



COMMENT

Failed Scientific Advocacy, Misappropriation and Erosion of Public Trust: Generalisations About Burning From Tall Wet Eucalypt Forests

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In the aftermath of the 2019–2020 Black Summer fires, and again after the 2022 fire season, scientists and policymakers called for renewed reflection on the role of fire in Australian landscapes. During this period, several influential papers cautioned that enthusiasm for burning risks ecological harm and misrepresents the complexity of fire regimes (Lindenmayer and Bowd 2022; Zylstra et al. 2022; Taylor et al. 2021). These interventions positioned ecology as the objective referee of when and where fire should occur and challenge calls for more active burning, particularly Aboriginal cultural burning.

The stated intent was to bring nuance to a polarised debate. The effect has been the opposite. In warning against simplification, these contributions reproduced it. Their conclusions relied on narrow ecological contexts and limited temporal frames that did not represent the heterogeneity of Australian ecosystems, or the diversity and longevity of Aboriginal fire practice. What is presented as scientific caution is, in practice, a selective gatekeeping.

The landscapes underpinning these assertions were the tall wet eucalypt forests of Australia's south. They comprise <2% of Australia's forested area (Montreal Process Implementation Group 2018) yet they have exerted a disproportionate influence on national fire debates. Research conducted in these systems, particularly studies linking forest age, logging history and fire severity in tall wet forests, has been taken up in policy-facing

contexts well beyond those environments. For example, submissions to the Royal Commission into National Natural Disaster Arrangements (e.g., The Wilderness Society 2020) and to the NSW Bushfire Inquiry (e.g., North East Forest Alliance 2020) explicitly cite wet-forest fire and logging studies (including Lindenmayer and Sato 2018; Taylor et al. 2014) when advancing arguments about bushfire risk, hazard reduction and forest management across Australian forests more generally. Similarly, state-level advocacy and policy briefs have drawn on the same body of wet-forest research to support claims about the effects of logging and fire management at statewide scales, rather than restricting inference to the tall wet forest systems in which those studies were conducted (Nature Conservation Council of NSW 2022). This influence reflects the prominence of tall wet forests in fire-severity research rather than their representativeness of Australian fire regimes as a whole.

Within these forests, researchers show that what is regarded as frequent burning, in the context of recent decades of government-controlled fire practice, threatens long-lived trees and reduces canopy complexity (Lindenmayer and Sato 2018; Zylstra et al. 2022). Related work has demonstrated strong interactions between stand age, fuel structure and fire behaviour in these systems (Taylor et al. 2014). These results are plausible within those environments, although much debated (McCaw 2024; Miller et al. 2024). More broadly, the extent to

Acknowledgement of Country: I am a Wiradjuri man who lives on Bunurong Country and works from Wurundjeri Country. I acknowledge the Bunurong and Wurundjeri Woi-wurrung peoples as the Traditional Custodians of these lands and waters, and I pay respect to Elders past and present. I recognise that sovereignty was never ceded.

Implications for Managers

- Avoid generalising data and processes to non-analogue environments, particularly idiosyncratic forest types such as tall wet eucalypt forests.
- Recognise that fire suppression, not cultural burning, drives instability through woody thickening and loss of habitat diversity.
- Shift power from scientific gatekeepers to local Indigenous authority.
- Support Indigenous-led cultural burning as a lawful practice that builds ecological resilience and public trust under the guidance of a place-based governance system.
- Rebuild management frameworks to incorporate Indigenous authority as decision-making, not consultation, ensuring policy and practice reflect diverse fire histories and ecologies.

which these relationships apply beyond tall wet forests has been explicitly questioned. Bradstock (2010), for example, showed that Australian fire regimes are structured into distinct biogeographic domains, cautioning against generalising fire responses from moist, infrequently burned forests to dry sclerophyll and savanna systems. Similarly, Bowman et al. (2021, 2022) argued that relationships between forest age, management history and fire severity inferred from wet eucalypt forests do not hold consistently across other forest types, where climate, fuel continuity and ignition patterns dominate fire behaviour.

Taken together, this body of work indicates that even within tall wet forests the role of fire in regulating long-term flammability remains unresolved, with uncertainty over mechanisms, inference and management implications. Importantly, scenario analyses indicate that management strategies consistent with sustained fire exclusion, if adopted based on these contested relationships, could plausibly increase wildfire by up to 65% (Miller et al. 2024). Given this level of uncertainty *within* wet-forest science itself, transferring such logic to other forest types is not merely speculative but potentially irresponsible, as it propagates contested assumptions into landscapes where the consequences of error are likely to be larger. In this sense, wet-forest exceptionalism, the elevation of the most fire-averse forests into national archetypes, risks recasting ecologically atypical fire-vegetation dynamics as implicit baselines for Australian forests more broadly.

1 | Wet-Forest Exceptionalism as Advocacy

The persistence of this paradigm is not simply an empirical misstep; it is a form of advocacy couched as science. Over the past decade, a network of wet-forest researchers have produced a sequence of papers that reinforce a single narrative arc. Disturbance, whether by fire, thinning or selective logging, is framed as collapse (Lindenmayer and Sato 2018). Attempts at restoration or fuel reduction are portrayed as ineffective or ecologically harmful (Taylor et al. 2021). Modelling studies claim that long-unburnt forests self-thin and therefore become less

flammable, rendering active management unnecessary (Zylstra et al. 2022). Historical reconstructions celebrate the ‘naturalness’ of unburnt wet forests as an ecological ideal (Lindenmayer et al. 2024a, 2024b). Each step consolidates the same conclusion: intervention threatens complexity and therefore should be avoided.

This body of work has come to define environmental virtue within Australian fire science. Its authors and allied Non-Governmental Organisations continue to shape media and policy narratives that frame restraint and non-intervention as virtuous, often by selectively mobilising evidence from tall wet forests and historical inquiries to caution against burning more broadly (e.g., Lindenmayer 2024; Lindenmayer and Bowd 2022; Lindenmayer et al. 2024a; Lindenmayer et al. 2024b; Zylstra and Lindenmayer 2025). Comparable framings have appeared in media and policy discourse following major wildfire events in the United States, particularly after the 2020 Californian and Oregon fires, where thinning and prescribed burning were frequently characterised as ecologically damaging and non-intervention as restraint (see syntheses in Kolden 2019; Stephens et al. 2021). Studies there found that a small number of researchers and advocacy groups repeatedly cited their own work to sustain a policy of non-intervention in old-growth reserves (Stephens et al. 2021; Kolden 2019). The same recursive logic operates in Australia. Tall wet forests, because they are the ecosystems least shaped by Aboriginal burning, are used to generalise about the continent’s fire regimes, a pattern that persists despite long-standing literature demonstrating that wet-forest fire dynamics do not apply to other forest types (e.g., Gill 1997; Bradstock 2010; Price and Bradstock 2012; Collins et al. 2021).

It is important to note that this is not the only normative framework operating within Australian fire science. In northern Australia, extensive empirical and applied research documents the ecological, cultural and climatic benefits of frequent, fine-scale Aboriginal burning in savanna systems, including reduced late-dry-season wildfire extent, emissions abatement and biodiversity outcomes (Yibarbuk et al. 2001; Russell-Smith et al. 2009). Contemporary Indigenous scholarship and practitioner-led movements further frame cultural burning as an ethically grounded, relational and place-based practice that corrects the legacy of colonial fire exclusion (McKemeey et al. 2020; Steffensen 2020). Cultural burning is thus also framed as a form of environmental virtue within parts of the fire science and land-management community. However, unlike wet-forest exceptionalism, this virtue framing has had limited influence on statutory fire policy in southern Australia, where cultural burning remains weakly embedded within legal and bureaucratic frameworks and is implemented largely through discretionary or pilot-scale programs rather than as a core organising principle of fire governance (Williamson 2021; McCormack et al. 2024).

Wet-forest exceptionalism produces an uneven exercise of authority across fire contexts. In southern tall wet eucalypt forests, Indigenous governance and autonomy are explicitly constrained through ecological arguments that position these systems as incompatible with cultural burning, thereby locating decision-making authority firmly within Western scientific assessment rather than Indigenous law or custodianship (Lindenmayer and Bowd 2022; Lindenmayer 2024). At the same time, many

of the same scientists and institutions actively pursue partnerships with Indigenous practitioners in other ecosystems where cultural burning aligns with prevailing ecological framings and management objectives, such as temperate woodlands (Bowd, Cary, et al. 2025; Bowd, Bell-Garner, et al. 2025). In these cases, Indigenous fire practice is recognised and supported, but primarily through scientific evaluation and endorsement rather than through the transfer of governance authority. The effect is to position scientific institutions as arbiters of legitimacy across contexts, determining when, where and under what conditions Aboriginal fire is considered acceptable, while retaining control over questions of risk, scale and policy inference. This produces an uneven landscape in which Indigenous fire is treated as requiring scientific validation against externally defined criteria, and is consequently rejected, enabled or celebrated depending on its alignment with scientific priorities rather than Indigenous authority.

This is not value-neutral science. When scientists embed preferred ecological states, such as 'intact', 'undisturbed' and 'wilderness', within their frameworks and models, they import normative assumptions while claiming objectivity (Lackey 2007; Fletcher et al. 2021a, 2021b). Sarewitz (2004, 2015) and Pielke Jr (2007) traced how such value-laden framings convert complex social questions into pseudo-technical ones, enabling scientists to advocate policy positions while denying that advocacy from diverse voices and landscapes. The wet-forest canon in Australia exemplifies this pattern of hegemony. By invoking 'complexity' and 'fragility' as universal truths in Australian ecosystems, it converts a local preference for static, closed-canopy systems into a national ethic, rather than recognition of place-based nuances and inclusive local decision-making.

If wet-forest exceptionalism maintains its hegemony, it is not because it is uniquely robust, but because its inferences are generalised far beyond their evidentiary limits. Findings derived from a narrow set of mesic forests are routinely detached from their ecological and historical limits, then re-presented as general guidance for fire governance. Preventing this repetition does not require replacing one prescription with another, but reasserting basic epistemic discipline. Claims must remain anchored to the forest types, disturbance histories and governance contexts from which they arise, and uncertainty must be treated as a reason for plural decision-making rather than as licence to entrench a preferred management ethic. Where fire decisions materially affect Country, this discipline cannot be purely technical. It must also be institutional, requiring a shift from advisory inclusion toward Indigenous authority in defining objectives, acceptable risk and the lawful use of fire. Without such constraints, science slides predictably into gatekeeping and advocacy, with downstream effects now familiar elsewhere: polarisation, institutional paralysis and erosion of public trust.

2 | Global Echoes and the Erosion of Trust

The consequences of advocacy masquerading as neutrality are well worn. The long battle over forest restoration in the Sierra Nevada produced two polarised camps: one treating human fire as inherently destructive, the other promoting large-scale prescribed burning and mechanical thinning as

salvation (Stephens et al. 2021). Both claimed the authority of 'best available science'. The result has been deep public mistrust, litigation paralysis and a collapse of nuance. This 'pathology of politicised expertise' weaponises science in moral conflict rather than allowing it to guide collective reasoning (Sarewitz 2015) and the application of place-based, nuanced and culturally defined approaches which we know shaped Australia's environments for millennia of Aboriginal occupation.

Australia is now showing the same symptoms as the United States. On one side, conservation scientists assert that self-regulating wet forests demonstrate the futility of active management. On the other, hazard-reduction advocates rely on simplified fuel-load models to justify broad-acre burning. Each accuses the other of ideology while practising it. The first proposes salvation through human exclusion; the second through constant intervention. Both use Aboriginal knowledge as moral validation. Yet, as Williamson and Weir (2021) showed, this embrace rarely extends beyond rhetoric. Following the Black Summer fires, Indigenous fire knowledge was incorporated into the language of public inquiries and agency frameworks, particularly through bushfire reviews and recovery processes. However, this uptake occurred primarily through advisory and collaborative arrangements rather than through the transfer of decision-making authority, with Aboriginal people required to continually persuade, legitimise and stabilise their authority within existing state fire governance systems (Smith et al. 2021; Williamson et al. 2020; Williamson 2022). Similar sentiments around Māori inclusion in biosecurity decision-making have been noted in Aotearoa (Godfery et al. 2024).

Recent analyses within Australian fire science recognise this same pattern. The continuing dispute over prescribed burning in south-west Western Australia, centred on tingle forests, has been described as a rigidity trap sustained by advocacy on both sides and by institutional path dependence in state fire agencies (Clement et al. 2024; Fontaine et al. 2025; Cannon and Clement 2025). These studies argue that technical claims about 'leverage' and 'fuel load' have become proxies for moral positions, and that the absence of 'honest brokers' capable of mediating between scientific, Indigenous and community knowledges perpetuates public mistrust.

Aboriginal burning is alternately framed as evidence that landscapes 'need more fire' or as cultural branding for programs that otherwise replicate agency-led hazard reduction. In other contexts, it is invoked rhetorically to humanise anti-burn positions, while the actual governance authority of Aboriginal people remains absent (although see Yibarbuk et al. 2001; Steffensen 2020 as counterpoints). This instrumentalisation of culture was identified long ago in critiques of co-management regimes in North America and Scandinavia (Nadasdy 2005; Tengö et al. 2014) and is now routine in Australia. The irony is profound: both camps, long complicit in the exclusion of Indigenous people from fire governance, now use fragments of Indigenous knowledge framed through their own lens to authenticate their advocacy. This critique is directed at policy-facing and media-visible fire governance, not at the many Indigenous communities who continue to burn Country lawfully and effectively beyond the spotlight, often despite, rather than because of, state frameworks.

Such appropriation is more than symbolic. It erodes public trust in science by demonstrating that ‘evidence’ can be mobilised for any position. Driscoll et al. (2020) found that nearly a third of Australian ecologists had been pressured to modify or suppress findings inconsistent with policy preferences. Martin (2006) and Lackey (2007) warned that when advocacy is dressed as science, journals and institutions become part of the problem. Once credibility is politicised, data no longer persuade; they divide.

3 | Fire, Disturbance and Selective Empiricism

The empirical record across Australia contradicts the notion that long fire-free intervals promote stability. Palaeoecological and historical studies have repeatedly presented evidence that before invasion, many (*not all*) forests and woodlands were more open, and that grassy mosaics maintained by frequent, low-intensity burning governed by local place-based law and custom (now termed cultural burning) were more widespread. The loss of these care structures has profoundly altered fuel loads and fire regimes (Howitt 1890; Hallam 1975; Nicholson 1981; Rolls 1981; Bowman 1998; Russell-Smith et al. 2009; Gammage 2011; Pascoe 2014; Fletcher et al. 2021; Steffensen 2020; Mariani et al. 2022, 2024). Aboriginal authors describe this practice as an obligation rather than an option: a system of law in which fire expresses relationship, ceremony and responsibility to Country rather than ecological technique or fuel management (Pascoe, Shanks, et al. 2024).

In both dry and wet regions, fire suppression has produced unprecedented woody thickening and fuel continuity. In the high-rainfall north-west of Tasmania, rainforest expanded rapidly once Aboriginal burning ceased (Fletcher et al. 2021). Contemporary studies of Martu burning in the Western Desert show the same process at work: the loss of fine-grained mosaics created by women’s patch burning, which sustained biodiversity and ecological resilience, has led to woody thickening and large, destructive fires (Bird et al. 2016, Bliege Bird et al. 2012). The same pattern holds across much of the continent: it is suppression, not burning, that drives instability. Idiosyncratic patterns observed in the least representative forest systems, where Aboriginal fire management was likely highly localised, are poor surrogates for the rest of the continent and for most forest types.

By contrast, recent empirical studies demonstrate that Indigenous-led cultural burning produces qualitatively different outcomes from agency-led hazard reduction. McKemey et al. (2025) found that small, patchy cultural burns reduced surface fuels without simplifying vegetation structure, while higher-intensity agency burns homogenised understoreys and reduced biodiversity. These findings echo half a century of northern Australian research showing that frequent early-dry-season burning enhances habitat diversity and lowers late-season wildfire severity (Russell-Smith et al. 2013; Ansell et al. 2020).

The selective empiricism of the wet-forest canon marginalises this evidence. Its datasets are geographically and ecologically narrow yet are extrapolated as continental forest truth. The claim that ‘self-thinning forest understoreys reduce wildfire risk’ is derived from debated datasets from karri and tingle

forests in south-west Western Australia, mesic forests that are among the least representative Australian eucalypt forests. Such conclusions collapse ecological heterogeneity into moral simplicity.

4 | Science, Values and the Illusion of Neutrality

The deeper problem is epistemic. Environmental science has never been value-free, yet the authority of neutrality remains its primary rhetorical resource. Sarewitz (2004) showed that environmental controversies persist not because of data gaps but because science provides multiple, equally plausible interpretations that align with competing social values. Fire ecology is a textbook example. For some, disturbance signifies disorder; for others, renewal. Both readings can be supported by data, and both are therefore political choices.

When scientists disguise such choices as objective with statistical rigour, they convert empirical debate into moral dispute (Lackey 2007). In Australia’s forest fire discourse, the moral framing is clear. Humans are cast as inherently destructive. The pre-colonial landscape is idealised as pristine ‘wilderness’ (Fletcher et al. 2021b) and self-regulating, while Aboriginal fire is acknowledged rhetorically but stripped of agency. The resulting polarity between ‘no fire’ and ‘fuel reduction’ positions science as salvation from human excess and the gatekeeper of truth. Neither position recognises that humans have shaped and maintained healthy Australian ecosystems for millennia, or that science cannot stand outside society as a neutral arbiter of ecological truth, but instead operates within value-laden frameworks that shape what is seen, measured and authorised.

These dynamics are not uniquely Australian. North American forest debates, particularly around the Pacific Northwest ‘timber wars’, demonstrate how scientific authority can become a proxy for environmental virtue. The moralisation of science alienates communities who experience policy consequences directly (Pielke Jr 2007; Sarewitz 2015). Once science is perceived as advocacy, people treat it as one more political interest, deepening polarisation and undermining conservation itself. This type of advocacy has well and truly grown roots in Australian forest and fire science (Lindenmayer 2024).

5 | Reclaiming Pluralism

Global syntheses of Indigenous stewardship offer a way for the environmental sciences out of this impasse. They present an empirical demonstration that cuts through the polarised advocacy. A review of 861 studies of Indigenous fire stewardship across all global biomes found biodiversity benefits in nearly 80% of cases (Hoffman et al. 2021), while an analysis of 648 conservation cases showed that positive ecological outcomes increase sharply with Indigenous governance authority (Dawson et al. 2024). These results demonstrate that the most reliable predictor of ecological resilience, including fire, is not disturbance frequency or forest type, it is governance equity.

In Australia, however, governance remains the missing variable. Despite the language of partnership, Aboriginal law rarely

shapes fire policy. Aboriginal voices are used to validate advocacy, locating non-Aboriginal scientists as the gatekeepers of fire policy and practice. They arbitrate the who, where and when of fire use. Cultural burning programs operate at the margins of agency hierarchies, although they are increasing, for example the Firesticks programs of eastern Australia (Steffensen 2020; McKemey et al. 2020; Costello and Cameron 2022) and savanna burning in the north (Yibarbuk et al. 2001); however, they are typically constrained by liability frameworks and narrow risk definitions (NSW EPA 2024) and gate-kept by ecological discourse in which Aboriginal people are used as pawns, rarely as equal decision-makers. The rhetoric of inclusion thus conceals the persistence of epistemic exclusion.

Indigenous-led frameworks now articulate clear alternatives. The Eastern Maar authors of *Pang-ngooteekeyya weeng malan-geepa ngeeye* describe restoration as an enactment of Law, centred on Culturally Significant Entities that guide both ecological practice and governance (Pascoe, Clarke, et al. 2024). Their work reframes restoration as a practice of reciprocity and responsibility, inviting scientists and agencies to work within Indigenous governance systems rather than beside them or against them.

Recognising pluralism requires confronting the moral binaries that dominate current fire discourse. Both the ‘no-fire’ and ‘fuel-reduction’ camps treat landscapes as ecological objects to be optimised rather than as living systems governed through relationship. Both appropriate Aboriginal knowledge and practice to legitimise strategies that remain externally controlled. The result is not restoration but repetition of colonial logic, in which Western science remains the sole arbiter of ecological truth.

6 | Conclusion

The controversy over fire in Australia is not simply about fuel, frequency or forest type. It is about knowledge, power and the uses of science. Wet-forest exceptionalism elevates a tiny portion of the continent into a moral exemplar, transforming empirical observation into advocacy. The opposing ideology of hazard-reduction absolutism repeats the error in reverse. Each invokes Aboriginal knowledge when convenient and ignores it when inconvenient.

Across this divide runs a deeper cultural story: that humans are either the destroyers of nature or its saviours. This dichotomy is sustained by the illusion of scientific neutrality and by the selective deployment of complexity as moral shield. In reality, the stability of Australian ecosystems has depended on active, law-bound human care for millennia.

If environmental science is to recover public trust, it must confront its own values openly. The task is not to claim purity or objectivity but to acknowledge that knowledge is relational and situated. It will require humility from those who currently wield power, rather than the entrenched recursive self-reinforcing rhetoric and advocacy that currently frames both sides of the forest fire debate.

Fire has never been merely a biophysical process. It is a conversation between people and Country that cannot be captured

through the narrow lens of either advocacy or avoidance. The challenge for Australian ecology is to leave the hall of mirrors and learn to see again, not the forests it prefers to study, but the continent as a whole.

Conflicts of Interest

The author declares no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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