yet conveniently overlook the fact that forest management has radically changed over the last half century.

41. The lack of knowledge of the forestry sector among the report committee is highlighted by the fact that their recommendations to improve biodiversity of forests are already embedded in current forest policy (e.g. UKFS, 2024). A more detailed review of the literature would have highlighted that well-implemented commercial forest management has little or no long-term environmental impact on water quality and freshwater ecology (e.g. Binkley & Brown, 1993; Nisbet et al., 2002; Shah et al., 2021). Even newly established areas of forest quickly provide a wide range of ecosystem services including improved water quality and recreation (Vesterdal et al., 2002; Zandersen et al., 2007). The establishment of productive forests can also provide natural flood mitigation (e.g. FAO, 2005; Wheater and Evans, 2009; Wilby and Keenan, 2012), a role that needs to be better recognised given the increased incidence of severe flooding attributed to a changing climate.
42. A major theme of the report is in rigidly linking tree species to their native/non-native status with the underlying argument that they are associated with poor biodiversity (p37, para 109). The comment (p39 third bullet point down) '*Where such species are nonnative, this can lead to biodiversity loss in all habitats…*' implies harm to biodiversity of natural tree colonisation of open habitats without any supporting empirical evidence. A wider examination of the literature would have highlighted numerous studies demonstrating that productive forests of non-native temperate trees sustain a level of biodiversity equivalent to that in planted forests of native species (e.g. Humphrey et al., 2000; Sax et al., 2005; Smith et al., 2008; Quine & Humphrey, 2010; Irwin et al., 2014). Well managed productive forests can take on certain characteristics of 'old-growth' forests if longer rotations are adopted (Oliver & Larson, 1996). Extending rotation ages including 'long-term-retentions' (stands left to grow indefinitely) have been part of forest management practice for decades (Hibberd, 1991). While the RSE report highlights its dislike of non-native forest tree species, it is a moot point whether this extends to agriculture (covering five times more land than forestry in Scotland) where almost every plant or animal used is of non-native origin.
43. The subject of invasiveness is raised in paragraph 100 (p39) yet there is no review of the extensive literature on the subject (e.g. see Ellison et al., 2017; El-Shafie, 2020; Wani and Shah, 2020). In summary, invasive plant species tend to have specific traits or specific combinations of traits such high rates of growth, rapid reproduction including vegetative propagation, and in some cases the capacity to alter their environment (e.g. soil chemistry), that allow them to out-compete native species. Based on the current scientific understanding of invasiveness, the assertion made in the report that Sitka spruce is an invasive species (p39, para 110) has absolutely no basis. While Sitka spruce can spread though seed fall outside the area that it is growing, the same is true for a great many species including native species such as birch or Scots pine.
44. Many species, both native and non-native, can become a nuisance in specific locations without being invasive. To avoid ambiguous, subjective, and pejorative vocabulary that so often accompanies discussion of invasive species even in scientific papers, Colautti and MacIsaac (2004) proposed a new nomenclature system based on biogeography rather than on taxa. It evaluates individual populations rather than entire species, classifying each population based on its success in that environment. This approach applies equally to indigenous and introduced species and does not automatically categorise successful introductions as harmful.
45. NatureScot (executive non-departmental public body of the Scottish Government responsible for Scotland's natural heritage; https://www.nature.scot/) only recognises four invasive plant species

in Scotland - rhododendron (*Rhododendron ponticum*), Japanese knotweed (*Fallopia japonica*), giant hogweed (*Heracleum mantegazzianum*) and Himalayan balsam (*Impatiens glandulifera*).

46. Greater use of species mixtures is highlighted in the report (p41, para 115) but fails to recognise that non-native species are better adapted to a changing climate through intermixing with native species and are seen as an essential part of increasing resilience in European forests (e.g. Bolte et al., 2009; Lindner et al., 2010; Jandl et al., 2019). Using a wider range of species is already part of current forest policy in Scotland, although the report fails to appreciate that it takes time to ensure supplies of suitably site adapted species are available from forest nurseries and to sufficiently understand the silvicultural requirements and wood properties of alternative species.

Environmental Impact Assessment (EIA) (pp 45-47)

47. The report questions the role of EIAs in forestry developments claiming that the EIA process is inadequate (p46, para 127) and goes on to recommend that '*…all planting proposals of 40 ha and above, or smaller applications adjoining existing woodland, submit an EIA*') (p47, para 130). This recommendation appears to be based on comments from three responders (*Anonymous 2, University of Edinburgh Centre for Sustainable Forests and Landscapes,* and *Butterfly Conservation*). This is an extremely narrow pool of sources to draw such a wide-reaching recommendation, and no empirical evidence is presented to support this assertion. There are also questions whether additional EIAs will have any material effect on the decision-making process since much of the content of EIAs is already part of planting grant applications suggesting unnecessary duplication of effort.

Urban trees (pp 49-50)

48. The report highlights current urban tree planting supported by Scottish Forestry through its 'Woods in and Around Town' (WIAT) and the Central Scotland Green Network (CSGN) programmes; however, it states that '*Although these are undoubtedly valuable, they are not located in the hard urban environments where a significant number of people would directly benefit from them.*' (p49, para 136). The inference from the concluding section (p50, para 141) is that Scottish Forestry should be directly involved with 'street tree' planting.
49. It is not clear from the report how Scottish Forestry could be involved. The skills required in urban tree planting are entirely different to that in conventional forestry; for example, choosing the right species in terms of survival in often harsh conditions, potential size of tree (height, canopy width), potential root damage to underground services, blocking light from neighbouring buildings, maintenance costs, what is offered in public amenity (e.g. visual, shade), and knowledge of the law (e.g. tree preservation orders). Furthermore, there is no evidence presented in the report that local authorities, who already have professional staff with the specific expertise in urban tree planting, would want intervention by Scottish Forestry that would undoubtedly result in conflict over responsibility.
50. There is also an element of contradiction in this section of the report given that a significant proportion of tree species planted in hard urban environments are non-native when an earlier section of the report recommends that only native tree species should receive public funding for tree planting. Choice of species in urban settings is challenging since space limitations above and below ground limits what can be successfully planted with the preference for small, low maintenance, ornamental trees typically of non-native origin. Species to meet these requirements and still survive in stressful urban locations will over-ride any considerations about native or non-native species (e.g. Ennos, 2010).

Rural communities (pp 52-54)

51. This section raises several issues—housing, long-term jobs, connectivity, public transport, and telecommunications (p52, para 142). Other than long-term jobs, it is difficult to see how these relate to the main theme of the report. The report (paras 143-146) implies that forestry does not provide rural housing (but no mention of whether other businesses provide rural housing), limited employment (using out of date figures, see para 23 of this paper), roads are being damaged (para 147), and that there is a lack of community consultation (paras 148-151). There is a lack of empirical evidence to support these claims.
52. The issue of EIAs is raised again in this section on rural communities (pp53-53, paras 152-157) and is mainly repetition of the earlier section (pp 45-47). The suggestion that the '*…screening of [planting] proposals is not transparent and further hinders effective engagement or public oversight…*' (p53, para 155) supported only by three anonymous references (Anonymous 4, Anonymous 5, and Anonymous 10) presents a poor argument for significant change to the way planting proposals are processed.

Summary and Recommendations (p 56)

53. The report's findings are based on a seriously flawed methodology, a lack of a comprehensive literature review, and an almost complete absence of empirical data to support the statements being made. Consequently, the recommendations presented here are biased and therefore highly unreliable.

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