24 November 2023

Fire and Emergency Service Act Reform
Department of Police, Fire and Emergency Management

By email: FES.Reform@dpfem.tas.gov.au

Dear Minister Ellis

Submission on the Consultation Draft of the Tasmania Fire and Emergency Service Bill 2023

We welcome this opportunity to make a submission on the consultation draft of the Tasmania Fire and Emergency Service Bill 2023 (**TFES Bill** or **Bill**).

This statutory drafting process is taking place at a critical time for Tasmania's communities, environments, fire agency and emergency services. It is now widely accepted in the global wildfire science and management community that anthropogenic climate change is causing a surge in destructive wildfires driven by a complex constellation of social and environmental factors. The most important of these are associated with anthropogenic climate change that is causing fire weather to be more extreme and fire seasons to be longer making fuel management and firefighting less effective thereby exposing human communities to greater risk of destructive wildfires.

Tasmania clearly conforms to this global pattern with over a quarter of the state having been burned by wildfires in the last thirty years. The cost of wildfire suppression has been rapidly rising in step with increasingly geographically large and prolonged Tasmanian bushfires such as the 2013, 2016 and 2019 fire season. Tasmania has been affected by economically destructive wildfires (e.g. Dunalley in 2013), with growing concern, particularly in the insurance industry, of the vulnerability of the greater Hobart area to a disaster of the same or greater magnitude as the 1967 disaster. Adapting to the growing risk of wildfires demands carefully crafted law, policy and administrative arrangements that enable all tiers of government, industry, communities, and individuals to work effectively together to manage bushfire fuels, improve urban and rural planning and design to increase the resilience of infrastructure and communities to bushfire disasters. Effective 'shared responsibility' can markedly reduce the reliance on, and escalating costs of, fire suppression and insurance. Without leadership, incentivisation and large-scale interventions, however, Tasmania is likely to experience increasing destructive and costly and environmentally destructive bushfire disasters.

This consultation process therefore presents an excellent opportunity to enhance the TFES Bill in ways that better prepare Tasmania for the challenges of future fire seasons and the urgent need to 'build in' opportunities and obligations for climate adaptation in our legal frameworks. This submission is based on the authors' combined experience of more than 50 years in research, policy and law about climate adaptation and fire in Australia.

Dr Phillipa McCormack is a Future Making Fellow at the Environment Institute, The University of Adelaide, and a Postdoctoral Fellow in the Adelaide Law School. She is the inaugural recipient of an Early Career Fellowship with Natural Hazards Research Australia for her research on fire law reform. Phillipa sits on a Committee of the Board of the International Association of Wildland Fire, is the Vice President of the National Environmental Law Association, and a member of the Bushfire Research Group convened by the Department of Natural Resources and Environment (NRE) Tasmania. She is the author of more than 30 peer-reviewed articles on topics relevant to fire, adaptation and biodiversity law and, in 2022, was invited to deliver a keynote presentation on fire law reform to the California Fire Science Consortium and University of California Davis' *Forest Fire Lecture Series*.

Professor David Bowman is an Australian Research Council Laureate Fellow and Director of the Fire centre at the University of Tasmania where he holds a research chair in Pyrogeography and Fire Science. He is recognised as a thought leader in wildfire science and management, publishing influential research in high-impact journals, providing policy advice to government, and serving as an expert media commentator. From 2019-2022 he was listed as a Clarivate highly cited cross-disciplinary Researcher, an honour bestowed on the top 0.1% researchers globally, reflecting their demonstrated significant and broad influence through the publication of multiple highly-cited papers over the preceding decade.

We **attach** the following material, setting out some of the key research that underpins this submission in greater detail:

- **Bowman DMJS** & JJ Sharples, 'Taming the flame, from local to global extreme wildfires' (2023) 381(6658) *Science* 616-619.
- **McCormack PC**, RK Miller and J McDonald, 'Prescribed burning on private land: Reflections on recent law reform in Australia and California' (2023) *International Journal of Wildland Fire* doi:10.1071/WF22213.
- **Bowman DMJ** and **McCormack PC**, 'Arrested Policy Development of Private Fire Shelters (Fire Bunkers) Is A Barrier to Adaptation to the Australian Bushfire Crisis' (2023) 6 *Fire* 298.
- Woinarski J, **PC McCormack**, J McDonald, L Rumpff, S Leggett, S Garnett, B Wintle, 'Making Choices: Prioritising the Protection of Biodiversity in Wildfires', *International Journal of Wildland Fire* doi:10.1071/WF22229.
- **McCormack PC**, J McDonald, M Eburn, SJ Little, **DMJS Bowman**, RMB Harris, 'An anatomy of Australia's legal framework for bushfire' (2022) 46(1) *Melbourne University Law Review* 156.
- McDonald J and **PC McCormack**, 'Responsibility and Risk-Sharing in Climate Adaptation: A Case Study of Bushfire Risk in Australia' (2022) 12(2) *Climate Law* 128.

We look forward to opportunities to continue to engage with the Minister, the Department and those responsible for guiding this reform process. We are happy to answer any questions that you have about this submission or the attached documents.

Sincerely,
Phillipa McCormack and David Bowman

Submission on the Consultation Draft of the Tasmania Fire and Emergency Service Bill 2023

McCormack, Bowman

We address the following aspects of the Bill in our submission, and make recommendations in relation to each (36 recommendations in all).

1. Objects, principles and functions

1.1. Objects clauses

We understand from the review documents that preceded the TFES Bill, including the Blake Review, that the Tasmanian Government intended the reforms to result in legislation that is 'principles-based' (though the review documents did not explain what was meant by that term). It is surprising to see that the TFES Bill does not include any overarching objectives, nor does it include any principles to guide decision making, broadly, under the Bill.

Clause 9 sets out the objectives of TFES and includes an obligation on TFES to ensure that it exercises its functions (cl 10), as far as practicable 'to further the objectives of the TFES'. We support this language, and we broadly support the new objectives of TFES, though the omission of the environment from cl 9(1)(a) is unfortunate, and the framing of cl 9(1)(c), inviting TFES to simply recognise that Tasmanians natural and cultural environmental values, should be strengthened (see recommendation 2).

However, the absence of overarching objectives and principles means that the TFES Bill is substantially out of step with modern statutory drafting practice and almost all fire-related statutes in other Australian jurisdictions (the South Australian *Fire and Emergency Services Act 2005* has no objects clause, but this has been identified as a problem and is almost certain to be addressed in legislative reforms in that state, in the near future).

Statutory objects clauses play an important role in legislation. They provide a statement of purpose for the legislation and articulate the aspirations of Government and – in this case – the fire agency. The Government can be ambitious in objects clauses, explaining to Tasmanian communities and businesses how this piece of legislation will help us, as a community, 'get to where we need to be' in the future. Objects clauses also provide a lens through which decision makers, policymakers, tribunals and courts interpret the substantive obligations and powers set out in the Bill. Objects clauses should also guide the Department's development of subsidiary instruments under what will become 'the Act', such as regulations, codes, guidelines and even factsheets. In doing so, these clauses help to ensure consistency in the message and focus of the legal framework as a whole.

While clause 9 provides objectives for TFES, there are other actors with functions under the TFES Bill, such as police officers and electricity entities (given powers under Part 3, Div 2) and the new State Fire and Emergency Service Committee and other committees (clauses 17, 18). Those actors may not be bound to act in a way that is consistent with, let alone that furthers, the objectives in clause 9. As another example, the Minister, when exercising powers or performing functions under the Bill, need not be guided by the objectives set out in clause 9.

Clause 9 is also not expressed in a way that would govern the development of regulations under the Bill, if the Bill becomes law. This means that the multitude of permitting provisions and other important fire-related functions that have been left to be developed in future regulations (the term 'prescribed' appears 55 times in the Bill), are unlikely to be required to further TFES' objectives, and may be entirely unconnected with the aspirations and purposes of this Bill. Given the range of decision making that is intended to be left to the regulations, the absence of overarching objects is a serious oversight that needs to be addressed.

Overarching objects clauses are where the Bill should be explicitly engaging with the challenge of climate change and the nature of fire on this island. The Tasmanian Government could be ambitious here. Objects clauses could articulate the certainty of more frequent, damaging fire seasons in future, and the need for community members to play an active role in risk reduction. But the objects clauses could also acknowledge the fact that fire has critical roles to play in the health and function of

Tasmanian landscapes, both as a natural landscape-scale disturbance regime that is crucial to the survival of some Tasmanian species and ecosystems, and as a fundamental feature of cultural landscapes and a cultural responsibility for many of the palawa and pakana people of lutruwita.

Recommendation 1. The next iteration of the Bill should include objects clauses at the outset of the Bill, consistent with good drafting practice and most other Tasmanian legislation, so that the purposes of the legislative regime are clearly articulated, consistently applied and future focused.

Recommendation 2. Clause 9(1)(a) should include natural and cultural values, as follows: "to preserve human life and to protect property, ~~and~~ premises and natural and cultural values, if an emergency event occurs", to clarify that when TFES is responding to an emergency that affects Tasmania's internationally-renowned environment, and the host of cultural values inherent in Tasmanian landscapes, protecting those values is also an operational priority.

1.2. Directing principles

Objects clauses should be expressed as outcomes that are intended to be achieved by a piece of legislation but there is another kind of statutory tool that is very important for 'principles-based legislation', known as directing principles. Directing principles are rules-based principles that spell out 'matters that decision-makers are obliged to apply when exercising their statutory functions'.[1] These are, in essence, principles that guide *how* decisions are made, rather than *what* decisions are made or what *goals* are being pursued. They are express statutory obligations on decision-makers to act in a particular way when exercising functions under the Act. The Victorian *Environment Protection Act 2017* (equivalent of Tasmania's *Environmental Management and Pollution Control Act 1994*) provides particularly useful examples of directing principles for the TFES Bill.

Examples of directing principles from the EP Act include:

> A decision, action or thing directed towards minimising harm or a risk of harm to human health or the environment should be proportionate to the harm or risk of harm that is being addressed (s 14).
>
> [*Note: this principle might increase ambition with hazard reduction, given that the effects of hazard reduction would need to be balanced against the likelihood and potential severity of future bushfires*].
>
> Protection of human health and the environment is a responsibility shared by all levels of Government and industry, business, communities and the people of Victoria (s 16).
>
> [*Note: we urge the Tasmanian Government to consider how shared responsibility might be articulated in the TFES Bill, though we do not consider that this expression of the principle provides much clarity for businesses or communities in the context of shared responsibility for bushfire mitigation. At present, there is no mention of shared responsibility in the TFES Bill, despite the fact that the TFES will not be able to visit every home and save every person in a catastrophic fire event – even now, let alone in future*].
>
> Actions or decisions under this Act should be based on the best available evidence in the circumstances that is relevant and reliable (s 19).
>
> [*Note: this is an eminently sensible and, we argue, a critical directing principle for the TFES Bill, in the context of rapidly changing fire risks. Given that so much decision-making is proposed to take place under regulations rather than under the Act, if passed, we would add "under this Act and its subsidiary instruments" to this principle*].

[1] Australian Panel of Experts in Environmental Law, *The Foundations of Environmental Law: Goals, Objects, Principles and Norms, Technical Paper 1* (APEEL 2017) 3, available here <www.edo.org.au/publication/australian-panel-of-experts-in-environmental-blueprint-and-technical-reports/>.

> Members of the public should— (a) have access to reliable and relevant information in appropriate forms to facilitate a good understanding of issues of harm or risks of harm to human health and the environment and of how decisions are made under this Act; and (b) be engaged and given opportunities to participate in decisions made under this Act, where appropriate to do so; and (c) have their interests taken into account in decisions made under this Act (s 22).
>
> [*Note: this is an eminently sensible and, we argue, a critical directing principle for the TFES Bill, in the context of rapidly changing fire risks*].

Directing principles are implemented in either all decision-making or specified decisions made under legislation. Implementation is made explicit through provisions such as:

> It is the intention of Parliament that in the administration of this Act and the regulations, regard should be given to the principles specified in this Chapter (EP Act, 11(2)).

Directing principles are legally enforceable and we argue that this is not something that the Tasmanian Government should shy away from. Many of these directing principles are a statutory expression of common sense and good practice. For example, decisions should be based on the best available evidence, and it should not be surprising that people may wish to review decisions that are based on 'a hunch' or the input of one stakeholder or a very limited consultation process.

In this context of identifying appropriate directing principles, we wish to highlight the fact that there is no mention of shared responsibility in the current iteration of the TFES Bill. The Tasmanian Government will need to pay close attention to how this Bill will give Tasmanian businesses, communities and individuals the necessary power, incentives, resources and information to take up responsibility for their safety, survival and adaptation to future bushfire regimes.

Recommendation 3. The next iteration of the Bill should include decision making principles to guide the performance of any function under the Act (if passed) and its subsidiary instruments, by any person or body with powers or responsibilities under the Act.

1.3. Functions of TFES

Clause 10(1)(d) lists as a function of the new TFES 'to assist in the provision of medical assistance, and provide medical assistance, if required'. It is not clear, from the provision of the Bill, why TFES would be responsible for providing medical assistance. However, from conversations that we have had, we understand that this may be designed to provide statutory support for existing agreements between the Tasmania Fire Service and Ambulance Tasmania, where volunteer fire fighters can respond more quickly than paramedics to some regional locations and, as a result, may play a dual or interim function while waiting for paramedics to arrive. If that is the case, the provision could more clearly articulate that it is an ancillary, rather than a core, function for TFES. The Bill may, for example, note that TFES members may provide some level of first aid as first responders, in certain circumstances; or where defined by agreement with Ambulance Tasmania?

Recommendation 4. The 'medical assistance' function of TFES does not seem consistent with the responsibilities of the Tasmania Fire Service and SES, and its inclusion should be clarified.

2. Institutional infrastructure

2.1. The Commissioner

We generally support the requirement in clause 13(2) of the TFES Bill that the Commissioner must have 'the technical expertise, and the management and professional skills, to perform the functions of the TFES Commissioner'. This requirement is not imposed in every other jurisdiction in Australia and

we see it as a strength of the Tasmanian legal framework that the head of this service is required to have particular skills and expertise. However, we recommend that clause be further strengthened and clarified to ensure that 'technical expertise' is interpreted as expertise *relevant to fire*. This clarification will ensure that the Commissioner has both the necessary expertise to manage and coordinate the new agency, and that that person has the trust and support of the members of the TFES based on having relevant and demonstrated capacity in relation to fire.

There is no provision in the TFES Bill for a Deputy Commissioner. We strongly recommend that the position of Deputy Commissioner, and the process for their appointment, be formalised in the TFES Bill. This is because the Deputy is usually empowered to exercise all of the functions and powers of the Commissioner in the Commissioner's absence. As such, it is appropriate and good practice to ensure that such authority is transparent in its allocation, and that the Deputy's exercise of the Commissioner's powers, responsibilities and functions are governed by the same constraints and objectives of the TFES Bill. If – as is apparent in the way that the Commissioner's required expertise is articulated – that the Commissioner ought to have particular skills, then the Deputy should be required to have those same skills.

In the alternative, when the Deputy Commissioner's role is formalised, the next iteration of the Bill could require that one of the officers appointed to the role of Deputy or Commissioner must have operational and fire-specific experience, and the other officer should hold technical expertise relevant to the work of the SES. This arrangement would provide flexibility in the appointment of the Commissioner and Deputy Commissioner, while ensuring that:

- the organisation is led by two people with complementary expertise;
- members of TFES from both TFS and SES backgrounds all feel that their contribution, experience and expertise is relevant and valued by the upper management of the organisation; and
- that decision-making within the organisation accounts for the needs, expectations, morale and operational requirements of both the TFS and SES personnel.

Recommendation 5. The TFES Bill should require that the Commissioner have 'fire-related technical expertise' or 'operational fire expertise… and the management and professional skills…'. Alternatively, the Commissioner and Deputy Commissioner should, between the two roles, be required to have specific expertise relevant to the fire and SES components of the organisation.

Recommendation 6. The TFES Bill should require that a Deputy Commissioner must be appointed, and that the Deputy must have the relevant technical expertise, management and professional skills to fulfil, on an interim or 'acting' basis, the functions of TFES Commissioner.

The Commissioner has more responsibilities under the new Bill than the *Fire Service Act 1979* gave directly to the Chief, though we understand that some of those responsibilities were delegated from the State Fire Commission to the Chief under the 1979 legislation. New powers and functions include strategic and funding decisions that were historically the responsibility of the State Fire Commission. The State Fire Management Committee (discussed below) does not appear to be designed to assist with any of those responsibilities, and it is not clear whether the Commissioner will have capacity to meet these administrative obligations while also effectively leading the Fire and Emergency Services organisation in a way that supports a healthy and flourishing organisational culture. Articulating the Deputy's role in the Bill may help with this, including because it would allow the Bill to distribute responsibility for some of these tasks to the Deputy.

The absence of a governing body such as the Commission also leaves the Commissioner without any formal oversight, governance support or accountability arrangements, other than reporting directly to the Minister. If the Commissioner is to be the Chair of the proposed State Fire Management

Committee and, have powers to, for example, establish other committees for any purpose that they wish, there is a risk that the Commissioner's perspectives will prevail over any dissent or concerns in a way that prevents proactive and pre-emptive conflict resolution. Under the current structure of the Bill, we support the Minister hearing directly from the Commissioner, but note that the Minister will *only* hear from the Commissioner in relation to TFES matters, and this risks falling short of the rigorous governance standards that the TFES deserves.

Finally, without independent advice to the Commissioner from a diverse and representative council or committee that comes from beyond the TFES, neither the Commissioner nor the Minister will have the benefit of any input or insights from the latest research on fire, ecology, communities or emergency management, nor will they have consistent, established access to independent expert advisors that can manage stakeholder communications and inform strategic organisational approaches to rapidly changing environments. The absence of such a body is particularly problematic given that decision making is becoming more complex, with more significant trade-offs and an urgent imperative to become more responsive and adaptive to changing circumstances, as the climate changes.

Recommendation 7. The TFES Bill should be drafted in a way that ensures good governance. The Committee – at least as it is currently articulated – does not appear to be intended as a body through which to facilitate adaptive and rigorous governance arrangements. Although, admittedly, we know nothing about the Committee's terms of reference, powers or composition at present. Nevertheless, if the Committee was to play a governance and strategic role in the organisation, the Bill might be improved by articulating (a) how competing views amongst members of the Committee; and (b) how competing or conflicting views of the Committee and the Commissioner, should be represented to the Minister.

Recommendation 8. Depending on the role that the Committee is intended to play in decision making, governance and stakeholder engagement, we suggest that the Bill provide for an independent Chair of the Committee, appointed by the Governor with the requisite skills to lead strategic planning and support good governance in TFES.

2.2. The Bill does not continue the State Fire Management Council

The TFES Bill does not mention the State Fire Management Council. As a result, the Council will cease to exist when the *Fire Service Act 1979* is repealed.

The State Fire Management Council has an important strategic role in native vegetation management in Tasmania. well-beyond emergency response. The Council, with its diverse membership of land managers (noting that the Tasmanian Fire Service is not a major land manager), also brings together a range of different perspectives on land management to negotiate strategies for hazard reduction and native vegetation management, including on private land. Native vegetation management strategies and policies produced by the Council recognise the crucial role for hazard reduction but also accommodate other values such as conservation, forestry, agriculture and local government planning. The absence of a dedicated position on the existing Council for a Tasmanian Aboriginal person is notable, but that issue could be readily resolved in a new body designed and implemented under the TFES Bill.

The current Bill misses a critical opportunity to enable all tiers of government, industry, communities, and individuals to work effectively together to manage fuels and improve urban and rural planning and design, and to increase the resilience of infrastructure and communities to bushfire disasters. This missed opportunity is apparent across the provisions of the Bill but is most apparent in this absence of a statutory body equivalent to the Council that offers a forum for stakeholders to work together to create fire-safe and environmentally healthy landscapes.

It is also—bafflingly—unclear in the TFES Bill, how programs such as the Red Hot Tips and bushfire-ready neighbourhoods programs would be empowered, resourced and implemented. Even statutory support for something as basic and fundamental as the fuel reduction program must be *implied* in the Bill – despite that program going to the heart of all national and international strategic risk reduction priorities in relation to fire. The lack of clarity and strategic support for hazard reduction and risk mitigation across tenures is a fatal flaw in this Bill. A reorientation towards prevention and preparation must be achieved before the next iteration of the Bill is released for consultation.

We see value in maintaining a strategic body such as the Council for this purpose. The Council offers a dedicated mechanism within the legal framework to provide strategic and independent advice to both the Commissioner and the Minister, with a focus on fire prevention and preparation, across tenures and landscapes, and across multiple values and perspectives.

Recommendation 9. Reinstate the State Fire Management Council or design another body that plays a similar role.

Recommendation 10. Ensure that the TFES Bill is appropriately oriented towards fire mitigation and preparation, and hazard reduction, rather than towards emergency response. This reorientation is consistent with international, national and local priorities to improve resilience and prepare for future hazards. In particular, the TFES Bill should be equipped to provide private, public and Aboriginal land managers with opportunities to negotiate shared native vegetation management strategies and priorities in a way that is sensitive to growing fire risks across tenures and land uses.

2.3. The State Fire Management Committee

The Bill creates a State Fire and Emergency Service Committee in clause 17. The Committee will advise the Minister (but will not provide advice to the TFES). It is possible that the Committee will have similar powers and responsibilities to the State Fire Management Council, though there is no way of knowing that, because the provisions relating to this Committee provide no information about its scope, except for the extremely broad discretion given to the Minister.

Clause 17(2)(a) of the TFES Bill makes the Commissioner the chair of the Committee, but the Commissioner has no control over the other appointees. The other appointees must include a union appointee and a volunteer association member (though which union and association is a decision left to the discretion of the Minister, a point that we discuss further, below). The Committee's membership need not include, unless the Minister decides to include them, any members relevant to the other fire-related agencies including Parks and Sustainable Timbers Tasmania (STT). Without knowing anything about the terms of reference for the Committee (which the Minister will set, presumably after the passage of this Bill through Parliament), it is difficult to assess whether other particular participants ought to be mandatory inclusions in the list. At present, the discretion given to the Minister in relation to this Committee is unnecessarily broad, insufficiently transparent and unreviewable, and we strongly recommend that the Minster's discretion is constrained and the purpose of this Committee is articulated in the Bill.

Recommendation 11. Provide a clearer indication of what role the Committee is intended to play in the framework created by the TFES Bill, so that the suitability of its structure, membership and functions can be assessed by stakeholders reviewing the next iteration of this Bill.

3. Substantive provisions

3.1. Liability management

In a recent academic article about law reform in NSW and California, McCormack and others observed that prescribed burning is inherently risky, creating a high risk of liability for private landholders who burn on their property. Landholders found to be negligent may have to cover the costs of fire suppression and pay compensation for damage to neighbouring properties. In many jurisdictions, the threat of liability has been identified as a disincentive to undertake hazard reduction ecological and cultural burns.

Law reform to reduce the risk of liability for escaped prescribed burns has significantly increased the use of prescribed fire on private land across many parts of the United States. In Australia, the most recent court case on this issue is a decision from NSW (*Woodhouse v Fitzgerald* (2021) 104 NSWLR 475), which reiterated that prescribed burning on private land may be reasonable and beneficial, even if it creates some risks for neighbouring landholders, but that there is no clear, consistent rule about when liability will apply. Instead, the court will balance multiple factors, deciding liability in any given matter on a case-by-case basis. Multiple post-fire inquiries in Australia have recommended statutory clarification of liability standards, and protection for private landowners from liability if they comply with valid permits and demonstrate appropriate diligence (e.g., see discussion in Legislative Council Environment and Planning Committee, Parliament of Victoria 2017).

With that in mind, we support the inclusion of clause 34(3), which exempts a person who complies with the terms of a permit from liability unless they act in a way that is malicious or reckless. This provision is consistent with law reforms being pursued in other highly fire-prone jurisdictions, such as the US state of California.

We do, however, note the following qualifications to our support:

- Is the phrase in clause 34(3), 'lights **and controls** a fire in accordance with the conditions of a fire permit' (emphasis added) based on a particular legal principle? Otherwise, it may be a confusing qualification. That is, it seems unlikely, on an ordinary reading of the provision, that a person who is *controlling* a fire will also cause loss, injury or damage, without having been malicious or reckless.
- Clause 60(3) creates an offence that might undermine the clarity of clause 34(3), by adding a requirement that a person must take 'all reasonable prescribed precautions and all other reasonable precautions to prevent the fire from spreading'. This appears to go further than 'malicious or reckless'.
- We also recommend that the word 'valid' be inserted into clause 34(3), as in '…in accordance with the conditions of a [valid] fire permit issued to that person'. This addition highlights the requirement that a permit is not only issued to the relevant person, but also has not expired, is not implemented on a total fire ban day, and is not invalid for any other reason.

We commend the Tasmanian Government for clause 34(3) and its effort to constrain liability for permitted fires (potentially, including ecological and cultural fire, depending on the purposes for which permits may be available? See discussion at 3.3 below). This provision, with some revisions as described above, appears to be a sensible and forward-looking mechanism that may expand the use of fire as a management tool, including on private land.

Recommendation 12. Consider whether the phrase 'and controls' in clause 34(3) is necessary and appropriate given that it may hinder the purpose of the provision, to exclude liability for people who act in good faith in compliance with a valid permit.

Recommendation 13. Consider adding the word 'valid' to clause 34(3).

Recommendation 14. Ensure that the offence created in clause 60(3) does not overlap with, confuse, override or undermine the constraint on liability created by clause 34(3).

3.2. Hazard reduction and bushfire prevention

We see value in setting an expectation within the scope of the Bill itself, that, alongside emergency response activities, the Tasmanian Government is committed to 'sharing responsibility'. This goal could be supported through effective incentives, resourcing and programs for communities to reduce hazards and adapt to future fires. Achieving this goal will, at first, require a clearer and more explicit focus on hazard reduction and fire mitigation more generally (neither term is mentioned at all, in the Bill). While the word 'prevent' is mentioned 25 times in the Bill, it is almost exclusively in the context of preventing a fire from spreading or other emergency contexts, rather than to indicate support for proactive fire prevention activities in the broader sense of the term. We discuss this in more detail in relation to the definition of 'emergency management operations', in Part 7.2.

There is no provision in the TFES Bill for funding or training programs about the use of fire and the management of risk at all – let alone specific training and resourcing arrangements for private land owners and managers. Targeted training programs could provide knowledge, equipment and expertise to support prescribed fire on private land, building on the success of existing programs such as Red Hot Tips.

Making provision for these kinds of arrangements need not reduce the flexibility of the TFES Bill. For example, the Bill could include a new Part that establishes a fund for training, equipping, upskilling and incentivising hazard reduction activities across tenures. This fund may also provide funding, on application, to low-income households to bulk purchase and retrofit protective measures on homes, such as fire shutters, sprinklers and bunkers, and to access support for mechanical removal of fire hazards such as vegetation.

The Tasmanian Government already operates a bulk fire equipment manufacturer and reseller ('TasFire Equipment') and could, through a fund such as the one proposed here, facilitate bulk purchasing, subsidised prices and coordinated installation of fire protective equipment for individuals or, even better, across low-income and high-risk communities in Tasmania. This could be transformative for accessing equipment and facilitating adaptation, and would demonstrate a practical commitment to shared responsibility.

The process for operating and applying to the fund could be set out in regulations.

3.3. Permitting

Clause 32 purports to restrict people from lighting fires during fire permit periods. Clause 32(1) prohibits a person from lighting a fir during a permit period, and clause 32(2) provides exemptions from that prohibition. Sub-clauses 32(2)(b)-(d) are relatively clear. They provide exemptions from the prohibition for: (b) people acting with all reasonable precaution and consistent with instructions from a TFES officer (though if there is no obligation to seek instructions from a TFES Officer, that part of the provision seems entirely voluntary?); or (c) consistently with the conditions of a fire permit; or (d) if the fire is in a designated place in a protected area.

However, clause 32(2)(a) is unusual and, we argue, potentially confusing, contradictory or unworkable. It allows a person to light, maintain and/or use a fire without a permit during a permit period provided they 'act in accordance with this Act' (cl 32(2)(a)). If that includes acting in accordance with clause 32(1), then a person will not be able to light a fire in a permit period without contravening that provision. We argue that the clause does not give enough information to allow a person to demonstrate that they are not in contravention of clause 32(1). They need to be able to point

to evidence of how they have complied with the rest of the Act. In the absence of an authorising document such as a permit, or other criteria that a person could demonstrate that they have implemented, such as instructions from a TFES officer, a person relying on clause 32(2)(a) would need to undertake a full statutory analysis of the whole Act and – presumably – the wealth of regulations that are intended to be drafted under the Bill.

Recommendation 15. The exemption in clause 32(2)(a) should be deleted, or clarified by adding "in accordance with this Act[, particularly sections x, y and z]; and", to ensure that it is clear what constraints apply. This would allow a person accused of contravening clause 32(1) to demonstrate that they have met the requirements of clause 32(2)(a).

At present, the TFES Bill leaves to the regulations all of the rules about the activities for which permits will be available, when a person may apply for a permit, how a decision maker must assess that application, whether there is an opportunity for review, and how those permits will operate (cls 34 'fire permits', 86). This may well be flexible, but it also risks falling significantly short of basic standards of transparency, predictability, fairness, efficiency and accountability. The Bill should, at least, include:

- a list of activities for which permits will be available,
- an explanation of how decisions will be made, and
- information about whether a review process is available.

In addition, we recommend that the next iteration of the Bill include a framework for designing clear, rigorous and streamlined assessment processes for certain permits – perhaps in the form of a power for the Minister or the TFES to make Codes.

Legislation in some other Australian jurisdictions govern streamlined permitting processes for the purposes of hazard reduction. These existing streamlined approaches, such as Bushfire Hazard Reduction Certificates in NSW, are governed by legislated standards. That is, the *Rural Fires Act 1997* (NSW) creates a power to make Codes provided that they are consistent with certain standards and with the objects of the Act and, if those legislated standards are not met, any shortfall is open to scrutiny and enforcement. Relying on that statutory power, the Rural Fire Service developed the Bushfire Environmental Assessment Code, which governs applications for low-risk, standard forms of prescribed fire on private land. More complex applications can be diverted from that streamlined process back into the general stream, which typically requires detailed, expensive and potentially costly application processes under multiple statutes.

Importantly, streamlined processes in other jurisdictions are available for hazard reduction but not for other purposes, such as fires for ecological restoration or cultural purposes. The narrow focus of these existing streamlining processes has been acknowledged as a shortfall in other jurisdictions. The Tasmanian Government has an opportunity to pursue the benefits of this approach while learning from other jurisdictions and avoiding the shortfalls of existing examples. In doing so, the Tasmanian Government could create new opportunities to use fire for beneficial purposes, while ensuring appropriate levels of oversight and support.

Recommendation 16. The process for seeking a permit, and the rules that govern decision making and review of applications for a permit, should be set out in the main legislation and not in the regulations. Permitting processes should be made subject to the overarching objects of the Act and should be decided consistently with new decision-making principles (see recommendations 1-3).

If the Government determines that permitting will not be set out in the legislation, it must – at the very least – set out a clear statutory process for designing standards of assessment that comply with or promote the objects and principles of what will become the Act. This is another argument in favour of

clear statutory objects in the TFES Bill, and principles that govern decision making, particularly decision making under regulations, because it is otherwise far more difficult to monitor, scrutinise, review and appeal such decision making.

Recommendation 17. If the TFES Bill does not include all of the permitting requirements in the main legislation, it is even more important that the next iteration of the Bill includes clear objects clauses and principles for decision making; makes the design of Regulations contingent on furthering the objects, and ensures that all decision making under the Regulations furthers the objects.

Clause 86(6) provides that 'The regulations may authorise any matter to be from time to time approved, determined, applied or regulated by any person or body as specified in the regulations'. This is exceptionally broad. In essence, it allows the Minister and/or the Department of Police, Fire and Emergency Management to add to or change the operation of the primary legislation without having to seek the approval of Parliament to do so. This is not good practice in law-making, particularly where any such matter that could be 'approved, determined, applied or regulated' may involve penalties.

Despite the Tasmanian Government's legitimate desire for this new legislation to be agile and flexible, and to remain relevant over time, it must also be comprehensible, clear and fair. We urge the Government to avoid a scenario where a large portion of the rules being imposed by this new TFES framework are not apparent when reading the parent Act.

Recommendation 18. Remove clause 86(6) from the next iteration of the TFES Bill, and commit to ensuring that all of the fundamental powers, authorisations, standards and offences are contained within the new TFES legislation.

4. Interactions with other legislation

4.1. The role for the police

Part 3, Div 2 of the TFES Bill sets out particular powers of police officers at emergency events. It is not clear that this division provides the police with any powers that they do not already hold under other Tasmanian legislation. Setting out police powers in the new TFES Bill has the potential to confuse or conflict with other powers, particularly given that this Bill is intended to prevail to the extent of any inconsistency (other than the *Emergency Management Act 2006*, which prevails over this Bill, clause 5(2)).

Recommendation 19. Remove additional police powers from the Bill or clarify precisely how they interact with or add to existing powers, cross-referencing other relevant legislation.

Recommendation 20. If these additional powers for police remain in the Bill, they should be made explicitly subject to new, overarching objects and decision-making principles.

4.2. The role for other agencies with responsibility for fire

Clause 9(1)(d) of the TFES Bill describes, as an objective of TFES:

> to facilitate, and initiate if appropriate, effective interoperability between Agencies in this State, and in other jurisdictions, in respect of an emergency event, or potential emergency event, in either jurisdiction.

Responsibility for fire planning, hazard reduction, fire response and recovery in Tasmania has long been split between the Fire Service, Tasmania Parks and Wildlife, Sustainable Timbers Tasmania (STT, formerly Forestry Tasmania), and Hydro Tasmania. These other fire agencies are recognised in

a limited way in the *Fire Service Act 1979* and in Tasmania's Emergency Management Arrangements, but have specific fire prevention responsibilities under other legislation (e.g. the *National Parks and Reserves Management Act 2002*).

There has been no indication in the review process to date that that arrangement is intended to be set aside or altered in any way. In fact, in the recommendations made by the House of Assembly Standing Committee on Community Development in 2016, one of the key issues to be resolved by new legislation was to articulate:

- A streamlined approach to fire fighting between Tasmania Fire Service (TFS), Tasmania Parks and Wildlife Service, Forestry Tasmania, and other relevant agencies

Aside from clause 9(1)(d), and clause 22 ('powers of responsible officers'), the TFES Bill does not refer to these other government agencies. There is no explicit provision, statutory Schedule or other indication of proposed consequential amendments to other legislation, that might be made in the implementation of this TFES Bill.

The existing collaborative arrangements between TFS, Parks, STT and other bodies are important, valuable and worth retaining, particularly given that a majority of the state is conservation tenure and a substantial majority of the state is covered by native vegetation including forests. We urge the Minister and those responsible for the TFES Bill to articulate how the new TFES will work with existing fire response bodies in a streamlined and collaborative way.

Recommendation 21. We recommend that the next iteration of the TFES Bill explicitly support collaboration in fire prevention and response between the different agencies with responsibility for fire; or, at least, acknowledge in the Bill in some way that that collaborative approach is intended to be maintained and fostered in Tasmania.

4.3. Building Act, Building Regulations and the National Construction Code

As noted at the outset of this submission, fuel and hazard management is one aspect of shared responsibility, and the TFES Bill places an insufficient focus on these aspects of shared responsibility. Another aspect of community preparation for fire is the standards to which dwellings and other infrastructure must be built. The existing fire service plays a role in overseeing building and development to ensure that it produces infrastructure that is safe – consistent with the purposes of the service and the *Fire Service Act 1979*.

There is no indication in this Bill of any statutory powers, training requirements, decision making standards or priorities for the new TFES in conducting assessments of, for example, private bushfire shelters (also known as 'bunkers'), unlike the accreditation requirements set out from clause 43 in relation to land use planning. We consider this to be a missed opportunity. Private landholders should be equipped to take responsibility for their safety from bushfires as often as safely possible, given that climate change is changing the scale, extent and frequency of bushfires, and the TFES will not be able to attend every property and save every landholder in the event of a bushfire emergency.

We have considered the barriers to installing bunkers in a recent paper (see ANNEXURE). A recent decision in the Tasmanian Civil and Administrative Tribunal demonstrated the potential complexity and disincentives that individuals may experience in trying to install a bunker – as a form of independent, self-funded adaptation to future fire risks. Acknowledging that there were land use planning matters at issue in this case, it highlights for us a serious barrier of complexity and uncertainty associated with self-funded and independent adaptation in Tasmania. We urge the Tasmanian Government to consider the intersections between Building Code of Australia, Tasmania's

building legislation and regulations, and the goal of this Bill to mitigate the risk and potential harm from catastrophic bushfires in future.

We urge the Minister and those drafting the next iteration of the TFES Bill to take this opportunity to clarify confusing aspects of the interaction between building laws, land use planning laws and bushfire prevention and response. This might take the form of new provisions in the TFES Bill, or separate instructions to the TFES to take a strategic approach to fire-related building laws through guidelines, codes and other legal and policy mechanisms. We would happily provide additional, specific input on a new mechanism for the next iteration of this Bill, to clarify the connection between fire safety, shared responsibility and building laws in Tasmania. Experts such as Mark Chladil within the Tasmanian Fire Service are exceptionally well-equipped to speak to this issue, and we recommend internal consultation to identify resolutions to the existing complex and opaque legal requirements for approving bushfire bunkers.

Recommendation 22. We urge the Minister and those drafting the next iteration of the TFES Bill to consider whether this Bill could create a new mechanism for streamlined applications to install accredited fire adaptation measures, such as bushfire bunkers. Alternatively, we strongly recommend the Tasmanian Government consider amendments to the Building Act and Regulations to provide greater clarity and certainty about products that the TFES would consider 'safe' as emergency shelters, and the requirements for their compliant installation and ongoing management.

4.4. Land Use Planning

Clause 20 of the TFES Bill gives the TFES power to enter premises. This clause is framed very, very broadly. It gives the TFES powers that would include (but are not limited to) the power under the *Fire Service Act 1979* for TFS to assess fire hazards on private land and issue notices to address or abate such hazards.

If this provision is designed to support the reduction of fire hazards on private land, it provides no guidance or even an explicit indication to private landholders of what might trigger the TFES to enter their land, what might be the focus of TFES' inquiries or investigation, and what kinds of issues might be the subject of an order under this provision. The clause, as it is currently drafted, is too broad and general to allow landholders to proactively seek to reduce or remove threats or mitigate the risk of a TFES officer entering their premises and issuing an order and thus directly undermines any intention that it support hazard reduction on private land (if such an intention is, in fact, behind the drafting of this clause).

To resolve this lack of clarity, the clause could include a non-exhaustive list of examples of when and how this power might be used. For example, the Bill could include a new clause 20(2)(a)-(c):

> *This power may be used in circumstances that include, but are not limited to:*
>
> *(a) entering property to identify and order the removal of an emergency hazard;*
> *(b) entering property to assess the origins of an emergency event; or*
> *(c) entering property to determine compliance (or otherwise) with a permit.*

However, if the clause was to be revised in this way, the Bill would need to include an obligation to reduce or remove emergency hazards at premises (that is, a sufficiently clear obligation with which a person must comply) – because clause 20(2) only allows authorised officers to enter premises to determine whether the Act is being complied with. There is no such obligation in the current iteration of the TFES Bill.

Clause 20 could also benefit from guidance set out in narrative form below the clause (in italics), which is something that is often included in modern legislation, particularly at the Commonwealth

scale. Narratives/notes are not part of the statute itself and are not binding. For example, the clause could be followed by guidance such as:

> *Note: this provision could, for example, empower a TFES officer to enter a person's property and identify a fire hazard, such as a pile of dead vegetation immediately adjacent to a home, and recommend that the TFES Commissioner order the person to remove that vegetation, or to organise to remove the vegetation on behalf of the landholder, at the landholder's cost.*

Given that that is just one circumstance in which the power could be exercised, a narrative approach would only be appropriate if the clause itself was narrowed and made more explicit. There are sure to be a host of other actions that the TFES would be empowered to take under this clause. The Bill would benefit from more information about these actions, and an explanation of the scope of the power granted in this clause to the TFES.

Recommendation 23. The clause needs far more detail, and accompanying obligations set out explicitly so that the clause can be interpreted and applied.

Clause 20 does not include any consequences for the owner or occupier of premises that chooses not to comply with an order of the TFES Commissioner under clause 20(5). Clause 72 provides that the regulations may 'prescribe such matters as are necessary, or reasonable, to ensure that an appeal or review may occur in respect of this Act', but there is no other guidance about how decisions under clause 20 may be reviewed, appealed or challenged.

An additional sub-clause 20(6) should be included, noting either where those rules are to be found in the TFES Bill, e.g. 'an owner or occupier of premises may be entitled to seek review of an order of the TFES Commissioner under clause 20(5), under the process set out in Part [x], Div [x]', or by directly providing access to review such an order to the Tasmanian Civil and Administrative Appeals Tribunal (TASCAT).

Recommendation 24. Explain the implications of an order under clause 20(5) and opportunities to seek review.

4.5. Conservation Law

The TFES Bill currently mentions the environment five times. Clause 9 includes as objectives, supporting the community to prevent or limit environmental impacts from emergency events (cl 9(1)(b)(ii)), and recognising that Tasmanian communities value the environment (cl 9(1)(c)). The other three references are to the Environment Protection Authority and exemptions from the *Environmental Management and Pollution Control Act 1994*.

We acknowledge that the Bill is not intended to be an environmental law. However:

- *Bushfires in Tasmania cause environmental harm*. In mitigating the impact of bushfires and conducting bushfire response, TFES should include amongst its responsibilities the prevention or mitigation of that harm to the greatest extent practical.
- *The new TFES will sometimes be the lead response agency for bushfires that are purely environmental in their impact.* For example, large-scale or long-running bushfires the Tasmanian Wilderness World Heritage Area are likely to be emergencies led by TFES on some occasions, as they were in 2016 and 2019. The critical role of coordinating and collaborating with Parks and STT on bushfires in the parks and forestry estate will require TFES to pay heed to those agencies' primary (statutory) purposes, and to support them in their mandate to protect environmental values.
- *Emergency management principles in Australia prioritise the protection of human life, property and the environment (typically in that order)*. These principles are implemented in

legislation for fire agencies around Australia and it is entirely unclear why the third priority for other fire agencies and emergency management arrangements such as TEMA have been excluded from this Bill, particularly given the two dot points immediately above.
- *Acknowledging in legislation that Tasmanians care about the environment, but not including any priority, objective or obligation to act on that acknowledgement is unacceptable*.

Other provisions in the Bill that are relevant to environmental protection include:

Clause 41 – This clause empowers the TFES to plough firebreaks in a way that removes living trees *unless* those trees are needed for agriculture or silviculture. There is no exemption for firebreaks for protecting conservation covenants on private land, critically endangered species (under national or state laws) or their habitat (including listed critical habitat), internationally significant environments such as World Heritage Areas and, e.g., Ramsar-listed wetlands, or the protection of important water catchments, including for major urban centres such as Hobart and Launceston.

Given the acknowledgement that Tasmanians care about the environment – as limited as that acknowledgement is – we are surprised that the Bill does not include any mechanism for assessing the significance of biodiversity or catchment values before ploughing a firebreak. No doubt, decisions about the location of firebreaks are urgent, and sometimes those decisions are made with limited information. However:

- decision makers are clearly going to be required to turn their mind to the value of trees for agriculture and silviculture, so there must necessarily be enough time and information for some level of assessment and balancing of values in decision making; and
- information about relevant environmental and water catchment values is already available to decision makers in Incident Management Teams (IMTs), including through various layers on LISTmap/COP and expert advisors in IMTs from Parks & Wildlife and other relevant agencies.

Moreover, if environmental values are deemed to be less important – in all circumstances – than the need to plough a firebreak, we would argue that there will *certainly* be circumstances when trees on agricultural land are important for agriculture, but similarly less important than the need to plough a firebreak.

Recommendation 25. Clause 41 should be revised, either (a) to require that decision makers balance the value of trees and other vegetation on any tenure and for any sector or industry, including agriculture, silviculture, conservation and water catchments, against the need to plough a firebreak; OR (b) to allow decision makers to plough a firebreak unless the trees or vegetation are needed for agriculture, silviculture, internationally- or nationally-significant biodiversity or the protection of a water catchment.

Clause 42 – This clause allows landholders neighbouring Crown land to put in firebreaks on Crown land, provided the Minister administering the *Crown Land Act* has given consent. This provision is framed in the negative, which is a bit odd (that a person may not form a firebreak on Crown land if the relevant Minister does not give consent). Importantly, the provision does not require consent from the relevant land manager (e.g., Parks & Wildlife). We support the prohibition on private landholders being able to form a firebreak on land that being occupied, used or managed by the State – which presumably includes Crown land managed for conservation purposes by Parks & Wildlife.

Recommendation 26. Private landholders should be required to seek permission from Parks & Wildlife – not the Minister for Crown lands, or in addition to the Minister for Crown lands – if the land is being managed for conservation purposes.

5. Aboriginal cultural fire management

The National Royal Commission and state government inquiries in NSW and Victoria after the 2019-2020 bushfires – the most recent and comprehensive reports on government prevention, preparation, and response to bushfires around Australia – have recommended that governments investigate opportunities to facilitate cultural burning as a contribution to hazard reduction activities and for cultural purposes. For example, the 2020 NSW Bushfire Inquiry final report (Owens and O'Kane 2020) made two recommendations regarding Indigenous cultural burning, the most pertinent being that:

> 'Government commit to pursuing greater application of Aboriginal land management, including cultural burning, through a program ... working in partnership with Aboriginal communities. This should be accompanied by a program of evaluation alongside the scaled-up application of these techniques.' (Recommendations 25 and 26)

Similarly, the National Royal Commission (Binskin et al. 2020) highlighted the importance of cultural fire management, recommending that Australian, state, territory and local governments should:

> 'engage further with Traditional Owners to explore the relationship between Indigenous land and fire management and natural disaster resilience' (Recommendation 18.1)
>
> 'explore further opportunities to leverage Indigenous land and fire management insights, in the development, planning and execution of public land management activities' (Recommendation 18.2).

A key recommendation from the comprehensive review Australia's Megafires: Biodiversity Impacts and Lessons from 2019–2020 was to 'Support Indigenous land management' (Woinarski et al 2023, 458), which suggested that:

> Limiting the spread of wildfire in the catastrophic weather conditions that will become increasingly common may remain a management challenge, but there is much to be gained from following Indigenous leadership to reset our relationship with fire, and its application for looking after and connecting with our country.

These recommendations reflect rapidly growing recognition of the significance of cultural fire management for First Nations' people around Australia and overseas (see, for example, detailed analysis of law and policy reform on this issue in New South Wales and California in the attached paper McCormack, Miller and McDonald 2023).

In June 2023, Tasmania Parks and Wildlife released a new cultural burning policy and procedures, and the agency has begun to work on building capacity, expertise and opportunities to return cultural fire to Tasmanian landscapes, including through its Aboriginal Ranger program. There is a strong focus in that policy document on safety, and little in the way of enabling provisions for cultural fire, but this is likely a result, at least in part, of a legislative regime that provides no enabling conditions or recognition of the role and importance of cultural burning.

The Tasmanian Fire Service and the Department of Police, Fire and Emergency Management do not appear to be investigating anything similar. Moreover, in the absence of overarching objects clauses, there is no indication at all in the TFES Bill that Tasmanian Aboriginal people might be able to receive approval, or even apply, to conduct cultural burns on Aboriginal, public or private land.

The Tasmanian Government has an opportunity to act on the National Royal Commission's recommendations in new objects clauses in the next iteration of the TFES Bill. It could, for example, acknowledge that fire can be used to promote positive ecological, cultural and hazard reduction outcomes, which would provide a context for new permits that apply to prescribed fire for purposes other than hazard reduction.

The Bill could go further – and we strongly recommend that it does – creating a clear, statutory pathway for cultural fire management in Tasmania. In the absence of that step, the Bill must, at least, empower TFES to work with Aboriginal communities or bodies such as Aboriginal Heritage Tasmania to develop a Code or Guidelines to inform cultural fire management in Tasmania. This could be made a responsibility of a new or revised iteration of the State Fire Management Council, along with other 'beneficial' approaches to fire such as ecological, cultural and hazard reduction burning.

Recommendation 27. The TFES Bill should:

- ***(i) include an overarching object clause that recognises that fire can be used in purposeful ways to achieve positive outcomes, including to facilitate cultural practices, promote ecological health and resilience, and reduce landscape-scale hazards; and***
- ***(ii) either:***
  - ***a. include a new, streamlined permitting process under which Tasmanian Aboriginal communities can receive approval for cultural burning on Aboriginal land, and/or on public or private land with the explicit, prior consent of the land owner and/or manager; or***
  - ***b. include an obligation on the new TFES or another body, such as the State Fire Management Committee, to consult with Tasmanian Aboriginal communities and negotiate a process for facilitating cultural fire under Tasmanian law.***

Recommendation 28. In the absence of an explicit acknowledgement and/or pathway for cultural fire in the next iteration of the TFES Bill, the Tasmanian Government should clearly articulate how it sees cultural fire interacting with the legal framework being developed under the TFES Bill, and set a timeline for developing a government policy for supporting cultural burning in Tasmania.

6. Review of the Act

We support clause 88, which requires the Minister to initiate a review of what will become the TFES Act after five years in operation. Mandatory reviews are a useful tool for ensuring that a piece of legislation does not languish and become unfit for purpose.

However, at present, the only obligation on the Minister is to give the report from that review to both Houses of Parliament. If the Tasmanian Government sees fit to impose a requirement for a review after five years, it should, at least, also require the Minister and/or the Department to respond publicly to that review, if not justify any decision not to make all of the changes recommended in the report.

Recommendation 29. The Minister should be required in clause 88 to publicly release a response to the report of the five year review, explaining which recommendations have been adopted, and which (if any) have only been adopted in part or have been rejected, and why.

Additional provisions for review should be included in the next iteration of the TFES Bill, as follows.

Recommendation 30. The Bill should also include the following provisions:

- ***(a) That the Minister initiate an independent review of the operation of the Act every ten years after the report of the first five years of the Act has been published.***
- ***(b) As with the report of the five year review, the Minister must publish a response to the report from these reviews and explain which recommendations have been adopted or rejected in whole or in part, and why.***

7. Other considerations

7.1. Miscellaneous

Membership of the State Fire Management Committee is expressed in broad terms, providing additional discretion to the Minister in a way that may create conflict and/or reduce trust in the Committee's decision-making (if the Committee is, in fact, given powers to make decisions on any given matter). For example, clause 17(2)(b)(i) identifies a member nominated by 'the most relevant trade union representing members of the TFES, as determined by the Minister'. With TFES made up of fire and SES services, and permanent and volunteer members (as defined in clause 3), it is not clear precisely which union may be designed as 'most relevant' by the Minister. Depending on the terms of reference of the Committee, and its power and relevance in the organisation, this discretion risks pitting unions against each other and invites the Minister to penalise or reward particular unions. Similarly, there are three volunteer associations that are relevant to the TFES and it is not clear which of these will be given a position on the Committee under clause 17(2)(b)(ii).

In establishing the new, combined TFES, the Bill should represent a commitment to fostering a culture of transparency, trust and collegiality, ensuring through the membership of this Committee that a range of perspectives are heard, and that members feel that they have a stake in decision making processes that affect them.

Recommendation 31. The Minister should not be empowered to identify which union and association is most relevant to the work of the Committee or, if the Minister is so empowered, the Bill should set out a clear and streamlined mechanism for seeking a review of that decision.

Part 3, Div 6 of the TFES Bill (from clause 43) provides for accreditation under the *Land Use Planning and Approvals Act 1993*.

Recommendation 32. Processes for accreditation could be defined in the regulations and extend from land use planning to other legislation such as building laws.

Clause 12(1) places volunteers under the 'supervision and control of the TFES Commissioner'.

Recommendation 33. Volunteers should, we suggest, be placed under the supervision and control of the TFES Commissioner or the Commissioner's delegate, in their role as a TFES volunteer.

7.2. Definitions

'Emergency management operations'

The definition of 'emergency management operations' includes fire-fighting operations and protecting people or property or rendering assistance during an emergency. It is not clear whether 'rendering assistance' includes only members of the public or other fire response agencies such as Parks, STT and Hydro.

We note that:

- more than 50% of the state is in some form of protected area;
- more than 70% of the state is covered by native vegetation of some kind; and
- TFES will continue to play a role in coordinating and responding to some major fires in protected areas such as the TWWHA.

As a result, the definition of emergency management operations should be extended to include working alongside other fire response agencies to achieve the third aspect of the hierarchy, as included in most other documents and around the country, which is life, property and the environment. That is, the Bill must do more than simply acknowledge that Tasmanians care about the

environment, as set out in clause 9(1)(c), but include an active commitment to protecting the environment as well as life and property, consistent with emergency management in law and policy around the Country.

The definition of emergency management operations includes prevention activities. This is a tortured definition. Day-to-day management of vegetation to minimise hazards while also achieving other positive outcomes such as ecological restoration, visual amenity, shade and climate control, water filtering and so on, should hardly be considered 'emergency management'. The definition also suggests an unhelpful shift towards bringing hazard reduction and landscape-scale management under the emergency banner, instead of bringing some of the work, resourcing and effort of emergency response out into a clearer, more comprehensive and concerted commitment to prevention – good management in an holistic way – as is a priority of a host of different state and national government, and international, strategies and policies.

Environmentally and economically sustainable fire management requires a broad and sophisticated understanding of landscape fires. Landscape fires are not necessarily economically nor environmentally destructive. Indeed, skilful fire management can reduce fire hazards, protect biodiversity and increase important ecosystem services including water yield, air quality and carbon storage. Achieving sustainable fire management requires a diversity of perspectives and multiple stakeholders. A narrow 'disaster' and 'emergency' framing of bushfires is unlikely to result in sustainable fire management because the emphasis will be on (economically costly) bushfire *fighting* and industrialised fuel management. We suspect that the strong ethos of command and control that permeates the Bill will be counterproductive in creating effective partnerships essential for 'shared responsibility'.

Recommendation 34. Addressing this concern effectively will require a wholesale revision of the Bill, beginning with well-designed and forward-looking objects or purpose clauses, clear guidance about good decision-making, and a strong governance body with responsibility for strategic planning about vegetation management and other 'beneficial' uses of fire.

While that task may be time consuming we urge the Minister and the Department, in the strongest possible terms, to take this opportunity for wholesale and consultative revision now, before the Bill is put to Parliament, and avoid having to continually 'tweak' a sub-optimal and poorly-adapted piece of legislation after it has entered into force.

A 'consistent approach'

Clause 10(1)(a) lists one of the functions of TFES as ensuring that 'there is a consistent approach by the TFES in preventing, preparing for and responding to and transitioning to recovery from emergency events…'. It is not clear, in this context, what a 'consistent approach' means. For example, is it the Government's intention that:

- TFES respond in the same way to similar emergency events, no matter where in the state they occur? The resourcing required for that kind of consistency – between urban and remote areas – is likely to be very high and perhaps unsustainable as the climate changes.
- TFES maintain a consistent response to fire events over time? Committing to this in legislation seems short-sighted, given the certainty that the scale, frequency and severity of fires will increase over coming years as the climate changes.
- TFES allocate its effort and resources in a more consistent way across its responsibilities for prevention, preparedness, response and recovery (consistent with international and Australian policy and strategic priorities)? If so, this needs to be clarified and may require greater attention to prevention and preparedness in the text of the Bill, given that so much of the activity that will be required for preventing bushfires and preparing for future fire regimes is either absent, implicit or left to the regulations.

Recommendation 35. The next iteration of the TFES Bill should clarify what is meant by a consistent approach, or remove the phase from the Bill.

7.3. Offences

Clause 60 prohibits 'any of the following actions' including lighting a fire or using or moving anything that is alight, 'if the action endangers any premises'. It will be difficult for a person to defend themselves against such an accusation if premises burn down because of an action that they have taken, even if it may not have been obvious that a premises was 'endangered' by the action beforehand. Perhaps most importantly, the clause does not create any exemption for a fire lit in accordance with a permit, which seems to be an oversight.

Recommendation 36. Include an exemption as a new sub-clause 60(2) *[shifting down the numbering for the two sub-clauses that follow]* ***along the following lines 'Subsection (1) does not apply to actions that are taken in accordance with a permit or other authority issued under this Act or the regulations, unless it is proven that the person acted maliciously or recklessly'.***

We support clause 62, which makes it an offence to light fires on peat or in stumps or standing trees. These kinds of fires are exceptionally difficult to extinguish and have been the origin of a number of bushfires over recent years around Australia.

7.4. Legislation repealed

All of the amending Acts that are listed in Schedule 2 have already been repealed as a result of the expiry of 90 days or whatever time period was allocated in the amending Act, to allow for the primary legislation to incorporate the amendments.

However, Regulations and proclamations made under the Fire Service Act are not listed in Schedule 2. Is it the case that the following subsidiary instruments will also be repealed?

- Proclamation under the Fire Service Amendment Act 2012
- Fire Service (Miscellaneous) Regulations 2017
- Fire Service (Finance) Regulations 2017
- Fire Service Amendment Order 2021

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PERSPECTIVE

Taming the flame, from local to global extreme wildfires

Australia rethinks strategies after 2019 to 2020 bushfires

By **David M. J. S. Bowman**[1] *and* **Jason J. Sharples**[2]

The surge of extreme wildfires around the world, most recently in Canada, provides a frightening glimpse of the potential for intense fires driven by climate change to cause remarkable damage to human and environmental life. From 2019 to 2020, Australia experienced unprecedented wildfires (commonly referred to as bushfires), which increased the burned area by 800% relative to the 1988 to 2001 average (*1*). As well as causing dangerous "fire weather," extreme heat combined with record low rainfall caused widespread dieback of vegetation, guaranteeing that wildland fuels burnt at maximal intensity (*2*). The societal and environmental impacts have spurred Australia to rethink wildfire management and work toward innovative solutions. This includes driving research into the effects of climate change on fire, optimizing approaches to prescribed burns, and leveraging Indigenous knowledge and expertise of Aboriginal communities. These approaches could prove vital not only for Australia but for managing extreme fires elsewhere in the world.

From September 2019 to March 2020, Australia experienced frequent and dangerous fire weather, which led to large uncontrolled fires that were started by both lightning and anthropogenic ignitions (*1*, *3*). The geographic scale of these fires was nationally and globally anomalous, burning 20% of the temperate eucalypt forests

PHOTO: MATTHEW ABBOTT

The 2019 to 2020 Australian wildfires were driven by extreme weather conditions and destroyed large areas of bushland.

that fringe the populated regions of southeastern Australia (*4*). The wildfires were the culmination of multidecadal drying and warming trends linked to anthropogenic climate change that lengthened the fire season and contributed to a prolonged and unusually intense drought that desiccated landscapes (*1*, *3*).

The 2019 to 2020 fires had unparalleled effects. Direct national financial costs exceeded 10 billion AUD, 33 people were killed, and more than 3000 homes were destroyed in addition to numerous other adverse effects on human physical and mental health (*5*). The fires burned biodiversity hotspots, harming the habitat of floral and faunal species that are vulnerable to extinction, and made large areas of postfire regenerating vegetation susceptible to ecological collapse if reburned (*6*). Estimates of greenhouse gas emissions suggest that these fires released around 715 Tg of carbon dioxide (CO_2), an amount equivalent to 80% of Australia's combined annual fire and fossil fuel emissions, signaling the potential for dangerous climate-carbon feedbacks (*7*). Fire could switch forests from important carbon sinks to sources of CO_2, thereby amplifying climate change and increasing the risk of more frequent, ecologically destructive wildfires. Smoke from the fires caused widespread and protracted pollution, which affected most of the Australian population and caused an estimated 429 premature deaths and at least 3230 hospital admissions (*8*). Annual health costs associated with deaths and hospitalization from smoke increased by 900% in the financial year encompassing the fires compared with the prior 19-year median. The smoke was transported across the Southern Hemisphere, triggering anomalous algal blooms in the Southern Ocean, with unknown effects on marine ecosystems, including whether the captured carbon was sequestered in the deep ocean (*9*) (see the figure).

"The Australian fires show that extreme wildfire events can harm societies and amplify climate change..."

The 2019 to 2020 fires also produced high levels of pyroconvective activity with 44 fire thunderstorms. Fires were large enough to spur the formation of pyrocumulonimbus clouds that stoked lightning and wind, further exacerbating the fires. These fire thunderstorms represent 35% of such events detectable in the satellite record since it began in 1978 and included several rare nighttime pyrocumulonimbus (*3*). One outbreak of extreme pyroconvection, involving a total of 38 pyrocumulonimbus "pulses," injected about 1 Tg of smoke particles into the lower stratosphere (*10*). With parallels to volcanic eruptions and nuclear winter scenarios in terms of energy released, aerosol emissions, and plume height, this pollution encircled the Southern Hemisphere and persisted for more than 15 months (*10*). The smoke also affected stratospheric circulation patterns (*10*), causing a cooling of Earth's surface (*11*). This possibly contributed to a 3-year La Niña climate mode that triggered widespread flooding across eastern Australia (*12*). A completely unexpected effect of the stratospheric aerosol pollution was a new atmospheric organic chemistry that caused a 3 to 5% loss of ozone in Southern Hemisphere mid-latitudes. This could slow recovery of the ozone layer, especially if pyrocumulonimbus outbreaks become more frequent (*13*).

The Australian fires show that extreme wildfire events can harm societies and amplify climate change, highlighting the urgency to find means to mitigate them. Policy discussion after the 2019 to 2020 fires mostly centered on disaster management responses and firefighting capability and capacity. This included the use of sophisticated technologies to detect fires when they start but much less consideration of climate change and the consequences for fire management (*1*–*3*, *5*). Furthermore, because this fire activity outstripped firefighting capacity, consistent with global trends, scientific and public debates focused on appropriate reduction of vegetative fuel to help control future climate-driven fires (*2*).

Australia has a long-established fire management practice of reducing fuel loads in flammable vegetation types, particularly dry eucalypt forests and woodlands (bushland), by setting fires under moderate fire weather conditions. Current amounts of this prescribed burning treat around 3071 ± 732 km^2 of forest and woodland per year, but the area burned in wildfire events continues to increase (*1*). The protective effect of prescribed burning diminishes under extremely hot, dry, and windy weather conditions because fires can burn across areas with low surface fuel loads (*2*). Nonetheless, such fuel management can reduce the intensity of wildfires, making them easier to control and reducing their severity. For example, geospatial analyses showed that house losses in the 2019 to 2020 fires were reduced proximate to areas that had recent prescribed burning (*2*). Theoretically, prescribed burning could help decrease the risk of extreme pyroconvection by reducing fire intensity, although this is yet to be demonstrated. Prescribed burning necessarily involves complex and unresolved trade-offs associated with the risk of fires escaping control relative to reducing the risk of fire disasters. There is also the harmful versus protective effect on public health, biodiversity, and cultural values. Achieving environmentally sustainable prescribed burning will require the spatial pattern, extent, and frequency of burned area to

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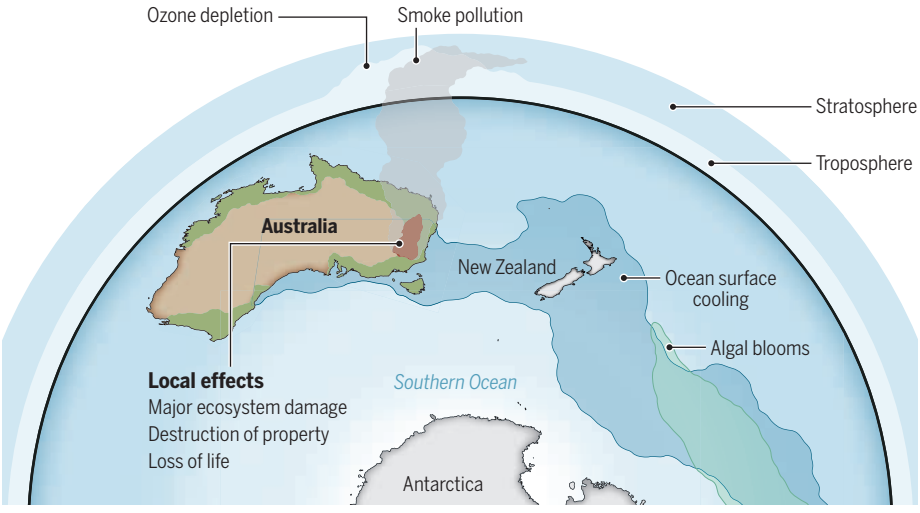
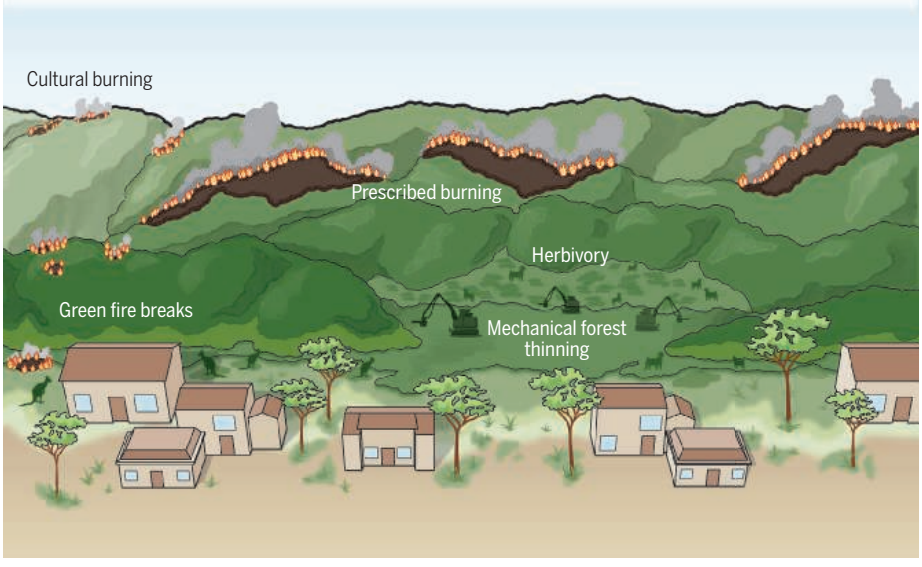
Global fire effects

The 2019 to 2020 Australian fires killed and injured humans, destroyed property, and severely polluted all urban areas in southeastern Australia. Substantial ecological harms included damage to vegetation cover and reduced wildlife populations. Earth system processes were adversely affected through prodigious smoke and greenhouse gas emissions, which caused stratospheric pollution that damaged the ozone layer and caused regional cooling, with fallout causing anomalous Southern Ocean algal blooms.



Fire management strategies

Local management actions to reduce wildland fuels include cultural and prescribed burning, herbivory, and forest thinning. Green fire breaks could also be created by the cultivation of plants with low flammability to provide a barrier between fire-prone areas and human settlements.



be optimized to maximize benefits for fuel reduction while minimizing adverse effects on ecosystem services (e.g., carbon storage and soil health) and biodiversity.

Before European settlement, Aboriginal people across Australia managed clan estates by setting small and frequent fires that created biodiverse habitat mosaics. However, this system was drastically disrupted by colonial processes. A deeper understanding of how Aboriginal people managed landscapes is a critical research topic that will require a variety of techniques to reconstruct precolonial fire regimes and landscape ecologies using a range of environmental archives (such as lake sediments, tree rings, and historical records). It will also depend on working with Aboriginal fire managers to codesign research programs. The findings of such collaborative research could provide an evidence-based framework for creating prescribed burning programs as well as restoring "cultural burning" to manage wildfire—an approach now firmly on the fire management agenda (*2*, *5*, *14*).

It is important to acknowledge that although both cultural burning and prescribed burning use fire to reduce fuel loads, they are not the same. Prescribed burning typically involves burning large areas in the most economically efficient way possible to meet institutional targets, whereas Aboriginal fire management emphasises social processes associated with cultural connection to landscapes (called "Country" in Aboriginal English) (*2*, *5*, *14*). Notably, such cultural connections have been shown to have measurable physical and psychosocial health benefits for Aboriginal people (*2*). Cultural burning is typically low intensity and is applied regularly to small areas to create a patchwork of habitats with different postfire ages. It also involves social justice issues given that Aboriginal people suffer social disadvantages, including disposition from their ancestral lands. Consequently, effective cultural burning programs demand ongoing government and nongovernment support to train and employ Aboriginal fire managers. Whether cultural burning can be implemented at sufficient scale to mitigate the risk of extreme wildfire events and sustain ecosystems is uncertain and requires landscape-scale evaluation.

An important constraint on both prescribed and cultural burning is the increased density of woody plants that followed the substitution of Aboriginal fire management with colonial approaches (*14*). To restore Australian landscapes to the lower–fire risk state that likely existed before colonization requires evaluating the effectiveness of mechanical removal of understoreys and thinning overstocked forests. Such ecological restoration projects need to also investigate the effectiveness of marsupial and non-native herbivores in reducing understorey biomass and controlling tree and shrub recruitment (*2*, *14*).

Another constraint of prescribed burning, and possibly also of cultural burning if conducted at large scales, is the potential for pollution to cause public health harm. This is especially true given that climate change is shifting the window suitable for prescribed burning toward winter months when temperature inversions (i.e., when the atmospheric base is cooler than the air layer above it) and light breezes favor pooling of smoke close to the ground surface. In principle, prescribed burning can also diminish greenhouse gas emissions from fires by reducing the intensity and scale of wildfires. However, demonstrating this has not been achieved, except possibly for tropical savannas (*15*)—a finding that requires further

GRAPHIC: A. FISHER/*SCIENCE*

scientific validation. The imperative to reduce air pollution from prescribed burning provides an incentive for exploring alternatives. In addition to mechanical removal of vegetation or the action of herbivores, other options might include constructing "green fire breaks" by planting, and possibly irrigating with wastewater, native and non-native plants with low flammability to provide barriers between fire-prone wildlands and urban areas.

Meeting the escalating challenges of sustainable economic and environmental coexistence with landscapes prone to extreme fire events requires Australia—and indeed any country threatened by extreme wildfires—to rethink the basis of fire management and embrace a diversity of approaches (*2*). This involves sustained and serious investment in landscape-scale interventions that use innovative combinations of prescribed and cultural burning, mechanical thinning, and herbivory close to urban areas as well as in wildland areas prone to enhanced pyroconvection. It also must draw on the wisdom and skills of Indigenous fire management practices. Such ambitious applied research demands better coordination among scientists, managers, and other stakeholders, including Indigenous communities, underpinned by the acquisition, curation, and analysis of high-quality biophysical, social, and economic data. Moreover, international comparative studies of wildfire management are of prime importance to drive innovation to control and adapt to climate-driven extreme wildfires. ■

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POLICY FORUM

Cultural water and Indigenous water science

Australia shows the need for more sustainable and just water management

By **Erin O'Donnell[1], Melissa Kennedy[2], Dustin Garrick[3], Avril Horne[4], Rene Woods[5]**

Rivers and freshwater ecosystems are in trouble, which deeply affects communities who depend on them (*1*) and undermines international commitments to the United Nations (UN) Sustainable Development Goals. Australia's Murray-Darling Basin (MDB) is a prime example. Water governance in this transboundary river system in southeastern Australia, seen by some as a gold standard for managing water scarcity, has nonetheless failed to meet environmental water recovery targets, despite the investment of AUD$13 billion. Water management failings in the MDB, which is home to more than 40 First Nations who have lived sustainably with water for tens of thousands of years through the creation and application of Indigenous water science (*2*) (see the first box), have drawn attention to the living legacies of colonial exploitation and the associated social and ecological impacts. We need to learn from Australia's failures and change the way we know, value, and manage water, including learning from Indigenous scientists and Elders.

The MDB, which supports a center of irrigated agriculture across more than 1 million km^2, is known for its multiyear "boom-bust" riverine cycles, but climate change is intensifying these extremes (*3*). Over the past three decades, major efforts to improve MDB governance have included intergovernmental agreements in 1994 and 2004 (the National Water Initiative), new federal legislation in 2007, and the MDB Plan in 2012, overseen by the MDB Authority. More than AUD$13 billion has been invested in water recovery for the environment by using water markets and increasing water delivery efficiency. Despite this long-standing attention and investment, the MDB suffers from poor water quality, overextraction of water for irrigation, flow modification, increasingly disconnected and degraded floodplains, and declining biodiversity (*4*). We trace these contemporary problems to a root cause—aqua nullius—that, in Australia and elsewhere, excludes Indigenous Peoples' from ownership of and control over water (*5*, *6*). First Nations in the MDB now own less than 0.2% of all water rights and have little power in the management of waterscapes (*7*). In a reflection of the need for urgent action, in 2023, the UN hosted its first water conference since 1977, which argued for full participation of Indigenous Peoples in water management.

Terminology

When describing Indigenous Peoples in the Murray-Darling Basin (MDB), we use specific terminology.

Aboriginal and Torres Strait Islander Peoples refers to the Indigenous Peoples of Australia.

First Nations and Traditional Owners refer to Indigenous polities and governance structures in the MDB. Some groups have been formally recognized by the settler state (e.g., native title), but some have not.

Country is an Aboriginal English word that refers to the world around us, a living entity including people, land, water, air, sky, and all plants and animals.

AQUA NULLIUS: FUNDAMENTAL FLAW

When the British invaded Australia, the legitimacy of their occupation was founded on the assumption of terra nullius, or land belonging to no one, despite the clear presence of First Nations with laws governing access to and use of land. This flawed beginning enabled the equally erroneous assumption of aqua nullius, or water belonging to no one, with no acknowledgment that First Nations had and continue to have laws governing the care and management of water (*5*). These flawed assumptions became the foundation for more than two centuries of extractive, unsustainable water management.

Water colonialism is intertwined with globalization, neoliberalism, and extractive capitalism (*8*). The commoditization of water and the separation of water from land are foundational concepts in Western water management but are fundamentally at odds with Indigenous Peoples' relationship with

Taming the flame, from local to global extreme wildfires

David M. J. S. Bowman and Jason J. Sharples

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International Association of Wildland Fire

Prescribed burning on private land: reflections on recent law reform in Australia and California

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ABSTRACT

Background. Prescribed fire is a critical tool for building resilience to changing fire regimes. Policymakers can accelerate the development of effective, adaptation-oriented fire governance by learning from other jurisdictions. **Aims.** We analyse reforms to prescribed fire governance to highlight improvements for fire hazard reduction and resilience. **Methods.** We searched legislative registers in New South Wales (NSW), Australia and California, United States, identifying Bills tabled between 2011 and 2022 that mention the terms 'prescribed (fire or burn)' or 'controlled (fire or burn)'. We reviewed the eight relevant Bills from NSW and 67 Bills from California to identify and thematically code reforms relevant to private landowners. **Key results.** We found three primary themes across relevant legislative proposals: (1) reforms to simplify permitting and regulatory approval processes (primarily in Australia); (2) efforts to mitigate the risk of legal liability for escaped burns (primarily in California); and (3) recent recognition of and support for cultural burns (primarily in California). **Conclusions.** Expanding prescribed burning on private land remains an ongoing challenge in NSW and California but recent reforms indicate greater attention, and jurisdiction-specific approaches, to this challenge. **Implications.** Despite differing governance arrangements, California and NSW offer important insights for improving climate-adaptive governance of prescribed fire.

Keywords: California, climate adaptation, fire hazard mitigation, governance, law reform, New South Wales, prescribed fire, private land, responsibility.

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Introduction

Climate change is driving rapid increases in the frequency and severity of wildfires around the world, with fire-prone continents already experiencing these changes (Dowdy *et al.* 2019). Disaster resilience and adaptation policies emphasise the need to adapt and build resilience to changing wildfire regimes (Moritz *et al.* 2014; Schoennagel *et al.* 2017). Adapting to future fires will require more strategic and inclusive use of prescribed burning to manage fire and fuel on both public and private land, particularly at the peri-urban interface (USDA 2015; Schoennagel *et al.* 2017; Paveglio *et al.* 2018). Prescribed burning involves the deliberate application of fire to vegetation to manage fuel loads, create fire breaks, and reduce the spread and impact of uncontrolled fires (Dovers 2020, p. 15; California Wildfire and Forest Resilience Task Force 2022). Reintroducing prescribed fire can also foster Indigenous cultural connection to land (Binskin *et al.* 2020*b*; Clark *et al.* 2021), and improve the health and function of fire-adapted ecosystems, particularly where previous policies have disrupted or excluded fire regimes from those landscapes (Stone *et al.* 2022). Other benefits include reducing smoke pollution and carbon emissions through the controlled reduction of fuels that might otherwise burn under catastrophic fire conditions (Ryan *et al.* 2013; Morgan *et al.* 2020; Mariani *et al.* 2022).

Different stakeholders have very different views about the appropriate role, objectives and locations for prescribed fire (Paveglio *et al.* 2018; Leavesley 2020, p. 5). Prescribed burning cannot prevent all wildfires and is only one tool in a suite that includes

mechanical and selective clearing, fire-adapted vegetation planting and asset hardening (Paveglio *et al.* 2018). Nevertheless, prescribed burning can be cost-effective and successful at reducing fuel loads across large areas, particularly areas with limited access for mechanical clearing (North *et al.* 2012; Penman *et al.* 2020). There appears to be growing support across media reporting, independent reviews and inquiries, new legislative instruments and committee reports in Australia and the western United States for more prescribed burning and fuel management across landscapes and tenures (Binskin *et al.* 2020*a*; Kupfer *et al.* 2020; Leavesley *et al.* 2020; Miller *et al.* 2020). Governments in both jurisdictions have set ambitious targets for fuel treatment, including prescribed burning, across public, private and tribal land (MOU between the State of California and the USDA, USFS, Pacific Southwest Region 2020; McCormick and May 2021; cf. Rod 2021).

This paper focuses on the governance context for prescribed fire on land under private ownership, and land under Tribal or Indigenous ownership or management (referred to hereafter as 'First Nations land'). The reduction of wildfire risk on publicly owned land has been studied in detail in scholarly and policy documents in both the United States and Australia (Schultz *et al.* 2019; Binskin *et al.* 2020*a*, Chapter 17), whereas private land is relatively understudied. Private and First Nations tenures constitute a significant area of both California and Australia. Approximately 52 609 km^2 (39%) of California's forests are owned by private landowners, with 99% of these landowners owning small plots of under 2 km^2 (Forest Climate Action Team 2018). More than half of Australia's land mass is privately owned, with approximately another 26% of the land mass held as exclusive native title or Aboriginal freehold (Australian Bureau of Statistics (ABS) 2002; Nicholas *et al.* 2021).

Many factors influence why and how private landholders conduct prescribed burns on their land, including financial and other incentives, social dynamics and ideology (Paveglio *et al.* 2018; Rougle 2019). Governance arrangements also play an important role, including by imposing obligations and standards for prescribed fire that enable or constrain action. Governance for prescribed fire on private and First Nations land differs from public land. There are differences in resourcing and liability exposure, and prescribed burning on private land is complicated by the risk of legal liability or penalties for damage caused by escaped fire. Moreover, government planning and resourcing typically focus on publicly managed land, and government priorities have less influence on private landholder behaviour than on public authorities like forestry agencies and public protected area managers.

Australian natural disaster and bushfire policies rely heavily on the concept of 'shared responsibility' between governments, local communities and individuals. Shared responsibility often takes the form of legal obligations on landholders to remove or manage wildfire hazards on private land, and potential legal liability for damage caused by fire ignited or exacerbated by those hazards (McDonald and McCormack 2022). There are no similar obligations on private landholders in California, though recent government strategies articulate an urgent need to mitigate fire hazards on both public and private land (Forest Climate Action Team 2018).

The local nuances of fuel, fire behaviour and climate change mean that if private landholders are to use prescribed fire well, they will need to be properly equipped. Landholders will need *knowledge* about fire behaviour and their local environment; *support*, including technical assistance with burn planning and preparation, and governance arrangements that empower landholders to use fire on their land; *resources*, including to manage a prescribed burn or cancel a planned burn in the wrong conditions; and *long-term capacity* to monitor and understand changing flammability and fuel loads on their land and adapt burn practices over time. Law and policies can set the necessary conditions for prescribed burning to be used safely and effectively by private landholders, as they assume responsibility to prepare for future fires.

Here, we focus on California in the United States and the Australian state of New South Wales (NSW). We analyse legal reforms designed to support private landowners to balance obligations and incentives for fire hazard reduction on their land, using prescribed fire. Both jurisdictions have been gravely affected by recent wildfires, which are increasing in frequency and severity consistent with climate projections (Canadell *et al.* 2021; United Nations Environment Programme 2022). State parliaments in both jurisdictions have legislated important reforms to facilitate prescribed burning on private land. These include limits on civil liability and compensation arrangements for fires that escape and cause damage (Miller *et al.* 2020) and more permissive rules about vegetation clearance (McDonald and McCormack 2022). Many other jurisdictions around the world are implementing reforms in response to recent fire seasons and, although a comprehensive international analysis is beyond the scope of this article, our findings may resonate in other countries facing similar increases in wildfire risk and severity, such as Canada, Mexico, South Africa, Brazil and Italy (Moreira *et al.* 2020).

This paper begins by briefly explaining the governance framework for prescribed burning on private land, drawing on scholarship to demonstrate the importance and complexity of this strategy for fire hazard reduction. We then identify our research method and highlight three important insights from our analysis, before reflecting on how these insights may inform future legal reform. We conclude with a call to embrace holistic approaches to governing prescribed fire on private land, recognising value beyond simple hazard reduction and learning from reforms implemented in other jurisdictions.

The governance framework for prescribed fire on private land

Governments in the United States and Australia have a range of strategies and plans that enable the use of prescribed fire at landscape scales (USDA 2015; Little Hoover Commission 2018; California Wildfire and Forest Resilience Task Force 2022; Forest Fire Management Victoria 2022), but there are differences in whether and how governments permit or *require* hazard reduction, and the circumstances in which prescribed fire will be required as opposed to other methods of fuel treatment (McDonald and McCormack 2022).[1] In both jurisdictions, flexibility to manage fire hazards on private land may be constrained by protection for other values such as clean air, threatened species or waterways, and a failure to control a prescribed fire may expose landholders to liability for any harm caused. In California, there are no positive legal obligations on private landholders to reduce or remove fire hazards, but private landowners may obtain permits to do so.

In some Australian states, prescribed burning may be expressly required if a landholder has not addressed a fire hazard on their land (s 66 Rural Fire Service Act 1997 (NSW))). If a landholder in NSW is ordered to remove a hazard, that order may also include a requirement for supervision or involvement of a rural fire brigade (Rural Fire Service Act 1997 (NSW) s 66(6)(b)). Alternatively, a municipal or state fire officer may undertake a prescribed burn on the landholder's behalf and, in some cases, invoice the landholder for costs incurred (McDonald and McCormack 2022). In other Australian states, and in California, there are no legal consequences for failing to address fire hazards on private land. Rather, landholders risk being penalised for any prescribed burn that escapes and causes damage. This risk of liability may create an incentive *not* to manage wildfire hazards proactively using prescribed fire, despite fire being more efficient and cheaper than many other methods of fuel treatment, and despite unmanaged fuel loads posing greater risks in the event of a wildfire (Eburn and Cary 2017). Potential liability for an escaped burn complicates the regulatory environment in jurisdictions that impose a duty on landholders to manage fire hazards.

Environmental laws may constrain prescribed burning on private land and rarely address the risks of *not* burning, or the ecological benefits of fire (Quinn-Davidson and Varner 2012; Stone *et al.* 2022). Obligations to protect threatened species and habitat and preventing impacts on covenanted private land (New South Wales Rural Fire Service 2021) may also limit the use of fire or mechanical clearing. However, in practice, exemptions to environmental protections typically allow fire hazard mitigation activities to be prioritised over environmental protection. For example, prescribed burning for a 'bushfire mitigation purpose' can be exempt from native vegetation clearing restrictions in NSW, provided a landowner has a burn permit or the burn is conducted in accordance with agency guidelines or standards (McDonald and McCormack 2022).

NSW and California also have mechanisms that are designed to make it easier to undertake prescribed burning, including opportunities for landholders to engage a fire agency or volunteer organisation to conduct a burn on their behalf (Rural Fire Service Act 1997 (NSW) s 12(5)). Free support programs such as the Hotspots Fire Project in NSW educate private landholders about fire hazard reduction activities and fire management planning (New South Wales Rural Fire Service n.d.) and, in other Australian states, can extend to coordinating regional burn plans and joint permit applications for multiple landholders, along with hazard reduction training and mentoring activities. The Californian Vegetation Management Program similarly enables private landholders to engage the California Department of Forestry and Fire Protection (Cal Fire) to conduct prescribed burns on their land (Cal Fire n.d.). Outsourcing prescribed burning can enable landholders to undertake hazard reduction even if they lack the necessary equipment or expertise. The benefits of these arrangements include harnessing substantial experience and expertise, accessing appropriate equipment, involving people with the confidence to manage prescribed burning efficiently and safely, and bringing a prescribed burn on private land under the relevant organisation's insurance policy and liability cover. In addition, prescribed burn associations support Californian landowners by providing access to equipment, training and guidance for burning and air quality permit applications (Stackhouse and Quinn-Davidson 2019).

Alongside enablers, there are important legal and policy restrictions on prescribed burning on private land. The most important is the need to obtain and comply with permits from the relevant fire agency (NSW Rural Fire Service (RFS) in rural fire districts, Cal Fire or a local fire department or council). Permitting obligations may be triggered by factors such as the location and size of the proposed burn, its timing, including whether it is a fire permit period or 'total fire ban day', and whether the burn will affect other landscape values such as cultural heritage, threatened species or waterways. In NSW, a bushfire hazard reduction certificate can be issued for any period of time that is deemed appropriate (Rural Fire Service Act 1997 (NSW) ss 100F(6)(d), 100I), and will typically include any necessary environmental and native vegetation clearing approvals. A fire permit is required for prescribed burning during the 'Bush Fire Danger Period' (summer, plus the spring and autumn 'shoulder periods') and in urban fire districts and, given the greater risk of bushfires at that time of year and in

[1]Duties and powers of private landholders operate in parallel with statutory duties on public bodies in some jurisdictions, such as local councils and protected area agencies, to take practical steps to reduce bushfire hazards (e.g. s 43 *Country Fire Authority Act 1958* (Victoria)).

urban areas, fire permits remain in force for no more than 21 days (Rural Fire Service Act 1997 (NSW) ss 89, 90). Fire permits for prescribed burning on private land in California similarly remain in force for up to 1 or 2 years depending on the jurisdiction, though private landholders that engage Cal Fire to conduct a prescribed burn on their land may, in some circumstances, benefit from longer approvals through 10-year contracts under the Vegetation Management Program (extended from 3 years in 2018 under California Senate Bill 1260; see discussion in Stackhouse and Quinn-Davidson 2019).

Landholders in both jurisdictions may be required to apply for an air quality permit to emit smoke from a prescribed burn. In Australia, air quality regulations may not be triggered for prescribed burns on private land if they are conducted outside peak burn periods or in a way that limits smoke emissions, and/or if air quality impacts are assessed and approved as part of a streamlined fire agency permitting process. In California, prescribed fires always trigger the need for air quality permits issued by local regulatory air districts, which consider the extent of smoke emissions, the potential impact of those emissions on public health and compliance with the United States' National Ambient Air Quality Standards or NAAQS (see California Code of Regulations Title 17, § 80120). If Cal Fire is conducting a prescribed fire on private land as part of its Vegetation Management Program, it must also obtain a permit under the *California Environmental Quality Act 1970* (CEQA) to minimise negative environmental impacts of the burn. California's Vegetation Treatment Program was designed to speed up regulatory processes, including CEQA permitting, for prescribed burns that are funded or conducted by Cal Fire (California Board of Forestry and Fire Protection 2019; Office of the Governor Gavin Newsom 2019). Regulatory frameworks for managing air quality have long been recognised as a restriction, if not a barrier, to prescribed burning in the United States (cf. Sneeuwjagt *et al.* 2013; Schultz *et al.* 2019; Miller *et al.* 2020), though the extent to which these critiques apply to smaller-scale burns on private land is unclear.

Methods

We first reviewed the existing law governing the rights and responsibilities of private land owners in respect of prescribed burning. We then examined law reforms proposed in California, USA, and NSW, Australia, as case studies of the legal and policy trends in those jurisdictions. Following severe wildfire seasons in California and NSW, state legislatures in both jurisdictions have introduced law reforms to facilitate prescribed burning. We searched the legislative registers for draft legislation ('Bills') put before the Californian and NSW parliaments between 2011 and 2022, using the terms 'prescribed [fire or burn]' or 'controlled [fire or burn]'.

The NSW legislature considered eight relevant Bills across the 11 1-year legislative sessions in that period (Fig. 1*a*). Seven have been passed by both houses of parliament, with the eighth Bill still under consideration by the Legislative Council (LLS Bill 2020). The small number of Bills likely reflects the fact that existing NSW laws already supported prescribed burning, and more detailed arrangements are contained in subsidiary instruments such as the *Bush Fire Environmental Assessment Code* (New South Wales Rural Fire Service 2021), which can be amended without legislation.

We also reviewed the six 2-year California legislative sessions, between 2011–2012 and 2021–2022, and identified 66 proposed Bills related to prescribed fire, with a significant increase since the 2017–2018 session. Twenty-one (32%) Bills were passed and have become law (Fig. 1*b*).

Next, we filtered the results for their application to prescribed burning on private land, resulting in all eight Bills from NSW (100%) and 18 Bills from California (27%). We used qualitative content analysis (Hsieh and Shannon 2005; Elo and Kyngäs 2008) to code the Bills by first identifying preliminary themes through thematic association and then recoding the preliminary themes in an iterative process. Each Bill was reviewed by both primary and secondary coders to resolve discrepancies and ensure consistency.

We identified two closely connected themes in the NSW Bills, both of which relate to the emphasis in Australian policies on 'sharing' responsibility for managing fire hazards with private landholders: (1) clarifying obligations on landholders to manage bushfire hazards on their land (75%, 6/8 Bills); and (2) streamlining and reducing formal permitting processes for vegetation management (87.5%, 7/8 Bills) (see 'Streamlined Permitting Processes'). The three primary themes in the relevant California Bills that passed the legislature were: (1) mitigating landowners' exposure to liability for escaped prescribed burns (56%, 10/18 Bills); (2) acknowledging and providing new, though limited, support for cultural burning across tenures (61%, 11/18); and (3) providing funding or resources for private landowners (39%, 7/18 Bills). In California, a 'cultural burn' is defined in Senate Bill 332 (now § 3333.8(e) of California's Civil Code) as:

> the intentional application of fire to land by Native American tribes, tribal organizations, or cultural fire practitioners to achieve cultural goals or objectives, including subsistence, ceremonial activities, biodiversity, or other benefits.

Other definitions in the US and Australia are similar, emphasising the controlled application of fire to vegetation with a cultural focus (e.g. McKemey *et al.* 2020). Cultural burning is Indigenous-led, with elders and children actively participating to develop and maintain deep relationships with their land. Although not undertaken for fuel management purposes, *per se*, cultural burning can reduce fuel loads

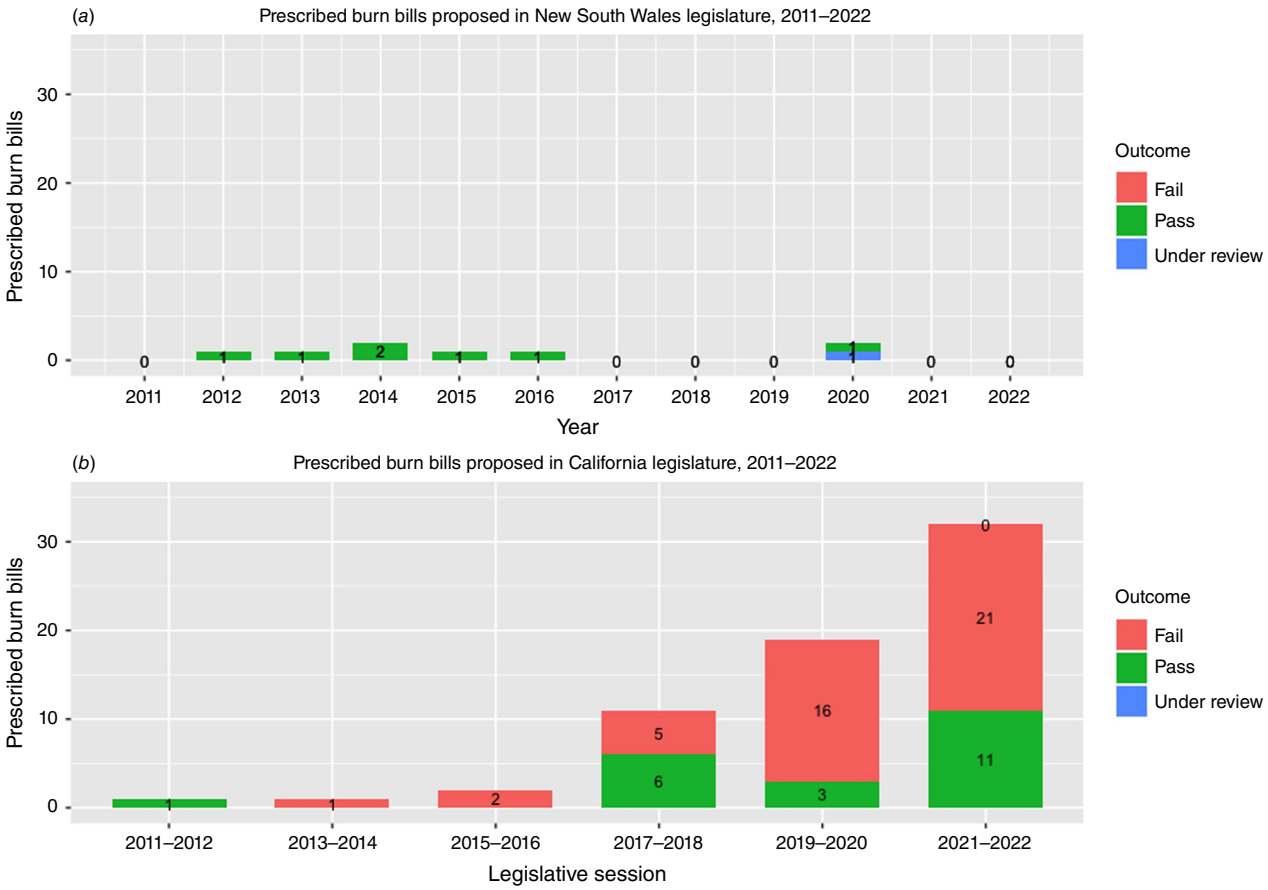

Fig. 1. Bills introduced to the (*a*) New South Wales, and (*b*) California state legislatures on prescribed burning between 2011 and 2022. All bills from New South Wales included language related to prescribed burning on private land.

while advancing other values such as reconciliation, human health and landscape management (Binskin *et al.* 2020*b*; Clark *et al.* 2021; and see Hoffman *et al.* 2022). Cultural fire management bases decisions about when and how to burn, and when not to burn, on cultural knowledge of landscapes, species and seasons (Long *et al.* 2021). Though we identified three main themes among California bills, we focus exclusively here on liability and cultural burning owing to the potentially transformative nature of these bills in expanding prescribed burning for private landowners. By comparison, bills related to funding or resources primarily describe new responsibilities for Cal Fire for grants or cost sharing. We reflect on the two main themes from California and their connection with the legal framework in NSW in 'Managing Liability' and 'Cultural Burning', below.

Trends in prescribed fire governance reforms

We identified three primary trends in our analysis of proposed reforms for prescribed burning on private land in California and NSW. First, the NSW legislature has prioritised reforms intended to streamline fire hazard management permitting and clarify obligations on landholders to manage fire hazards on their land. Second, the California legislature has sought to empower landowners by tightening laws about liability for escaped fires. Third, new legislation in California explicitly supports cultural burning for the first time.

Streamlined permitting processes

The most consistent theme that we identified in NSW reforms was to streamline and expedite approvals for fire hazard reduction, including by limiting vegetation clearing constraints and exempting fire hazard reduction from certain conservation and heritage laws (New South Wales Rural Fire Service 2015; McCormack *et al.* 2022). These reforms enable landholders to meet their hazard reduction obligations, and respond to a perception that complex and prescriptive regulations currently impede necessary hazard reduction on private land (Binskin *et al.* 2020*a*, recommendations 3.1–3.6). For example, a 2013 NSW Bill allowed a single bush fire hazard reduction certificate to permit hazard reduction activities, including prescribed fire, across

multiple parcels of adjoining land (Rural Fires Amendment Bill 2013, cl 22; Rural Fire Service Act 1997 (NSW) s 100E (3)). The same Bill extended bushfire hazard reduction certificates from 1 to 3 years, and enabled certificates to cover repeated hazard reduction activities in some circumstances (Rural Fires Amendment Bill 2013, cl 23). A subsequent amendment empowered the RFS to endorse certificates for any period of time it deems appropriate (RFS (Vegetation Clearing) Bill 2014).

Law reform has cycled between expanding and contracting landholder rights. For example, following major bushfires in NSW in 2013, regulatory controls on land managers were relaxed (Rural Fires Amendment Bill 2013), but those streamlined processes were misused, including to improve property views and land values (Hansard 2015; McCormack *et al.* 2022, pp. 15–17). Statutory protections were subsequently tightened to better protect a wide diversity of landscape values such as biodiversity and ecological integrity, Aboriginal cultural heritage and built heritage, carbon sinks, water catchments and forestry assets.

The second reform theme in NSW focused on clarifying landholders' responsibilities to manage hazards on their land, including through increased government oversight of bushfire management plans on private land. For example, authorised officers can enter private property, impose fines and/or clear land or conduct hazard reduction burns if a landowner has failed or refused to do so (Bushfires Legislation Amendment Bill 2020; New South Wales Government 2021, p. 3; McCormack *et al.* 2022, pp. 15–17). A 2020 Bill in NSW expanded fire agencies' responsibility to audit landholders' compliance with bushfire risk management plans – to improve compliance with hazard reduction goals.

By contrast, there has been little activity in the California State Legislature designed to streamline permitting processes for prescribed fire on private land, despite permitting being recognised as a barrier to burning in California (Miller *et al.* 2020). Adaptation of reforms similar to those in NSW could address criticisms of the burdensome permitting process in California. In addition, imposing legal obligations on Californian landholders to manage fire risks may face strong opposition from landholders, despite such a reform having been supported by at least one commentator (Monthei and Wara 2022).

Managing liability

In both California and NSW, common law liability may be imposed on a private landholder for damage caused by a fire they lit on their land. Fire services and volunteers typically enjoy statutory immunity from liability (e.g. Rural Fire Service Act 1997 (NSW) s 128) but a private landholder may be liable if a fire escapes and causes damage, either because the landholder created a nuisance or was negligent (though the risk of escape and potential for harm from prescribed and cultural burns are low, e.g. Dether and Black 2006; McCaffrey and Dickinson 2006; Weir *et al.* 2019; McKemey *et al.* 2021). For example, 99.84% of the US Forest Service's annual prescribed burns are completed 'according to plan', with only approximately one escape for every 1000 prescribed burns (Moore 2022). Prescribed burning is inherently risky, and under 'simple' or ordinary rules of negligence, there is a high risk of liability for private landholders who burn on their property. Landholders found to be negligent may have to cover the costs of fire suppression, rehabilitation and compensation for damages. Liability concerns are thus disincentives to burn (Miller *et al.* 2020). However, reducing the risk of liability by increasing the fault threshold to a standard known as 'gross negligence' has significantly increased the use of prescribed fire on private land across the southeastern United States (Wonkka *et al.* 2015). Recent Californian reforms respond to these concerns by introducing the higher gross negligence standard of fault in respect of liability for costs associated with fire suppression and investigation, though not for third party damages (California Senate Bill 332 2021).

In California, prescribed burn Bills have primarily aimed to mitigate the risk of legal liability being a barrier to prescribed burning on private land (Wonkka *et al.* 2015; Miller *et al.* 2020). For example, a 2018 law (California Senate Bill 1260 2018) clarified that compliance with a permit was evidence of due diligence and also established a state-certified burn boss training program to increase the number and skills of people qualified to supervise prescribed fires. In 2021, SB332 passed, ensuring that qualified and appropriately prepared people who light prescribed fires will not be held liable for costs, including fire suppression and emergency medical costs, and the costs of investigating, reporting on and collecting funds in relation to the fire, except in cases of gross negligence (California Senate Bill 332 2021). In 2022, the legislature passed a Bill to establish a Prescribed Fire Liability Pilot Program (California Senate Bill 926 2022). The pilot program will establish a public 'Prescribed Fire Claims Fund' to cover losses of up to US $2 million from escaped prescribed burns conducted by non-government entities such as private landholders and cultural fire practitioners. Commercial liability insurance is expensive, rarely available to prescribed burn operators and only covers losses from prescribed burns in rare circumstances. The new insurance pool is intended to reduce costs and 'increase the pace and scale' of prescribed fire and cultural burning in California (Varner *et al.* 2021; California Senate Bill 926 2022). Claims against the Fund will only be permitted for prescribed or cultural burners that acquire and comply with all necessary permits and Cal Fire guidelines (California Senate Bill 926 2022, 95-6). Implementing these new laws is intended to supplement demand for Cal Fire 'burn bosses' by increasing the range of people who can lead prescribed and cultural burns. This should help to rapidly expand prescribed and cultural burning across public and non-government lands.

Compared with California, the relevant standard of liability in Australia is less clear-cut because it remains a matter for the courts to determine. The most recent Australian decision on this issue reiterated that prescribed burning on private land may be reasonable and beneficial, even if it creates some risks for neighbouring landholders (*Woodhouse v Fitzgerald* (2021) 104 NSWLR 475; McDonald and McCormack 2022, pp. 14–15). Even so, multiple post-fire inquiries in Australia have recommended statutory clarification of liability standards and protecting private landowners from liability if they comply with valid permits and demonstrate appropriate diligence (Legislative Council Environment and Planning Committee, Parliament of Victoria 2017). Clarification about liability for prescribed (and ecological and cultural) fire could support an expansion of burning on private land in Australia.

Advocates and post-disaster inquiries have also recommended the introduction of disaster insurance in Australia for many years without success (Biggs 2012; Lucas and Booth 2020, p. 4). A national disaster insurance scheme could achieve similar goals to California's Senate Bill 926, supporting fire hazard reduction through prescribed burning and activities to mitigate other disasters such as extreme floods and storms. No laws in Australia have established funding or training programs specifically for private landowners, but targeted training programs could provide knowledge, equipment and expertise to support prescribed fire on private land, similar to California's reforms and building on existing programs such as the NSW Hotspots Fire Project.

Cultural burning

Finally, recent law reforms in California reveal nascent legislative recognition for First Nations' cultural knowledge and fire management practices (Ansell *et al.* 2020; California Assembly Bill 642 2021). The 2021–2022 legislative session featured the first recognition in law of the value of cultural fire for First Nations communities in California, and some limited legislative recognition of particular barriers to cultural burning (California Assembly Bill 642 2021; California Senate Bill 332 (SB332) 2021; Miller *et al.* 2022). The impact of fire suppression policies on First Nations communities was acknowledged in proposed legislation prior to the 2021–2022 legislative session, but those bills did not propose new measures to support or expand cultural burning. AB642 included the first mention of 'cultural burning' in state law, creating a new liaison role to advise Cal Fire on cultural burning in California. It also articulated a new Cal Fire position on cultural burning, tasking Cal Fire with actively engaging tribes, tribal organisations and cultural fire practitioners to expand cultural burning education and practice. In addition to increasing the general fault threshold for private burners to a gross negligence standard for fire suppression costs associated with prescribed burning (though not, as noted above, for third party damages), SB332 extends that protection to First Nations fire practitioners conducting cultural burns. These reforms are not comprehensive and do not address many challenges that First Nations researchers have highlighted, including inadequate resourcing and inconsistencies and technicalities in permitting processes (Clark *et al.* 2021). However, they appear to signal a new willingness from the legislature to begin to recognise cultural fire management and perhaps, through future reform, to support and promote its use (Miller *et al.* 2022).

State and federal inquiries have urged Australian governments to support the reintroduction of cultural burning as a way to foster healthier landscapes and reduce wildfire hazards (Binskin *et al.* 2020*a*; Owens and O'Kane 2020, rec 25). Although NSW has not yet seen legal reform equivalent to that in California, cultural fire management is gaining institutional recognition. For example, the NSW Parks and Wildlife Service adopted a Cultural Fire Management Policy in 2016 to guide the reinstatement of cultural fire by Aboriginal communities in public protected areas in the state. More recently, a Cultural Fire Management Unit was established within the NSW Department of Planning, Industry and Environment, to 'coordinate and support the resurgence of cultural land management programs in NSW' (Williamson 2021, p. 2). Members of the Unit contributed to drafting a 'Cool Burning Bill' (Cronshaw 2021), though this Bill has not yet been presented to Parliament and its future is unclear. Greater legal recognition of the importance of First Nations fire management in both California and NSW may provide opportunities to promote reconciliation and cultural wellbeing, while also contributing to hazard reduction (Ansell *et al.* 2020; Clark *et al.* 2021).

Discussion

Current policies and reform proposals in NSW and California highlight challenges and opportunities for expanding the use of prescribed burning on private land as a climate adaptation strategy. The proposal and passage of new prescribed burn legislation reveals enthusiasm for fuel treatments among policymakers (Miller *et al.* 2022). Recent proposals emphasise streamlining vegetation clearing regulations in NSW, addressing liability concerns in California, and beginning to recognise and promote cultural burning in both jurisdictions. Despite significant differences in the legal systems and fire histories of NSW and California, both regions will require dramatic increases in prescribed burning and active management of fire hazards on private land over coming decades. Legislative changes can support these much-needed expansions in the pace and scale of prescribed burning.

Policymakers in NSW and California can draw on examples of legal and policy reform from their counterparts as they seek to respond to changing fire regimes. For example,

California could explore the benefits and trade-offs in NSW reform efforts, as it seeks to streamline fire regulations under the new Vegetation Treatment Program. Australia could look to California for insights on reforming negligence liability standards for prescribed burning and other activities that facilitate climate adaptation on private land. State governments in both NSW and California have committed to increasing First Nations' cultural fire management but research on legal and policy barriers to cultural burning demonstrates that further reforms will be necessary. These two jurisdictions may be well placed to learn from each other as they both seek to improve governance arrangement for cultural fire. Opportunities for legal transplantation and learning to improve governance frameworks could also support adaptation-oriented reform in other places that are facing many of the same challenges, such as South Africa (van Wilgen *et al.* 2012), New Zealand (Bayne *et al.* 2019), Europe and Latin America (Fernandes *et al.* 2013; Molina-Terrén *et al.* 2016; Metallinou 2020), and on land managed by First Nations' people around the world (Hoffman *et al.* 2022).

However, legal reform can also introduce new challenges. For example, there is a fine balance between removing regulatory complexity and ensuring that prescribed burns balance competing values. Prescribed burns can harm biodiversity (Pastro *et al.* 2011; Nimmo *et al.* 2022), and negatively affect health, carbon storage and cultural values if they are not carefully designed and implemented to maximise co-benefits (Pastro *et al.* 2011; Bentley and Penman 2017; Cirulis *et al.* 2020). Moreover, although trees may present some level of wildfire risk, they can also sequester carbon emissions and reduce the extreme effects of heatwaves and post-flood erosion. These factors mean that aggressive fuel management plans may, in some contexts, be maladaptive in the medium to long term. None of the NSW Bills that we analysed mentioned climate change, or acknowledged complexity in balancing trade-offs across landscapes and values, over the short and long term, or between private and public interests (Foerster *et al.* 2015). Both NSW and California face the challenge of finding a balance between streamlining permit processes and protecting values beyond simply hazard reduction.

In addition, while cultural burns have increased in scale in recent years (McKemey *et al.* 2020; Clark *et al.* 2021), First Nations researchers and fire practitioners in the United States, Australia and elsewhere around the world have identified a wide range of barriers to cultural burning, including on private land (Shaffer 2010; Binskin *et al.* 2020*b*; McKemey *et al.* 2020, p. 28; Clark *et al.* 2021; Hoffman *et al.* 2022). The most significant barriers are a lack of recognition for cultural expertise and complex legislative and regulatory processes. For an example of a legal response that appears to have successfully overcome some of these barriers, Californian and NSW legislatures may look to northern Australia. Although only relatively small areas of the Australian continent are managed with cultural fire – including just 0.54% (42 957 ha) of NSW (McKemey *et al.* 2020, p. 16) – Aboriginal fire practitioners in Australia's Northern Territory and the state of Queensland are considered 'world leaders in savanna fire management, due to their widespread reinstatement of landscape-scale, Indigenous-led, fire management programs' (Moura *et al.* 2019; Ansell *et al.* 2020). These savanna burning programs are supported under the Emissions Reduction Fund, a Federal law that awards tradable credits for carbon emissions avoided by cultural burning in savanna ecosystems, where small and frequent burning mitigates intense, late-season fires (Clean Energy Regulator 2018; Aboriginal Carbon Foundation 2022). The carbon trading mechanism that underpins savanna burning in northern Australia may be of interest to legislatures in California and NSW owing to its co-benefits for climate mitigation, fire hazard reduction and restoring cultural responsibility for fire.

Indigenous scholars have argued that legal reform to address barriers to cultural fire management should be led by First Nations' communities (McKemey *et al.* 2020; Clark *et al.* 2021; Hoffman *et al.* 2022). Recommended reforms include recognising First Nations' authority to conduct cultural burning including by exempting cultural fire management from 'settler state' permitting frameworks; providing culturally relevant incentives, resourcing and indemnities from liability where cultural burning is conducted in good faith; and ensuring that cultural burns are Indigenous-led and country-centred (McKemey *et al.* 2020; Owens and O'Kane 2020, rec 25; Clark *et al.* 2021; Weir *et al.* 2021). More broadly, legislation could establish processes for negotiating access to public and private land for cultural burners and create assessment mechanisms that are more consistent with First Nations' 'fire sovereignty' (Marks-Block and Tripp 2021).

The legislative reforms analysed in this paper are also supported by policies and programs that are implemented by the executive branch or non-government organisations, and these non-legislative arrangements will remain critical in supporting prescribed burning on private land. For example, California's Vegetation Treatment Program is a non-legislative program designed to speed up environmental approvals for prescribed burn projects undertaken by public agencies (California Board of Forestry and Fire Protection 2020). At the time of writing, it does not apply directly to private landholders but demonstrates a mechanism for increasing prescribed burning without legislative reform. Other non-legislative programs in both jurisdictions support prescribed fire on private land by providing information and equipment, and may need to be scaled up as climate change increases the frequency and severity of fire regimes (New South Wales Rural Fire Service n.d.).

Conclusion

Our research highlights ongoing opportunities for NSW, California and other jurisdictions to learn from each other

as we promote adaptation to changing wildfire regimes through legal reform. Laws must find a balance between supporting private landowners to undertake prescribed burning for fuel management with the need to protect other community and private values. Reducing regulatory complexity and legal risk are important reform objectives if we are to move from fire-shy to fire-proponent, and from fire-sensitive to fire-adapted. So too is the need to ensure that prescribed burning is managed for multiple values, especially on private lands where landowners have historically had a minimal role in setting prescribed burn targets. Embracing a more holistic approach to fire management through targeted law reform, including by supporting cultural fire management, can help advance this goal.

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Perspective

Arrested Policy Development of Private Fire Shelters (Fire Bunkers) Is A Barrier to Adaptation to the Australian Bushfire Crisis

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Abstract: The Victorian Government Inquiry into wildfires that killed 173 people in 2009 has driven an Australian policy shift from self-evacuation or staying and defending a well-prepared property ('go or stay') to self-evacuation under catastrophic fire weather ('leave early'). The Inquiry also led to the establishment of national 'performance standards' for Private Fire Shelters (PFSs, that are also known as bunkers). Nonetheless, the incorporation of PFSs into national bushfire policy remains embryonic, with only Victoria having streamlined accreditation and planning approval processes. Arguments against PFSs include potentially engendering complacency about preparing dwellings to survive fire and encouraging risky behaviour in response to a fire threat. Counteracting these arguments is research that shows that residents without PFSs have low engagement with bushfire preparation and typically delay evacuation. In any case, because wildfire is unpredictable, it is accepted that self-evacuation plans must have fallback positions that include sheltering 'in place' from the bushfire, making properly used and well-maintained PFSs an important element of bushfire safety. A less discussed barrier to PFS uptake outside Victoria appears to hinge on a lack of clarity about obligations for their design, certification, and consistency with planning approvals. The escalating Australian fire crisis demands much greater research and development in legal frameworks, policy and planning processes for PFSs, as well as design and construction standards. Progress in enhancing Australian laws and policies on this issue may offer important opportunities for other jurisdictions that will experience similar challenges as climate change intensifies fire regimes around the world.

Keywords: building codes; climate change; extreme wildfires; evacuation; fire disasters; land use planning; law and policy reform; risk

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1. Introduction

Australian approaches for co-existing with wildfires (known as bushfires) have been of great policy relevance and interest to other nations with flammable landscapes [1]. A key feature of the Australian approach is an ethos of community and individual self-reliance and self-assessment of bushfire risk. Until recently, Australian residents in bushfire-prone areas were expected to either self-evacuate well before the threat of fire, or stay and defend their property on the condition that it had been prepared to withstand bushfire, a policy colloquially known as 'stay or go' [2–4]. This approach sharply contrasts with the North American approach based on government-initiated, often mandatory, mass evacuations from areas threatened by fire [5–7].

The tragic loss of 173 lives in the 2009 bushfires and subsequent Victorian Government Inquiry [8], however, ushered in a radical shift in Australian firefighting doctrine [5,7,9]. The old 'stay or go' policy has now been replaced by a 'leave early' policy that is based around self-organized evacuations under catastrophic fire weather conditions [3]. This pivot is associated with many other policy changes including the establishment of a national fire danger rating system (AFDRS) that defines catastrophic fire weather [10].

For a variety of natural and anthropogenic disasters, it has long been accepted that sheltering in place, especially in purpose-built refuges, is a better strategy than poorly executed evacuations [6]. Nonetheless, the 2009 Bushfire Inquiry found that 169 people died sheltering in place [6,8]. The 2009 Victorian Government Bushfire Inquiry recognized that sheltering in place was an effective strategy to survive bushfire if there was appropriate design of fire shelters and sufficient preparation for their use, leading to the recommendation to develop design and building standards for 'private fire shelters' (PFSs), also known as 'fire bunkers', to serve as refuge of last resort [8,11,12]. Consequently, in 2014, the Australian Building Codes Board ('ABCB') provided detailed guidelines for the construction of fire shelters, the 'PFS Performance Standard' (ABCB 2014, iv) [13]. Importantly, the PFS Performance Standard sets objectives for what should be considered and achieved when designing a PFS, but it is not directly enforceable. That is, it needs to be adopted or implemented through state legislation or regulations to become law (see discussion in Part 2, below). Unlike the Australian Standard for construction of buildings in bushfire-prone areas ('Bushfire Construction Standard') [14] (Figure 1), the PFS Performance Standard has not yet been explicitly implemented in building laws across Australia (though even the Bushfire Construction Standard is adopted differently in different states and territories).

Highlighting the pivot from the 'stay-go' to the 'leave early' policy, The Royal Commission into the 2019–2020 Bushfires did not 'investigate the adequacy or inadequacy of individual sheltering facilities' [15]. Rather, the 2019–2020 Bushfire Inquiry focused on issues around 'shared responsibility' for bushfire evacuation involving individuals, various tiers of government and non-government organizations, with recommendations concerning coordinated emergency planning and preparation, coupled with the need for nationally consistent terminology and education relating to places of refuge. The 2019–2020 Bushfire Inquiry did, however, note that 'consideration should be given to the need to shelter in place and build more resilient sheltering facilities', particularly for circumstances when evacuations will be impractical or impossible [15].

Thus, the two most important bushfire inquires in recent Australian history neatly bracket the arrested development of enabling regulations and policy support for PFSs. Here, we briefly sketch the current legal and policy framework for PFSs, and reflect on the risk and design trade-offs relating to PFSs that have shaped the development of this framework to date. We argue for further urgent research and development of PFS design and legal and policy frameworks so that they can become an effective option of last resort in a bushfire, rather than an object of conflict and confusion.

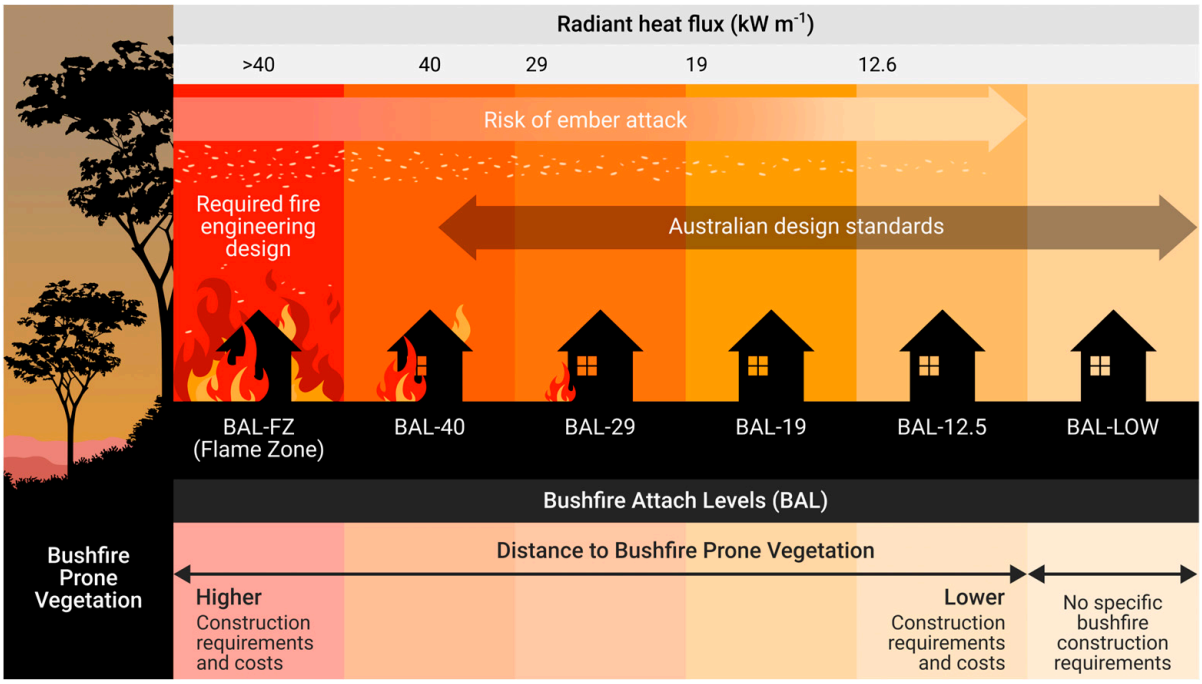

Figure 1. Conceptual diagram of Bushfire Attack Levels (BAL) used to frame the Australian Standards for house construction. PFSs are most needed in the BAL-Flame Zone by the Australian Building Codes Board performance standards (Adapted from [16]).

2. Current PFS Law and Policy Framework in Australia

PFSs are, arguably, most needed for residents of homes in the highest category of 'bushfire attack level' (BAL), the Flame Zone category, which has the highest risk of death under catastrophic conditions [6] (Figure 1). BAL categories are established under the Australian Standard for Construction of buildings in bushfire-prone areas, AS 3959:2018, and require a determination of the potential exposure to radiant heat flux according to six BALs, based on estimated radiant heat flux expressed as kWm^{-1} (Figure 1). BAL ratings are derived by considering likely fire weather, terrain, vegetation type and distance to vegetation [14]. The higher the BAL rating, the greater the risk and the more stringent the building requirements become. However, at present, the legal and policy framework for PFSs is not connected with or prioritized according to the BAL rating of a property.

The ABCB's PFS Performance Standard was developed:

'. . .to ensure that a private bushfire shelter built in accordance with the Standard provides a measured degree of protection to people with nowhere else to go, such as occupants of dwellings in remote locations' [13].

The PFS Performance Standard considers the construction, siting, capacity and design and operational constraints for PFSs (Table 1) [13,16]. PFSs may need to be accredited by a particular body or under a specific process before being installed. For example, in Victoria, PFSs must either be accredited by the Building Regulations Advisory Committee, approved for use by the Building Appeals Board or certified by a registered fire safety engineer [17]. A purpose-built (i.e., non-commercial) design may need to be assessed and approved by a registered fire safety engineer [17]. PFSs may also need to be detached from a dwelling, but may be able to be installed inground or above-ground, depending on the characteristics of the site and the proposed structure (Table 1) [13].

Table 1. Summary of key Acceptance Criteria in the Performance Standard for Private Bushfire Shelters [13] (adapted from [16]). Note these standards were developed as a design and construction guide for private bushfire shelters focusing on prescribing the performance metrics a shelter needs to meet to provide a certain level of protection for a range of people who use it correctly.

Design Elements	Acceptance Criteria
Siting	Positioned away from structures and flammable material and vegetation.
External Access	<20 m from dwelling with a 1 m pathway with clear signage
Construction	Materials and design to withstand bushfire and enable easy egress with viewing window to observe external environment
Tenable interior environment	Habitable for >60 minutes occupation providing tenable interior environment in terms of air and surface temperature and air quality
Maintenance	Mandated maintenance regime

In Australia, building and development activities are governed under state, not national, laws. As a result, the PFS Performance Standard only becomes part of the law (and, e.g., enforceable) when it is 'adopted' by state building statutes or regulations and/or land use planning schemes. For example, in the state of Victoria, a person must have a permit under the Building Act 1993 (s 16) [18] before carrying out any building work. A PFS is defined as a class 10c 'non habitable' structure under the Building Code of Australia, which is part of the National Construction Code, and so, to build a PFS, a person must have a building permit. The Building Regulations 2018 (Vic) govern how and when to apply for a permit, and they specifically adopt the Building Code of Australia as if it was part of the state regulations (r 10) [19]. This means that the Performance Standards for PFSs set out in clause HP76 of the Building Code of Australia (which are guided by the ABCB PFS Performance Standard) are adopted into Victorian law. As such, the PFS Performance Standards provide—through the Building Regulations—guidance on the strict performance measures required for PFS construction in Victoria, including maintaining and accessing a PFS (Building Regulations 2018 (Vic), r 164-6) [19].

In addition to a building permit, some landholders in Victoria will also need to obtain a planning permit before constructing a PFS. For example, planning approval is required if a proposed PFS is larger than 30 m^2 or if it will be constructed in a sensitive area such as a Floodway Overlay or Heritage Overlay (Victorian Planning Provision 52.12-4, [20]). The Victorian Government and the state's fire management agency, the Country Fire Authority, both encourage people to contact their local government to find out whether planning approval is necessary before they purchase or begin to build a PFS on their land.

Because fire management and building laws are the responsibility of Australian state and territory governments, the interpretation and application of the national standards 'varies enormously' [16]. This is apparent in the treatment of PFSs. Victoria is the only state that has specific planning and design guidelines for PFSs (as set out above) and is the only jurisdiction where commercial PFSs are manufactured [16,17]. While the permission process for installing PFSs in Victoria is comparatively clear compared to the other states and territories, the process still involves many administrative steps and can take a long time to finalize. Importantly, it is illegal to build a bushfire shelter while claiming it is for another purpose [17]. Despite detailed design, building and planning oversight in the State, the Victorian Building Authority guidelines stress that PFSs 'should not be considered a substitute for creating a bushfire plan and leaving early' [17]. Additionally, the Victorian Country Fire Authority stresses the need for PFS owners to identify other places of last resort in addition to a fire bunker [21], noting there is ambiguity about what is an appropriate place of last resort. Nonetheless, the installation of a PFS is recognised as a bushfire safety measure, including because installing an approved PFS can reduce the required construction standards for a dwelling below what would ordinarily be required based on the assessed BAL rating (see below) [17].

All Australian states and territories implement the National Construction Code in some way, typically through legislation about building (e.g., Building Act 2016 (Tas) [22], s 11; Environmental Planning and Assessment Regulation 2021 (NSW), r 4 [23]), and typically explicitly engage with the provisions of the Australian Standard 3959:2018 for the construction of buildings in bushfire-prone areas (e.g., Environmental Planning and Assessment Regulation 2021 (NSW), Part 14) [23]. However, unlike in Victoria, legal instruments in other jurisdictions do not refer directly to the PFS Performance Standard or set specific arrangements for constructing or accrediting PFSs, and provide less additional guidance about how the building and planning law and policy frameworks govern the installation and maintenance of PFSs (e.g., [24]; however, see Tasmanian Government advice [25]). Because Victoria experienced catastrophic bushfires in both 2009 and 2019–2020, and policy development was a recommendation of the government inquiry in 2010 [8], it appears that—relative to other states and territories—the Victorian government responded to strong public demand for both access to approved PFSs and clarity about the relevant governance framework. In contrast, despite other states and territories recently experiencing extreme fire events, and that they are certain to experience more in future, there has not been similar progress in PFS policy development elsewhere.

The ABCB's PFS Performance Standard creates a clear mechanism that could readily be used as a basis for guidance under state frameworks. We suggest that there is value in proactively articulating and consistently implementing clear governance across the country for PFSs, recognising what has been learned from the post-fire inquiries of recent years. Taking a proactive approach to these kinds of reforms may help to avoid the worst of the trade-offs described below and mitigate the possibility that concerned landholders will construct unregulated, inadequate and/or unsafe PFSs. Such unregulated activities may, at best, create unnecessary costs for landholders and an undesirable administrative burden for local governments responsible for regulating planning activities (e.g., [26]). At worst, a lack of clarity in the governance of PFSs may create unnecessary risks to landholders' lives in future fires.

3. Private Fire Shelter Trade-Offs

Fire shelters have a long history in Australia. For example, in Victoria in the early 1900s, forestry workers constructed 'dugouts' (crude fire bunkers) to provide refuges from bushfires [27]. The inquiry into the disastrous 1939 bushfires recommended making dugouts mandatory at bush sawmills and recommended research to optimize their design [28]. Government-constructed forestry fire shelters were still in use into the 1980s, but improved vehicle access saw a decline in the perceived importance of bushfire safety in the forestry industry [27].

As outlined below, there are a range of arguments for and against installing PFSs. Many of these issues remain unresolved, contributing to the arrested development of PFS policies amongst Australian states and territories. The deaths of seven people sheltering during the 2009 Victorian Black Saturday bushfires in shipping containers, cellars and self-built bunkers highlight the danger of poorly designed PFSs [12,29] and, arguably, the dangers of using a well-designed PFS incorrectly. By contrast, preliminary reports suggest that PFSs designed in accordance with the national PFS Performance Standard protected lives during the 2019–2020 bushfires in Victoria, with no reported deaths or injuries in six shelters, three of which were adjacent to destroyed residences [29]. Though we acknowledge the need for further research to understand the use and performance of these PFSs, particularly under extreme wildfire conditions, we do not dispute that there is scope for further improvement in PFS design [30], including in producing more cost-effective designs. However, the lack of nationally consistent implementation and support for the ABCB PFS Performance Standard, combined with variable approaches in planning approval processes, none of which appear to support, let alone prioritize or even mandate, the installation of PFSs to provide a last resort in the most bushfire-prone locations, may be a formidable barrier for the widespread adoption of PFSs. Limiting adoption across

the country limits investment in commercial designs and the achievement of economies of scale. The reasons for resistance to explicit planning and building support for PFS appear to relate to political, philosophical, legal, and psychological factors, as outlined below.

Bushfire management in Australia is a state and territory responsibility, although the Australian Government is exploring ways to provide leadership and national coordination [15]. A virtue of this arrangement is that it creates a diversity of approaches, such as the Victorian Government's relatively progressive and more explicit policies towards PFSs. Nonetheless, nationally consistent approaches to bushfire safety—and particularly to messaging about bushfire safety—are recognized as being advantageous by fire managers, as illustrated by the Australian Fire Danger Rating system [10]. However, national systems can be slow to develop and may carry heavy administrative and implementation costs. Given the diversity of arrangements that exist at the state and territory scale in Australia and the lessons that are now available from more than ten years of legal and policy reform—particularly in the state of Victoria—we argue that it is time for the Australian Government to take a more active role in promoting clearer, more consistent approaches to PFSs across the country.

Accredited PFSs have been characterized as potentially encouraging delayed self-evacuation by providing a false sense of safety, clouding or encouraging hasty decision making [9,11]. This criticism, however, ignores research findings that show that residents without PFSs will delay evacuation for a complex range of biophysical, social and psychological reasons, often to the point that it is no longer safe to evacuate at all [4,6,7,9,31]. Indeed, recognizing the likelihood that self-evacuation is often poorly executed led Johnson et al. [4] to assert that 'well designed fire bunkers for every dwelling in bushfire-prone areas' should be a land use planning requirement. Even without a legal requirement of this kind, Lohm and Davis [32] found that many residents in the Victorian wildland urban interface understood that leaving early under dangerous fire weather was an impractical approach and this led some residents to install fire bunkers to provide a refuge from bushfire. Importantly, McLennan et al. [33] found that the installation of PFSs did not axiomatically mean residents would not leave early from a bushfire threat, albeit most PFS owners intended to stay and defend their property.

Another prominent argument against PFSs is that their existence can engender complacency [6] and could disincentivize 'other practical means to mitigate fire hazard' [11]. This argument overlooks a perverse feature of self-evacuation: people who do not have PFSs and who plan to leave in advance of a fire are typically the least prepared to shelter in place [34]. In sum, PFSs can counteract a key vulnerability of the 'leave early' policy: the need for backup plans when evacuation is impossible [9]. This is consistent with advice from authorities in Victoria and Tasmania that 'leaving early is always the safest option' but that a PFS as a last resort—when it is no longer safe to leave and a person is faced with imminent impact from fire—may be an acceptable 'part of an overall bushfire plan' [21,25].

The financial cost of PFSs has been identified as a barrier to PFSs' uptake. In Victoria, despite building and planning frameworks explicitly accommodating PFSs, it has been shown that only the affluent can afford PFSs to mitigate their bushfire risk, raising questions about social equity [32]. Furthermore, a strictly economic argument posits that PFSs may be a poor investment given the low likelihood of use, especially if a 'leave early' policy is adopted, and may even encourage the installation of PFSs where they are not required. Nonetheless, an opposing alternative economic argument is that installing PFSs to provide a refuge of last resort presents a cost-effective alternative to extensive retrofits of poorly designed structures in dangerous landscape settings [35] and a prudent response to escalating risk of catastrophic fire danger driven by climate change. An often overlooked additional benefit of PFSs is the provision a safe place to store valuable items for residents that leave early to avoid the threat of fire [36].

Finally, in Victoria, PFSs provide a means to reduce the construction requirements for a building, below the BAL assessed at the property [17]. This approach is explicitly excluded in Tasmania, where the fire agency has warned that 'a PFS will not be accepted as an offset

or substitute for compliance with other bushfire safety requirements' [25]. However, even in Victoria, the opportunity to reduce a construction requirement below a BAL rating by installing a PFS must be balanced against requirements to maintain both the PFS itself, as well as a clear and safe line of access to the shelter, which would necessarily involve some ongoing clearing and vegetation management.

An adequately designed PFS can still be dangerous if it is not properly used, for example, by exceeding capacity, or if it is poorly maintained [11]. However, these concerns can be mitigated through adequate design of PFSs and appropriate preparations and education regarding their use [6].

In the United States, legal responsibility for loss of life associated with PFSs has been identified as a barrier to finding alternatives to mass evacuations [37], noting that government-declared evacuations may not be enforceable in some US states and, even where such declarations can be enforced, citizens may nevertheless resist evacuation orders and remain in place—such that 'sheltering in place' remains an issue that is worthy of policy attention. It is not clear whether a similar liability-related concern is driving the hesitation by most Australian state and territory governments to support or mandate PFSs in Australian legal frameworks. We suggest the Australian policy shift from stay-and-defend to self-evacuation has deflected responsibility from government and onto individuals in a way that has been observed in a range of climate adaptation and land management contexts [38]. Likewise, decisions by states not to facilitate, mandate and accredit PFSs means that building designers and surveyors and fire engineers must not only design and certify that a PFS is built to a reasonable standard but may also retain liability for their work [13,16]. Furthermore, the risk to designers, surveyors and engineers may not be eliminated with professional insurance, given the uncertainties surrounding PFS design and performance under extreme wildfire conditions.

More research is required to understand the use and effectiveness of PFSs in bushfire emergencies [9], but this will not occur without PFSs being prioritized as an important and practical research area. The escalating Australian fire crisis demands serious investment, research and development in PFS-related laws, policies, design standards and planning processes.

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Making choices: prioritising the protection of biodiversity in wildfires

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ABSTRACT

Biodiversity is in chronic decline, and extreme events – such as wildfires – can add further episodes of acute losses. Fires of increasing magnitude will often overwhelm response capacity, and decision-makers need to make choices about what to protect. Conventionally, such choices prioritise human life then infrastructure then biodiversity. Based on shortcomings revealed in the 2019–20 Australian wildfires, we propose a series of linked steps that can be used to identify and prioritise biodiversity assets (including their priority relative to other types of assets), enhance and implement their protection through planning and practice, and strengthen legislation to safeguard them.

Keywords: biodiversity, climate change, conservation, emergency response, fire management plans, prioritisation, sacred values, wildfires.

Introduction

> '*The real problem is not just that of achieving a whole new attitude of responsibility, but of seeing this as possible, or even desirable*' (Wright 1968).

Global climate change is leading to marked changes in fire regimes and escalating the frequency of severe environmental disturbances, including catastrophic wildfires (Abatzoglou *et al.* 2019). In many cases, the magnitude of such fires exceeds the response capability of management agencies. In such situations, decision-makers must make urgent and fateful choices about what they prioritise for protection – and hence what they abandon.

Using the Australian Black Summer wildfires of 2019–20 as a case study, we review how biodiversity assets are considered by decision makers during fire, relative to other values, and then suggest how decision-making processes and legal frameworks might be improved. Although we focus on this single case, the issues are global in nature: increasingly, across the world, key biodiversity assets are being lost in extreme events (Kelly *et al.* 2020), at least in part due to low prioritisation accorded to those assets and insufficient obligations to protect them. The issues described in this paper are germane to other forms of crisis management, and we consider that biodiversity protection should be explicitly recognised and included within the basic functions of crisis response networks generally (Quarantelli 1988).

The Black Summer fires led directly to the death of 33 people (Filkov *et al.* 2020) and destroyed at least 3000 houses (Filkov *et al.* 2020), with estimated economic losses of approximately AUD 10 billion (Royal Commission into National Natural Disaster Arrangements 2020). These tolls are notwithstanding heroic efforts to save human lives and property as part of the operational response. Some efforts were also made to protect biodiversity; for example, emergency actions were taken to prevent looming fire from destroying the few remaining Wollemi pines (*Wollemia nobilis*) that occur in the wild. However, most biodiversity assets in the path of the fires were not actively

protected and the fires burnt approximately 10 million ha of native vegetation, damaged World Heritage areas, killed millions of wild animals, and caused the likely extinction of at least one species (Moir 2021) and the imperilment of hundreds of species (Gallagher *et al.* 2021; Legge *et al.* 2022*b*; Marsh *et al.* 2022). In some cases, actions taken to protect human life or property were not only undertaken in preference to actions for the protection of biodiversity, but those actions themselves (such as widespread use of back-burning, and bulldozing mineral earth containment lines) are likely to have caused at least some detriment to biodiversity.

A springboard for this paper is the formal review processes undertaken in the aftermath of these fires, a focus of which was to make recommendations on how to reduce the likelihood of future losses. The Royal Commission into National Natural Disaster Arrangements (2020) recognised that in an emergency setting with finite resources, there needed to be a consistent hierarchical approach to asset protection. It explicitly stated that in wildfire control operations, biodiversity protection was subordinate to other considerations:

> 'In responding to disasters, … emergency services agencies have primary responsibility for protection of people, property and the environment – they provide protection in that order.'

The Royal Commission did not challenge this deeply rooted hierarchy or reflect on whether there may be circumstances in which the risks of significant and irreparable biodiversity loss may justify prioritising that biodiversity ahead of other assets, such as human infrastructure. This hierarchy appears to be widely presumed and applied in many other emergency settings, globally (Kanowski *et al.* 2005; Boin and 't Hart 2010).

In contrast, a contemporaneous inquiry in New South Wales was more nuanced (Government of NSW 2020). It recognised that there was no system in place for determining or ranking priorities 'when multiple assets of value are threatened by fire and there are insufficient resources to protect them all', and concluded that:

> 'to avoid uninformed decisions during a fire event on what to protect, a formal mechanism is needed for working out in advance the relative value of different assets' (p. 149).

The New South Wales inquiry recognised some successful examples of the protection of biodiversity, such as the Wollemi pine, but posited some fundamental questions:

> 'But should the Wollemi Pine be saved at the expense of human life? And at the expense of houses, farms, towns and infrastructure? And why were the Wollemi Pines saved and not, for example, some other rare botanical species?' (p. 150).

The inquiry concluded that a more comprehensive approach was required to attribute value to assets of varying types and thence to prioritise them for protection, and that such a valuation and prioritisation system was challenging and required community support.

In this paper, we take up the challenge sketched by the New South Wales inquiry and consider how biodiversity assets can be more explicitly prioritised and thus protected in extreme events. In the sections below, we describe a framework that would improve protection for prioritised biodiversity assets in emergencies (Fig. 1). A fundamental premise of our response is that such a framework should be developed *prior to* wildfires (Boin and 't Hart 2010).

Prioritising among biodiversity assets

The New South Wales inquiry lamented that there was no existing system for evaluating relative importance among different biodiversity assets. As a consequence, significant biodiversity assets were unprotected, in part because their 'relative value' was not defined or not known to decision makers leading the emergency response. Assigning relative value amongst biodiversity assets is challenging, given that there are many dimensions of value for biodiversity. However, for other purposes (such as the allocation of management resources and systematic reserve design), workable approaches for prioritisation have been developed based on such considerations as degree of imperilment, phylogenetic distinctiveness, contributions to ecosystem services, and cultural value (Pressey *et al.* 1993; Joseph *et al.* 2009).

A further critical consideration should be irreplaceability (Pressey *et al.* 1994): the extent to which an asset is either localised or has multiple occurrences, with prioritisation given to the former. Although the Black Summer wildfires were so extensive that they caused major population losses for many widespread species, impacts were most pronounced for some highly localised species, where fire impacts affected the entire population (Dorey *et al.* 2021; Gallagher *et al.* 2021; Moir 2021).

In the context of wildfires, prioritisation should also consider the susceptibility of biodiversity assets to individual fires and fire regimes (Gallagher *et al.* 2021; Legge *et al.* 2022*a*; Marsh *et al.* 2022), and the extent of their ability to recover without intervention (Legge *et al.* 2022*b*). Many species are fire-adapted but many are not. It is more important to protect a biodiversity asset that will not recover from fire (such as the sole location of a fire-susceptible threatened species) in preference to protecting one for which the likely impact of fire is transient.

We note it may be difficult to assign value and prioritise sites for the protection of poorly known species. For

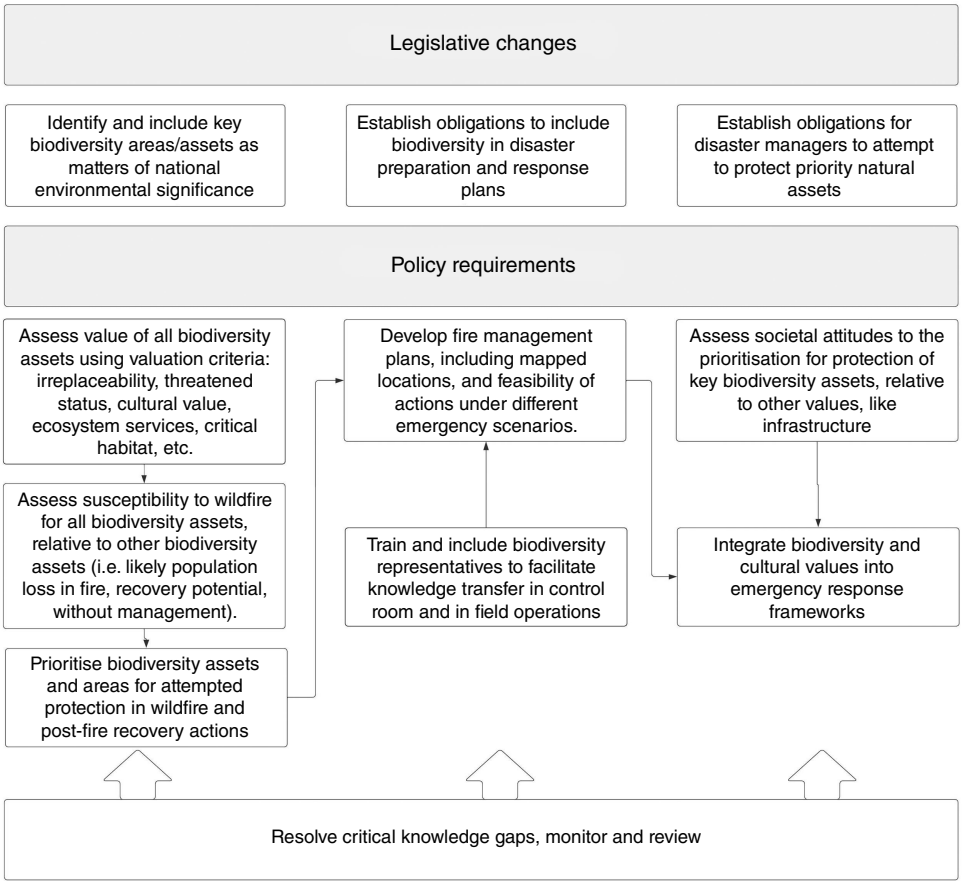

Fig. 1. Schematic diagram outlining the components and linkages required for enhancing the protection of biodiversity during a wildfire (or comparable major disturbance events).

example, susceptibility may not be well known for some species, especially in the context of wildfires that are more extreme than in the past. However, in the absence of evidence from studies of previous responses to fire, information on life history and other traits can be used to infer susceptibility (Gallagher *et al.* 2021; Marsh *et al.* 2022). Furthermore, many poorly known and imperilled species, including many that are likely to be fire-susceptible, co-occur at centres of endemism (Harvey *et al.* 2011). If we protect these critical sites from fire, many species may be saved; conversely, if such sites are burnt, many species may be lost (Marsh *et al.* 2022).

Knowledge shortcomings constrain many aspects of crisis management, not just fire (Boin and 't Hart 2010). With respect to the valuation and protection of biodiversity, these knowledge gaps include uncertainty about the way that many species respond to fire (Jolly *et al.* 2022) and hence the priority that should be accorded to their protection, as well as uncertainty about the efficacy of management responses. For example, during the Black Summer wildfires, managers undertook a rescue operation for a population of threatened eastern bristlebirds (*Dasyornis brachypterus*) that occurred in the fire's projected path. However, of the 15 birds that were captured, many soon died in captivity (in part due to lack of previous husbandry experience or recognition of risks) and only eight birds were re-released after the fire (Selwood *et al.* 2022). This example serves to illustrate that biodiversity protection during wildfires, or other comparable crises, may not be straightforward or without risks. It also shows that a more robust evidence base and appropriate recognition of uncertainty will lead to better decision making (Rumpff *et al.* 2023), as will training as part of contingency planning.

Freely available spatial decision support tools can be used to prioritise sites during emergencies, based on the distribution of 'high value' biodiversity assets (Moilanen *et al.* 2005). Such tools were used after the Black Summer wildfires to prioritise biodiversity recovery efforts (Geary *et al.* 2021).

Once key biodiversity assets have been identified, management plans should be developed that articulate feasible and cost-effective actions for them under varying fire emergency scenarios. This will help highlight which biodiversity assets or sites may be easy to protect and require few resources to do so, and where protection of others in an emergency may be an insuperable challenge. These plans are pre-prepared, such that when risks to key assets are identified, a ready plan for action exists if a decision is made to act.

The valuation system sketched here would have provided an explicit justification for prioritising the protection of Wollemi pine, at least relative to other biodiversity assets.

It is a Critically Endangered species of extraordinary phylogenetic significance, likely to be extremely susceptible to high-severity fire, and occurring at only a single site (therefore irreplaceable); protecting the population from fire was feasible. Furthermore, appropriate information outlining the need to protect the Wollemi pine during wildfire, and how this could be achieved, was available prior to the Black Summer wildfire in the species' recovery plan and in the fire management plan for the conservation reserve in which it occurs (NSW Department of Environment and Conservation 2006). The Wollemi pine example clearly illustrates the application of the criteria we describe for prioritising species for protection; however, its protection was a near-exceptional case. We are seeking here to provide a more formal and explicit approach that would apply to, and help protect, other biodiversity assets of value.

Valuing biodiversity relative to other assets

Much more complex than relative valuation within the set of biodiversity assets is the valuation of biodiversity assets relative to human life and property. This task is complex and fraught. The issue of what to save in an emergency includes taboo trade-offs – forced choices that pit values that may be considered sacred, absolute and inviolable (such as a threatened species) against secular values, such as a house (Tetlock 2003). Even more formidable are tragic trade-offs, which pit one set of sacred values (such as human life) against another set, such as a species extinction (Tetlock 2003). Tragic trade-offs necessarily violate a moral principle no matter what choice is made, and their resolution will often result in greater moral conflict and less confidence in choice (Mandel and Vartanian 2008).

These are complex challenges but a range of established valuation techniques can provide guidance. Whereas the insurance industry can attribute explicit financial value (and hence a prioritisation) to human life and property, the value of biodiversity attributes is not quite so fungible. Nonetheless, monetary value can be ascribed to environmental services (Liu *et al.* 2010). Furthermore, social surveys have provided estimates for what the community is willing to pay to conserve biodiversity (Zander *et al.* 2022), and those values could be weighed against the cost of repairing or reconstructing infrastructure. Similarly, biodiversity 'crediting' processes associated with offsets suggest that biodiversity can be assigned a value that is legally defined and tradable (e.g. Division 2, *Biodiversity Conservation Act 2016* (NSW), empowering the relevant Minister to enter biodiversity stewardship agreements that support the creation and trade of biodiversity 'credits' or payments for management that benefits biodiversity).

However, notwithstanding such approaches that may allow for comparison of the financial value of biodiversity vis-à-vis infrastructure, such valuation is a solipsistic human construct. It can be argued instead that all species have a right to exist, and much more so than does, say, a shed (Heise 2016). Built assets may be readily replaceable and are insurable, whereas at least some forms of biodiversity loss cannot be recompensed or replaced. A large majority of people believe that extinctions should be prevented regardless of cost (Zander *et al.* 2021). Therefore, options that may result in the potential extinction of a species should not be countenanced as an acceptable trade-off: in an emergency setting, protecting a species that would otherwise become extinct should take precedence over any infrastructure.

Furthermore, the protection of biodiversity is exclusively within the remit of decision makers and cannot realistically be delegated. During the Black Summer wildfires, fire services issued explicit warnings to people in at-risk areas, to evacuate before fires reached them, and warned that fire fighters might be unable to assist them if they stayed. No such transfer of responsibility to potential victims of fire can be given to biodiversity.

These trade-off issues should not be left to decision makers operating under multiple pressures in an emergency setting. The issue of tragic and taboo trade-offs requires considered community input and should be explored and established in deliberative settings well before any emergency need. There are established mechanisms to do so: for example, best–worst scaling approaches can be used to gauge society's rankings of disparate assets (Zander *et al.* 2021). There are also precedents for societal consideration of comparable complex trade-offs. For example, studies have shown that communities are prepared to accept fire management practices that provide explicitly for protection of biodiversity, even if such practices lead to reduced effort allocated to protecting human life or property (Moskwa *et al.* 2016). More such studies are needed to provide a socially acceptable basis for the prioritisation of biodiversity vis-à-vis other assets, and thus to break the convention of always ranking biodiversity last.

A more supportive regulatory and legislative basis

Choices about which priority biodiversity assets to protect in emergency settings should be clearly articulated (including their precise location and value) well before an emergency. The more location- and context-specific the instrument in which these priorities are articulated, the better the chances of implementation. For example, this could be in fire management plans, particularly where such plans are widely accessible, developed with an opportunity for public input, and are referred to during an emergency response. Although these plans may not be statutory (and therefore not strictly enforceable), they are specifically designed to articulate priorities, objectives, actions and zones for fire management, and provide a mechanism for guiding decisions made by incident controllers in emergency settings.

Other planning instruments may help to support the protection of biodiversity in emergency settings. For example, threatened species recovery plans (developed and implemented under environmental laws) typically provide information about the locations of key populations, susceptibility and management needs during and following any major disturbance. In the Black Summer wildfires, established plans that described actions to protect Wollemi pines were used to implement and justify rapid conservation interventions. However, in practice, many threatened species do not have recovery plans, and for those that do, few are fully implemented.

Failures in the protection of biodiversity during extreme events are consistent with broader shortcomings in Australia's conservation laws, and such laws have proven inadequate to arrest biodiversity decline (Samuel 2020). Improving conservation laws more generally could support the implementation of clear, explicit priorities for protecting biodiversity in fire management plans and enhance the protection of biodiversity during extreme events in four important ways. First, Australia's primary national legislation – the *Environment Protection and Biodiversity Conservation Act 1999* ('EPBC Act') – provides a foundation for recognising and conserving matters of national environmental significance. However, much of its operational focus is reactive, aimed at minimising the impacts of development proposals. It provides no explicit requirement for any person to attempt to proactively protect biodiversity values from catastrophic events, nor any guidance about how trade-offs between biodiversity and other competing values ought to be balanced, including in emergency response scenarios (McDonald and McCormack 2022).

The EPBC Act does provide a mechanism for protecting Critical Habitat, which *could* allow for a clear demarcation of locations essential for conservation, including as priority places for protection during wildfire. However, the Act gives the Minister a discretion (not an obligation) to declare Critical Habitat, and may only do so on Commonwealth land. Accordingly, very few designations have been made, and none were listed in the area affected by the 2019–20 wildfires. In contrast, under legislation in some states, notably that of New South Wales, critical habitat has been more widely designated. National legislative change is needed to increase the designation of Critical Habitat or comparable setting as a mechanism to create legal and spatially specific bases for prioritising biodiversity in an emergency response (Fitzsimons 2020). One such setting – established as a response to the post-wildfire inquiry (Government of NSW 2020) that identified as a failing the lack of formal identification and obligation to protect high biodiversity values – has been the recent amendment of the *National Parks and Wildlife Act 1974* to declare Assets of Intergenerational Significance for areas of exceptional natural or cultural significance that warrant and are given special protection, with required protective measures specified in fire management and other plans.

Second, there is a need to address the poor implementation, resourcing and enforceability of Australian environmental laws generally. Implementation and resourcing failures likely played a role in the low priority accorded to biodiversity in the Black Summer wildfires (Royal Commission into National Natural Disaster Arrangements 2020), for example through the failure to develop and implement threatened species recovery plans. Another example of resource allocation de-prioritising biodiversity relates to federal cost-sharing arrangements for fire-fighting. Unlike fire-fighting to protect human assets, fire-fighting costs incurred by state government agencies for environmental protection are not automatically eligible to be partially reimbursed under the Australian government's National Disaster Support, instead requiring specific approval by the Australian Prime Minister – and exceptional circumstances.

Third, there is a need to introduce accountability for actions or inaction that cause a species' extinction, such as deciding not to protect a site of high biodiversity value (Woinarski *et al.* 2017). There is no legislative requirement in Australian law for planners and emergency decision makers to seek out and consider biodiversity information, or to respond to an emergency in a way that protects biodiversity. In fact, emergency firefighting activities are typically exempt from conservation and many other laws (e.g. ss 124B and 124D of the *Rural Fire Service Act 1997* (NSW)). Legislative obligations to act in a way that prevents a species from becoming extinct, and that creates incentives to avoid extinctions, with mandatory public extinction inquiries and/or reports to Parliament following events, could support changes to fire management plans and policies that more readily provide and oblige protection of biodiversity. A further factor that influences the low prioritisation for protection of biodiversity in wildfires is its limited legal rights. For animals and plants, this shortcoming allows them to be relegated to a status of 'legal inferiority' (Best 2021).

The inquiries that follow major wildfires in Australia have so far not proven to be an effective way to achieve the accountability we describe here. These inquiries have created a risk-averse culture focused particularly on human life and infrastructure in emergency agencies (Eburn and Dovers 2017). These 'accountability' measures lead to decisions focused on risk aversion, blame avoidance and conservativism in emergency response decisions, and this necessarily favours human assets not biodiversity. Some form of legal mandate to consider biodiversity assets may be needed to shift entrenched practice and attitudes. For example, strong legislative language requiring decision makers to act on the advice of conservation managers could help address the low priority currently accorded to biodiversity in firefighting operations. Developing the detail of appropriate interventions will be an essential next step, once emergency managers accept the need to mainstream biodiversity conservation in firefighting decision making.

Other enabling mechanisms

Our focus in this paper is on prioritising the protection of biodiversity in emergency settings, through more explicit valuation of biodiversity and enhanced legal support. Many others factors can be woven into this objective, particularly to help reduce the risks to biodiversity assets before and during emergencies and to support their subsequent recovery. These include pre-fire management to bolster resilience of key biodiversity assets (e.g. through translocations to establish additional populations, control of other threats, protective burning around the perimeter), and the establishment of funding and capability to allow for rapid post-fire remedial responses (Wintle *et al.* 2020; de Bie *et al.* 2021).

Inclusion of biodiversity expertise in decision making and incident teams can increase the likelihood that biodiversity values are recognised, and that they will be considered by decision makers (Inspector-General for Emergency Management 2020). As an example of this kind of institutional setting, Tasmania's emergency management arrangements establish a coordinated response to major fires (Tasmanian Interagency Fire Management Protocol), recognising that the conservation objectives of the state's Parks & Wildlife Service should be prioritised and adequately funded in bushfire planning and response, alongside the objectives of other relevant agencies (State Emergency Service 2018). This arrangement has been endorsed in post-fire reviews as an important way of ensuring that a full range of values – including World Heritage values – are considered and balanced in wildfire responses.

This paper was catalysed by the limited consideration of biodiversity in most post-fire inquiries that followed the Black Summer wildfires. The final important enabling mechanism is the requirement that such inquiries provide transparent assessments of successes and failures in protecting biodiversity, and compelling recommendations for improvements in legislation and management. It is rare for governments commissioning such inquiries to include Terms of Reference that are specific to biodiversity conservation, or to include biodiversity expertise amongst those appointed to lead these inquiries. This misses important opportunities to learn from failings and to build systems that can better protect biodiversity in future comparable events. It is also a deficiency that can be readily rectified.

Conclusion

The agony of choice about what to protect during emergencies is becoming more pressing and consequential, as biodiversity further declines, human populations expand and climate change drives an increasing incidence of catastrophic wildfires and other disturbances. The Royal Commission into the Black Summer wildfires reinforced a long-held perspective that biodiversity protection is a dispensable discretionary priority in emergency settings, to be undertaken only after other values have been protected. We argue that this should not be so, given the significant value that society accords to biodiversity and the broadly agreed goal to protect species from extinction. Biodiversity loss affects us all – increasingly so because ongoing loss of biodiversity has pervasive consequences on our lives, health and prosperity.

As in crisis management generally (Boin and 't Hart 2010), we recognise that the approach we describe here may be overwhelmed by the unmanageable nature of some crises, especially as climate change ratchets up the magnitude of such events. Nonetheless, plans and processes that incorporate protection of priority biodiversity, and that are supported by society and underpinned by policy and legislation, are more likely to achieve conservation benefits than the current, largely *ad hoc*, approaches.

We were motivated to write this paper by the extraordinary losses of biodiversity that occurred in the Australian Black Summer wildfires, and the realisation that many of these losses may have been prevented. However, some biodiversity was saved, and substantial investments were made to support recovery of biodiversity after these fires. These are important precedents well worth celebrating. In the face of escalating catastrophes, we will increasingly need to consolidate, repeat and extend such efforts to secure and recover nature across the world.

To progress the framework we outline here, and enhance the likelihood of protection of biodiversity during wildfire or other crisis, we make the following recommendations.

1. The relative value of biodiversity assets and sites, and their need for protection, should be explicitly determined based on the criteria described above. This valuation should be informed by evaluation of society's relative prioritisation of biodiversity vis-à-vis other types of assets;
2. Priority research should address key knowledge gaps, including (i) information about species' vulnerability to and recovery from fire events and changing wildfire regimes, and (ii) distributional information and location of key sites for poorly known biodiversity;
3. Fire management plans and other fire-specific planning instruments should include explicit mapping of biodiversity values and clear and explicit priorities for biodiversity protection during emergencies (with this planning underpinned by legislation; Step 6 below);
4. Fire-fighting to protect biodiversity should be automatically eligible for cost-sharing arrangements among different levels of government, in the same way as fire-fighting to protect other assets;
5. Incident control teams established to coordinate responses to a wildfire should routinely include a biodiversity expert to ensure that wildlife and other

ecological values are understood and considered in fire-fighting strategy;

6. Systemic shortcomings in biodiversity conservation laws must be addressed, including to ensure that: compliance with these laws is fully resourced and implemented; that they (i) accurately identify and provide explicit protection to the highest priority biodiversity sites; and (ii) that conservation obligations apply equally in emergency settings (as a catalyst for implementing recommendations 3–5); and
7. The extent to which significant biodiversity assets were protected during wildfire events, and factors influencing such outcomes, should be monitored and reviewed following fire (e.g. as an explicit component of formal government inquiries), and processes subsequently refined to improve performance and outcomes.

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AN ANATOMY OF AUSTRALIA'S LEGAL FRAMEWORK FOR BUSHFIRE

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Australian landscapes, people and laws have a long history with fire, but climate change is increasing the frequency and severity of fires and the scale of their impact. In this article, we ask the question: what laws make up the constituent parts, or the anatomy, of our legal framework for bushfire? We propose a novel conceptual model for the full spectrum of laws that relate to bushfire — from the crime of arson through to consumer lending laws and the Constitution *— and reveal a complex web of (sometimes competing) values, objectives and substantive tools. Understanding this legal context can help us to prepare more effectively for a future that will be defined by our experience of fire.*

CONTENTS

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I Introduction

Fires have always been a part of the Australian landscape, but climate change is driving rapid change in the frequency, geographic scale and severity of bushfires.[1] Changes to Australia's fire regimes present a dramatic increase in fire-related threats to human and natural values across the continent, a step change that was evident in the catastrophic 2019–20 'Black Summer' fire season. Australia's Black Summer bushfires were globally unprecedented in their size,

[1] *Royal Commission into National Natural Disaster Arrangements* (Final Report, 28 October 2020) 56 [2.10]–[2.11], 63–4 [2.51]–[2.57] ('*2020 Royal Commission Report*'). We use the term 'bushfire' to refer to uncontrolled fires — whether caused by 'natural' ignition such as spontaneous combustion or lightning strike, or human-caused ignition such as arson or an escaped hazard reduction burn — that burn trees, forests, grasslands, riparian vegetation and other vegetation types. While the terms 'bushfire' and 'fire' are used interchangeably here, the legal and policy arrangements associated with electrical, chemical and structural fires are beyond the scope of this article.

severity and impact.[2] The area burnt, the intrusion of fire into subtropical and tropical forests and the radiative power of the fires had not been seen before in the historical record.[3]

The law has an important role to play in building resilience to climate-heightened bushfire risk. That role is embedded in the full breadth of arrangements for fire, including institutional and regulatory tools for improving preparedness for, responses to, and recovery from changing fire regimes across sectors, scales and actors.

Australia's framework of laws and policies relating to bushfire spans national, state and territory, and local scales. Some relate explicitly to fire, such as criminal laws about arson and legislation establishing fire agencies. Other laws and policies are indirectly relevant, such as protected area management laws and the ability of the Commonwealth executive to declare a state of emergency under the *Constitution*.[4] Laws with indirect application to bushfire are increasingly important in preparing for and responding to bushfire events, and in building or potentially undermining community resilience.

No existing scholarship defines the broad spectrum and operation of Australian laws and policies that can, together, be described as 'bushfire law'. Yet, having a bird's-eye view of the multitude of fire-related laws and policies in Australia is valuable, because post-fire reviews and inquiries consistently recommend reform but do not necessarily acknowledge broader, interacting legal instruments and obligations.[5] Furthermore, while efforts are underway to develop a clear and pragmatic research agenda about bushfire,[6] few researchers

[2] Matthias M Boer, Víctor Resco de Dios and Ross A Bradstock, 'Unprecedented Burn Area of Australian Mega Forest Fires' (2020) 10 (March) *Nature Climate Change* 171, 171–2; Nerilie J Abram et al, 'Connections of Climate Change and Variability to Large and Extreme Forest Fires in Southeast Australia' (2021) 2 *Communications Earth and Environment* 8:1–17, 1.

[3] Abram et al (n 2) 1.

[4] See *Australian Constitution* s 61.

[5] See generally *2020 Royal Commission Report* (n 1). The value of a bird's-eye view of law has been recognised and discussed in a wide variety of legal contexts: see, eg, Sabine Gless, 'Bird's-Eye View and Worm's-Eye View: Towards a Defendant-Based Approach in Transnational Criminal Law' (2015) 6(1) *Transnational Legal Theory* 117, 121–7; Jonathan Baron and Tess Wilkinson-Ryan, 'Conceptual Foundations: A Bird's-Eye View' in Joshua C Teitelbaum and Kathryn Zeiler (eds), *Research Handbook on Behavioral Law and Economics* (Edward Elgar Publishing, 2018) 19, 19. On resolving trade-offs between competing legal instruments and values, see generally Anita Foerster, Andrew Macintosh and Jan McDonald, 'Trade-Offs in Adaptation Planning: Protecting Public Interest Environmental Values' (2015) 27(3) *Journal of Environmental Law* 459 ('Trade-Offs in Adaptation Planning').

[6] See 'Our Research Focus', *National Hazards Research Australia* (Web Page) <https://www.naturalhazards.com.au/research/our-research-focus>, archived at <https://perma.cc/63MB-MMMV>. Natural Hazards Research Australia incorporated the Bushfire and Natural Hazards

have dedicated specific attention to the broader roles of law in this area.[7] We cannot effectively respond to bushfire law reform recommendations without a clear understanding of the legal instruments and institutions that already govern our relationship with fire. Moreover, as catastrophic bushfires become more common and destructive, a clear map of the existing legal framework offers a useful starting point for understanding the stunning complexity[8] of Australia's bushfire laws and policies. The core task of this article is to fill this important gap in legal scholarship.

To map Australia's bushfire laws and policies across sectors, scales and jurisdictions, we have borrowed the concept of an 'anatomy' from the study of the human body. The science of anatomy is concerned with the bodily structure of living things, especially as revealed by dissection (the Greek term for 'anatomy' literally means 'to cut up').[9] The term anatomy is also used in a more general sense to describe a study of the structure or internal workings of something. This concept provides a useful analytical lens because our goal is precisely that: to separate out the components of Australia's legal framework for fire so that we have a better understanding of its constituent parts.[10] Knowing the anatomy of this legal framework will better equip us to understand its physiology or

Cooperative Research Centre: Natural Hazards Research Australia (Facebook, 24 August 2021, 3:30pm AEST) <https://www.facebook.com/hazardsresearch/posts/132151915797420>, archived at <https://perma.cc/7M2R-H3WN>.

[7] Despite the absence of a cohesive legal research agenda, the Commonwealth Department of Home Affairs' *National Disaster Risk Reduction Framework* does note the need for a coordinated effort across areas including land use planning, emergency management, agriculture, education, energy and the environment to limit the impact of disasters: National Resilience Taskforce, Department of Home Affairs (Cth), *National Disaster Risk Reduction Framework* (Report, 2018) 4 ('*National Disaster Risk Reduction Framework*'). By contrast, the New South Wales Bushfire Risk Management Research Hub has six work packages, none of which relate specifically to law and policy: 'Work Packages', *NSW Bushfire Risk Management Research Hub* (Web Page) <https://www.bushfirehub.org/work-packages/>, archived at <https://perma.cc/3ZKG-8P2T>. Among notable exceptions is research conducted for the National Climate Change Adaptation Research Facility: see, eg, Andrew Macintosh, Anita Foerster and Jan McDonald, *Limp, Leap or Learn? Developing Legal Frameworks for Climate Change Adaptation Planning in Australia* (Final Project Report, 2013) ('*Limp, Leap or Learn?*'). Other notable exceptions have also been published in the United States ('US'): see, eg, Robert B Keiter, 'Wildfire Policy, Climate Change, and the Law' (2012) 1(1) *Texas Wesleyan Journal of Real Property Law* 87, 88.

[8] A previous study undertook a limited review of the US legal framework for bushfire and described that framework as 'stunningly complex': Karen M Bradshaw, 'A Modern Overview of Wildfire Law' (2010) 21(3) *Fordham Environmental Law Review* 445, 451.

[9] *Encyclopaedia Britannica* (online at 11 April 2022) 'anatomy' (def 1).

[10] We do not claim that our use of the 'anatomy' metaphor is unique. In fact, a simple online search will reveal a host of academic articles analysing the 'anatomy' of different legal frameworks, including for comparative corporate law, tort law and in relation to private law theory, among others.

'function' — that is, how the different components of bushfire laws can work together to help prepare communities and environments for changing fire regimes.

The remainder of this article is structured in four parts. Part II provides an overview of the physical and climatic context for bushfires and the development of Australia's bushfire laws. In Part III, we present for the first time an 'anatomy' of Australia's legal framework for bushfire, using a novel conceptual model of its diverse, nested components. Part IV explains the significance of this analysis, including as a prerequisite to designing holistic law reform and understanding the limitations of law. In Part V, we conclude by acknowledging that bushfire is not a problem that law can 'solve', calling for greater attention to the role that law *can* play in tackling the challenges of a future that will be fundamentally shaped by our experience of fire.

II Understanding the Context for Australia's Legal Framework for Bushfire

The Black Summer was — in terms of area of land burnt — Australia's largest fire season ever.[11] But it may not hold that title for long because fire seasons are becoming more extreme, particularly in Australia's south-east, as the climate changes.[12] Australia's legal framework for bushfire has evolved over more than a century and must continue to evolve. In this part, we briefly explain the physical and climatic backdrop to Australia's changing fire regimes and the origins of Australian laws about bushfire as important context for the anatomical analysis of the legal framework that follows.

A *Australia's Bushfire Regimes Are Changing*

Australia is 'the most fire-prone continent on Earth'.[13] When European settlers arrived in Australia, Indigenous nations had maintained fire regimes for tens of thousands of years and landscape-scale burning formed a central part of

[11] Lisa Richards and Nigel Brew, '2019–20 Australian Bushfires: Frequently Asked Questions', *Parliament of Australia* (Web Page, 12 March 2020). See generally World Meteorological Organization, *State of the Global Climate 2020* (Report No 1264, 2021).

[12] See David Bowman et al, 'Wildfires: Australia Needs a National Monitoring Agency' (2020) 584(7820) *Nature* 188, 189.

[13] Abram et al (n 2) 7. See also Jeremy Russell-Smith et al, 'Bushfires "Down Under": Patterns and Implications of Contemporary Australian Landscape Burning' (2007) 16(4) *International Journal of Wildland Fire* 361, 361.

Indigenous culture and lore.[14] Many of the landscapes that Europeans encountered had been shaped by fire, and many of Australia's ecosystems had adapted to survive and even flourish after bushfire. Colonisation abruptly changed these fire regimes, and likely contributed to the scale and extent of the destructive fires that have caused substantial economic and property damage and loss of life over the past 250 years.[15] Catastrophic bushfires in Australia have also been influenced by a range of other variables such as natural climate variability, including periods of severe drought and heatwaves, and changing land use, particularly the (ongoing) expansion of human settlements into urban fringes that are both high in biodiversity and some of the most fire-prone places in Australia.[16]

There is now clear evidence that fire regimes are changing in response to climate change.[17] Fire weather, fire activity and fire impacts have increased over recent decades in response to changes in mean climate conditions and the increasing frequency of extreme weather events such as drought and heatwaves.[18] On average, Australia's climate has warmed by 1.44 ± 0.24°C since 1910, and there has been a shift towards drier conditions across southern Australia since

[14] Michael-Shawn Fletcher et al, 'Catastrophic Bushfires, Indigenous Fire Knowledge and Reframing Science in Southeast Australia' (2021) 4(3) *Fire* 61:1–11, 4–5. See also Noeleen McNamara, 'Australian Aboriginal Land Management: Constraints or Opportunities?' (2014) 21 *James Cook University Law Review* 25, 25–34, though specific cultural significance and use of fire differs across Indigenous groups and regions.

[15] See, eg, GW Morgan et al, 'Prescribed Burning in South-Eastern Australia: History and Future Directions' (2020) 83(1) *Australian Forestry* 4, 7–8. For discussion of the dramatic increase in frequency of intense forest fires in south-west Western Australia following European colonisation, see ND Burrows, B Ward and AD Robinson, 'Jarrah Forest Fire History from Stem Analysis and Anthropological Evidence' (1995) 58(1) *Australian Forestry* 7, 7, 12. See generally Stephen J Pyne, *The Pyrocene: How We Created an Age of Fire, and What Happens Next* (University of California Press, 2021).

[16] Neal J Enright and Joseph B Fontaine, 'Climate Change and the Management of Fire-Prone Vegetation in Southwest and Southeast Australia' (2014) 52(1) *Geographical Research* 34, 34–5; A Malcolm Gill, 'Bushfires and Biodiversity in Southern Australian Forests' in Ross A Bradstock, A Malcolm Gill and Richard J Williams (eds), *Flammable Australia: Fire Regimes, Biodiversity and Ecosystems in a Changing World* (CSIRO Publishing, 2012) 235, 235–6, 245. Approximately 85% of the population lives in urban and peri-urban centres along Australia's coastline: Barbara Norman, Peter Newman and Will Steffen, 'Apocalypse Now: Australian Bushfires and the Future of Urban Settlements' [2021] *npj Urban Sustainability* 2:1–9, 1.

[17] RMB Harris et al, 'Biological Responses to the Press and Pulse of Climate Trends and Extreme Events' (2018) 8(7) *Nature Climate Change* 579, 579, 583–4; Abram et al (n 2) 7. See generally Geert Jan van Oldenborgh et al, 'Attribution of the Australian Bushfire Risk to Anthropogenic Climate Change' (2021) 21(3) *Natural Hazards and Earth System Sciences* 941.

[18] Josep G Canadell et al, 'Multi-Decadal Increase of Forest Burned Area in Australia Is Linked to Climate Change' (2021) 12 *Nature Communications* 6921:1–11, 1, 5, 8.

the late 1990s.[19] As a result, since the 1950s, dangerous fire weather has increased and fire seasons have lengthened, particularly in the south.[20]

Since the 1980s, against the backdrop of these warming and drying trends, the number of years between fires has decreased while the area burnt annually across Australia has increased.[21] There has also been a substantial increase in the frequency of forest mega-fires (fires that burn more than 1 million hectares) since 2000.[22] Recent studies demonstrate the extent to which climate change is contributing to these bushfire events. For example, Tasmania's 'Angry Summer' fires in 2012–13 were found to have been linked to the extreme summer heat, which was made five times more likely due to human influence on the climate.[23] The heat extremes associated with the 2019–20 bushfire season in south-eastern Australia were shown to be at least two times more likely under anthropogenic warming and the Fire Weather Index was at least 30% higher than under natural forcings.[24]

The Black Summer fires had significant social, environmental and economic impacts.[25] Thirty-three lives were lost, and more than 3,000 houses destroyed by the fires,[26] while an estimated 417 deaths and 3,151 hospital admissions were attributed to smoke exposure.[27] Ongoing post-traumatic stress disorder and depression are expected to have long-term effects on fire-affected communities.[28] Impacts on water quality, soil conservation and threatened fauna and flora have also been widespread. For example, more than 23% of temperate forests in south-eastern Australia were burnt and, in New South Wales ('NSW') alone, more than 290 threatened fauna, 680 threatened flora species and 37% of the State's national park estate are thought to have been destroyed, injured or

19 CSIRO and Bureau of Meteorology (Cth), *State of the Climate 2020* (Report, 2020) 2.

20 Abram et al (n 2) 7–8.

21 Canadell et al (n 18) 8.

22 Ibid.

23 Sophie C Lewis and David J Karoly, 'Anthropogenic Contributions to Australia's Record Summer Temperatures of 2013' (2013) 40(14) *Geophysical Research Letters* 3705, 3709.

24 van Oldenborgh et al (n 17) 956.

25 Alexander I Filkov et al, 'Impact of Australia's Catastrophic 2019–20 Bushfire Season on Communities and Environment: Retrospective Analysis and Current Trends' (2020) 1(1) *Journal of Safety Science and Resilience* 44, 55.

26 Ibid 54.

27 Nicolas Borchers Arriagada et al, 'Unprecedented Smoke-Related Health Burden Associated with the 2019–20 Bushfires in Eastern Australia' (2020) 213(6) *Medical Journal of Australia* 282, 283. See also Fay H Johnston et al, 'Unprecedented Health Costs of Smoke-Related $PM_{2.5}$ from the 2019–20 Australian Megafires' (2021) 4(1) *Nature Sustainability* 42, 42.

28 Richard A Bryant et al, 'Psychological Outcomes following the Victorian Black Saturday Bushfires' (2014) 48(7) *Australian and New Zealand Journal of Psychiatry* 634, 639–40.

otherwise impacted by the fires, including 54% of the Gondwana Rainforests in the World Heritage Area.[29]

We can expect more seasons like this in the future. Extreme weather events such as heatwaves and droughts are projected to become more widespread, frequent and intense,[30] leading to more dangerous fire weather conditions. Opportunities for controlled hazard reduction burning are also decreasing, with fire seasons extending back into spring and later into autumn, reducing the periods in which it is both dry and cool enough to burn.[31]

B *Australian Laws for Bushfire Have a Long History*

The focus of early legislative interventions about bushfire emphasised fire prevention and extinguishment. The first legal instrument, introduced in Western Australia in September 1847, was the *Bush Fires Ordinance 1847* (WA) ('*Bush Fires Ordinance*').[32] The *Bush Fires Ordinance* prohibited burning '[g]rass, [s]tubble, shrub, or other natural vegetation whatsoever' at certain times of year 'to prevent the evils which result from what are commonly called "[b]ush [f]ires"', and authorised floggings for 'boy[s] under the age of sixteen years' and Indigenous people in lieu of fines.[33] Over the next decade, Tasmania, South Australia and Victoria followed suit, creating statutory offences for lighting fires

[29] Department of Planning, Industry and Environment (NSW), *NSW Fire and the Environment 2019–20 Summary: Biodiversity and Landscape Data and Analyses To Understand the Effects of the Fire Events* (Report, March 2020) 5, 12. See generally Michelle Ward et al, 'Impact of 2019–2020 Mega-Fires on Australian Fauna Habitat' (2020) 4(10) *Nature Ecology and Evolution* 1321. Many animals, plants and ecosystems were killed or destroyed by the fires while others struggled to survive in burnt landscapes with limited access to shelter and food: at 1321.

[30] Sonia I Seneviratne et al, 'Changes in Climate Extremes and Their Impacts on the Natural Physical Environment' in Christopher B Field et al (eds), *Managing the Risks of Extreme Events and Disasters To Advance Climate Change Adaptation: Special Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, 2012) 109, 202.

[31] See, eg, Climate Council, *Be Prepared: Climate Change and the Australian Bushfire Threat* (Report, 2013) 28. See generally Hamish Clarke et al, 'Climate Change Effects on the Frequency, Seasonality and Interannual Variability of Suitable Prescribed Burning Weather Conditions in South-Eastern Australia' (2019) 271 *Agricultural and Forest Meteorology* 148.

[32] 10 Vict, No 15 ('*Bush Fires Ordinance*'). See also NP Cheney, 'Bushfires: An Integral Part of Australia's Environment' in Australian Bureau of Statistics, *Year Book Australia, 1995* (Catalogue No 1301.0, 1 January 1995) 515, 518.

[33] *Bush Fires Ordinance* (n 32) ss 1, 4. See also Burrows, Ward and Robinson (n 15) 10. See generally Lesley Head, 'Landscapes Socialised by Fire: Post-Contact Changes in Aboriginal Fire Use in Northern Australia, and Implications for Prehistory' (1994) 29(3) *Archaeology in Oceania* 172.

at certain times of year and obliging landholders to actively extinguish fires on private property.[34]

Other important early rules were contained in general policing and land management statutes, which created penalties for causing damage, including by fire.[35] Statutes also modified landowners' exposure to liability in negligence for escaped fires if, for example, they maintained firebreaks along fence lines.[36] Despite evidence of firebreaks being implemented in publicly managed timber reserves in NSW as early as 1891,[37] statutes did not vest specific bushfire-related powers in public agencies until after Federation. For example, the *Local Government Act 1906* (NSW) empowered councils to provide for the 'prevention or mitigation of bush fires' (including through the organisation of bushfire brigades),[38] and the *Forests Act 1915* (Vic) empowered the Victorian Board of Works and Forests Commission respectively to prevent, suppress and control fire on public land.[39]

Many royal commissions and inquiries following natural disasters in Australia have informed the development of legal and institutional arrangements

[34] *Bush Fires Act 1854* (SA) 18 Vict, No 14, ss 1, 5 ('*Bush Fires Act 1854* (SA)'); *Bush Fires Act 1854* (Tas) 18 Vict, No 10, ss 1–2; *An Act To Restrain the Careless Use of Fire 1854* (Vic) 18 Vict, No 8, s 1.

[35] See, eg, regulations which could be made under the *Forestry Act 1909* (NSW) s 29(1)(k), which could prescribe 'the conditions under which fires may or may not be lighted or used in State forests'. The *Crimes Act 1957* (Vic) ss 196–203 and *Police Offences Act 1890* (Vic) 54 Vict, No 1126, s 22 included penalties for damaging property, including by fire.

[36] See, eg, *Careless Use of Fire Act 1901* (NSW) s 5(1) and, later, *Careless Use of Fire Act 1912* (NSW) s 5. See also *Bush Fires Act 1854* (SA) (n 34) s 2, which imposes a '[p]enalty for neglecting precautions'.

[37] TC Grant, *History of Forestry in New South Wales 1788 to 1988* (Forestry Commission of NSW, 1989) 195. However, firebreaks were only extensively established in state forests later under the *Forestry Act 1916* (NSW).

[38] *Local Government Act 1906* (NSW) s 73(iv)(a). Under the *Local Government Act 1919* (NSW) s 495, councils could require landowners and occupiers to create a firebreak on land where living or dead vegetation occurred within 100 feet of buildings, crops or orchards. Prior to the *Bush Fires Act 1949* (NSW), NSW essentially had three parallel approaches to bushfire management: councils and brigades under the *Local Government Act 1919* (NSW) ss 494–5; individual responsibility for controlling fires and creating firebreaks on private land under the *Careless Use of Fire Act 1912* (NSW) s 5; and responsibility for fire and firebreaks in the forest estate under the *Forestry Act 1916* (NSW) s 11(1)(i).

[39] *Forests Act 1915* (Vic) ss 34–5. Similarly, the *Forestry Act 1916* (NSW) created the New South Wales Forestry Commission and its regulatory power to protect state forests and timber reserves from potential fire damage: ss 5(1), 41(1). These powers in Victoria were allocated exclusively to the Forests Commission in 1939 to remedy regulatory overlap and confusion about agency responsibilities for fire: *Forests Act 1939* (Vic) s 4. See also 'Black Friday 1939', *Forest Fire Management Victoria* (Web Page, 2 July 2021) <https://www.ffm.vic.gov.au/history-and-incidents/black-friday-1939>, archived at <https://perma.cc/XE48-39SL>.

for bushfire in profound ways.[40] For example, recommendations from Leonard Stretton's highly influential 1939 Royal Commission after the devastating 'Black Friday' bushfires in Victoria resulted in the establishment of local and rural fire brigades in many Australian jurisdictions.[41] That report also recommended establishing fire trails to facilitate access for firefighting, fire towers for early fire detection, and 'preventative' controlled burning to reduce fuel loads.[42] The 2009 Victorian Bushfires Royal Commission's ('Victorian Royal Commission') recommendations also influenced bushfire law reform nationwide. For example, the Victorian Royal Commission's recommendations informed a national rollout of comprehensive bushfire hazard mapping and Bushfire Management Overlays in land use planning,[43] and stricter minimum bushfire construction standards, including ember protection measures.[44]

[40] Josh Whittaker and David Mercer, 'The Victorian Bushfires of 2002–03 and the Politics of Blame: A Discourse Analysis' (2004) 35(3) *Australian Geographer* 259, 260, 263. See generally PJ Kanowski, RJ Whelan and S Ellis, 'Inquiries following the 2002–2003 Australian Bushfires: Common Themes and Future Directions for Australian Bushfire Mitigation and Management' (2005) 68(2) *Australian Forestry* 76.

[41] *Royal Commission To Inquire into the Causes of and Measures Taken To Prevent the Bush Fires of January, 1939, and To Protect Life and Property and the Measures To Be Taken To Prevent Bush Fires in Victoria and To Protect Life and Property in the Event of Future Bush Fires* (Final Report, January 1939) 20–1 ('*Stretton Report*'). The *Fire Brigades Act 1928* (Vic) had introduced the first formal arrangements for regional firefighting brigades in some parts of Victoria: ss 4–5; but those arrangements were updated substantially to implement the recommendations of the *Stretton Report* (n 41), including by introducing a statewide fire service: *Country Fire Authority Act 1944* (Vic) s 5; *Stretton Report* (n 41) 20–1. See also *Bush Fires Act 1949* (NSW) s 19; *Bush Fires Act 1935* (Tas) ss 9–10; *Fire Brigades Act 1942* (WA) s 26. In comparison, in South Australia a formalised, statutory firefighting authority did not emerge until the *Country Fires Act 1976* (SA) s 23: 'History of the CFS', *South Australian Country Fire Service* (Web Page, 29 June 2017) <https://www.cfs.sa.gov.au/about-cfs/history-of-the-cfs/>, archived at <https://perma.cc/6WV3-K6ER>.

[42] *Stretton Report* (n 41) 30–1; Peter Hannam, 'Lessons Learnt (and Perhaps Forgotten) from Australia's Worst Fires', *Sydney Morning Herald* (online, 11 January 2019) <https://www.smh.com.au/environment/climate-change/lessons-learnt-and-perhaps-forgotten-from-australia-s-worst-fires-20190108-p50qol.html>, archived at <https://perma.cc/HY5Z-TAJZ>. See generally Joëlle Gergis, *Sunburnt Country: The History and Future of Climate Change in Australia* (Melbourne University Press, 2018).

[43] The Bushfire Management Overlays replaced the Victorian Wildfire Management Overlay, which had only applied to 'areas of forest greater than 5ha with a vegetation density greater than 80%': 'Why Have Bushfire Rules?', *Department of Environment, Land, Water and Planning (Vic)* (Web Page, 25 January 2022) <https://www.planning.vic.gov.au/policy-and-strategy/bushfire/why-have-planning-and-building-rules#open_drawer>, archived at <https://perma.cc/939J-T6DW>.

[44] Ibid. Bushfire Management Overlays and construction standards now also integrate more nuanced data through fire hazard mapping that considers the impact of elements such as slope, weather and vegetation type on fire risk.

We do not propose to analyse all of the recommendations from the 57 or more formal inquiries and reviews specifically focusing on bushfire from 1939 to 2020.[45] Indeed, not all recommendations by these inquiries have been implemented,[46] and there remain important shortfalls in monitoring implementation and effectiveness over time.[47] Nevertheless, the changing nature of bushfire regimes and our growing exposure to catastrophic fires demonstrate the importance of gaining a clear understanding of Australia's legal frameworks, particularly if these laws are to continue to evolve and adapt to the bushfire regimes of the future.

III Dissecting the Anatomy of Bushfire Law

At present, there is no holistic concept of bushfire law that encompasses all of the different legal principles and mechanisms relevant to fire in the way that, for example, there are cohesive areas of law that can be described as 'tax law' or 'climate change law'.[48] A large proportion of Australian literature about law and bushfire relates to emergency management, but the legal framework for fire is much broader than that. In fact, almost all areas of law relate in some way to bushfire. Laws about fire include criminal laws, such as for arson, and civil laws, such as for fire insurance. Bushfires engage both private and public laws, for example, by obliging private property owners to mitigate fire hazards, by governing the impacts of smoke on public health, and by managing the risks of fire to workers under work health and safety ('WH&S') laws. Laws about bushfire also cross landscapes, sectors and industries including under natural resource

[45] 'Inquiries and Reviews Database', *Bushfire & Natural Hazards CRC* (Web Page) <https://tools.bnhcrc.com.au/ddr/inquiries>, archived at <https://perma.cc/637Y-NUEN>.

[46] State government inquiries completed since the Black Summer appear to have been implemented in a more comprehensive way: see, eg, 'NSW Bushfire Inquiry Progress Reports', *NSW Government* (Web Page) <https://www.nsw.gov.au/nsw-government/projects-and-initiatives/nsw-bushfire-inquiry/nsw-bushfire-inquiry-progress-reports>, archived at <https://perma.cc/4PXD-QGPH>. The Government of South Australia has confirmed that all short-term actions recommended in its 2020 inquiry are now complete: 'Actions To Be Completed for the Next Bushfire Season', *South Australian Fire and Emergency Services Commission* (Web Page, 1 June 2021) <https://www.safecom.sa.gov.au/independent-review-sa-201920-bushfires/actions-to-be-completed-for-the-next-bushfire-season/>, archived at <https://perma.cc/GDU2-VMQ9>. But see Climate Council, 'One Year On: Royal Commission Recommendations Left Burning' (Media Release, 28 October 2021) <https://www.climatecouncil.org.au/resources/one-year-on-royal-commission-recommendations-left-burning/>, archived at <https://perma.cc/J2CT-59ZK>.

[47] See Government of South Australia, *Independent Review into South Australia's 2019–20 Bushfire Season* (Report, June 2020) v–vi.

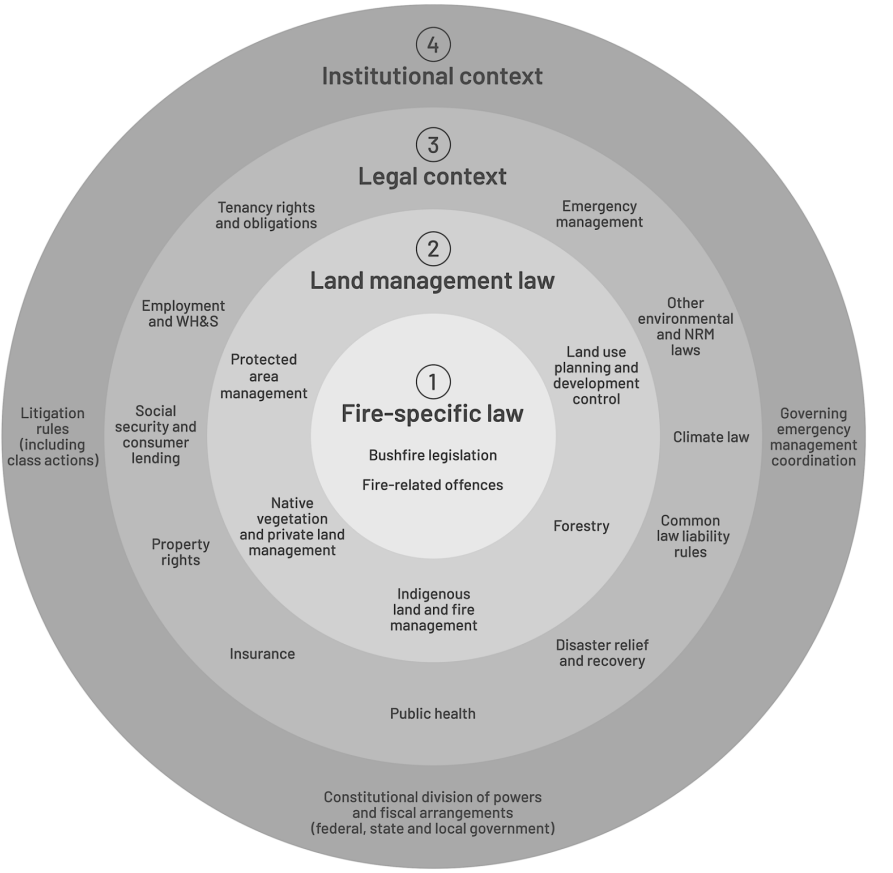
[48] See, eg, Jacqueline Peel, 'Climate Change Law: The Emergence of a New Legal Discipline' (2008) 32(3) *Melbourne University Law Review* 922, 924.

management ('NRM') laws, which include obligations and permiting processes for fire mitigation and management in forestry coupes and water catchments. The sources of law about bushfire include the full spectrum; from the common law, Commonwealth, state and territory statutes, subsidiary legislation including instruments administered by local government, and the *Constitution*. International laws also have a role to play, including in relation to Australia's climate targets and carbon accounting mechanisms, and for managing fire in internationally significant places such as Ramsar wetlands.[49]

Figure 1 provides a conceptual model of the diversity of legal instruments, procedural rules and institutional arrangements that make up the anatomy of the legal framework for bushfire in Australia. The four concentric rings in Figure 1 demonstrate the nested nature of this framework. Figure 1 will also likely resonate beyond Australia, as it is organised according to the nature or characteristics of different kinds of law, rather than by a list of specific statutes, regulations or policies.

[49] Phillipa C McCormack, 'Climate Change, Wildfires and Wetland Ecosystem Services: Governing Transformation' (2020) 39(3) *University of Queensland Law Journal* 417, 427–31 ('Climate Change, Wildfires and Wetland Ecosystem Services'). See generally *Convention on Wetlands of International Importance Especially as Waterfowl Habitat*, signed 2 February 1971, 996 UNTS 245 (entered into force 21 December 1975).

Figure 1: Conceptual Model of Australia's Legal Framework for Bushfire



At the heart of Figure 1, in Ring 1, are laws that are most clearly and directly related to bushfire, including the establishment of fire agencies, controls on lighting fires, fire prevention obligations and fire-specific offences such as arson. Land management laws set out in Ring 2 have explicit application to bushfire — including in mitigating fire hazards, responding to fire in protected areas, and facilitating bushfire recovery — but also operate beyond the context of fire to support broader land management goals. Rings 3 and 4 illustrate the complex and varied range of legal and institutional contexts that influence fire preparation, response and recovery in human communities with a particular influence on social aspects of vulnerability and resilience in the face of changing fire regimes. The outer ring demonstrates the significance of formal allocations of executive power and resourcing for bushfire, across all tiers of government, and

formal rules that govern both access to the courts and the conduct of bushfire litigation.

While Figure 1 implies that there are clear boundaries between each Ring and category of law, in reality they overlap and the boundaries between the rings may be permeable. For example, the management of air quality is a matter for both public health and environmental law (separate categories listed in Ring 3). In fact, some legal instruments deployed as the basis for public health measures may concomitantly be described as environmental law instruments.[50] Similarly, protected area laws in Ring 2 are important land management laws that explicitly provide for bushfire preparation, response and recovery. However, protected area laws are widely understood to be a subcategory of conservation laws, which are themselves a subcategory of environmental law (Ring 3). While the nuances of how we have allocated each legal category in Figure 1 can be debated, we argue that this conceptual model nevertheless makes a valuable contribution to the literature about bushfire and law, demonstrating the breadth and diversity of legal instruments that operate in relation to fire.[51] In the remainder of Part III, we briefly introduce each category of law listed in Figure 1 and highlight its position and role in the anatomy of Australia's legal framework for bushfire.

A *Fire-Specific Laws (Ring 1)*

The first ring, at the centre of Figure 1, is dedicated to those laws that are directly and explicitly concerned with bushfire. Perhaps the most easily-recognised laws in this category are the statutes in every state and territory that establish fire agencies and brigades, and their core functions and responsibilities.[52] Fire-specific laws empower fire agencies or officials to declare restricted burning periods and total fire ban days,[53] and to declare fire protection or

[50] See, eg, *National Environment Protection Council Act 1994* (Cth) s 3, and the subsidiary *National Environment Protection (Ambient Air Quality) Measure 1998* (Cth) s 5.

[51] In drawing distinctions between these areas of law and allocating them to the various rings of Figure 1, the authors have drawn on their broad and deep expertise in legal practice, legal academia, human geography and climate and fire sciences.

[52] See, eg, *Rural Fires Act 1997* (NSW) ss 8–9; *Fire and Emergency Services Act 2005* (SA) ss 24–6, 57–9; *Country Fire Authority Act 1958* (Vic) ss 2, 6; *Fire and Emergency Services Act 1998* (WA) pt 3A.

[53] Under most regimes, existing fire permits are automatically suspended for the period of a 'total fire ban' day declaration, and statutes create heavy penalties for breach: see, eg, *Emergencies Act 2004* (ACT) ss 114–16; *Rural Fires Act 1997* (NSW) s 99; *Bushfires Management Act 2016* (NT) ss 65–6, 86–8; *Fire and Emergency Services Act 1990* (Qld) ss 87–92; *Fire and Emergency Services Act 2005* (SA) s 80; *Fire Service Act 1979* (Tas) s 70; *Country Fire Authority Act 1958* (Vic) s 40; *Bush Fires Act 1954* (WA) ss 17, 22A–22B.

management zones that will be subject to particular management obligations, including to reduce fire hazards.[54] Fire-specific legislation also regulates whether and when permits may be required to light a fire,[55] and may create exemptions from certain permitting obligations. For example, a person may be exempt from needing a smoke pollution permit for smoke produced by a controlled burn that is conducted under a valid permit.[56]

State and territory statutes also impose legal duties on public and private landowners and occupiers to prevent fires; remove, minimise or mitigate sources of ignition or fire hazards; and manage or extinguish fires on their land.[57] In some circumstances, fire agencies and/or local councils may issue a notice to remove a fire hazard and, if a landowner fails to comply, the agency or council may enter the property and remove the hazard at the landowner's expense.[58] Fire-specific laws may also facilitate, or even mandate, activities such as prescribed burning to reduce bushfire risks.[59] Some jurisdictions and fire agencies have developed guidance for landowners and managers, helping them to balance overlapping legal priorities before they act to remove a fire hazard, either by mechanical clearing or by conducting a prescribed burn. For example, proposed hazard reduction activities in NSW are assessed against the *Bush Fire Environmental Assessment Code 2021* (NSW) ('*Bush Fire Code*') and certified

[54] *Bushfires Management Act 2016* (NT) pt 3; *Fire and Emergency Services Act 2005* (SA) ss 4A, 105G–105H; *Fire and Emergency Services Act 1998* (WA) s 18P.

[55] See, eg, *Rural Fires Act 1997* (NSW) ss 86, 89, establishing 'bush fire hazard reduction certificates' and fire permits; *Bushfires Management Act 2016* (NT) s 46; *Fire and Emergency Services Act 2005* (SA) s 81.

[56] See, eg, *Fire Service Act 1979* (Tas) s 66(12), providing that '[a] person who lights and controls a fire in accordance with the conditions of a [valid] permit granted' under that section is exempt from the provisions of the *Environmental Management and Pollution Control Act 1994* (Tas); *Rural Fires Act 1997* (NSW) s 95, providing that permits are not required for fires lit by public authorities.

[57] *Rural Fires Act 1997* (NSW) s 63; *Bushfires Management Act 2016* (NT) ss 90–1; *Fire and Emergency Services Act 2005* (SA) ss 105F–105I; *Bush Fires Act 1954* (WA) ss 32–3. Related duties and offences can also be found in criminal laws: see below nn 64–7 and accompanying text. See generally Jan McDonald and Phillipa C McCormack, 'Responsibility and Risk-Sharing in Climate Adaptation: A Case Study of Bushfire Risk in Australia' (2022) 12(2) *Climate Law* 128.

[58] Enforceable hazard reduction notices can be issued under fire legislation in some jurisdictions: see, eg, *Rural Fires Act 1997* (NSW) ss 66, 70, pt 4 div 2A ('[b]ush fire hazard complaints'); *Bushfires Management Act 2016* (NT) s 69; or as part of a more general nuisance 'abatement' power in others: see, eg, *Local Government Act 1993* (Tas) pt 12 div 6, s 199(d). See generally Northern Territory Government, *Gamba Fire Mitigation: Compliance Policy* (Policy, June 2021) ('*Gamba Fire Mitigation Policy*'). This was implemented under the *Weeds Management Act 2001* (NT) and *Bushfires Management Act 2016* (NT).

[59] See, eg, *Rural Fires Act 1997* (NSW) pt 4 div 2; *Fire and Emergency Services Act 2005* (SA) pt 4A div 3; *Bush Fires Act 1954* (WA) pt III div 6.

by the Rural Fire Service or relevant certifying authority.[60] The *Bush Fire Code* creates a 'one-stop shop'[61] certification process for bushfire hazard reduction activities, applying standards to protect against soil erosion, weed incursion and impacts on threatened species,[62] while bypassing the full range of environmental assessment and approval processes that would otherwise apply.[63] While this aspect of hazard reduction, and particularly prescribed burning, is facilitated through fire-specific legislation (for example, laws firmly located in Ring 1), hazard reduction activities may also trigger obligations under a range of land management laws listed in Ring 2, including land use planning and native vegetation laws, and duties and processes for forestry and protected area management.

Laws in Ring 1 also include fire-specific offences, which may be contained in bushfire legislation or in state and territory criminal codes. These offences include arson,[64] causing a bushfire[65] or lighting a fire that is likely to injure another person,[66] and failing to take reasonable care to avoid a fire destroying or causing damage to property.[67] Each jurisdiction uses slightly different terminology but, to establish these offences, a prosecutor will typically need to demonstrate that an alleged perpetrator: (i) had the required mental element, such as an intention to cause injury or damage to life or property or recklessness as to that result; (ii) acted or omitted to act, for example, by lighting a grass fire or failing to extinguish a camp fire, knowing or believing that that act or omission was likely to cause injury or damage; and (iii) that the act or omission was

[60] *Bush Fire Environmental Assessment Code 2021* (NSW) r 1.9.

[61] Ibid rr 5.3, 5.7, 5.12.

[62] Ibid rr 1.4, 5.3, 5.7, 5.12.

[63] See, eg, ibid r 5.3.3.2. Certifying authorities may proceed with an assessment, even where conditions on the NSW Rural Fire Service, *Threatened Species Hazard Reduction List* (List, 25 September 2013) would prevent the works.

[64] See, eg, *Crimes Act 1900* (ACT) s 117; *Crimes Act 1900* (NSW) ss 196–202; *Criminal Code Act 1899* (Qld) s 461; *Criminal Law Consolidation Act 1935* (SA) s 85(1); *Criminal Code Act 1924* (Tas) s 268; *Crimes Act 1958* (Vic) ss 197–197A (and the related offence of '[i]ntentionally or recklessly causing a bushfire' contained in s 201A); *Criminal Code Act Compilation Act 1913* (WA) ss 444–5.

[65] See, eg, *Criminal Law Consolidation Act 1935* (SA) s 85B; *Criminal Code Act Compilation Act 1913* (WA) s 444A.

[66] See, eg, *Bush Fires Act 1954* (WA) s 32.

[67] See, eg, *Criminal Law Consolidation Act 1935* (SA) s 85(1)(b); *Criminal Code Act Compilation Act 1913* (WA) ss 444A(1)–(2).

the cause of the relevant damage, that is, that the fire that the alleged perpetrator lit caused the relevant death, injury or property damage.[68]

Fire-related criminal offences are notoriously difficult to detect and prosecute because so many fires start in secluded places and crucial evidence is often destroyed by the fire itself.[69] Even so, researchers have estimated that arson could be responsible for up to half of Australia's bushfires.[70] A crucial role for fire-specific laws in future will be to reduce the incidence of these deliberately lit and accidentally escaped fires (ie those for which there is a possibility of intervention)[71] and thereby reduce the need to divert already-stretched firefighting resources from unavoidable fires, such as those caused by lightning.

Many Australian jurisdictions are in the process of reviewing and/or introducing new fire-specific legislation. For example, the Tasmanian Government released a draft Bushfire Mitigation Measures Bill in late 2020,[72] and the NSW Government revised a range of bushfire-specific laws after its review of the 2019–20 fire season.[73] While post-fire reviews and inquiries continue to propose reforms to fire-specific laws, it seems unlikely that new *categories* of law will be introduced to this central ring.

[68] See, eg, *Crimes Act 1900* (ACT) s 117; *Crimes Act 1900* (NSW) ss 196–202; *Criminal Code Act 1899* (Qld) s 461(1); *Criminal Law Consolidation Act 1935* (SA) s 85; *Criminal Code Act 1924* (Tas) ss 13(1), 268; *Crimes Act 1958* (Vic) ss 197, 201A(1); *Criminal Code Act Compilation Act 1913* (WA) s 444(1).

[69] Monash Sustainability Institute, *Advancing Bushfire Arson Prevention in Australia*, ed Janet Stanley and Tahl Kestin (MSI Report No 10/3, June 2010) 21, 37.

[70] Ibid 5.

[71] Gaye T Lansdell, John Anderson and Michael S King, '"Terror among the Gum Trees": Is Our Criminal Legal Framework Adequate To Curb the Peril of Bushfire Arson in Australia?' (2011) 18(3) *Psychiatry, Psychology and Law* 357, 364–8.

[72] Bushfire Mitigation Measures Draft Bill 2020 (Tas). The Bill sought to introduce a relatively undefined duty to reduce fire risks on private land and faced opposition from a wide range of stakeholders: cl 6. The Tasmanian Government has since referred the issue of bushfire risk mitigation to the Tasmanian Fire Service to be included in its long-running review of the *Fire Service Act 1979* (Tas): see McDonald and McCormack (n 57) 146–8, 158.

[73] See, eg, *Final Report of the NSW Bushfire Inquiry* (Report, 31 July 2020) ('*NSW Bushfire Inquiry Final Report*'); NSW Government, *NSW Bushfire Inquiry 2020: Implementation of the NSW Government's Response to the NSW Bushfire Inquiry, January to March 2021* (Progress Report, March 2021) 3 ('*NSW Bushfire Inquiry: March Progress Report*'). See other progress reports on reforms to the *Rural Fires Act 1997* (NSW): NSW Government, *NSW Bushfire Inquiry 2020: Implementation of the NSW Government's Response to the NSW Bushfire Inquiry, April to June 2021* (Progress Report, June 2021) 22–4; NSW Government, *NSW Bushfire Inquiry 2020: Implementation of the NSW Government's Response to the NSW Bushfire Inquiry, July to September 2021* (Progress Report, September 2021) 48.

B *Land Management Laws (Ring 2)*

The second ring in Figure 1 identifies laws and policies for managing private and public land. While these laws also operate outside the context of bushfire, they are directly implicated in bushfire preparation activities such as vegetation clearing and burning for bushfire hazard reduction and, to a lesser extent, in fire response and recovery activities such as post-fire environmental rehabilitation.

1 *Land Use Planning and Building Controls*

The most important land management laws in Ring 2 are land use planning controls, which are implemented across Australia under state planning legislation and policies and in local land use planning schemes.[74] Land use planning controls govern how and where developments are located, including in response to changes in fire risk;[75] give practical effect to bushfire risk mapping, urban design and construction standards;[76] and in some cases, require that proposals are referred to relevant fire authorities for assessment.[77]

Legal instruments such as tree preservation orders, Aboriginal cultural heritage protections,[78] and planning scheme codes and overlays that protect native vegetation, heritage and biodiversity may *limit* or *prohibit* fire hazard reduction.[79] Planning controls may also *facilitate* bushfire hazard reduction, including on private land. Facilitative tools include obligations to incorporate 'defendable space' into development permit applications for new dwellings, and mechanisms for encouraging landowners to maintain defendable spaces around

[74] These are established by statute and implemented through statewide planning schemes supplemented by local government area-specific provisions. See below n 84 for examples of policies and codes.

[75] Lucy Groenhart, Alan March and Mark Holland, 'Shifting Victoria's Emphasis in Land-Use Planning for Bushfire: Towards a Place-Based Approach' (2012) 27(4) *Australian Journal of Emergency Management* 33, 33.

[76] Ibid 33, 36.

[77] Mark Holland et al, 'Land Use Planning and Bushfire Risk: CFA Referrals and the February 2009 Victorian Fire Area' (2013) 31(1) *Urban Policy and Research* 41, 43–5; Macintosh, Foerster and McDonald, *Limp, Leap or Learn?* (n 7) 128–30. See generally Constanza Gonzalez-Mathiesen and Alan March, 'Nine Design Features for Bushfire Risk Reduction via Urban Planning' (2014) 29(3) *Australian Journal of Emergency Management* 29.

[78] Implemented through land use planning: see, eg, *Aboriginal Heritage Regulations 2018* (Vic) reg 7, which requires an approved cultural heritage management plan for certain hazard reduction activities in areas of 'cultural heritage sensitivity'.

[79] For instance, in NSW, protections made under planning instruments such as state planning policies and local planning schemes 'cannot prohibit, require development consent for or otherwise restrict' bushfire hazard reduction work: *Rural Fires Act 1997* (NSW) s 100C(1).

existing homes and infrastructure.[80] Planning tools that facilitate bushfire hazard reduction also include exemptions from permit rules for some forms of vegetation clearing. For example, to protect human life and property from bushfires, cl 52.12 of the *Victoria Planning Provisions* allows landowners and occupiers in bushfire prone areas to clear vegetation around buildings and boundary fences, and to create or maintain defendable space, without a planning permit.[81]

Bushfire safety measures and design requirements are also implemented through land use planning arrangements, including planning guidelines, policies, codes and standards.[82] These bushfire protection instruments may require or permit urban design features for bushfire protection, including fire-resilient landscaping and building siting and obligatory setback distances from the bush, or 'Asset Protection Zones'.[83] Bushfire protection instruments also facilitate emergency fire responses by requiring permanent water supplies, emergency egress and evacuation routes, standards for road design and infrastructure protection.[84] Mainstreaming bushfire protection into state planning frameworks has been an area of major law reform in Australia in the past two decades, but the degree to which planning frameworks give effect to bushfire protections varies widely, both across states and territories and between local government areas.[85] Characteristics that affect whether bushfire protections are

[80] For example, landholders can maintain defendable space around existing dwellings as well as new developments by claiming bushfire mitigation exemptions from certain vegetation clearing rules: see below Part III(B)(2). These facilitative arrangements operate in parallel with obligations to manage fire hazards: see above Part III(A).

[81] Introduced into the scheme in August 2020: Department of Environment, Land, Water and Planning (Vic), *Victoria Planning Provisions* (Web Page, 10 June 2022) <https://planning-schemes.app.planning.vic.gov.au/Victoria%20Planning%20Provisions/ordinance>, archived at <https://perma.cc/E9FR-BU25>. See also Michael Eburn and Geoffrey J Cary, 'You Own the Fuel, but Who Owns the Fire?' (2017) 26(12) *International Journal of Wildland Fire* 999, 1002–3; McDonald and McCormack (n 57) 146.

[82] See below nn 83–4 and accompanying text.

[83] See, eg, Western Australian Planning Commission, *Guidelines for Planning in Bushfire Prone Areas* (Guidelines, 13 December 2021) 68.

[84] See, eg, NSW Rural Fire Service, *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities and Developers* (Report, November 2019) 44–5 ('*Planning for Bush Fire Protection* (NSW)'); Queensland Fire and Emergency Services, *Bushfire Resilient Communities: Technical Reference Guide for the State Planning Policy State Interest* (Report, October 2019) 9–10; Western Australian Planning Commission, *Planning in Bushfire Prone Areas* (State Planning Policy 3.7, December 2015) 4 [6.7.1]; ibid 21–2 [4.5.1].

[85] Anita Foerster, Andrew Macintosh and Jan McDonald, 'Transferable Lessons for Climate Change Adaptation Planning: Managing Bushfire and Coastal Climate Hazards in Australia' (2013) 30(6) *Environmental and Planning Law Journal* 469, 470 ('Transferable Lessons for

implemented or effective in practice include whether these instruments are directly referenced in state legislation or left to local councils to incorporate in planning provisions, whether bushfire safety requirements apply consistently across all stages of the planning process, and the level of discretion that decision-makers have in applying them.

Building regulations, such as national building standards and state and local building rules, operate alongside land use planning controls to improve the bushfire safety of dwellings.[86] The *National Construction Code* requires that new buildings in 'bushfire prone areas' comply with the relevant Australian standard.[87] The *Australian Standard: Construction of Buildings in Bushfire-Prone Areas* ('*Australian Standard*'), which governs construction in bushfire prone areas, requires a site-specific bushfire risk assessment based on bushfire attack level ('BAL') risk ratings which, in turn, determines the level of safety of building construction methods and materials required.[88] For example, a proposed dwelling in the highest category of risk (commonly described as the 'flame zone')[89] must be able to resist very high levels of ember attack, radiant heat and direct flame, so for dwellings in these areas, the *Australian Standard* requires non-

Climate Change Adaptation Planning'); Nigel Bell, 'Development in Australian Bushfire Prone Areas' (Design Note, 17 October 2019) <https://acumen.architecture.com.au/environment/place/climate/development-in-australian-bushfire-prone-areas/>, archived at <https://perma.cc/JC2D-PE33>; Michael Eburn and Bronwen Jackman, 'Mainstreaming Fire and Emergency Management into Law' (2011) 28(2) *Environmental and Planning Law Journal* 59, 61–2; Emily Browne and John Minnery, 'Bushfires and Land Use Planning in Peri-Urban South East Queensland' (2015) 52(3) *Australian Planner* 219, 219–20; Holland et al (n 77) 44.

86 See generally Constanza Gonzalez-Mathiesen et al, 'Urban Planning: Historical Changes Integrating Bushfire Risk Management in Victoria' (2019) 34(3) *Australian Journal of Emergency Management* 60. The relevant regulations are contained within vols 1–2 of Australian Building Codes Board, *National Construction Code* (at 1 July 2020) <https://ncc.abcb.gov.au/>, archived at <https://perma.cc/LK6V-RRUK> ('*National Construction Code*'), and are implemented through land use planning schemes and local government codes, policies and permitting processes.

87 *National Construction Code* (n 86) vol 1 pt G5. See also Standards Australia, *Australian Standard: Construction of Buildings in Bushfire-Prone Areas* (at 14 November 2018) 6 ('*Australian Standard*'). The *National Construction Code* (n 86) vol 2 pt 3.10.5 requires compliance with the *Australian Standard* (n 87).

88 *Australian Standard* (n 87) 30–3. The BAL rating is calculated on slope, surrounding vegetation type and clearance, and the Fire Danger Index: at 13–17; Christine Eriksen, Scott McKinnon and Eliza de Vet, 'Why Insurance Matters: Insights from Research Post-Disaster' (2020) 35(4) *Australian Journal of Emergency Management* 42, 44. Importantly, some states vary in their implementation of *National Construction Code* (n 86) rules. NSW applies the *Australian Standard* (n 87) to BAL ratings through the process described in *Planning for Bush Fire Protection* (NSW) (n 84) 23: see *National Construction Code* (n 86) vol 2 pt 3.10.5.

89 See, eg, NSW Rural Fire Service, *Australian Standard AS3959-1999* (Summary Table, 2018).

combustible cladding, bushfire shutters for windows and doors, and non-combustible gutters, among other things.[90]

Building controls have the potential to increase protection for new buildings, though they only apply in areas designated as bushfire-prone by state or local governments.[91] In practice, the majority of dwellings in bushfire-prone areas predate the BAL risk ratings, and the Bushfire Building Council has estimated that more than 90% of buildings in Australia are not built to the bushfire building standards.[92] Responsibility for managing bushfire risks to these established dwellings is complex and unclear. For example, while most states require annual maintenance checks for fire safety measures to protect against fires that affect built infrastructure, the same obligation does not exist for bushfire safety measures. In any case, local councils have few monitoring obligations for building standards and other bushfire safety measures, and rarely have the resources, political capital or incentives to monitor and enforce such conditions.[93]

Land use planning can govern whether and how landowners can rebuild in an area devastated by bushfire.[94] For example, the 2009 Victorian Royal Commission proposed a 'retreat and resettlement strategy for existing developments in areas of unacceptably high bushfire risk'.[95] This recommendation saw a modest 'opt in' scheme of land buybacks, resulting in 116 high-risk properties sold to government by 2014.[96] In contrast, in 2015 the Victorian Government introduced streamlined planning controls to facilitate rebuilding after the Wye River and Separation Creek bushfires,[97] and in 2020, introduced a new cl 52.10 to the

[90] *Australian Standard* (n 87) 9 [1.5.18]; Eliza de Vet and Christine Eriksen, 'When Insurance and Goodwill Are Not Enough: Bushfire Attack Level (BAL) Ratings, Risk Calculations and Disaster Resilience in Australia' (2020) 51(1) *Australian Geographer* 35, 37 ('When Insurance and Goodwill Are Not Enough'). Additional state construction and approval requirements may apply for development in the flame zone: at 38.

[91] de Vet and Eriksen, 'When Insurance and Goodwill Are Not Enough' (n 90) 43.

[92] *2020 Royal Commission Report* (n 1) 403 [19.20].

[93] See *NSW Bushfire Inquiry Final Report* (n 73) 195; Office of the Auditor General (WA), *Local Government Building Approvals* (Report No 28, 26 June 2019) 17.

[94] Note that land use planning rules intersect in important ways here with insurance laws: see below Part III(C)(7). Land use planning rules also intersect with disaster recovery and relief arrangements: see below Part III(C)(5). They also intersect with broader social and community drivers.

[95] *2009 Victorian Bushfires Royal Commission: Fire Preparation, Response and Recovery* (Final Report, July 2010) vol 2, 252 (recommendation 46) ('*2009 Victorian Bushfires Royal Commission Final Report*'). See also Foerster, Macintosh and McDonald, 'Transferable Lessons for Climate Change Adaptation Planning' (n 85) 474–5, considering 'retreat' strategies from fire-prone areas in a comparison of land use planning tools for coastal and bushfire hazards in Australia.

[96] *Bushfires Royal Commission Implementation Monitor* (Annual Report, July 2014) 45.

[97] 'Building in Wye/Sep Bushfire Affected Areas', *Colac Otway Shire* (Web Page), archived at <https://perma.cc/9ABU-V47Q>.

statewide planning scheme that, along with financial rebates, streamlined recovery and reconstruction for buildings destroyed by fire after 1 January 2019.[98] Over recent years, development has increased in heavily-vegetated, fire-prone peri-urban areas,[99] and this will remain an important land use planning challenge in coming decades.

While fire hazard reduction is governed under the laws described in Ring 1, land use planning laws also have a role to play. For example, recent reforms ensure that prescribed burning is not inhibited by planning laws, with the proviso that high-conservation value or sensitive environments usually receive specific protection. Many jurisdictions have also established planning law exemptions for clearing native vegetation that would otherwise be protected, provided that clearing is for a bushfire hazard reduction purpose. These exemptions are implemented through streamlined environmental assessment and landholder self-assessment frameworks under multiple statutes,[100] examples of which are described below.

2 *Native Vegetation and Private Land Management*

Historical clearing practices have left just 25% of Australia's original native vegetation extent intact, with far greater losses for some ecosystem types, such as native grasslands.[101] Every state and territory has laws and policies governing native vegetation clearing on private land, which may be implemented through land use planning schemes or standalone legislation.[102] These laws prohibit

[98] Clause 52.10 streamlines the planning permit application process, including by exempting certain planning permit applications from public notice and appeals processes, and now applies to emergencies other than bushfire: Department of Environment, Land, Water and Planning (Vic), *Planning Exemptions for Bushfire Reconstruction* (Factsheet, October 2021). This was accompanied by the Bushfire Recovery Planning and Building Assistance Rebate Program for the worst-affected regions, providing a rebate on costs up to $5,000 per property for professional advice in support of a building and/or planning permit to rebuild or repair a dwelling: 'Rebuilding and Recovery after Bushfire', *Department of Environment, Land, Water and Planning (Vic)* (Web Page, 24 January 2022) <https://www.planning.vic.gov.au/policy-and-strategy/bushfire/rebuilding-and-recovery>, archived at <https://perma.cc/VEA3-EDWY>.

[99] Norman, Newman and Steffen (n 16) 4.

[100] Some states have also produced guidelines and factsheets to support landholders in making decisions about the permits and processes that are required to reduce fire risks on their land: see, eg, NSW Rural Fire Service, *Before You Light That Fire: Advice for Landowners That Are Planning To Burn Vegetation on Their Property* (Fact Sheet); *Bush Fire Environmental Assessment Code 2021* (NSW) r 1.4.

[101] Noting that 13% of the estimated extent of Australia's original native vegetation has been completely converted to other land uses and another 62% has been disturbed or modified to some degree: Daniel J Metcalfe and Elisabeth N Bui, *Australia State of the Environment 2016: Land* (Report, 2017) 3.

[102] See, eg, *Local Land Services Act 2013* (NSW) pt 5A.

some forms of clearing and may create processes for assessing and/or permitting other forms of clearing, including by burning.[103]

Streamlined assessment processes, particularly for areas at high risk of bushfire, have changed the operation of native vegetation clearing rules on private land in many jurisdictions.[104] For example, the *10/50 Vegetation Clearing Code of Practice for New South Wales* ('*10/50 Code*') creates a qualified rule of thumb for clearing certain vegetation without the need for approvals.[105] The *10/50 Code* allows landholders in designated entitlement areas to clear trees within 10 metres of a home, and 'understory' vegetation within 50 metres of a home, without a permit.[106] Landholders conduct an online self-assessment to determine whether their property falls within an 'entitlement area' and, if it does, they must comply with the *10/50 Code*.[107] This may be best described as a 'no-stop-shop' arrangement, given that landholders need not engage with fire or planning authorities to determine their eligibility under the scheme.

The new *Rural Boundary Clearing Code for New South Wales* ('*Rural Boundary Code*') provides similar streamlined assessment and approval processes for rural landholders.[108] The *Rural Boundary Code* allows landholders to clear up

[103] See, eg, *Forest Practices Regulations 2017* (Tas) reg 4, enumerating circumstances in which a forest practices plan is not required, including for fire management work under an approved fire management program: reg 4(h); Forest Practices Authority, *Guidelines for Consideration of Exemptions under Regulation 4 of Forest Practices Regulations 2017: Circumstances in Which a Forest Practices Plan Is Not Required* (Guidelines, 22 April 2021) 8. See also *Native Vegetation Act 1991* (SA) ss 26–7. The regulation of native vegetation removal in Victoria is primarily implemented through local council planning schemes: see generally Department of Environment, Land, Water and Planning (Vic), *Guidelines for the Removal, Destruction or Lopping of Native Vegetation* (Guidelines, December 2017). The *Local Land Services Act 2013* (NSW) s 60C defines 'clearing' as 'removing', 'destroying' or 'burning' native vegetation, among other things.

[104] McDonald and McCormack (n 57) 158–9.

[105] NSW Rural Fire Service, *10/50 Vegetation Clearing Code of Practice for New South Wales* (Code, 4 September 2015) 6–9 ('*10/50 Code*'). The *Rural Fires Act 1997* (NSW) s 100C also exempts certain bush fire hazard reduction work from environmental planning controls under the *Environmental Planning and Assessment Act 1979* (NSW), and from the operation of the *Biodiversity Conservation Act 2016* (NSW) and *National Parks and Wildlife Act 1974* (NSW), with the qualification that such clearing must comply with a valid bushfire risk management plan and bushfire hazard reduction certificate.

[106] *10/50 Code* (n 105) 9. The *10/50 Code* (n 105) is authorised under the *Rural Fires Act 1997* (NSW) pt 4 div 9.

[107] As identified through a mapping tool available on the NSW Rural Fire Service website: 'Check If You're in a 10/50 Area', *NSW Rural Fire Service* (Web Page) <https://www.rfs.nsw.gov.au/plan-and-prepare/1050-vegetation-clearing/tool>, archived at <https://perma.cc/S3H5-4D43>. See also *10/50 Code* (n 105) 6–7.

[108] NSW Rural Fire Service, *Rural Boundary Clearing Code for New South Wales* (Code of Practice, 26 August 2021) 7–8 ('*Rural Boundary Code*').

to 25 metres from their property boundary to reduce bushfire hazards without approvals under any other legislation, even if the area to be cleared is threatened species habitat.[109] The *Rural Boundary Code* was developed in response to a NSW Bushfire Inquiry recommendation to further simplify vegetation management for rural landholders.[110] Native vegetation rules in other states also exempt some clearing along fence lines, though they are far more limited. For example, in Victoria, rural landholders may clear a combined maximum width of four metres across existing boundary fences;[111] in South Australia the exemption extends to a maximum width of five metres;[112] and in the Northern Territory, perimeter firebreaks must be no less than four metres wide and cleared of overhanging branches and any vegetation greater than 50 millimetres high.[113]

These streamlined assessment processes for native vegetation clearing were designed to improve the bushfire readiness of communities.[114] These processes aim to create certainty about the application of exemptions from clearing rules and reduce a perceived regulatory burden for landowners reducing fire hazards on their land.[115] Some of these processes have been tightened in recent years, including in response to criticisms that they prioritise fire hazard risk reduction

[109] *Rural Fires Act 1997* (NSW) ss 100RA–100RB. Though some vegetation is excluded from the *Rural Boundary Code* (n 108), including trees of significance to Aboriginal people, certain designated critically endangered ecological communities, and areas such as Lord Howe Island and designated areas of outstanding biodiversity value: cls 6.2, 6.7–6.8. In addition, clearing cannot be inconsistent with a legal obligation under, for example, conservation agreements, conditions on development permits or court orders: cl 6.9.

[110] *NSW Bushfire Inquiry: March Progress Report* (n 73) 26.

[111] See, eg, Department of Sustainability and Environment (Vic), *Preparing for Bushfire: 10/30 Rule, 10/50 Rule and Fence Line Clearing* (Fact Sheet, October 2011) 2 ('*Preparing for Bushfire*'). For land outside of metropolitan areas, where the 10/30 rule applies, an additional one metre can be cleared if land on the other side of the fence has already been cleared to a width of four metres or more: Department of Environment, Land, Water and Planning (Vic), *Vegetation Clearing Exemptions: Bushfire Protection* (Fact Sheet, August 2020) 2 ('*Vegetation Clearing Exemptions*').

[112] 'Fire Prevention: Around Dwellings and Fence Lines', *Department for Environment and Water (SA)* (Web Page) <https://www.environment.sa.gov.au/topics/native-vegetation/clearing/fire-prevention>, archived at <https://perma.cc/3ZES-V47P>.

[113] *Bushfires Management Act 2016* (NT) ss 68(1), (6).

[114] *Preparing for Bushfire* (n 111) 1.

[115] *Vegetation Clearing Exemptions* (n 111) 1. These schemes cannot exempt or override obligations to protect federally listed threatened species and ecological communities under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) ss 18–19.

over other important landscape values,[116] and based on evidence that landowners have used the exemptions to clear vegetation for purposes other than bushfire protection, including to improve views and real estate values.[117] Nevertheless, recent laws have tended to increase the responsibility of private landholders for mitigating bushfire risks on their land.[118] As obligations to remove fire risks from private land are applied more broadly and enforced more strictly, exemptions from native vegetation protections are also likely to become more common.

3 *Forestry Laws*

Bushfires can affect the viability and productivity of native and plantation forestry operations directly, by destroying forestry assets, and indirectly, for example, by interrupting the supply of timber and pulp products to the domestic building industry and international markets. Forestry laws govern the native and plantation forestry industries as well as some aspects of native vegetation management.[119] For example, regeneration burns may be required after timber is harvested;[120] forestry officials may establish firebreaks, and extinguish or manage hazardous fires in state forests, timber reserves and other forestry

116 See, eg, the revisions made to the NSW 10/50 scheme by the *Rural Fires Amendment (Bush Fire Prevention) Act 2015* (NSW) sch 1. See also New South Wales, *Parliamentary Debates*, Legislative Assembly, 12 August 2015, 2521–2 (David Elliott, Minister for Emergency Services) ('*Parliamentary Debates* (NSW)').

117 *Parliamentary Debates* (NSW) (n 116) 2521–2.

118 Legal reforms in 2020 in NSW have created the strongest powers yet for fire agencies to require private landowners to manage vegetation on their land to mitigate fire risk, with expanded powers for the Rural Fire Service to enter private property, clear land or conduct hazard reduction burns if a landowner has failed or refused to do so: *Rural Fires Act 1997* (NSW) s 70(2). There have also been legal reforms to facilitate hazard reduction, including on private land: see, eg, *NSW Bushfire Inquiry: March Progress Report* (n 73) 3.

119 Relevant statutory frameworks provide for the operation of, access to, and other uses of forestry products and forestry land, including through stock grazing and apiary permits: see, eg, *Forestry Act 2012* (NSW) pts 3–5; *Forestry Act 1959* (Qld) ss 35(1)(c)–(d); *Forestry Act 1950* (SA) pt 4; *Forest Management Act 2013* (Tas) ss 13–16; *Sustainable Forests (Timber) Act 2004* (Vic) pts 2, 5–7A; *Conservation and Land Management Act 1984* (WA) pts V, VIII; *Forest Products Act 2000* (WA) pts 7–8.

120 *Sustainable Forests (Timber) Act 2004* (Vic) ss 3(c), 70. But see *WOTCH Inc v VicForests [No 8]* [2021] VSC 268, [31], [40] (Keogh J); Department of Environment and Primary Industries (Vic), *Code of Practice for Timber Production 2014* (Code of Practice, 2014) ('*Timber Production Code of Practice*'), requiring that harvested coupes be regenerated as soon as practical, and that all practical measures are taken to protect areas excluded from harvesting from the impact of regeneration burns: cls 2.6.1.7–2.6.1.8.

areas;[121] and, in the absence of a permit, fires that are likely to injure, burn off or clear vegetation or forestry produce in a forestry area are prohibited.[122]

Forestry statutes also impose duties on lessees, licensees and permit holders to take reasonable measures to prevent, detect, control and extinguish any bush, grass or other fire in a forestry area,[123] and may empower forestry agencies to cooperate in hazard reduction burns on adjoining private or public land.[124] Forestry laws include subsidiary instruments such as forestry codes, regulations and policies[125] and, in some jurisdictions, intergovernmental Regional Forest Agreements ('RFAs') between state and Commonwealth governments.[126] RFAs provide Commonwealth accreditation to state forest management arrangements, exempting forestry operations from Commonwealth approvals processes under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) including in relation to land clearing and fire management.[127]

Various measures have been taken since the Black Summer fires to assess damage and the potential for short-term adjustments to forestry operations in fire-affected areas. The NSW Environment Protection Authority imposed new conditions on some state forestry operations to protect soil, water quality and

[121] See, eg, *Forestry Act 1959* (Qld) s 61TW; *Forests Act 1958* (Vic) s 29; *Sustainable Forests (Timber) Act 2004* (Vic) pt 8; *Conservation and Land Management Act 1984* (WA) ss 33(1)(aa), 99A(2)(b), 120.

[122] See, eg, *Forestry Act 1959* (Qld) s 62; *Forests Act 1958* (Vic) ss 63–4; *Conservation and Land Management Act 1984* (WA) s 104(1).

[123] See, eg, *Forestry Act 1959* (Qld) ss 63–63A; *Forests Act 1958* (Vic) s 67; *Conservation and Land Management Act 1984* (WA) ss 104(1)(b), 105. See also *Sustainable Forests (Timber) Act 2004* (Vic) ss 80–1.

[124] See, eg, *Forestry Act 1959* (Qld) s 68; *Forests Act 1958* (Vic) ss 62B–62C.

[125] See, eg, *Timber Production Code of Practice* (n 120). Four codes of practice govern private native forestry across forestry regions in NSW: see 'Private Native Forestry Codes of Practice', *Local Land Services (NSW)* (Web Page) <https://www.lls.nsw.gov.au/help-and-advice/private-native-forestry/private-native-forestry-code-of-practice>, archived at <https://perma.cc/28MF-7J58>.

[126] RFAs are in operation in Tasmania and in regions of NSW, Western Australia ('WA') and Victoria: see 'Regional Forest Agreements', *Department of Agriculture, Water and the Environment (Cth)* (Web Page, 22 October 2020) <https://www.awe.gov.au/agriculture-land/forestry/policies/rfa>, archived at <https://perma.cc/Q28M-LYYL>.

[127] The Full Court of the Federal Court of Australia has discussed the scope of Victoria's RFAs and their interaction with certain other Victorian and Commonwealth laws in detail: *VicForests v Friends of Leadbeater's Possum Inc* (2021) 285 FCR 70, 103–4 [126]–[129] (Jagot, Griffiths and SC Derrington JJ).

biodiversity in heavily burnt landscapes,[128] including limiting harvest intensity and protecting habitat hollows and some areas of unburnt or lightly-burnt trees.[129] In Victoria, the State and Commonwealth governments initiated a joint 'Major Event Review' to assess the environmental, economic, social and cultural impacts of the fires and their implications for the long-term stability of Victoria's forest industries.[130] The review is being overseen by an independent panel, and is the first of its kind, due to report in 2021 and make recommendations about remedial actions for future forestry operations in the State.[131]

After the Black Summer fires, unburnt and lightly-burnt forests in south-eastern Australia are dramatically more important habitats for species. Emergency federal funding[132] and other measures to protect native forest harvesting have been criticised for accelerating the destruction of these areas,[133] even as

[128] The NSW Environment Protection Authority's website provides a full list of sites and new conditions: 'Bushfire-Affected Forestry Operations', *NSW Environment Protection Authority* (Web Page, 14 July 2021) <https://www.epa.nsw.gov.au/your-environment/native-forestry/bushfire-affected-forestry-operations>, archived at <https://perma.cc/7DEE-C8AE>.

[129] Ibid.

[130] The major event review provision is unique to Victorian RFAs and was included as part of the RFA modernisation process in March 2021, supported by a power held by the Minister to review the allocation of timber resources in Victoria if there has been 'a significant variation, as a result of fire … in the timber resources in State forests which are available for timber harvesting in accordance with sustainable forest management': *Sustainable Forests (Timber) Act 2004* (Vic) s 18(2)(a). See 'The Major Event Review of Regional Forest Agreements', *Department of Environment, Land, Water and Planning (Vic)* (Web Page, 6 January 2022) <https://www.delwp.vic.gov.au/futureforests/what-were-doing/the-major-event-review-of-regional-forest-agreements>, archived at <https://perma.cc/27NP-GP35>. At the time of writing, a final report had yet to be delivered to the Victorian and Commonwealth governments. For updates, see 'Major Event Review of the Victorian Regional Forest Agreements', *Department of Agriculture, Water and the Environment (Cth)* (Web Page, 14 December 2021) <https://www.awe.gov.au/agriculture-land/forestry/policies/rfa/regions/victoria/mer>, archived at <https://perma.cc/57Q8-4DVX>.

[131] Commonwealth of Australia and State of Victoria, *Victorian Regional Forest Agreements: Scoping Agreement for the Major Event Review To Assess the Impacts of the 2019–20 Bushfires* (Agreement, September 2020) 5–8 <https://www.awe.gov.au/sites/default/files/documents/major-event-review-scoping-agreement.pdf>, archived at <https://perma.cc/GQ3H-6DB7>.

[132] Including $65 million in Commonwealth funding for privately-owned native forestry operators in NSW and Victoria to rebuild wood processing facilities and subsidise transport costs for burnt, salvaged logs to be processed outside of fire-affected areas: 'Supporting Forestry Bushfire Recovery', *Department of Agriculture, Fisheries and Forestry (Cth)* (Web Page, 21 September 2021) <https://www.agriculture.gov.au/forestry/bushfirerecovery>, archived at <https://perma.cc/4YEW-HC5D>.

[133] ER Bendall et al, *Conserving Fauna in Fire-Prone Landscapes: A Review of Fire-Associated Management Actions That Affect Fauna Conservation and Recovery* (Report, July 2021) 4, noting that salvage logging has an overwhelmingly negative impact on native fauna post-fire. The

native forestry operations are being phased out in some jurisdictions.[134] Increasingly frequent and severe bushfires in south-eastern Australia will complicate these plans for Australia's forestry industry, as the intensive nature of plantation forestry renders it even more vulnerable to bushfire than native forests.[135] Future fire regimes will exacerbate challenges and conflicts over forest management and, without statutory intervention, Australian courts will continue to have to decide relative priorities and trade-offs for managing Australia's forest estate.[136]

4 *Protected Area Management Laws*

Bushfires can have a catastrophic impact on natural and cultural values protected in Australia's reserve estate, particularly when entire protected areas are burnt, as occurred in some places in 2019–20.[137] The primary purpose of protected area legislation, regulations and statutory management plans is to ensure that land designated as a protected area is managed in a way that maintains the area's natural and cultural values, including from the harmful effects of fire.[138]

In some cases, protected area laws empower land managers to use fire to conserve protected values, including to recover lost ecological processes, improve the health of natural ecosystems and restore Indigenous fire practices.[139]

Supreme Court of Victoria has issued injunctions to prevent Victoria's forestry agency from conducting logging and regeneration burns in multiple coupes since early 2020: see, eg, *WOTCH Inc v VicForests [No 4]* [2020] VSC 433, [5]–[6] (Keogh J). See also *Kinglake Friends of the Forest Inc v VicForests* [2020] VSC 865, [35]–[36] (Ginnane J).

134 Such operations will be phased out by 2030 under the Victorian Forestry Plan: 'Victorian Forestry Plan', *Department of Jobs, Precincts and Regions (Vic)* (Web Page, 11 April 2022) <https://djpr.vic.gov.au/forestry/forestry-plan>, archived at <https://perma.cc/6C4R-8MMG>; and by the beginning of 2024 in WA: Government of Western Australia, 'McGowan Government's Historic Move To Protect Native Forests' (Media Release, 8 September 2021).

135 In NSW, 26% of the plantation estate was burnt in the Black Summer fires and more than 70% of plantations experienced 'severe canopy damage': David MJS Bowman et al, 'The Severity and Extent of the Australia 2019–20 *Eucalyptus* Forest Fires Are Not the Legacy of Forest Management' (2021) 5(7) *Nature Ecology and Evolution* 1, 1. The impact in plantations was greater than that observed in native forestry coupes: at 4–5.

136 Legal reforms are being investigated to resolve this tension in favour of conservation: see, eg, 'Defending the Unburnt: A Landmark Legal Initiative', *Environmental Defenders Office* (Web Page, 15 April 2021) <https://www.edo.org.au/2021/04/15/defending-the-unburnt-a-landmark-legal-initiative/>, archived at <https://perma.cc/K2TG-6JU4>.

137 For example, 100% of Charleston Conservation Park and Porter Scrub Conservation Park were burnt in the South Australian bushfires: Government of South Australia (n 47) iii.

138 See Tony Press, *Tasmanian Wilderness World Heritage Area Bushfire and Climate Change Research Project* (Final Report, December 2016) 9–12.

139 See Phillipa C McCormack, 'Australia's Legal Frameworks for Biodiversity Conservation: Facilitating Adaptation in a Rapidly Changing World' (PhD Thesis, University of Tasmania,

For example, the statutory management plan for Kakadu National Park reintroduced cultural burning to wetlands to restore Indigenous connection to Country and rebuild lost biodiversity processes.[140] Protected area laws also govern the management of bushfires in protected areas,[141] including with obligations to exclude fire to protect sensitive ecosystems such as Gondwana forests and alpine peatlands[142] and to actively suppress or extinguish fires.[143] Suppressing or extinguishing fires may require firebreaks, either through back burning or mechanical clearing with bulldozers, and applying chemical fire retardants and suppressants.[144] Protected area managers may be required to rehabilitate a protected area if a fire, or fire management activities, have caused damage to protected values.[145] There is some controversy about how best to balance the value of extinguishing a fire to maintain values and protect neighbouring

January 2018) ch 5. However, fire intensity, frequency and timing matter a great deal: see Matthew G Gale and Geoffrey J Cary, 'Stand Boundary Effects on Obligate Seeding *Eucalyptus Delegatensis* Regeneration and Fuel Dynamics following High and Low Severity Fire: Implications for Species Resilience to Recurrent Fire' (2021) 46(5) *Austral Ecology* 802, 802–3, 814.

140 Sandra McGregor et al, 'Indigenous Wetland Burning: Conserving Natural and Cultural Resources in Australia's World Heritage-Listed Kakadu National Park' (2010) 38(6) *Human Ecology* 721, 722–4; Kakadu National Park Board of Management, *Kakadu National Park Management Plan 2016–2026* (Report, 2016) 88–91 ('*Kakadu Management Plan*').

141 Legislation and regulation may be accompanied by other, more specific instruments, such as codes of practice or fire management plans: see, eg, *National Parks and Reserves Management Act 2002* (Tas) s 88A, which empowers the Minister to approve a code of practice guiding fire prevention, management and control in Tasmania's reserved land. See also Tasmania Parks & Wildlife Service, *Tasmanian Wilderness World Heritage Area: Draft Fire Management Plan* (Plan, 2021) ('*Tasmanian Wilderness World Heritage Area*').

142 See, eg, *National Parks and Reserves Management Act 2002* (Tas) sch 1. The NSW Government's Macquarie Marshes vegetation threshold of '[t]oo [f]requently [b]urnt' requires managers to exclude fire as much as possible: National Parks & Wildlife Service (NSW), *Macquarie Marshes Nature Reserve Fire Management Strategy (Type 2) 2020–2025* (Strategy, 13 March 2020). See generally *Tasmanian Wilderness World Heritage Area* (n 141).

143 See, eg, *National Parks and Reserves Management Act 2002* (Tas) s 30(3)(ca), which empowers management to 'take any steps or undertake any activities that the managing authority considers necessary or expedient for the purposes of preventing, managing or controlling fire in reserved land'.

144 See Jennifer Styger, *The Impact of Firefighting Chemicals on the Natural Values of the Tasmanian Wilderness World Heritage Area* (Report, 2018) 1. Bulldozers and chaining, also known as fuel-modification or scrub rolling, are used to create firebreaks and access routes across fire grounds and may be explicitly permitted under protected area management plans: see, eg, Department of Primary Industries, Parks, Water and Environment (Tas), *Tasmanian Wilderness World Heritage Area (TWWHA) Management Plan* (Report, 2016) 171.

145 For example, the fire strategy for the Macquarie Marshes requires emergency rehabilitation after fire to prevent erosion where vegetation has been cleared for new firebreaks, containment lines and access tracks, requiring that drainage lines and channels disturbed by the construction of containment lines be rehabilitated as soon as possible as part of the suppression operations: McCormack, 'Climate Change, Wildfires and Wetland Ecosystem Services' (n 49) 432.

properties, and the short- and long-term impacts of firefighting methods in sensitive areas.[146] There is no single formula for balancing these objectives across all ecosystems or regions, and the balance will likely become more complex in future, as catastrophic bushfires threaten fire-sensitive ecosystems and repeatedly burn protected areas beyond their capacity to recover.[147]

Protected area managers in Australia have been criticised following major bushfires for failing to mitigate fire risks on public land. The 2020 Royal Commission into National Natural Disaster Arrangements ('National Royal Commission') noted that this critique may be due, at least in part, to a lack of community understanding about the role and effectiveness of bushfire mitigation strategies.[148] Nevertheless, the NSW Government has already begun implementing a recommendation from its latest inquiry that public land managers be subject to the same bushfire risk mitigation obligations as those imposed on private landowners. The *Rural Fires Act 1997* (NSW) also now requires public land managers to pass on complaints they receive about bushfire hazards directly to the NSW Rural Fire Service.[149] These kinds of reforms may increase scrutiny and costs for public protected area agencies while also creating conflict between bushfire mitigation priorities and protection for other important values.[150]

146 See, eg, Styger (n 144) 2–6; *Tasmanian Wilderness World Heritage Area* (n 141) 51.

147 Senate Environment and Communications References Committee, Parliament of Australia, *Responses to, and Lessons Learnt from, the January and February 2016 Bushfires in Remote Tasmanian Wilderness* (Report, December 2016) 10, 18; Press (n 138) 23. Fires in some protected areas will trigger Australia's international reporting obligations, such as the requirement to report changes to the ecological character of listed wetlands: McCormack, 'Climate Change, Wildfires and Wetland Ecosystem Services' (n 49) 428. Fires in such areas may also trigger '[w]orld [h]eritage in [d]anger' listings: see 'The World Heritage Convention', *Department of Climate Change, Energy, the Environment and Water (Cth)* (Web Page, 3 October 2021) <https://www.awe.gov.au/parks-heritage/heritage/about/world/world-heritage-convention>, archived at <https://perma.cc/8AFG-9SHY>.

148 *2020 Royal Commission Report* (n 1) 375 [17.58]. A similar critique was rejected in Australasian Fire and Emergency Service Authorities Council, *AFAC Independent Operational Review: A Review of the Management of the Tasmanian Fires of December 2018–March 2019* (Report, July 2019) 32 [4.3.11], 34 [4.3.17]–[4.3.18].

149 *Rural Fires Act 1997* (NSW) s 74CA, as amended by *Bushfires Legislation Amendment Act 2020* (NSW), which came into effect in November 2020; *NSW Bushfire Inquiry Final Report* (n 73) 176 (recommendation 23). See also *NSW Bushfire Inquiry: March Progress Report* (n 73) 22.

150 For a broader discussion about competing values and trade-offs in legal frameworks: see generally Foerster, Macintosh and McDonald, 'Trade-Offs in Adaptation Planning' (n 5); Blythe McLennan and Michael Eburn, 'Exposing Hidden-Value Trade-Offs: Sharing Wildfire Management Responsibility between Government and Citizens' (2015) 24(2) *International Journal of Wildland Fire* 162.

5 *Indigenous Land and Fire Management*

Indigenous peoples have used fire to shape and manage landscapes across the Australian continent for more than 60,000 years.[151] Colonisation disrupted traditional burning practices,[152] and the re-emergence of traditional burning practices is testament to the resilience of Indigenous peoples and their cultures.

'Cultural burning' describes the deliberate use, management or exclusion of fire for cultural purposes.[153] Relevant laws will depend on the tenure of the land that is to be burned, and the nature of Indigenous rights to manage that land. For example, Indigenous peoples may own land in freehold, including as a result of land rights legislation[154] and, in very rare cases, where a native title determination recognises 'exclusive possession' of land.[155] More commonly, native title rights and interests are limited to rights to practice traditional customs and 'have a say' in land management.[156] To conduct cultural burns on privately-owned land, Indigenous landholders will typically need to comply with the same legal obligations as non-Indigenous landholders.[157] On land that is co-managed, including where non-exclusive native title rights exist, 'having a say' may include the right to conduct or negotiate certain forms of cultural burning

[151] 'Cultural Burning Practices in Australia' (Background Paper, Royal Commission into National Natural Disaster Arrangements, 15 June 2020) 4 ('Cultural Burning Background Paper').

[152] Statutory prohibitions on burning are one source of this disruption: see above Part II.

[153] Cultural burning may have other benefits, such as hazard reduction and carbon abatement: see below Part III(C)(3). However, by definition, the primary purpose of these burns is the protection, maintenance and enhancement of Indigenous culture.

[154] See, eg, *Aboriginal Land Grant (Jervis Bay Territory) Act 1986* (Cth) pt III; *Aboriginal Land Rights (Northern Territory) Act 1976* (Cth) s 4; *Aboriginal Land Act 1991* (Qld) pt 2A; *Aboriginal Land Rights Act 1983* (NSW) pt 2; *Aboriginal Lands Trust Act 2013* (SA) pt 4; *Aṉangu Pitjantjatjara Yankunytjatjara Land Act 1981* (SA) pts 2–3; *Aboriginal Lands Act 1995* (Tas) pt 3; *Aboriginal Lands Act 1970* (Vic) s 9; *Aborigines Act 1889* (WA) 52 Vict, No 24, s 8 (although the Government could retain title for Crown land reserved for Aboriginal people). Private hand backs of land are uncommon: but see Phoebe Hosier, 'Tom and Jane Own 220 Hectares: Today They're Handing Back Half to the Aboriginal Community', *ABC News* (online, 21 February 2019) <https://www.abc.net.au/news/2019-02-21/tasmanian-private-land-handed-back-to-aboriginal-community/10825984>, archived at <https://perma.cc/75C5-S6QJ>.

[155] *Fortescue Metals Group v Warrie* (2019) 273 FCR 350, 451 [363] (Jagot and Mortimer JJ), 452–3 [370] (Robertson and Griffiths JJ). See also Richard Bartlett, 'Native Title Rights to Exclusive Possession, Use and Enjoyment and the Yindjibarndi' (2018) 43(1) *University of Western Australia Law Review* 92, 102–4.

[156] Human Rights and Equal Opportunity Commission, *Native Title Report 2006* (Report, 5 April 2007) 32. See also *Native Title Act 1993* (Cth) ss 44A–44B; *Traditional Owner Settlement Act 2010* (Vic) pt 4. See generally 'Glossary', *National Native Title Tribunal* (Web Page) <http://www.nntt.gov.au/Pages/Glossary.aspx>, archived at <https://perma.cc/5UDQ-TFQL>.

[157] That is, in accordance with the laws described in Part III(B) above, for 'private land' and 'native vegetation'.

or collaborate with land managers such as parks agencies to burn for cultural (and other) purposes.[158]

In some jurisdictions, cultural burning may be assessed and permitted by fire agencies or land management authorities on non-Indigenous land.[159] For example, sch 5A of the *Local Land Services Act 2013* (NSW) allows native vegetation clearing for non-commercial, 'traditional Aboriginal cultural activit[ies]', implicitly including cultural burning.[160] There are few formal mechanisms for facilitating 'good fire' through multi-tenure cultural burning, including on non-Indigenous private land, but there is growing interest in the possibility of legal support for this form of fire management at landscape scales.[161]

C *Legal Context (Ring 3)*

The third ring of Figure 1 illustrates the broader legal context for bushfires in Australia. These laws are not specific to fire or land management but shape the wider context that informs social and ecological vulnerability and resilience to bushfire. These laws operate across a diverse range of issues, including emergencies and disasters, governing climate change and public health. This legal context is important for understanding the effectiveness or failure of particular aspects of bushfire governance.

1 *Emergency Management Laws*

Emergency management laws and policies provide a fundamentally important legal context to Australia's legal framework for bushfire. These laws and policies establish and implement the Prevention, Preparedness, Response and Recovery management framework, and underpin all fire response activities. However, emergency management laws govern more than simply emergency response or, in this context, fire management. Australian emergency management

[158] See, eg, *Kakadu Management Plan* (n 140) 90 [5.3.18].

[159] See McNamara (n 14) 35–6; 'Cultural Burning Background Paper' (n 151) 6–10.

[160] *Local Land Services Act 2013* (NSW) sch 5A cl 18.

[161] See below Part IV.

legislation[162] provides for emergency planning at the local, regional and state level,[163] and for the exercise of emergency powers by the Minister or appointed emergency controller (often the police commissioner or local police commander).[164] It also ensures whole-of-government response and planning for long-term recovery from emergencies, including the appointment of a recovery coordinator.[165]

There are overlaps between the legal context for emergency management and the broader, institutional context listed in Ring 4. Chief and delegated officers are given power to take whatever action is necessary to respond to a bushfire as well as more general emergency management powers, such as the power to require people to remove or reduce risks in anticipation of future fires (for example, to clear vegetation but not to retrofit their homes with fire protection) and to take action after a fire (for example, to secure areas and remove debris).[166] In theory, emergency management should be pre-emptive in the sense that taking steps to prevent a hazard is considered part of emergency management. Emergency managers however have little control over prevention. The discussion of other laws above demonstrates that all laws impact on risk and contribute to a greater or lesser degree to risk prevention. Chief officers or professional emergency managers cannot determine building codes or make land use planning decisions. Although 'prevention' is considered part of emergency management theory, institutional arrangements for emergency management, including providing for emergency services, are mostly reactive, coming to the fore during an emergency and not during the 'calm before the [fire]storm' when steps could be taken to reduce risk.[167] Emergency management is a key element in bushfire law but the risk posed by fire is just one factor to be considered by many decision-makers.[168]

[162] *Emergencies Act 2004* (ACT); *State Emergency and Rescue Management Act 1989* (NSW); *Emergency Management Act 2013* (NT); *Disaster Management Act 2003* (Qld); *Emergency Management Act 2004* (SA); *Emergency Management Act 2006* (Tas); *Emergency Management Act 1986* (Vic); *Emergency Management Act 2013* (Vic); *Emergency Management Act 2005* (WA).

[163] With the exception of the Australian Capital Territory which, because of its size, does not have local or regional planning: *Emergencies Act 2004* (ACT) pt 4.4; Explanatory Statement, Emergencies Bill 2004 (ACT) 2.

[164] *Emergencies Act 2004* (ACT) pt 3.2.

[165] See, eg, ibid pt 7 div 7.3.3; *Emergency Management Act 2013* (NT) ss 32–3; *Emergency Management Act 2005* (WA) pt 2 div 2.

[166] See, eg, *Emergencies Act 2004* (ACT) ch 5; *Emergency Management Act 2013* (NT) pt 3.

[167] Michael Eburn and Stephen Dovers, 'Mainstreaming Fire and Emergency Management across Legal and Policy Sectors: Preliminary Findings on Measures of Success' (2012) 27(2) *Australian Journal of Emergency Management* 14, 16–17.

[168] See below Part IV.

2 *Other Environmental and Natural Resource Management Laws*

Environmental laws are operationalised through assessment, approval and enforcement processes when human activities harm, or threaten to harm, environmental values. These laws provide a crucial context for reducing fire hazards and responding to bushfires. Some environmental laws are already addressed in Ring 2, such as protected area management and aspects of land use planning (through which environmental laws such as native vegetation and biodiversity protections find their practical implementation). Other environmental laws, such as air, land and water pollution controls also intersect closely with categories of law such as public health laws that protect humans from harmful pollutants such as bushfire smoke.[169] Natural resource management laws govern the use and management of natural assets for human-oriented values such as forestry industries,[170] mining,[171] weed management[172] and the protection of water catchments.[173]

It is useful to begin by considering environmental and natural resource management laws together because they intersect in relation to fire in important ways. For example, freshwater ecosystems and drinking water catchments are both increasingly at risk of contamination during and immediately after bushfires, when rain can wash ash and sediments into waterways. The implications of this contamination range from habitat destruction and the suffocation of freshwater species, to 'do not drink' declarations for city water supplies

[169] See below Part III(C)(6). As noted in the introduction to Part III above, some legal instruments are common to both environmental and public health laws for smoke pollution, including the *National Environment Protection (Ambient Air Quality) Measure 1998* (Cth) and *National Environment Protection Council Act 1994* (ACT). Pollution laws are commonly considered to fall within a sub-category of environmental law, and regulate — as a form of environmental pollution — smoke emitted both from domestic fires and from controlled fires such as hazard reduction burns: see, eg, *Environmental Management and Pollution Control (Smoke) Regulations 2019* (Tas) regs 7–9, developed under the *Environmental Management and Pollution Control Act 1994* (Tas) s 102.

[170] See above Part III(B)(3).

[171] For example, mine site rehabilitation can dramatically increase fuel loads and fire risk in the broader landscape: Andrew H Grigg, Melanie A Norman and Carl D Grant, 'Prescribed Burning of Thinning Slash in Regrowth Stands of Jarrah (*Eucalyptus Marginata*) following Bauxite Mining in South-West Australia' (2010) 19(6) *International Journal of Wildland Fire* 737, 738, 744.

[172] The intersection between weed and fire management can present valuable opportunities for co-benefits. For example, the *Gamba Fire Mitigation Policy* (n 58) authorises Territory officials under both the *Weeds Management Act 2001* (NT) and the *Bushfires Management Act 2016* (NT) to work with landholders to reduce risks from late-season fires in gamba grass, because this nationally-listed weed can cause fires up to eight times more intense than native grass fires: *Gamba Fire Mitigation Policy* (n 58) 5.

[173] See, eg, *Water Act 2007* (Cth) ss 3(a), (c), (d)(iii).

and damage to coastal fish nurseries, seagrass systems and aquaculture industries.[174] Some existing legal and institutional arrangements are poorly equipped to facilitate emergency intervention and long-term rehabilitation across connected waterway and catchment systems, where biodiversity and water resource values are damaged by fire and sediments.[175] The complexity of planning for and managing the effects of bushfire in these connected environments will require more research and may require new legal principles and priorities that transcend traditional siloed approaches.[176]

A more specific focus on species conservation law — a well-recognised subcategory of environmental law — also demonstrates the complexity of governing fire for environmental outcomes. Some legal instruments for conserving species, habitats and ecological communities promote the use of fire to conserve fire-adapted threatened species and habitats.[177] For example, the statutory recovery plan for the endangered northern bettong recommends actively experimenting with fire as a recovery tool, including by establishing 'an experimental fire management mosaic with intensive monitoring'.[178] Recent research

[174] Jason Alexandra and C Max Finlayson, 'Floods after Bushfires: Rapid Responses for Reducing Impacts of Sediment, Ash, and Nutrient Slugs' (2020) 24(1) *Australasian Journal of Water Resources* 9, 9–10; Ian White et al, 'The Vulnerability of Water Supply Catchments to Bushfires: Impacts of the January 2003 Wildfires on the Australian Capital Territory' (2006) 10(2) *Australasian Journal of Water Resources* 179, 183. Drinking water systems can also become contaminated when bushfire ash and chemical runoff or melted plastic affect drinking water pipes, an issue that remains unregulated and poorly understood, but which intersects with building regulations: see above Part III(B)(1). This issue also intersects with public health laws: see below Part (III)(C)(6). See also Caitlin R Proctor et al, 'Wildfire Caused Widespread Drinking Water Distribution Network Contamination' (2020) 2(4) *AWWA Water Science* e1183:1–14, 1–2.

[175] See JJ Shelley, TA Raadik and M Lintermans, *Summary of the 2019–20 Bushfire Impacts on Freshwater Fish and Emergency Conservation Response in South-Eastern Australia* (Report, August 2021) 22–4; McCormack, 'Climate Change, Wildfires and Wetland Ecosystem Services' (n 49) 443–4.

[176] See generally Bendall et al (n 133).

[177] But note that the intensity, frequency and timing of conservation burns are crucial considerations for maintaining desirable fire regimes and conserving focal habitats, ecological communities and ecosystems: see Gale and Cary (n 139) 802–3, 814. See also above Part III(B)(4) for a discussion on protected area laws.

[178] Andrew Dennis and Northern Bettong Recovery Team, *Recovery Plan for the Northern Bettong:* Bettongia Tropica *2000–2004* (Report, 2001) 19 (action 1.3.1). The Queensland recovery plan was adopted by the Commonwealth government under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth), and is available on the Commonwealth government's website: 'Recovery Plan for the Northern Bettong (Bettongia Tropica) 2000–2004', *Department of Climate Change, Energy, the Environment and Water (Cth)* (Web Page, 10 October 2021) <https://www.dcceew.gov.au/environment/biodiversity/threatened/recovery-plans/recovery-plan-northern-bettong-bettongia-tropica-2000-2004>, archived at <https://perma.cc/FUS8-HS98>.

that implemented that recovery action has reiterated the value of actively introducing 'early season patchy burns' for the species' conservation.[179] Other legal instruments, such as the recovery plan for the critically-endangered NSW *Grevillea caleyi*, recommends the use of specific fire intervals, such as excluding fire in some circumstances, to avoid serious conservation losses.[180] Catastrophic bushfires complicate this conservation law context for land managers and fire agencies, including because fire suppression may cause greater ecological harm than bushfires themselves.[181]

Changing fire regimes can cause population declines and local extinctions, as with alpine ash forests in Victoria's highlands;[182] exacerbate the impact of existing threats such as invasive predators[183] and habitat loss from land clearing;[184] and cause particularly severe impacts on 'fire naïve' species in sensitive ecosystems such as temperate rainforests and alpine peatlands.[185] The 2019–20 fire season is estimated to have affected more than three billion vertebrate animals, both directly by causing death and injury, and indirectly by, for example,

[179] Threatened Species Recovery Hub, *Saving the Endangered Northern Bettong with Fire Management* (Fact Sheet, September 2021) 4.

[180] This grevillea species is killed by fire and adversely affected by high fire frequency. Its recovery plan warns that 'fire-free intervals of less than 8–12 years will lead to local population extinctions': Department of Environment and Conservation (NSW), Grevillea Caleyi *R Br (Proteaceae) Recovery Plan* (Report, March 2004) 13. After being adopted by the Commonwealth on 11 April 2005, the plan expired in October 2015 and has not been replaced: see '*Grevillea Caleyi*: Caley's Grevillea', *Department of Agriculture, Water and the Environment (Cth)* (Web Page) <http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=9683>, archived at <https://perma.cc/FGW3-JT59>.

[181] See Dana M Backer, Sara E Jensen and Guy R McPherson, 'Impacts of Fire-Suppression Activities on Natural Communities' (2004) 18(4) *Conservation Biology* 937, 938; Michael P Dombeck, Jack E Williams and Christopher A Wood, 'Wildfire Policy and Public Lands: Integrating Scientific Understanding with Social Concerns across Landscapes' (2004) 18(4) *Conservation Biology* 883, 885.

[182] David MJS Bowman et al, 'Abrupt Fire Regime Change May Cause Landscape-Wide Loss of Mature Obligate Seeder Forests' (2014) 20(3) *Global Change Biology* 1008, 1014.

[183] See Bronwyn A Hradsky, 'Conserving Australia's Threatened Native Mammals in Predator-Invaded, Fire-Prone Landscapes' (2020) 47(1) *Wildlife Research* 1, 2; Lauren Delaney, Julian Di Stefano and Holly Sitters, 'Mammal Responses to Spatial Pattern in Fire History Depend on Landscape Context' (2021) 36(3) *Landscape Ecology* 897, 897–8; Hugh W McGregor et al, 'Extraterritorial Hunting Expeditions to Intense Fire Scars by Feral Cats' (2016) 6 *Scientific Reports* 22559:1–7, 1.

[184] See generally Bendall et al (n 133).

[185] Dale G Nimmo et al, 'Welcome to the Pyrocene: Animal Survival in the Age of Megafire' (2021) 27(22) *Global Change Biology* 5684, 5687.

increasing competition for the little-remaining habitat, shelter and food.[186] In this context, fire refugia and areas of long-unburnt habitat are both increasingly rare and important for biodiversity,[187] though neither is prioritised in conservation laws. Statutory processes for listing and protecting species must become more efficient to rapidly recalibrate management priorities for the safeguarding of species populations and their habitats in burnt and unburnt areas.[188]

3 *Climate Change Law*

Climate change law provides important legal context for bushfire management in Australia in four ways. First, rapid progress on Australia's international commitments to climate mitigation may reduce the impacts of future climate change, including from intensifying bushfire regimes.[189] Emissions from fire must be factored into Australia's greenhouse gas inventory.[190] The Intergovernmental Panel on Climate Change ('IPCC') technical guidance on greenhouse accounting allows an exemption for large, infrequent bushfires that are beyond human control. Countries may account for the year-to-year variability in emissions and post-fire sequestration, and report the long-term trend.[191]

The relevance of fire-based emissions means that improved fire practices can contribute to the mitigation effort. A methodology has been approved under Australia's Climate Solutions Fund that allows low-intensity savanna burning in northern Australia to create carbon credits equivalent to the emissions that

[186] Lily M van Eeden et al, *Impacts of the Unprecedented 2019–20 Bushfires on Australian Animals* (Report, November 2020) 7, 9, 39; Ward et al (n 29) 1321. Some groups such as insects are largely beyond the scope of conservation laws and fire impacts on them remain largely unknown: see Chris Dickman et al, *After the Catastrophe: A Blueprint for a Conservation Response to Large-Scale Ecological Disaster* (Report, January 2020) 3.

[187] Arjan JH Meddens et al, 'Fire Refugia: What Are They, and Why Do They Matter for Global Change?' (2018) 68(12) *BioScience* 944. See also Kelly M Dixon et al, 'More Long-Unburnt Forest Will Benefit Mammals in Australian Sub-Alpine Forests and Woodlands' (2019) 44(7) *Austral Ecology* 1150, 1159.

[188] Dickman et al (n 186) 9.

[189] Catastrophic bushfires can be categorised as climate disasters, given that they result from both natural climate variability and anthropogenic climate change: Rosemary Lyster, 'Climate Disaster Law: Does It Hold the Key to Dealing with Bushfires?' (2020) 64 *Law Society of NSW Journal* 68, 68; Intergovernmental Panel on Climate Change, *Managing the Risks of Extreme Events and Disasters To Advance Climate Change Adaptation: Special Report of the Intergovernmental Panel on Climate Change* (Report, 2012) 33.

[190] Ivar R van der Velde et al, 'Vast CO_2 Release from Australian Fires in 2019–2020 Constrained by Satellite' (2021) 597(7876) *Nature* 366, 369.

[191] Eduardo Calvo Buendia et al, *2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Overview* (Report, 2019) 14.

would otherwise derive from bushfires on these lands.[192] Traditional owners can claim carbon credits equivalent to the emissions 'saved' by this technique, thus creating an incentive for 'good' fire management.[193]

The promotion of forest carbon activities for carbon dioxide removal ('CDR') may have other important implications for bushfire.[194] Methodologies for measuring carbon removal assume the permanence of storage and therefore account for 'significant reversals' of carbon storage in areas affected by bushfire.[195] The Clean Energy Regulator must be notified of significant reversal events and a calculation of their impact will determine whether carbon credits must be relinquished.[196] Second, terrestrial 'nature-based' carbon removal approaches can themselves increase bushfire risk because they typically involve large-scale plantations that increase fuel load and place demands on water supply, and potentially constrain fire mitigation activities that adversely affect carbon storage.[197] This is a growing problem because large-scale deployment of CDR is a core assumption in recent IPCC reports and Australia is almost

[192] Department of the Environment and Energy (Cth), *Savanna Fire Management: Carbon Farming Roadmap* (Report, December 2019) 7–8.

[193] The Clean Energy Regulator calculates emissions abatements using a government-approved methodology: *Carbon Credits (Carbon Farming Initiative — Savanna Fire Management — Emissions Avoidance) Methodology Determination 2018* (Cth) pt 4 div 2. It issues Australian carbon credit units under the *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth) pt 2 and, prior to its automatic repeal under ch 3 pt 4 of the *Legislation Act 2003* (Cth), the *Carbon Credits (Carbon Farming Initiative) Regulations 2011* (Cth). The Commonwealth methodology has created new opportunities for cultural burning on Country in Northern Australia. One example is the establishment of an Aboriginal-owned, not-for-profit carbon farming business, established by Aboriginal traditional owners in the Northern Territory to support their engagement with the carbon industry: 'About Us', *Arnhem Land Fire Abatement* (Web Page) <https://www.alfant.com.au/about-us>, archived at <https://perma.cc/WC89-RSGM>; Corey JA Bradshaw et al, 'Brave New Green World: Consequences of a Carbon Economy for the Conservation of Australian Biodiversity' (2013) 161 *Biological Conservation* 71, 80.

[194] One such strategy is bioenergy with carbon capture and storage. This is the process of burning vegetation (which is absorbed in its growth cycle) to create bioenergy (replacing other forms of energy emissions), and capturing and storing the carbon dioxide produced in the process so that it is 'carbon-negative': Alexandre Babin, Céline Vaneeckhaute and Maria C Iliuta, 'Potential and Challenges of Bioenergy with Carbon Capture and Storage as a Carbon-Negative Energy Source: A Review' (2021) 146 *Biomass and Bioenergy* 105968:1–25, 2.

[195] Australian Government Clean Energy Regulator, *Reducing the Risk of Fire and Preserving Sequestered Carbon in Emissions Reduction Fund Vegetation Projects* (Report) 1–7.

[196] *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth) ss 90–1.

[197] For example, young trees need more water and are more flammable in the first decade. See Australian Government Clean Energy Regulator (n 195), which provides that 'well planned and conducted prescribed burning will have a far lower impact on credited carbon stores over the life of the project than an uncontrolled bushfire. The same is likely to be said for most fire risk reduction activity': at 4.

certain to expand its reliance on these activities over coming decades.[198] Laws and policies will need to balance competing CDR priorities against bushfire risk mitigation and fire response.

Finally, climate laws in some jurisdictions require decision-makers to consider the impacts of climate change when making plans, policies and decisions in sectors that have bushfire implications. For example, ss 34–5 of the *Climate Change Act 2017* (Vic) require the preparation of adaptation action plans for the built and natural environments and for primary production, supporting adaptation-oriented planning for bushfire, among other things, in those sectors.

4 *Common Law Liability Rules*

Common law liability rules include actions in negligence and nuisance, each of which are frequently called into play in the context of bushfire litigation. Ordinary principles of negligence apply when determining whether someone can be held liable for damage caused by fire.[199] To establish negligence the plaintiff must establish that a duty of care exists, that the defendant failed to exercise reasonable care in breach of that duty, and that that failure caused the plaintiff's losses.[200] It is not sufficient to simply demonstrate that a person caused or contributed to a fire that damaged property.[201] Rather, that person must have been negligent in causing the fire or in their response once it was alight.[202]

Case law confirms that a person who lights a fire *does* have a duty of care to avoid that fire causing harm.[203] Government agencies, including fire services and the Australian Defence Force, are typically protected by statutory limitations on liability for hazard mitigation and fire management, provided

198 Phillipa C McCormack, Jan McDonald and Kerryn A Brent, 'Governance of Land-Based Negative-Emission Technologies To Promote Biodiversity Conservation: Lessons from Australia' (2020) 10(2) *Climate Law* 123, 123–6.

199 See *Burnie Port Authority v General Jones Pty Ltd* (1994) 179 CLR 520, 530–1 (Mason CJ, Deane, Dawson, Toohey and Gaudron JJ) ('*Burnie Port Authority*'). See, eg, *Civil Liability Act 2002* (NSW) s 35, which empowers a court to allocate liability among multiple 'concurrent wrongdoer[s]' based on their respective responsibility for the harm.

200 See *Jaensch v Coffey* (1984) 155 CLR 549, 585–6 (Deane J); *Strong v Woolworths Ltd* (2012) 246 CLR 182, 186 [3] (French CJ, Gummow, Crennan and Bell JJ).

201 See *Burnie Port Authority* (n 199) 585–6 (McHugh J), citing *Hazelwood v Webber* (1934) 52 CLR 268, 277 (Gavan Duffy CJ, Rich, Dixon and McTiernan JJ); Michael Eburn, 'Proving the Ignition Source Does Not Prove Negligence', *Australian Emergency Law* (Blog Post, 23 December 2020) <https://emergencylaw.wordpress.com/2020/12/23/proving-the-ignition-source-does-not-prove-negligence/>, archived at <https://perma.cc/ZW2C-UQP6>.

202 Eburn, 'Proving the Ignition Source Does Not Prove Negligence' (n 201), discussing *Burnie Port Authority* (n 199) 547 (Mason CJ, Deane, Dawson, Toohey and Gaudron JJ).

203 *Burnie Port Authority* (n 199) 547 (Mason CJ, Deane, Dawson, Toohey and Gaudron JJ).

members (whether employees or volunteers) act in good faith.[204] These protections do not currently extend to landholders conducting fire hazard reduction burns on private property,[205] despite a statutory obligation in every state and territory to manage fire hazards on private land.[206] Case law has also established that firefighting agencies do not owe a duty of care to individuals who may be affected by a fire so it is not possible to sue for a failure to attend and protect private property.[207] Given the growing emphasis on individual responsibility for fire hazards, Eburn and Cary have argued that governments should legislate to ensure that hazard reduction burns conducted in good faith, and in compliance with the terms of a valid permit, attract a statutory defence to negligence claims if the fire escapes and causes damage.[208]

Common law litigation may drive improvement in fire safety, but it is a blunt and imprecise tool. First, litigation is only worthwhile where a defendant can pay. Uninsured defendants will not be pursued and, where defendants are insured, it is the insurer and not the defendant who must meet the costs.[209] Those costs may be passed to the pool of premium payers, but negligent defendants are not exposed to the full cost of the damage caused. Second, litigation may or may not result in a determination of where fault lies. For example, electricity companies have paid to compensate bushfire victims for fires that were allegedly caused by a fault or failure in electricity infrastructure,[210] an outcome that *should* speed up the adoption of strategies such as grounding powerlines, constructing micro-grids and implementing energy security measures such as

[204] See *Rural Fires Act 1997* (NSW) s 128(1), providing immunity for acts done in good faith; *Defence Act 1903* (Cth) s 123AA.

[205] Eburn and Cary (n 81) 1001; *Woodhouse v Fitzgerald* (2021) 104 NSWLR 475, 495–6 [81] (Basten JA), cited in Michael Eburn, 'Verdict against Landowners for RFS Managed Controlled Burn Set Aside', *Australian Emergency Law* (Blog Post, 9 April 2021) <https://emergencylaw.wordpress.com/2021/04/09/verdict-against-landowners-for-rfs-managed-controlled-burn-set-aside/>, archived at <https://perma.cc/Y5M2-WP86>.

[206] For a detailed discussion of the relevant legal frameworks, see McDonald and McCormack (n 57) 144–52.

[207] See, eg, *Warragamba Winery Pty Ltd v New South Wales [No 9]* [2012] NSWSC 701, [719], [734] (Walmsley AJ) ('*Warragamba Winery*'); *Electro Optic Systems Pty Ltd v New South Wales* (2014) 10 ACTLR 1, 80–1 [340]–[342] (Jagot J, Murrell CJ agreeing at 7 [2], Katzmann J agreeing at 196–7 [740]) ('*Electro Optic Systems*'). See also *Capital & Counties plc v Hampshire County Council* [1997] QB 1004, 1029–30 (Stuart-Smith LJ for the Court); *Hamcor Pty Ltd v Queensland* [2014] QSC 224, [3], [127], [155] (Dalton J) ('*Hamcor*').

[208] Eburn and Cary (n 81) 1004.

[209] See generally Michael Legg, 'Kilmore East Kinglake Bushfire Class Action Settlement Distribution Scheme: Fairness, Cost and Delay Post-Settlement' (2018) 44(3) *Monash University Law Review* 658.

[210] One example is the 2009 Kilmore East class action: see ibid 659–60.

backup power sources in hospitals.[211] However, most of those claims have settled without electricity authorities admitting liability or a court making a finding of negligence or liability. Electricity companies can, and do, still deny fault and legal liability.[212] Finally, even if it is possible to reduce risk and liability, the cost of taking action may exceed the potential liability and may not be tolerated by the community. For example, a consultation paper published by the Powerline Bushfire Safety Taskforce after the 2009 Black Saturday fires found that the community would not accept the increased electricity charges that would be required to bury high-risk power lines, nor would they tolerate deliberate decisions to disconnect power on high fire danger days.[213]

Regulatory reforms are needed to complement what is a weak litigation imperative and to speed up the transition.[214] In recent years, electricity providers in the United States have sought to avoid potential liability by shutting down power supply in anticipation of catastrophic fires, triggering blackouts and brownouts.[215] For vulnerable communities and sectors such as health care, preemptive power outages to avoid liability may be just as harmful to life and health as a bushfire itself. Questions about the appropriate scope of common law liability for igniting and responding to bushfires in Australia, whether for corporations, military personnel or private landholders, must be considered in this broader regulatory, social and ethical context.

5 *Disaster Relief and Recovery*

Natural hazards such as bushfires only constitute a 'disaster' when they affect human communities in a way that exceeds the capacity of those communities

[211] These are all technologies that have existed for some time and that, together, can contribute to reducing bushfire risks from electricity infrastructure to near-zero: Senate Select Committee on Agricultural and Related Industries, Parliament of Australia, *The Incidence and Severity of Bushfires across Australia* (Report, August 2010) 44.

[212] *Rowe v AusNet Electricity Services Pty Ltd* [2015] VSC 232, [5]–[13], [31] (Emerton J); *Matthews v AusNet Electricity Services Pty Ltd* [2014] VSC 663, [32] (Osborn JA) ('*Matthews*'); Michael Eburn, 'Bushfires: The Price We Pay for Electricity', *Australian Emergency Law* (Blog Post, 20 May 2014) <https://emergencylaw.wordpress.com/2014/05/20/bushfires-the-price-we-pay-for-electricity/>, archived at <https://perma.cc/U72P-HWLN>.

[213] Powerline Bushfire Safety Taskforce, *Final Report* (Report, 30 September 2011) 8–11, 70–1.

[214] See generally Powerline Bushfire Safety Taskforce (n 213); Victorian Auditor-General's Office, *Reducing Bushfire Risks: Independent Assurance Report to Parliament 2020–21* (Report, October 2020) ('*Reducing Bushfire Risks*').

[215] Myanna Dellinger, 'Electric Utility Wildfire Liability Reform in California' (2019) 49(11) *Environmental Law Reporter* 11003, 11003.

to cope and recover.[216] The recommendations of inquiries into major fire events have tended to focus on policy and legal reforms to reduce bushfire risk and improve community and agency preparedness and emergency response for the next fire season.[217] There has been less focus on how best to support recovery for those who have already suffered in a disaster, and lost property or suffered personal injury or the loss of a loved one.[218] Emergency relief is critically important in the immediate aftermath of an extreme event,[219] but this relief is aimed only at providing funds for short-term accommodation and other necessities such as food and home clean-up, and at replacing certain damaged contents.[220] Even with that limited focus, there is no guarantee that payments will be sufficient to cover those costs.[221]

Access to support for disaster relief and recovery after extreme events such as bushfires depends on a complex range of factors, including whether state governments declare an area to be a 'disaster area', whether legal and policy thresholds are reached to qualify for access to state and Commonwealth financial assistance, and whether individual insurance policies are adequate and accessible.[222] States and territories hold primary responsibility for coordinating relief and recovery efforts, including financial assistance, though all states and territories have delegated some recovery responsibilities to local government.[223]

[216] Thus, while natural and human-caused *hazards* such as bushfires are inevitable, *disasters* are not: see Mami Mizutori, 'Reflections on the Sendai Framework for Disaster Risk Reduction: Five Years since Its Adoption' (2020) 11(2) *International Journal of Disaster Risk Science* 147, 147–9.

[217] Georgina Barnes and Jan McDonald, 'Bushfire Recovery through Class Action Litigation' (2021) 40(1) *University of Tasmania Law Review* 33, 34.

[218] Ibid.

[219] See, eg, Prime Minister of Australia, 'Boost for Bushfire Recovery' (Media Release, 11 May 2020). See also *2009 Victorian Bushfires Royal Commission Final Report* (n 95) vol 1 ch 8.

[220] See, eg, 'Disaster Relief and Support', *NSW Government* (Web Page, 2021) <https://www.nsw.gov.au/disaster-recovery/disaster-relief-and-support>, archived at <https://perma.cc/GYQ3-43M7>; 'Financial Assistance', *VicEmergency* (Web Page, 2021) <https://emergency.vic.gov.au/relief/#financial_assistance>, archived at <https://perma.cc/BS92-MF8Q>.

[221] See, eg, Paige Cockburn, 'Bushfire Financial Aid "a Slap in the Face" as Family Receives $1,280 after Their Wytaliba Home Burned Down', *ABC News* (online, 17 January 2020) <https://www.abc.net.au/news/2020-01-17/bushfire-recovery-financial-aid-too-little-too-late/11869252>, archived at <https://perma.cc/5293-TX68>.

[222] Of course, recovery depends on far more than legal support, and requires access to initiatives such as support for mental and emotional health and wellbeing, community and family support structures, and long-term efforts to build hope for the future: see *2020 Royal Commission Report* (n 1) 427 [21.1]; Christine Eriksen and Eliza de Vet, 'Untangling Insurance, Rebuilding, and Wellbeing in Bushfire Recovery' (2020) 59(2) *Geographical Research* 228, 237–8.

[223] *2020 Royal Commission Report* (n 1) 430 [21.17].

The Commonwealth government is also involved in disaster relief and recovery, supporting and implementing the *National Disaster Risk Reduction Framework*.[224] The Commonwealth provides financial assistance to state and territory governments through its Disaster Recovery Funding Arrangements and cost-sharing arrangements, and to individuals under the *Social Security Act 1991* (Cth).[225] Ad hoc funding may also be provided through Commonwealth grant payments to local governments and non-government organisations and through tax exemptions and concessions under Australia's tax laws,[226] coordinated through the new National Recovery and Resilience Agency.[227] The 2020 National Royal Commission recommended a greater focus beyond recovery funding including by providing, relevantly, more consistent guidance and greater capacity-building for local government through standing disaster recovery plans, and clarity about the different roles, relevant processes and thresholds for addressing community recovery needs.[228]

6 *Public Health Law*

Public health law is the body of legal powers held by and duties imposed on governments, healthcare providers, employers and others, to reduce health risks, such as air pollution from smoke haze, and improve mental and physical

[224] *National Disaster Risk Reduction Framework* (n 7). The framework lists 'examples of sectors with a role to play in reducing disaster risk', including insurance, finance, investment, agriculture, energy, health and community services: at 20–1. This is the framework through which Australia implements its commitments under the *Sendai Framework for Disaster Risk Reduction 2015–2030*, GA Res 69/283, UN Doc A/Res/69/283 (3 June 2015): *National Disaster Risk Reduction Framework* (n 7) 6. See also 'Sendai Framework for Disaster Risk Reduction 2015–2030', *United Nations Office for Disaster Risk Reduction* (Web Page, 2015) <https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030>, archived at <https://perma.cc/9FZR-QCDT>.

[225] Provided that the responsible Commonwealth minister makes a determination that an event is a 'major disaster': *Social Security Act 1991* (Cth) s 1061KA(1)(c).

[226] See, eg, *Income Tax Assessment Act 1936* (Cth) s 170B; *Income Tax Assessment Act 1997* (Cth) ss 30-45A, 30-46, 59-55, 59-60. See also 'Australian Disaster Relief Funds and Tax Deductible Gifts', *Australian Taxation Office* (Web Page, 29 July 2020) <https://www.ato.gov.au/Non-profit/Getting-started/In-detail/Types-of-DGRs/Australian-disaster-relief-funds-and-tax-deductible-gifts/>, archived at <https://perma.cc/DAG7-EYTU>.

[227] A non-statutory body established in response to a recommendation of the *2020 Royal Commission Report* (n 1): 'About Us', *National Recovery and Resilience Agency (Cth)* (Web Page) <https://recovery.gov.au/about-us>, archived at <https://perma.cc/6596-AK4C>. The National Recovery and Resilience Agency will oversee, among other things, distribution of the National Bushfire Recovery Fund: '2019–20 Bushfires Support', *National Recovery and Resilience Agency (Cth)* (Web Page) <https://recovery.gov.au/recovery-support/2019-20-bushfires>, archived at <https://perma.cc/Y5GJ-L2JK>.

[228] *2020 Royal Commission Report* (n 1) 427 [21.2]–[21.7], 436–9 [21.32]–[21.43].

health outcomes across the Australian population.[229] Bushfire smoke is a major public health concern and impacts from smoke were perhaps the most significant health effects of the 2019–20 fires: approximately 11 million Australians were affected by poor air quality from smoke, with the Australian Capital Territory recording the worst air quality in the world in January 2020.[230] The health impacts from smoke included respiratory and cardiovascular illness, poor mental health and premature death.[231] To reduce health impacts from smoke, public health laws operate alongside environmental laws for air pollution control[232] including by restricting when and how controlled fires should be lit and managed.[233] State and territory regulators and public health officials must also conduct and report on air quality monitoring, set air quality standards[234] and publish air quality information, public health alerts and advice.[235]

As bushfires increase in frequency and scale, smoke pollution and other health impacts associated with bushfires will also increase. Legal frameworks can facilitate planning and risk mitigation, and guide trade-offs at a domestic scale — for example, by guiding trade-offs between reducing bushfire risk (such as hazard reduction burning) and managing community health impacts

229 Lawrence O Gostin, 'A Theory and Definition of Public Health Law' (2007) 10(1) *Journal of Health Care Law and Policy* 1, 1. But note that specific employment contexts such as firefighting are governed by occupational health and safety laws: see below Part III(C)(10).

230 Senate Finance and Public Administration References Committee, *Lessons To Be Learned in Relation to the Australian Bushfire Season 2019–20* (Interim Report, 7 October 2020) 68 [4.9], 69 [4.13] ('*Lessons To Be Learned in Relation to the Australian Bushfire Season*').

231 *2020 Royal Commission Report* (n 1) 311 [14.2]. Smoke from the 2019–20 bushfires is estimated to have resulted in an additional $1.95 billion in health costs: at 313 [14.11]. See also Arriagada et al (n 27) 282.

232 See above Part III(C)(2).

233 Implementing the *National Environment Protection (Ambient Air Quality) Measure 1998* (Cth) under the *National Environment Protection Council Act 1994* (Cth) s 7 and corresponding state legislation, which provides nationally agreed targets for regulating six key air pollutants, including particulate matter emitted from bushfires and controlled burning, and which requires increasingly stringent and legally binding targets to be developed for the future.

234 See, eg, Emergency Management Victoria, *Standard for Smoke, Air Quality and Community Health: Significant Fires with Fine Particles as the Primary Smoke Component of Health Concern* (Report, January 2021) 10.

235 Joshua C Hyde et al, 'Air Quality Policy and Fire Management Responses Addressing Smoke from Wildland Fires in the United States and Australia' (2017) 26(5) *International Journal of Wildland Fire* 347, 354; *2020 Royal Commission Report* (n 1) 314 [14.15]–[14.17]. National health arrangements and capabilities for national emergencies are coordinated under the *National Health Security Agreement* (Agreement, November 2011) and the *National Health Security Act 2007* (Cth). See also *NSW Bushfire Inquiry Final Report* (n 73) 238–9 (recommendations 34–5). States should publish information and advice in more consistent ways in order to avoid confusion: *Lessons To Be Learned in Relation to the Australian Bushfire Season* (n 230) 73 [4.31].

(including those arising from extended exposure to smoke).[236] The recent catastrophic bushfires in Australia created smoke haze that travelled all the way around the Earth, thus highlighting a new challenge for public health law, policy and management that transcends national borders.[237]

7 *Insurance Law*

Insurance plays a crucial role in community resilience, providing important context at all stages of bushfire preparedness, response and recovery.[238] For example, insurance laws influence potential and actual exposure to financial losses from fire, and high insurance premiums may influence where people can afford to build and live. Insurance can also affect hazard reduction activities including, for example, when high premiums prevent community organisations from conducting low-intensity cultural burns on Country.[239] Legislation in each state and territory has redefined the scope of insurance products covering fire-related loss, to mandate the incorporation of loss and damage caused by firefighting agencies responding to a fire.[240] Insurance plays a crucial role in recovery, determining the resources available to individuals to recover from bushfires, including by informing whether, where and how they can afford to (re)build.

[236] See GJ Williamson et al, 'A Transdisciplinary Approach to Understanding the Health Effects of Wildfire and Prescribed Fire Smoke Regimes' (2016) 11(12) *Environmental Research Letters* 125009:1–11, 1–2.

[237] Eric Kerr and Malini Sur, 'Australia's Bushfire Smoke Is Lapping the Globe, and the Law Is Too Lame To Catch It', *The Conversation* (online, 24 January 2020) <https://theconversation.com/australias-bushfire-smoke-is-lapping-the-globe-and-the-law-is-too-lame-to-catch-it-130010>, archived at <https://perma.cc/LTA4-WHPQ>.

[238] In Australia there is 'no specific insurance for catastrophic losses', which is 'particularly problematic' given the nation's growing exposure to events such as extreme bushfires: Rachel Anne Carter, 'Wild Fires: The Legal Regulatory System of Insurance and Emergency Services Funding' (2011) 14 *Southern Cross University Law Review* 75, 75. See also Kate Booth and Stewart Williams, 'Is Insurance an Under-Utilised Mechanism in Climate Change Adaptation? The Case of Bushfire Management in Tasmania' (2012) 27(4) *Australian Journal of Emergency Management* 38, 40–4.

[239] See, eg, Ben Collins, 'Indigenous Rangers in WA North Priced Out of Bushfire Prevention by Insurance Price Jump', *ABC News* (online, 1 February 2021) <https://www.abc.net.au/news/2021-02-01/indigenous-rangers-kimberley-bushfire-management/13090088>, archived at <https://perma.cc/WK78-7W4X>.

[240] That is, if a property is insured for fire-related damage, that insurance will extend to cover damage that a firefighting agency causes in the process of fighting the fire, including knocking down a fence or cutting containment lines: see, eg, *Rural Fires Act 1997* (NSW) s 28(1). See generally Michael Eburn, 'The Effect of s 28 of the Rural Fires Act 1989 (NSW)', *Australian Emergency Law* (Blog Post, 25 January 2021) <https://emergencylaw.wordpress.com/2021/01/25/the-effect-of-s-28-of-the-rural-fires-act-1989-nsw/?>, archived at <https://perma.cc/BBT9-SC7Q>.

Calculating home and contents insurance is complex, and miscalculations are an important cause of underinsurance,[241] alongside sharp increases in the cost of insurance premiums.[242] The Australian Prudential Regulatory Authority has argued that infrastructure upgrades, up-to-date hazard mapping, stronger building codes and land use rezoning are essential to achieving more affordable insurance premiums.[243] However, these kinds of reforms are unlikely to be sufficient without clear, accurate and timely information to home owners and occupiers about their exposure and vulnerability to bushfires.[244]

Access to private insurance may be conditional on compliance with building codes or other safeguards.[245] There are fewer opportunities to reduce insurance premiums by managing fire risks well after a development is complete, though the NSW Government is investigating opportunities for households to reduce their insurance premiums by demonstrating that they have mitigated their bushfire risk to a particular, defined standard.[246] Rising insurance costs are particularly challenging, and potentially inequitable, for tenants needing contents cover.

8 *Property Law and Tenancy Rights and Obligations*

Private property rights provide a crucial backdrop to most land-related activities, creating the expectation (though not necessarily the reality) that a private landholder has authority to choose how they will manage their land. Statutes in each state and territory have moderated the extent to which this is true, including by imposing duties to manage fuel loads and fire hazards on private land,

241 See de Vet and Eriksen, 'When Insurance and Goodwill Are Not Enough' (n 90) 35.

242 The number of households that are underinsured or uninsured has risen sharply in recent years: Roxanne Libatique, 'Will Insurance Soon Be Out of Reach in Australia?', *Insurance Business Australia* (online, 3 March 2021) <https://www.insurancebusinessmag.com/au/news/breaking-news/will-insurance-soon-be-out-of-reach-in-australia-248039.aspx>, archived at <https://perma.cc/UWM2-PBYZ>.

243 Ibid.

244 See de Vet and Eriksen, 'When Insurance and Goodwill Are Not Enough' (n 90) 45. See also Chloe H Lucas and Kate I Booth, 'Privatizing Climate Adaptation: How Insurance Weakens Solidaristic and Collective Disaster Recovery' (2020) 11(6) *WIREs Climate Change* e676:1–14, 1.

245 See John McAneney et al, 'Government-Sponsored Natural Disaster Insurance Pools: A View from Down-Under' (2016) 15 *International Journal of Disaster Risk Reduction* 1, 6–7. The long-term financial sustainability of such schemes is also a challenge in the face of more severe extreme weather events increasing the number of claims: see generally Ruth Biggs, 'Paying for Disaster Recovery: Australia's NDRRA and the United States' NFIP' (2012) 27(2) *Australian Journal of Emergency Management* 26.

246 The partnership includes the Insurance Council of Australia and has been established to implement a recommendation made by the NSW Government in the *NSW Bushfire Inquiry: March Progress Report* (n 73) 26.

and empowering authorised officers, such as state fire agencies or a local council, to require certain bushfire mitigation works on private land.[247] For example, authorised officers have the power to enter private land to manage or remove fire hazards and undertake any other works required under a notice, to investigate the suitability of land for a proposed fire trail or assess the status of a registered fire trail, and to construct or maintain a fire trail.[248]

Important issues about private property boundaries, rights and obligations in the context of bushfires still remain. For example, it is unclear how responsibility for fire hazard reduction and management should be allocated between owners and occupiers.[249] The extent to which a tenant can be held responsible for failing to manage fire risks on leased land is also unclear. This issue becomes even more complex if, in order to protect a dwelling, easements or covenants are placed over adjoining land to facilitate necessary vegetation management for property protection.[250] As bushfires become more frequent and intense, the extent to which responsibility for damage caused by a bushfire can be traced back to a particular landowner or occupier will continue to be complex and hotly contested.[251]

9 *Social Security and Consumer Lending Laws*

The Commonwealth government has primary responsibility for social security laws, which include short-term and one-off payments for eligible individuals and families affected by bushfires (discussed briefly in Part III(C)(5) above). Social security, insurance and consumer lending laws interact closely in the context of financial hardship and recovery, post-bushfire. Commonwealth social security payments under the *Social Security Act 1991* (Cth) include the one-off Disaster Recovery Payment and the Disaster Recovery Allowance, which may be paid fortnightly for up to 13 weeks.[252] Both payments are means-tested and eligible individuals must have been affected by a 'major disaster'.[253] This

247 See above Part III(A); McDonald and McCormack (n 57) 144–6.

248 See, eg, *Rural Fires Act 1997* (NSW) pts 3B–4. See especially s 62ZP. For more on these obligations, see above Part III(A).

249 But note that the *Rural Fires Act 1997* (NSW) s 66 empowers hazard management officers to issue notices to the owner *or* occupier of land to undertake bushfire hazard reduction work.

250 For example, the maintenance of Asset Protection Zones: see above n 83 and accompanying text.

251 See Eburn and Cary (n 81) 1000; McDonald and McCormack (n 57) 138–40.

252 *Social Security Act 1991* (Cth) pts 2.23B–2.24.

253 Ibid ss 1061KA(1)(c), 1061K(1)(c). Section 23 defines 'major disaster' as a 'disaster in respect of which a declaration is in force'. The Act also empowers the Minister to make a determination of a 'major disaster' by reference, among other things, to the number of people affected and the extent to which the disaster is 'unusual': ss 36(2)(a)–(b).

means that access is contingent on the responsible minister making a determination that a major disaster exists.[254] These schemes are intended to streamline access to social security payments at a time when applicants are under enormous emotional strain, but when the process of accessing the payments is complex and slow, that process itself may re-traumatise bushfire victims.[255]

Communities and individuals often suffer severe financial hardship after a bushfire, including because they have lost homes, businesses, family and access to employment. The immediate causes of financial hardship can compound after a bushfire, when bushfire victims may fall behind in paying bills, rent and mortgages. Laws that regulate consumer lending can be crucial in this context, protecting vulnerable people from predatory lenders and 'debt-traps'.[256] Effective, efficient and equitable access to financial support after a bushfire is a crucial component of resilience-building and a fundamental driver for community and individual decision-making, and the absence of appropriate financial supports may undermine resilience in both the short- and long-term.

10 *Employment and Work Health and Safety Laws*

Employment laws impose obligations on employers, including fire agencies, to meet national employment standards, such as salaries and leave entitlements. WH&S laws supplement these obligations by requiring that employers ensure, as far as is reasonably practicable, the health and safety of employees and independent contractors, including by minimising risks from their working environment.[257]

Employment and WH&S laws also provide important legal context for volunteer firefighters during fire seasons. Individuals registered as volunteers with a recognised emergency management body — such as state emergency services,

[254] See, eg, *Social Security (Australian Government Disaster Recovery Payment — South Australia Bushfires) Determination (No 7) 2020* (Cth) s 4.

[255] See Alexandra Beech, Stephanie Dalzell and Jack Snape, 'Bushfire Recovery Costs Start at $2 Billion but Government Assistance Can't Pay the Bills', *ABC News* (online, 6 January 2020) <https://www.abc.net.au/news/2020-01-06/scott-morrison-bushfire-recovery-bill/11844096>, archived at <https://perma.cc/32HX-AGVQ>.

[256] Natalie Vella, Meghan Malone and Angela Lauman, 'Protecting the Environment and Fostering Financial Fairness: Recovering from the 19–20 Bushfires' [2020] (May) *Ethos: Law Society of the Australian Capital Territory Journal* 12, 14.

[257] There are different rules in each state and territory but most align with the Safe Work Australia, *Model Work Health and Safety Bill* (Model Bill, 9 December 2019), discussed in Elizabeth Shi, 'What Employers Need To Know: The Legal Risk of Asking Staff To Work in Smokey Air', *The Conversation* (online, 13 January 2020) <https://theconversation.com/what-employers-need-to-know-the-legal-risk-of-asking-staff-to-work-in-smokey-air-129432>, archived at <https://perma.cc/L2D9-8TWM>. See also *NSW Bushfire Inquiry Final Report* (n 73) xv–xvi (recommendations 37–44).

the Royal Society for the Prevention of Cruelty to Animals, or the Country Fire Authority — are entitled to request community service leave from their employer.[258] The 2019–20 fire season demonstrated the risks of Australian firefighting agencies relying so heavily on volunteers, with some volunteers away from their usual employment for many months and businesses struggling to operate without key staff, prompting calls for new employment models and surge workforces.[259]

The 2019–20 fire season highlighted a broader dimension to the intersection between bushfires and WH&S law, with some employers directing their workers to stay at home to avoid the health risks of working in smoky air.[260] During the worst of the smoke haze in eastern Australian cities in early 2020, outdoor workers would have been exposed to hazardous air quality and low visibility. WH&S laws will likely require adjustments to work conditions in these circumstances, potentially requiring the provision of protective equipment such as masks and the rescheduling of work.[261] Whether office workers had access to a safer working environment at home was also a live question, and both WH&S and equity issues may arise for those workers who do not have access to home air conditioners or air filters in conditions of heavy bushfire smoke.

Other issues in employment law also arise. Employees may stay away from work to defend their property or if they are required to evacuate. This raises issues of whether employees will be forced to take annual leave or face dismissal if they cannot attend work. This will be particularly acute if the employee's home is impacted by a fire, but their workplace is not.

[258] The employee's award may contain specific provisions about community service leave, including whether that leave will be paid or unpaid: 'Employment Entitlements during Natural Disasters and Emergencies', *Fair Work Ombudsman (Cth)* (Web Page) <https://www.fairwork.gov.au/tools-and-resources/fact-sheets/rights-and-obligations/employment-entitlements-during-natural-disasters-and-emergencies>, archived at <https://perma.cc/7LWA-8GCC>.

[259] Blythe McLennan, Joshua Whittaker and John Handmer, 'The Changing Landscape of Disaster Volunteering: Opportunities, Responses and Gaps in Australia' (2016) 84(3) *Natural Hazards* 2031, 2033–4, 2037–43. See also Michelle Cull, 'Value beyond Money: Australia's Special Dependence on Volunteer Firefighters', *The Conversation* (online, 23 January 2020) <https://theconversation.com/value-beyond-money-australias-special-dependence-on-volunteer-firefighters-129881>, archived at <https://perma.cc/V4US-W787>.

[260] Highlighting overlaps and permeability across Ring 3, when smoke causes air pollution, it may trigger obligations under environmental laws, public health laws, and WH&S laws: see Andrew Greene, Kate Midena and Jordan Hayne, 'Canberra Air Quality Still Poor as Smoke Forces Home Affairs and Border Force To Close Doors', *ABC News* (online, 5 January 2020) <https://www.abc.net.au/news/2020-01-05/nsw-fires-blanket-canberra-in-thick-smoke/11841546>, archived at <https://perma.cc/A5LY-ERF7>.

[261] See Shi (n 257).

Many of the areas of law set out in Ring 3 are the subject of remarkably little bushfire-specific research in Australia. Having set out the 'anatomical components' of this legal context for bushfires, it is clear that this analysis has barely scratched the surface of the challenge of future bushfire regimes and the ways that these laws interact across the legal framework depicted in Figure 1. As the climate changes, compounding extreme events will complicate health and other community impacts from bushfires, complicating the possibility of recovery, the longevity of relief payments and the adequacy of insurance coverage. There is a clear need to develop our understanding of the legal implications of these changes across each of the categories of law in Ring 3.

D *Institutional Context (Ring 4)*

The three areas of law set out in Ring 4 are small in number but extremely broad in scope. These include the rules that govern litigation; the complex institutional arrangements for coordinating emergency management across Australia; and the constitutional basis for the allocation of power to make laws for bushfires, declare emergencies and allocate resources to fire planning, response and recovery. Each of these three areas of law intersect in a multitude of ways with the more-specific laws introduced in the other three rings in Figure 1.

1 *Litigation Rules*

Long-term recovery from bushfire requires access to funding to repair, rebuild, or relocate to safer areas. It is unrealistic to expect the public purse to compensate private individuals for bushfire losses. Private insurance is the primary source of coverage for bushfire losses[262] but, as noted above, un-insurance and underinsurance are rife.[263] Litigation has therefore been a critical means by which to fill gaps in insurance coverage and secure the funds necessary to recover from fire.[264] As Eburn and Dovers note, 'significant fire events such as the Black Saturday fires now trigger litigation almost before the fires are extinguished'.[265]

[262] See *2020 Royal Commission Report* (n 1) 417 [20.6]–[20.7].

[263] See ibid 418 [20.14]. See also above Part III(C)(7).

[264] The frequency has increased from one case every 10.4 years (from 1925–77) to one case every 3.8 years (from 1978–2009): Michael Eburn, 'Trends in Australian Wildfire Litigation' (Slide Deck, Wildland Fire Litigation Conference, 1 May 2015) 2.

[265] Michael Eburn and Stephen Dovers, *Litigation and Australian Bushfires* (Information Sheet, 2011) <https://www.bushfirecrc.com/sites/default/files/managed/resource/2011_poster_michael_eburn_stephen_dovers.pdf>, archived at <https://perma.cc/9Q6V-RZXY>. Since the Black Saturday bushfires, actions have been brought against four energy companies, the State of Victoria and the Country Fire Authority: see below nn 270–4 and accompanying text.

The target of bushfire litigation has changed over time.[266] In early litigation, the defendant was commonly the landowner or occupier. While some actions against parties who start fires persist,[267] the net has been cast widely in recent years: any party that contributed to damage, be they public land managers, energy infrastructure owners or firefighters, has been joined.[268] Claims are based principally in negligence, alleging mismanagement of a controlled burn that escapes[269] or failure to maintain electricity infrastructure.[270] Many are single plaintiff actions, but larger fire events can produce unmanageable volumes of litigation. The 1983 'Ash Wednesday' bushfires, for example, resulted in over 400 individual writs.[271] It is therefore unsurprising that class actions for bushfire

266 See Michael Eburn, 'Do Australian Fire Brigades Owe a Common Law Duty of Care? A Review of Three Recent Cases' (2013) 3(1) *Victoria University Law and Justice Journal* 55, 55–6; Tim Tobin and Andrew Fraatz, 'Bushfire Class Actions' (2012) 109 *Precedent* 4, 5–6. See generally *Rylands v Fletcher* (1868) LR 3 HL 330.

267 See, eg, *Herridge v Electricity Networks Corporation [No 4]* [2019] WASC 94, [1]–[11] (Le Miere J). See also Katri Uibu, 'Dunalley Fire Civil Action Case Hears Campfire in Stump Allegedly Led to 2013 Disaster', *ABC News* (online, 27 April 2021) <https://www.abc.net.au/news/2021-04-27/dunalley-fires-2013-class-action-reaches-court/100097528>, archived at <https://perma.cc/EMR3-WTYQ>.

268 Eburn and Dovers, *Litigation and Australian Bushfires* (n 265), noting that no actions against fire agencies have been successful: see, eg, *Warragamba Winery* (n 207) [1905] (Walmsley AJ); *Electro Optic Systems* (n 207) 7 [2] (Murrell CJ), 155–6 [522] (Jagot J), 197 [742]–[743] (Katzmann J); *Myer Stores Ltd v State Fire Commission* [2012] TASSC 54, [43], [52] (Blow J); *Hamcor* (n 207) [233], [370] (Dalton J). The net may extend further to alert system operators in the event of a significant failure: see 'Alert SA Scrapped by State Government after Failure during Catastrophic Fire Conditions', *ABC News* (online, 8 January 2018) <https://www.abc.net.au/news/2018-01-08/alert-sa-app-scrapped-after-failing-during-serious-bushfire/9310520>, archived at <https://perma.cc/QYP4-ZZFN>.

269 For example, a class action is being considered against firefighters for failing to control a small fire in the Guy Fawkes National Park which grew to be uncontrollable during the summer of 2019–20: Institute of Foresters of Australia and Australian Forest Growers, Submission to Royal Commission into National Natural Disaster Arrangements (April 2020) 25.

270 See, eg, *Mercieca v SPI Electricity Pty Ltd* [2012] VSC 204, [4]–[8] (Emerton J); *Matthews* (n 212) [7]–[9] (Osborn JA). See generally *Lenehan v Powercor Australia Ltd* [2018] VSC 579. Given the rapid advances in attribution science and the weight of evidence that climate change is increasing catastrophic fire conditions, traditional forms of litigation are increasingly likely to be supplemented by climate-related litigation: see, eg, Canadell et al (n 18) 8. See also *Bushfire Survivors for Climate Action Inc v Environment Protection Authority* [2021] NSWLEC 92, in which the NSW Land and Environment Court ordered the NSW Environment Protection Authority 'to develop environmental quality objectives, guidelines and policies to ensure environment protection from climate change', including climate-driven changes to bushfire regimes: at [149] (Preston CJ).

271 There were writs issued against the Electricity Trust of South Australia: see, eg, *Dunn v Electricity Trust of South Australia* (1985) 122 LSJS 201, 201–2 (Zelling J). Writs were also issued against a local council and electricity contractor: see, eg, *Casley-Smith v FS Evans & Sons Pty Ltd [No 5]* (1988) 67 LGRA 108, 154 (Olsson J); *Leslie v FS Evans & Sons Pty Ltd* (1988) 65 LGRA 168, 170 (Olsson J).

losses are also becoming more common. Australia's largest class action settlement (almost $500 million) arose from the Black Saturday fire.[272] Although that figure is large, the benefit to individuals was insufficient to meet their losses.[273] The Kilmore East class action had more than 5,000 registered group members, comprising 1,700 personal injury claims, 4,000 claims for uninsured property and 5,000 claims for insured property.[274] While personal injury claimants were expected to receive about 65% of their total claims, those claiming for property and economic losses would only obtain about 33% of their total claims.[275] Litigation may be a critical means by which to fill gaps in insurance coverage but is ineffective in securing the funds necessary to recover from fire.

The growth in bushfire actions in general, and class actions in particular, demands engagement with the procedural rules governing such litigation, the common law principles upon which liability may be based, and the interaction of those principles with any statutory protections or immunities. Litigation is an imperfect tool — it is expensive and takes years, and fear of it may stifle innovation and adaptation. While the rules governing class actions may sometimes simplify the experience of litigation for a claimant, they can also add cost and complexity and result in a lower payout overall. Factors influencing success might also be considered arbitrary, depending on how a fire started or spread. While the prospects of success are low where no-one is to blame or if they have some form of statutory protection, alternatives to litigation for resourcing bushfire recovery, including the insurance arrangements described above, are also problematic.

2 *Governing Emergency Management Coordination*

The institutional context for emergency management is broader than the legal instruments establishing the form, powers and responsibilities of the various emergency services. As we discussed in relation to Rings 1 and 3, laws for fire and emergency management include the creation of rural or bushfire brigades

[272] Vince Morabito, *An Empirical Study of Australia's Class Action Regimes: The First Twenty-Five Years of Class Actions in Australia* (Report No 5, July 2017) 18.

[273] *Matthews* (n 212) [432]–[433] (Osborn JA).

[274] Vince Morabito and Jarrah Ekstein, 'Class Actions Filed for the Benefit of Vulnerable Persons: An Australian Study' (2016) 35(1) *Civil Justice Quarterly* 61, 84. See also Maurice Blackburn Lawyers, *Kilmore East — Kinglake & Murrindindi — Marysville Black Saturday Class Action Settlement Administrations* (Final Report, 2018) 7. The money was first used to pay lawyers' fees ($60 million) and then to meet claims for damages, with 37.5% of the fund allocated to meeting claims for personal injury or death, and the remainder allocated to address property damage and economic losses: Legg (n 209) 660–1.

[275] Legg (n 209) 661. When taking into account insurance, the average claimant would actually obtain between 33% and 65% of their total losses.

and emergency services agencies, and the powers of these agencies to manage fire hazards and respond to bushfires.[276] Broader institutional arrangements coordinate emergency management across jurisdictions and emergencies (such as flood, fire and storms), including through the Australian Inter-Agency Incident Management System ('AIIMS'). AIIMS is adopted by all Australian fire, emergency and land management agencies, and is predicated on the assumption that there is a single incident controller who has 'overall management of the incident and overall responsibility for the management of resources allocated for the resolution of the emergency'.[277] During actual emergencies the boundary between the response to the fire and broader emergency management roles is not always clear. Jurisdictions do, however, have plans in place to escalate the management of an emergency to allow emergency managers to deal with the large scale while incident controllers manage the immediate impact.

Cross-state and territory and national cooperative emergency management arrangements support information and resource-sharing — such as firefighters and incident management teams — including through the coordination role played by the Australian and New Zealand National Council for Fire and Emergency Services.[278] While these coordination arrangements do not necessarily find expression in legal instruments, they may be formalised through policies, agreements and, for example, cross-border memoranda of understanding.[279] The Commonwealth government also coordinates nationally significant resources such as some aerial firefighting equipment and assets provided under

[276] These laws also establish emergency management and recovery planning committees and statutory officers: see, eg, *Fire and Rescue NSW Act 1989* (NSW) ss 74B–74C; *Rural Fires Act 1997* (NSW), establishing the NSW Rural Fire Service: s 8; and the Bush Fire Coordinating Committee: s 46. See also *Bush Fires Act 1954* (WA), providing for the establishment of 'bush fire brigades': s 41; and allowing for the designation of a 'Chief Bush Fire Control Officer': s 38A.

[277] Emergency Management Victoria, *Fundamentals of Emergency Management (Class 1 Emergencies)* (Report, February 2015) 29 [7.2.3].

[278] The Australian and New Zealand National Council for Fire and Emergency Services has members from emergency and land management agencies from the Commonwealth, every state and territory, and New Zealand, though it has no direct role in delivering emergency services: National Council for Fire and Emergency Services, 'AFAC is the Australian and New Zealand National Council for Fire and Emergency Services', *Who We Are* (Web Page, 2017) <https://www.afac.com.au/auxiliary/about/us>, archived at <https://perma.cc/8B5M-AWJ2>. The AIIMS is the nationally recognised system of incident management for the nation's fire and emergency service agencies: National Council for Fire and Emergency Services, Australasian Inter-Service Incident Management System, *AIIMS* (Web Page, 2017) <https://www.afac.com.au/initiative/aiims>, archived at <https://perma.cc/SFA2-UUGQ>.

[279] See *NSW Bushfire Inquiry Final Report* (n 73) 134; *NSW Bushfire Inquiry: March Progress Report* (n 73) 15.

international cooperative arrangements,[280] and maintains Defence Assistance to the Civil Community arrangements, under which states can request Commonwealth assistance in a disaster.[281]

3 *Fiscal Arrangements and the Constitutional Division of Power*

Fiscal arrangements reflect government priorities and underpin government and community responses to bushfires. The allocation of public funding is relevant to almost every other aspect of law listed in Figure 1 and can determine the capacity and responsiveness of government agencies, statutory officers and other bodies. For example, state governments fund emergency response agencies such as fire services, and state and local recovery costs post-fire can, in some cases, be claimed back under national disaster relief arrangements.[282] Future reform to fiscal allocations may need to pay particular attention to issues of equity and capacity across tiers of government, particularly for those local governments with a low density of ratepayers but high exposure to bushfire risks, because changing fire regimes will increase the cost of activities such as fire hazard reduction through the land use planning system.[283]

Ring 4 of Figure 1 also recognises the important institutional context provided by the *Constitution*, which allocates power between three branches of government. For example, the judiciary sets standards of behaviour and scrutinises decisions and actions of the executive through litigation,[284] while some bushfire laws are created by the legislature through legislation.[285] The executive has a central role, comprising fire agencies, government land managers, bushfire planners and other public decision-makers, as well as broader accountability mechanisms including standing bodies that review bushfire planning, spending, monitoring and reporting (such as auditors-general,[286] ombudsmen

[280] Through Emergency Management Australia, a non-statutory body within the Department of Home Affairs: see 'Emergency Management', *Department of Home Affairs (Cth)* (Web Page, 19 January 2022) <https://www.homeaffairs.gov.au/about-us/our-portfolios/emergency-management/resources>, archived at <https://perma.cc/U44V-7G2L>.

[281] See, eg, *2020 Royal Commission Report* (n 1) 194–5 [7.43]–[7.45].

[282] Including by drawing on emergency services levies imposed in local council rates: see above Part III(C)(5).

[283] Emergency services levies can be allocated to local governments to perform their obligations in relation to bushfire, among other things: see, eg, *Fire and Emergency Services Act 1998* (WA) pt 6A divs 2, 5, though there is no guarantee that the funding will cover all relevant costs.

[284] See above Parts III(C)(4), III(D)(1).

[285] See, eg, *Rural Fires Act 1997* (NSW).

[286] *Reducing Bushfire Risks* (n 214) 1.

and state coroners),[287] and ad hoc review bodies such as royal commissions.[288]

The *Constitution* also governs the allocation of powers between the different tiers of government. In the absence of an explicit head of power under the *Constitution* to legislate in relation to domestic emergencies,[289] responsibility for developing and reforming laws about bushfire preparation, response and recovery remains primarily with state and territory governments. The *Constitution* is also silent on the role of local government, which is established under state legislation, though local governments play many important roles in relation to bushfire.[290] For example, in many jurisdictions, local governments assess bushfire hazards on private land and issue and enforce hazard reduction notices, alongside fire agencies.[291] State and local governments are also substantial land managers themselves, responsible for fire planning and response in public protected areas and on Crown land.[292]

[287] For example, the NSW Coroners Court is conducting an inquiry 'focussing on events particular to each death and fire rather than the large scale themes extensively canvassed in other investigations already reported', with public hearings expected to resume on 9 May 2022: 'NSW Bushfires Coronial Inquiry', *Coroners Court New South Wales* (Web Page, 4 July 2022) <https://www.coroners.nsw.gov.au/coroners-court/upcoming-inquests/nsw-bushfires.html>, archived at <https://perma.cc/DEF9-GGTC>. See Michael Eburn and Stephen Dovers, 'Learning Lessons from Disasters: Alternatives to Royal Commissions and Other Quasi-Judicial Inquiries' (2015) 74(4) *Australian Journal of Public Administration* 495, 497.

[288] See generally *2020 Royal Commission Report* (n 1).

[289] For a detailed analysis on whether the Commonwealth has executive power to respond to catastrophic natural disasters, see generally Michael Eburn, Cameron Moore and Andrew Gissing, *The Potential Role of the Commonwealth in Responding to Catastrophic Disasters* (Report No 530, 6 May 2019).

[290] For example, local governments have primary (though not sole) responsibility for land use planning and, in some jurisdictions, for vegetation clearing and management. However, in NSW, regional local land services bodies have responsibility for land clearing approvals in rural areas: *Local Land Services Act 2013* (NSW) pt 5A divs 3, 6. For more on the role of local governments, see above Parts III(B)(1)–(2).

[291] For example, local government and the Tasmanian Fire Service have overlapping responsibility for issuing bushfire hazard reduction notices in Tasmania: see Environmental Defenders Office, Submission on the Draft Bushfire Mitigation Measures Bill 2020 (28 October 2020) 32. However, in NSW, it is the responsibility of the Rural Fire Service (not local government) to assess bushfire hazards on private land: *Rural Fires Act 1997* (NSW) ss 65A, 66–9.

[292] Outside of Antarctica, the Commonwealth government manages just ten protected areas (seven national parks and three botanical gardens), including on the Commonwealth offshore territories of Norfolk Island, Christmas Island and Pulu Keeling: see 'CAPAD 2020', *Department of Climate Change, Energy, the Environment and Water (Cth)* (Web Page, 3 October 2021) <https://www.awe.gov.au/agriculture-land/land/nrs/science/capad/2020>, archived at <https://perma.cc/8QWV-P2MC>.

Decades of post-disaster inquiries have recommended a more visible and proactive Commonwealth presence in emergency situations,[293] including to improve national coordination and overcome fragmented emergency responses.[294] In response, the Commonwealth Parliament legislated the *National Emergency Declaration Act 2020* (Cth), empowering the Prime Minister to make a 'national emergency declaration'[295] if they are satisfied that an emergency has caused, is causing or is likely to cause, nationally significant harm that either affects Commonwealth interests or is of sufficient scale or severity to justify a national declaration.[296] The Prime Minister must consult with relevant states and territories where practicable, unless they requested the declaration.[297] The effect of a declaration is that the Prime Minister can compel Commonwealth entities to provide certain information relevant to the emergency,[298] and vary administrative requirements in other Commonwealth legislation to streamline response and recovery processes,[299] though this new power does little to improve the capacity of the Commonwealth government to provide national coordination and leadership in disaster situations.

Despite purporting to address calls for better national coordination, this new legislation focuses only on the power to declare a national emergency and fails to address long-running coordination issues between states and territories

[293] These recommendations were reiterated by the Royal Commission into National Natural Disaster Arrangements. Of the 24 chapters in its final report, nine focus explicitly on the role of the national government and the need for greater coordination (including the first six substantive chapters: see generally *2020 Royal Commission Report* (n 1).

[294] See Michael Eburn, 'Responding to Catastrophic Natural Disasters and the Need for Commonwealth Legislation' (2011) 10(3) *Canberra Law Review* 81, 87–91. See also Department of Transport and Regional Services (Cth), *Natural Disasters in Australia: Reforming Mitigation, Relief and Recovery Arrangements* (Report, August 2002) 62.

[295] To 'recognise and enhance the role of the Commonwealth in preparing for, responding to and recovering from emergencies that cause, or are likely to cause, nationally significant harm': *National Emergency Declaration Act 2020* (Cth) s 3(1). '[N]ationally significant harm' is defined by its scale or consequences and includes harm to the lives or health of humans, animals or plants, harm to the environment, damage to property and infrastructure and disruption to essential services: s 10 (definition of 'nationally significant harm').

[296] Ibid ss 11(1) (making a declaration), 11(5) (declarations can be in place for up to three months unless extended), 12 (extending a declaration), 14A (all declarations must be reviewed within one year).

[297] Ibid ss 11(2)–(3)(a), 12(2).

[298] See, eg, ibid s 16(3)(a) on advice about stockpiles of medical or other supplies held by or available to a relevant Commonwealth entity.

[299] Ibid s 15.

in major disasters such as bushfires.[300] The need to improve coordination is both persistent and increasingly important, as 'compound extreme events' increase.[301] Compound events occur when, for example, catastrophic bushfires burn multiple areas at once, or at the same time as other disasters such as heatwaves or droughts.[302] Compound events are likely to transcend state and territory borders, and exceed individual states' capacity to address and prevent the cross-border resource-sharing that is crucial to Australia's 'surge capacity'. Greater international collaboration and long-term planning for firefighting resources are also crucial, because resources historically shared across hemispheres may no longer be available as northern and southern hemisphere fire seasons overlap.[303]

IV Why Is This Analysis Important Now?

Like human anatomy, our understanding of this legal anatomy of bushfire law is not perfect or complete. Even so, understanding the anatomy of this area of law is a crucial starting point for a more detailed analysis of the operation of individual components, in context. Medical professionals are trained in human anatomy so that they understand relationships between the different components of the human body, and so that they can diagnose health conditions, prioritise interventions and avoid causing additional health problems or comorbidities. Understanding the anatomy of a legal framework is similarly fundamental, helping lawyers, policymakers, researchers and others to understand relationships between different components of a complex and interconnected legal system; diagnose legal and policy problems in their social and ecological context and effectively prioritise interventions; and avoid making a problem worse.

The first and perhaps most important insight to be gained from this anatomy of bushfire law is about the relationship between the different laws listed in

300 Cf *2020 Royal Commission Report* (n 1) 149 (recommendation 5.1). See Michael Eburn, 'Federal Parliament Passes the National Emergency Declaration Bill 2020', *Australian Emergency Law* (Blog Post, 15 December 2020) <https://emergencylaw.wordpress.com/2020/12/15/federal-parliament-passes-the-national-emergency-declaration-bill-2020/>, archived at <https://perma.cc/Y8K4-VSPY>.

301 Intergovernmental Panel on Climate Change, *Climate Change 2021: The Physical Science Basis* (Summary for Policymakers, 2021) 9 n 18.

302 Ibid.

303 See Lisa Gibbs, 'More Than a Decade after the Black Saturday Fires, It's Time We Got Serious about Long-Term Disaster Recovery Planning', *The Conversation* (online, 30 March 2021) <https://theconversation.com/more-than-a-decade-after-the-black-saturday-fires-its-time-we-got-serious-about-long-term-disaster-recovery-planning-158078>, archived at <https://perma.cc/3EG3-QY9B>.

Figure 1. Major post-fire reviews often make recommendations to improve emergency services and emergency management laws, arrangements for hazard reduction (Ring 1), and native vegetation management and land use planning rules (Ring 2).[304] This is unsurprising, because the terms of reference for these reviews usually focus on lessons to be learned from a specific bushfire disaster. The anatomy of bushfire law set out in this article demonstrates that post-fire reviews are not an ideal vehicle for considering the legal framework holistically. In particular, those conducting such reviews may not have the remit or capacity to consider the full breadth of relevant, interacting laws, such as WH&S laws or integrated catchment management and freshwater habitat protection alongside, for example, streamlining hazard reduction activities.

A corresponding benefit to understanding relationships between the laws in Figure 1 is clarifying that institutional and legal contexts (Rings 3 and 4) constrain what can be achieved in reforming fire-related laws in Rings 1 and 2. For example, opportunities to improve coordination in the response to bushfires, both within and between state emergency services, are constrained in important ways by divisions of power and fiscal arrangements under the *Constitution*.[305] Similarly, native vegetation management and bushfire hazard reduction may be informed (and potentially undermined) by developments in common law liability and bushfire litigation. While it can be difficult to reform those broader legal and institutional contexts, attempts to reform the fire and land management laws at the centre of Figure 1 without reference to that context may be ineffective or even counterproductive. Conversely, revealing overlaps and permeability between the component parts of bushfire laws may allow us to promote desirable reform in unconventional ways. For example, the practical and regulatory overlaps in managing the impact of bushfire smoke on human and environmental health appear to support a recent proposal that promoting effective air quality management may also drive innovation in achieving more environmentally sustainable forms of fuel management.[306]

The third insight that we can draw from this anatomy of bushfire laws is that prioritising certain legal reforms could help us to achieve more effective fuel and fire management across landscapes while also promoting a range of other social, cultural and environmental goals. For example, Indigenous cultures have

[304] See, eg, *2020 Royal Commission Report* (n 1) ch 19; *NSW Bushfire Inquiry Final Report* (n 73) vii–xx. See also Government of South Australia (n 47) vi–vii (recommendations 1–15), with the exception of recommendation 6, which encourages the South Australian Government to '[c]onsider removing stamp duty from home insurance to encourage a wider section of the community to take out insurance': at vii.

[305] For example, through the social security system and in the form of ad hoc disaster payments.

[306] See generally David MJS Bowman et al, 'Can Air Quality Management Drive Sustainable Fuels Management at the Temperate Wildland-Urban Interface?' (2018) 1(2) *Fire* 27.

long used low-intensity, cool burns to nurture landscapes and build cultural connections to Country.[307] Despite the potential for cool burns to reduce the impact of late season fires on life, property and biodiversity, this form of fire management is not typically the subject of specific legal provisions.[308] Facilitating cultural burning and engaging Indigenous peoples in the management of fire on their Country could be an expression of reconciliation, supporting a growing push from many Indigenous communities to re-engage with 'good fire' on Country.[309] Legislation and policy could readily play a more supportive role for cultural burning,[310] including by clarifying access and burning rights on public land and underpinning cooperative arrangements for cultural burning on private land; streamlining integrated fire planning and management between Indigenous communities and fire and conservation agencies;[311] providing incentives, resourcing and indemnities from liability for cultural burns conducted in good faith; and ensuring that cultural burns are Indigenous-led and Country-centred.[312]

[307] Kira M Hoffman et al, 'Conservation of Earth's Biodiversity Is Embedded in Indigenous Fire Stewardship' (2021) 118(32) *Proceedings of the National Academy of Sciences of the United States of America* e2105073118:1–6, 1–2. The 2020 Royal Commission into National Natural Disaster Arrangements noted that hazard reduction burning may have little impact on catastrophic fires: *2020 Royal Commission Report* (n 1) 373 [17.41]–[17.43]. Cf Minister for Police, Fire and Emergency Services (Qld), 'Operation Cool Burn Activated' (Media Release, 4 April 2014) <http://statements.qld.gov.au/Statement/2014/4/4/operation-cool-burn-activated>, archived at <https://perma.cc/94MV-2VMJ>.

[308] With the exception of the legal instruments and arrangements discussed in Ring 2 regarding Indigenous land management and bushfire: see above Part III(B).

[309] See *2020 Royal Commission Report* (n 1) 389 [18.18]–[18.20]. See also 'Good Fire Podcast', *Your Forest* (Web Page, 2021) <https://yourforestpodcast.com/good-fire-podcast>, archived at <https://perma.cc/JYJ7-2YE8>. In the US context, see Scott L Stephens et al, 'Fire, Water, and Biodiversity in the Sierra Nevada: A Possible Triple Win' (2021) 3(8) *Environmental Research Communications* 081004:1–10, 1.

[310] This is being tackled by the new Cultural Fire Management Unit in NSW, which is working on a draft 'cool burning bill'. The NSW Hunter Local Land Services, Tocal College and the Firesticks Alliance have also co-developed the first accredited course incorporating cool burning into land management and conservation: Damon Cronshaw, 'Aboriginal Fire Management Returns to the Hunter and NSW with Cultural Burns', *Newcastle Herald* (online, 30 August 2021) <https://www.newcastleherald.com.au/story/7405102/aboriginal-bush-burning-returns-to-the-hunter/>, archived at <https://perma.cc/FD9R-U4J9>.

[311] Including to create new opportunities for cultural burning in co-managed and other protected areas, to identify co-benefits from cultural burns for weed management, habitat conservation and rehabilitation, and to emphasise 'healthy Country' in conservation management, allowing a broader ecological and cultural understanding of landscape health that includes fire.

[312] That cultural burning is an important component of broader Aboriginal land management, and not simply another technique for hazard reduction, was recognised in *NSW Bushfire Inquiry Final Report* (n 73) 183 (recommendation 25). See generally Jessica K Weir, Dean

Finally, a clearer understanding of this anatomy of bushfire laws may help us to avoid interventions that will worsen the challenges that bushfires present. For example, having demonstrated the complex diversity of legal instruments, principles and actors at play in relation to bushfires, we are not arguing that this legal framework should be centralised or simplified. Despite clear interactions and permeability between the rings in Figure 1, attempts to consolidate power or responsibility for *all* aspects of decision-making about fire would be rightly viewed with suspicion. Decisions about areas of specialist expertise are often appropriately located within the relevant, discrete area of law. Furthermore, top-down reform of a system this complex *may* promote desirable outcomes, such as better coordinated fire response across borders and sectors, but also risks consolidating power in undesirable ways. For the most part, any consolidation of power would be to fire agencies that are less equipped to understand and balance the multitude of social, ecological, cultural and economic values and priorities held by communities across Australia that are affected by fire.

Another way to make a problem worse can be to ignore it, or cherrypick 'symptoms' to treat, rather than tackle the root cause. This is evident in past failures to adopt or implement recommendations from the host of post-fire inquiries and reviews that have called for integrated bushfire law and policy reform.[313] Recognising the tendency to take this approach, the 2020 National Royal Commission noted that '[f]ailure by governments to act on our recommendations will shift risk to others', and '[i]f a recommendation is not accepted, reasons should be given, so that others know that they may need to act'.[314] The risks of a piecemeal approach are exemplified in recent reform efforts that accommodate aggressive fire prevention by relaxing or circumventing some or *all* land clearing restraints through streamlined approval processes.[315] Ignoring

Freeman and Bhiamie Williamson, *Cultural Burning in Southern Australia* (Report No 687, July 2021).

313 Kevin Tolhust, 'We Have Already Had Countless Bushfire Inquiries: What Good Will It Do To Have Another?', *The Conversation* (online, 16 January 2020) <https://theconversation.com/we-have-already-had-countless-bushfire-inquiries-what-good-will-it-do-to-have-another-129896>, archived at <https://perma.cc/XS3Q-P4JM>, noting that there have been approximately 57 formal public inquiries, reviews and royal commissions related to bushfires and fire management since 1939. For a list of inquiries and commissions into bushfires and other natural hazards, see generally 'Inquiries and Reviews Database', *Bushfire & Natural Hazards CRC* (Web Page) <https://tools.bnhcrc.com.au/ddr/dataspace-home>, archived at <https://perma.cc/6YTB-FQFV>.

314 *2020 Royal Commission Report* (n 1) 33 [114]–[115], noting that its recommendations will require a 'cohesive and unified national effort'. The complex process of improving coordination is a good example of a recommendation that has been made repeatedly, and rarely implemented: at 99–109 (recommendations 3.1–3.6).

315 See McDonald and McCormack (n 57) 159.

existing protections for social, cultural and environmental values risks destroying those values and politicising and fragmenting communities that might otherwise collaborate to enhance and deepen resilience and bushfire preparedness.[316]

V Conclusion

Bushfires are not a 'problem' that the law can solve. Even so, our laws and policies have an important role to play in preparing communities and environments for a future that will be defined by our experience of fire. In this article, we have used a novel conceptual model to illustrate the breadth of laws that relate to bushfires in Australia, ranging from fire-specific crimes and the establishment of bushfire agencies through to the legal and institutional structures that underpin the allocation of powers, obligations and liabilities for fire. We have illustrated the ways in which laws about fire cross a multitude of specialised legal sub-disciplines, and are influenced by legal instruments that do not, at face value, have any relationship with bushfire, such as consumer lending laws and the *Constitution*. In this anatomy of bushfire law, we have also demonstrated the range of values that can be affected by fire and prioritised in different ways by individuals, communities and sectors.

Understanding the anatomical components of Australia's legal framework for bushfire more clearly allows us to discuss, with specificity, the different management goals, desirable outcomes and substantive legal and policy tools that are available to prepare for, respond to and recover from fire. We have also argued that understanding this anatomy is an important prerequisite to developing rational, holistic and effective proposals for legal reform, and for breaking free of the bushfire inquiry 'cycle',[317] which will be increasingly important as climate change drives rapid increases in the scale and frequency of catastrophic bushfires.

This article has, by necessity, provided just a brief overview of each area of law in Figure 1. There remains important work to be done, including to interrogate the interactions between fire-specific laws, land management laws, and the legal and institutional contexts set out in Rings 3 and 4, particularly as

316 See Michael Eburn and Stephen Dovers, *Learning for Emergency Services: Looking for a New Approach* (Discussion Paper, 13 September 2016) 11–18 <https://www.bnhcrc.com.au/publications/biblio/bnh-3054>, archived at <https://perma.cc/5P9Z-B3C4>. See also Whittaker and Mercer (n 40) 274.

317 Kanowski, Whelan and Ellis (n 40) 78, where the bushfire inquiry 'cycle' describes the way in which major bushfire events are followed initially by blame; then by public inquiries, increases in emergency funding and initial community compliance; then later by coronial inquiries and growing complacency, until the next bushfire event when the cycle begins again.

climate change drives changes to Australia's bushfire regimes. There has been some progress on this point. For example, the 2009 Victorian Royal Commission gave little consideration to climate change beyond acknowledging that it will contribute to increased fire risk in future.[318] The 2020 NSW Inquiry recognised that the 2019–20 fire season was exacerbated by climate change,[319] and the 2020 National Royal Commission went further, explicitly acknowledging that climate change will increase bushfire risks in future and worsen bushfire trends in the near-term.[320] Nevertheless, a comprehensive and future-oriented legal reform agenda for Australian bushfire laws remains outstanding and overdue.

Climate change will continue to exacerbate unresolved challenges for legal and administrative arrangements for bushfire, including limitations in their flexibility, coordination and capacity to improve climate adaptation and community resilience. We have sought to articulate the full scope of Australia's existing laws to provide new clarity and a strong foundation for the task of ensuring that our bushfire laws, and our communities, are in the best possible position to adapt as fire regimes change.

Dedication

This article is dedicated to Dr Rebecca MB Harris, who passed away on 24 December 2021. Rebecca was a brilliant scientist, a lead author on the IPCC's Sixth Assessment Report, *Climate Change 2021: Impacts, Adaptation and Vulnerability* and, for some of the authors of this article, a long-time collaborator and friend. Among other things, her influential research tackled the intersection between climate change and bushfires and the impact of climate change on biodiversity, both of which are represented in her contribution to this research.

318 *2009 Victorian Bushfires Royal Commission Final Report* (n 95) vol 2, 223.

319 *NSW Bushfire Inquiry Final Report* (n 73) 78. Recommendation 36 includes 'commissioning experiments and feasibility studies for ecosystem adaptation experiments — for example, facilitating shift of high conservation-value rainforest vegetation communities further south as climatic conditions change': at 247.

320 The 2020 National Royal Commission acknowledged that '[s]trong adaptation measures are necessary to respond to the impacts of climate change': *2020 Royal Commission Report* (n 1) 61 [2.35]. Despite this, none of the Royal Commission's 80 recommendations specifically address the need for climate adaptation, pointing instead to the need for more monitoring and research, such as downscaled climate projections for states and territories: at 35 (recommendation 4.5).

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Responsibility and Risk-Sharing in Climate Adaptation: a Case Study of Bushfire Risk in Australia

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Abstract

'Shared responsibility' for managing risk is central to Australian adaptation and disaster-resilience policies, yet there is no consensus on what this term means or how it is discharged by various actors at each phase of the risk-management process. This has implications for both equity and effectiveness, because shared responsibility assumes that individuals have capacity and that the decisions they make will not conflict with other public values. This article explores how law assigns responsibility for climate adaptation by examining its approach to a specific climate impact in Australia: the increasing frequency and severity of bushfire. Australia faces heightened bushfire risk from the interplay of climate change effects and demographic shifts. While planning laws attempt to limit exposure of new communities to fire risks, adapting existing communities involves hazard mitigation across the landscape, through fuel reduction – accomplished by controlled burning or clearing of brush and timber – and the construction of fuel breaks. Most Australian jurisdictions impose some form of obligation on land managers or owners to mitigate fire risk. However, the effectiveness of shifting responsibility onto individual landholders, measured in terms of bushfire risk mitigation, is not established. The shifting of responsibility also has implications for equity because shared responsibility for fire management assumes that individuals know what must be done and have the capacity to do it themselves or pay others

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to. The law also privileges bushfire protection above other public values, including the protection of biodiversity and cultural values. To account for the complexity of adaptation decision-making, bushfire mitigation laws should avoid creating inequities and should include mechanisms for resolving trade-offs between competing values.

Keywords

adaptation to climate change – disaster resilience – shared responsibility for managing climate risks – conflict of values – Australian bushfires – bushfire-hazard management – Australian planning and bushfire law

1 Introduction

Climate adaptation policy seeks to promote adjustment to climate risks. Building resilience, or the capacity to cope with a hazardous event or disturbance, is an important part of promoting this adjustment.[1] Establishing who is responsible for making these adjustments and enhancing resilience is therefore a critical question in climate adaptation, as well as in the increasingly interconnected field of disaster law and policy.[2]

Adaptation and disaster policies are seeing greater convergence and share many features in common. Adaptation, resilience, and disaster policies typically invoke concepts of 'shared responsibility' for risk management.[3] While governments and the non-government sector retain important roles,

1 J. B. R. Matthews (ed.), 'Annex 1: Glossary', in *Global Warming of 1.5°C: An IPCC Special Report on the Impacts of Global Warming of 1.5°C Above Pre-industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty* (2018), 557. A similar definition is found in Australian Government, *National Climate and Resilience Strategy: 2021–2025* (2021), 8.

2 See Australian Institute for Disaster Resilience, *Australian Disaster Resilience Handbook 9: Australian Emergency Management Arrangements* (Melbourne: AIDR, 2014) (hereinafter, *AEMA*), 3; Jan McDonald and Phillipa McCormack, 'Rethinking the Role of Law in Adapting to Climate Change', 12 *WIREs Climate Change* e726 (2021).

3 United Nations Office for Disaster Risk Reduction (UNDRR), *Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters* (Kobe, Japan: UNDRR, 2005) (hereinafter, *Hyogo Framework*); UNDRR, *Sendai Framework for Disaster Risk Reduction 2015–2030* (Sendai, Japan: UNDRR, 2015) (hereinafter, *Sendai Framework*); Council of Australian Governments (COAG), *National Strategy for Disaster Resilience* (Canberra: COAG, 2011) (hereinafter, *NSDR*); COAG Select Council on Climate Change, *Roles and Responsibilities for Climate Change Adaptation in Australia* (Canberra: Australian

'shared responsibility' emphasizes the importance of individual self-care and capacity.[4] Placing responsibility on the individual to adapt has implications for both equity and effectiveness. It assumes that individuals have the capacity and resources to act, that their decision-making in respect of climate impacts are rational and informed only by climate risks, and that the decisions they make will have no spill-over adverse effects or unintended consequences for other parties.[5] These assumptions are fraught: many individuals lack the capacity to assess climate risks or to take the action required to avoid or reduce those risks. Some people fail to act because they do not have the necessary resources, infrastructure, opportunity, or support.[6]

Legal and institutional arrangements can address some of these assumptions. Laws can address equity and effectiveness concerns, although in practice equity considerations and trade-offs between competing public and private values are seldom dealt with explicitly.[7] Laws can also establish mechanisms 'for attributing and formalising responsibilities, holding parties to account and enforcing sanctions and penalties when legal obligations are not met'.[8] And they can clarify the allocation of responsibility for climate risks by enabling or mandating risk mitigation and in some cases imposing liability for failing to do so.

To be effective and durable, laws and other measures must assign responsibility equitably and attend to the trade-offs inherent in climate risk management. As McLennan and Eburn have observed, 'acknowledging and debating

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Government, 2012) (hereinafter, *COAG Roles and Responsibilities*); Australian Government, *National Climate Resilience and Adaptation Strategy* (Canberra, 2021) (hereinafter, *NCRAS*).

4 *AEMA*, supra note 2; *NCRAS*, supra note 3.

5 A detailed description of externalities and their implications for climate adaptation (both positive and negative) is beyond the scope of this paper; but see Emma L. Tompkins and Hallie Eakin, 'Managing Private and Public Adaptation to Climate Change', 22(1) *Global Environmental Change* 3 (2012).

6 Christopher B. Field, et al. (eds.), *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* (Cambridge, UK: Cambridge University Press, 2012) (hereinafter, *SREX Report*).

7 Elizabeth A. Law, et al., 'Equity Trade-Offs in Conservation Decision Making', 32(2) *Conservation Biology* 294 (2018); Anita Foerster, Andrew Macintosh, and Jan McDonald, 'Trade-Offs in Adaptation Planning: Protecting Public Interest Environmental Values', 17 *Journal of Environmental Law* 1 (2015); Anita Foerster, Andrew Macintosh, and Jan McDonald, 'Transferable Lessons in Climate Change Adaptation Planning? Managing Bushfire and Coastal Climate Hazards in Australia', 30(6) *Environmental and Planning Law Journal* 469 (2013).

8 Blythe McLennan and Michael Eburn, 'Exposing Hidden-Value Trade-Offs: Sharing Wildfire Management Responsibility Between Government and Citizens', 24(2) *International Journal of Wildland Fire* 162 (2014), 163. Responsibility encompasses informal political, moral, and social responsibilities that may reinforce formal legal rules.

core value trade-offs that are necessary in decisions about sharing responsibility between government and citizens is … a challenging but critical part of developing risk management arrangements' that are effective and socially and politically legitimate.[9] The extent to which responsibilities are discharged is often scrutinized after the event, amid claims that handling fell short of the requisite standard of care.[10] Ensuring that duties and responsibilities are understood and their legitimacy accepted *before* a damaging event occurs can reduce the severity of, and risk of liability for, damage.

This article explores how law assigns responsibility for climate adaptation by examining the domestic law approach to a specific climate impact in Australia: the increasing frequency and severity of bushfire or wildfire. Fire is an interesting and useful case study for three reasons. First, Australia has already experienced numerous devastating fires, the most recent being the 2019–2020 'Black Summer' fires. In 2019, Australia experienced its hottest and driest year on record, creating the backdrop for the longest and most severe fire season on record.[11] The fires caused unprecedented damage to public and private property, infrastructure, human health, and biodiversity.[12] Second, fire is an adaptation priority,[13] so by investigating the assignment of responsibility for bushfire risk management we hope to advance the broader scholarship on roles and responsibilities for climate change adaptation. Climate change is causing warming and drying trends across much of the Australian continent, and elsewhere; catastrophic bushfires are projected to become more common and more severe over the coming decades.[14] The fire season is also lengthening,

9 Ibid., 168.

10 Kevin Tolhurst, 'We Have Already Had Countless Bushfire Inquiries: What Good Will It Do to Have Another?', *The Conversation* (online, 16 January 2020); Michael Eburn and Stephen Dovers, 'What Sort of Inquiry Should Come After These Fires?', *Pearls and Irritations* (online blog, 7 January 2020); Michael Eburn, 'Litigation for Failure to Warn of Natural Hazards and Community Resilience', 23(2) *Australian Journal of Emergency Management* 9 (2008).

11 Lesley Hughes, et al., *Summer of Crisis* (Sydney, Australia: Climate Council of Australia, 2020).

12 Alexander Filkov, et al., 'Impact of Australia's Catastrophic 2019/2020 Bushfire Season on Communities and Environment: Retrospective Analysis and Current Trends', 1 *Journal of Safety Science and Resilience* 44 (2020).

13 Australasian Fire and Emergency Services Authorities Council (AFAC), *Climate Change and Disasters: Key Messages and Resources Report* (Canberra: AFAC and Australian Institute for Disaster Resilience, 2020) (hereinafter, *AFAC Report*).

14 Hamish Clarke, et al., 'Changes in Australian Fire Weather Between 1973 and 2010', 33 *International Journal of Climatology* 931 (2013); Kevin Hennessy, et al., *Climate Change Impacts on Fire Weather in South-East Australia* (Canberra: Commonwealth Scientific and Industrial Research Organisation, 2005).

which means that emergency and fire crews have less opportunity to undertake fuel-reduction activity, rest, or support brigades in other parts of the country. At the same time, the expansion of urban populations into peri-urban bushland is placing more people in harm's way, increasing the exposure of people and infrastructure.[15] An increase in both the likelihood of severe bushfire and a larger population exposed to such events results in an overall increased risk from bushfire under climate change.[16]

Fire is also a valuable case study in how law might assign responsibility for adaptation, as there is a well-established body of statute and common law imposing responsibilities for fire-hazard mitigation. This body of law spans land-use planning, vegetation management and conservation, emergency management, and, in some Australian states, dedicated bushfire laws.[17] It governs all aspects of the so-called Prevention, Preparedness, Response, and Recovery (PPRR) disaster-management spectrum, distributing responsibility differently at each stage.[18]

We acknowledge that fire has unique characteristics that limit the transferability of lessons learned from it to other climate risks. Adaptation law and policy is necessarily informed by the features of particular locations, impacts, and affected groups. Examining the assignment of risk in respect of one hazard nonetheless provides us with some guidance about what questions to ask about responsibility. We seek to reveal the assumptions implicit in current approaches and evaluate how the law addresses issues of equity, effectiveness, and trade-offs in respect of one aspect of fire risk management, namely the obligation to mitigate bushfire hazard.

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15 *AFAC Report*, supra note 13; Barbara Norman, et al., 'Apocalypse Now: Australian Bushfires and the Future of Urban Settlements', 1(2) *npj Urban Sustainability* (2021).

16 Climate Council of Australia, *"This Is Not Normal": Climate Change and Escalating Bushfire Risk,* Briefing Paper (Sydney: Climate Council of Australia, 12 November 2019).

17 Bushfires Management Act 2016 (Northern Territory); Bush Fires Act 1954 (Western Australia); Rural Fires Act 1997 (New South Wales); Bushfire Act 1936 (Australian Capital Territory).

18 The PPRR approach has formed the foundation of Australian emergency and disaster management for over two decades. It recognizes the need to develop actions aimed at mitigating hazard impact, preparing the community for particular events, responding at the time or immediate aftermath of an event, and supporting recovery of the community affected by a hazard impact. See, e.g., Queensland Fire and Emergency Services, *Queensland Prevention, Preparedness, Response and Recovery Disaster Management Guideline* (2018), <www.disaster.qld.gov.au/dmg/Documents/QLD-Disaster-Management-Guideline.pdf>. While the PPRR approach has been criticized as being linear and poorly adapted to dealing with complex or interacting risks, it is a helpful way of understanding how laws govern different aspects of risk management.

As a management strategy that occurs well ahead of imminent threat, bushfire risk mitigation affords an opportunity for reasoned deliberation on the allocation of risk and the resolution of public-private interest trade-offs. We could have examined the laws governing the response to imminent bushfire threat, and in particular questions about emergency managers' powers to order people to evacuate their properties. However, these have been addressed by others[19] and do not offer the same scope to consider wider questions of fairness and effectiveness, because at the time a fire is bearing down, protection of human life is the incontrovertible priority. So, we investigate how responsibility for mitigating bushfire risk is currently allocated, how the law both mandates and facilitates this responsibility to be discharged, and how it deals with competing values, including the impacts of fire mitigation measures on natural and amenity values.

In Section 2, we introduce the concept of shared responsibility as a key principle of Australia's climate adaptation policy and consider its application to bushfire mitigation. Section 3 examines the main regulatory tools used across Australia to manage bushfire risk and assign responsibility for that risk between public and private landholders and the wider community. This issue offers insights about the assignment of responsibility for adaptation more generally. Legal duties to mitigate bushfire hazards intersect with private-property rights, and potentially conflict with biodiversity values and with the sense of place of different communities and individuals. The imposition on individuals of a duty to mitigate risk is therefore relevant to a wide range of hazards exacerbated by climate change. In Section 4, we reflect on these trends in Australian law, their desirability both in terms of making trade-offs between competing values and in placing individual landholders at the centre of responsibility, and their transferability to other climate hazards and to adaptation law and policy more broadly. Section 5 concludes with a call for bushfire mitigation and adaptation laws that explicitly address the other relevant policy priorities, strive for equity in the allocation of responsibility, and accept the inevitability of heightened bushfire and other risks under climate change.

2 Risks and Responsibilities in Australian Adaptation Policy

Because the impacts of climate change will manifest in different ways in different places, the overarching goals of adaptation policy are typically expressed

19 Blythe J. McLennan and John Handmer, 'Reframing Responsibility-Sharing for Bushfire Risk Management in Australia After Black Saturday', 11(1) *Environmental Hazards* 1 (2012).

in broad terms, with the detail of specific adaptation responses tending to be highly place- or impact-specific.[20] Adaptation is not always even named as such, instead being incorporated into other policies and laws. For this reason, laws on coastal management, conservation, urban planning, and emergency management are all important mechanisms for promoting adaptation.[21]

There is an increasing convergence of policy goals in respect of climate adaptation and disaster management, with resilience and risk management being common features of both frameworks.[22] The Australian National Climate Resilience and Adaptation Strategy 2021–2025 (NCRAS) complements the work of the National Recovery and Resilience Agency on disaster risk reduction.[23] Resilience is not always defined,[24] but typically connotes a capacity to withstand or cope with exposure to the effects of a particular hazard while maintaining essential functions and structure.[25] Australia also has a National Strategy for Disaster Resilience (NSDR); it defines a resilient community as 'one where people understand their risks, take steps to protect themselves and work together in partnership with emergency services and other agencies to manage risks'.[26] Resilience and adaptation are thus closely bound to notions of risk management. In the context of slow-onset climate risks, this may mean reducing exposure to impacts by avoiding or retreating from affected areas. In the context of extreme events, risk minimization involves hazard mitigation, disaster preparedness, disaster response (including evacuation), and measures aimed at promoting recovery post-event.[27]

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20 Jan McDonald, 'The Role of Law in Adapting to Climate Change', 2(2) *WIREs Climate Change* 283 (2011); McDonald and McCormack, supra note 2, and the examples of sector-specific laws set out therein.

21 Ibid., Table 1.

22 *NCRAS*, supra note 3, 6; *NSDR*, supra note 3; National Resilience Taskforce, *National Disaster Risk Reduction Framework* (Canberra: Australian Government, 2018).

23 *NCRAS*, supra note 3, 6. The vision of the previous Strategy – to 'act together to support prosperity and wellbeing in Australia and beyond by building the resilience of communities, the economy and the environment to a variable and changing climate' – has been removed in favour of more general language about supporting government, business, and the community to better anticipate, manage, and adapt to the impacts of climate change. However, the inclusion of "resilience" in the strategy's title demonstrates its implicit relevance.

24 For example, neither the National Climate Resilience and Adaptation Strategy nor the National Strategy for Disaster Resilience define the term 'resilience'; see *NSDR*, supra note 3, 22 (Glossary); *NCRAS*, supra note 3.

25 The National Disaster Risk Reduction Framework notes that, 'as disaster risk increases, the capacity of communities and systems to be resilient is diminished'; supra note 22, 7.

26 *NSDR*, supra note 3, discussed in McLennan and Eburn, supra note 8.

27 *SREX Report*, supra note 6.

This link between adaptation, resilience, and climate risk makes the allocation of responsibility for managing risk a central question. Those responsible for managing the risks of climate impacts are, by extension, implicated in adaptation and resilience-building.[28] However, the task of allocating responsibility for complex and multi-faceted risks that involve trade-offs and value judgments is profoundly difficult.[29] Discussions about responsibility often occur after an event, taking the form of a 'blame game' over who should be liable for losses.[30] But such retrospective attribution of liability, done with the benefit of hindsight, can underplay the difficulty of making such choices in advance of damaging events.

The concept of shared responsibility is key to Australian adaptation and disaster-resilience policies. Shared responsibility is the first principle of 'effective resilience and adaptation', with governments, individuals, businesses, and communities all having 'important roles to play' in managing climate risks.[31] According to a statement on climate change adaptation roles and responsibilities approved in 2012 by the national government of Australia and by all Australian state and territory governments, private parties are expected to manage their own risks.[32] The NCRAS (2021) repeats this expectation, but acknowledges that the capacity of private actors will differ depending on their exposure to risk and their access to knowledge and resources.[33] The key roles of government are limited to: providing information to support private decisions; ensuring that regulatory and policy settings facilitate adaptation and apportion and communicate responsibility for managing risk; and providing public goods and services, including managing public assets and land.[34]

The concept of shared responsibility also underpins disaster-management arrangements in Australia.[35] The NSDR contemplates that:

> political leaders, governments, business and community leaders, and the not-for-profit sector all adopt increased or improved emergency man-

28 McLennan and Handmer, supra note 19, 1.

29 Ibid., 1.

30 Michael Eburn and Stephen Dovers, *Learning for Emergency Services: Looking for a New Approach*, Discussion Paper (Wollongong: Bushfire and Natural Hazards CRC, 2016), 11–18.

31 *NCRAS*, supra note 3, 14.

32 *COAG Roles and Responsibilities*, supra note 3; *NCRAS*, supra note 3, 14. The NCRAS offers a briefer account of the COAG statement, which goes on to say that private parties are expected to inform themselves of their risks and responsibilities, including by ascertaining specific risks to their assets and implementing risk-management strategies.

33 *NCRAS*, supra note 3, 14.

34 Ibid.

35 McLennan and Eburn, supra note 8.

> agement and advisory roles, and contribute to achieving integrated and coordinated disaster resilience. In turn communities, individuals and households take greater responsibility for their own safety and act on information, advice and other cues provided before, during and after a disaster.[36]

The sharing of risk across public and private spheres is reflected in international disaster law instruments such as the Hyogo and Sendai Frameworks.[37] It has been endorsed in Australia by major national and sub-national inquiries following major bushfire disasters, including the Victorian Bushfires Royal Commission, established in response to the 'Black Saturday' fires in the state of Victoria in 2009,[38] and the Royal Commission into National Natural Disaster Arrangements, established in the wake of Australia's 2019–2020 Black Summer bushfires.[39] Risk-sharing across public and private spheres is also reflected in most Australian state disaster-resilience policies and strategies.[40]

The adaptation principle of shared responsibility has been necessitated in part by significantly heightened risk. In emphasizing that communities must be empowered to share responsibility for disasters, the NSDR expressed the concern that 'governments' desire to help communities in need, and pressure to help those affected may be creating unrealistic expectations and unsustainable dependencies. Should this continue, it will undermine community

36 *NSDR*, supra note 3, 2.

37 *Hyogo Framework*, supra note 3, Priorities 3 and 5; *Sendai Framework*, supra note 3; Lila Singh-Peterson, et al., 'Deconstructing the Concept of Shared Responsibility for Disaster Resilience: A Sunshine Coast Case Study, Australia', 79 *Natural Hazards* 755 (2015).

38 Ruth Beilin and Jana-Axinja Paschen, 'Risk, Resilience and Response-Able Practice in Australia's Changing Bushfire Landscapes', 39(3) *Environment and Planning D: Society and Space* 514 (2020), citing Anna Lukasiewicz, et al., 'Shared Responsibility: The Who, What and How', 16(4) *Environmental Hazards* 291 (2017), 306. The Victorian Bushfires Royal Commission's statement went further in saying that 'ultimate responsibility for health and safety lies with individuals': Bernard Teague, et al., *Victoria Bushfires Royal Commission Report, Vol. 2* (Melbourne: Victorian Government, 2010), 355; but McLennan and Handmer suggest that in the context of bushfire preparation/response, this favored higher levels of government control: McLennan and Handmer, supra note 19.

39 Royal Commission into National Natural Disaster Arrangements, Final Report (Canberra: Australian Government, 2020) (hereinafter, *Royal Commission*).

40 Victoria, *Community Resilience Framework* (Melbourne: Victorian Government, 2017), 6; Queensland, *Queensland Strategy for Disaster Resilience* (Brisbane: Queensland Government, 2017), 13; South Australia, *Stronger Together: South Australia's Disaster Resilience Strategy 2019–2024* (Adelaide: South Australian Government, 2019), 8; Tasmania, *Tasmanian Disaster Resilience Strategy 2020–2025* (Hobart: Tasmanian Government, 2020), 5 and 6.

capability and confidence'.[41] As we discuss in Section 4, some critics see this shifting of responsibility for climate and disaster risks as part of a wider trend in neo-liberal governance towards 'responsibilization' of individuals for what previously might have been regarded as public duties and functions.[42]

Regardless of what motivated governments to embrace shared responsibility, significant issues arise in its implementation. A key challenge is a lack of clarity or consensus over what constitutes shared responsibility or how responsibility is to be discharged by each group of actors at each phase of the risk-management process. While the NSDR contemplates that every actor will accept 'their share of responsibility', make risk-informed decisions, and take appropriate action,[43] it does not clearly articulate each group's responsibilities or how they should work together.[44] The need for disaster-risk management to be nuanced for specific places and risks probably means this generality is unavoidable, but the lack of detail has implications for equity and effectiveness. This is because shared responsibility assumes that all individuals have sufficient capacity to act in necessary and appropriate ways, and also assumes that the decisions they make will not have adverse effects on other parties and their interests.

In the next section, we examine how the concept of shared responsibility plays out in relation to the specific risk of bushfire, which will be heightened by climate change.

41 *NSDR*, supra note 3, iii and 1.

42 The concept of 'responsibilization' emerged in the governance literature in the mid-1990s, particularly in the context of neo-liberal political discourses, and implies that individuals have avoided responsibility or have had it taken away from them by experts or government agencies as a consequence of the expansion of the welfare state. See Jarkko Pyysiäinen, et al., 'Neoliberal Governance and "Responsibilization" of Agents: Reassessing the Mechanisms of Responsibility-Shift in Neoliberal Discursive Environments', 18(2) *Distinktion: Journal of Social Theory* 215 (2017).

43 *NSDR*, supra note 3, v and 14. See also *NCRAS*, supra note 3, 14, explaining that individuals and communities 'have an important role to play in managing their own risks' and 'a strong incentive to act', but acknowledging that 'their capacity to act will differ depending on their exposure to risk and access to resources and knowledge'. This acknowledgment, while important, is extremely limited in its practical effect. For example, there is no other reference to the limitations of shared responsibility in the strategy, and NCRAS makes no distinction in its objectives, principles, or actions between actors with different capacities.

44 Lukasiewicz, et al., supra note 38; Singh-Peterson, et al., supra note 37.

3 Responsibility for Mitigating Bushfire Risk

The risks to human communities, infrastructure, and environments posed by bushfires have changed over time, as have strategies for mitigating them. In recent decades legal frameworks have also changed, as the risks themselves have changed and intensified, with legal obligations and policy arrangements beginning to place responsibility for bushfire risks squarely on individual landholders and communities, through a combination of legal duties and enabling provisions.

3.1 *Fire Risk in Australia*

Australia is the most fire-prone continent on Earth.[45] Many Australian species and ecosystems are fire-adapted, relying on fire and smoke for key parts of their life cycle, such as seed germination.[46] Australia's First Nations peoples used fire extensively for tens of thousands of years, both as a core component of cultural traditions of 'caring for Country' and as a tool to mitigate the risk of intense and destructive late-season fires.[47] European colonization abruptly changed fire regimes across Australia, radically reducing the extent of regular, low-intensity, burning and introducing government policies for fire suppression.[48] Bushfires over the past two-and-a-half centuries have likely been more severe in the absence of indigenous fuel management across Australia's highly flammable ecosystems; and they have caused enormous economic and ecological damage and loss of life.[49]

45 Ross A. Bradstock, 'A Biogeographic Model of Fire Regimes in Australia: Current and Future Implications', 19 *Global Ecology and Biogeography* 145 (2010); Nerilie J. Abram, et al., 'Connections of Climate Change and Variability to Large and Extreme Forest Fires in Southeast Australia', 2(8) *Communications Earth and Environment* (2021).

46 Rachael V. Gallagher, et al., 'High Fire Frequency and the Impact of the 2019–2020 Megafires on Australian Plant Diversity', 27 *Diversity and Distributions* 1166 (2021).

47 Richard Skiba, 'Usage of Cool Burning as a Contributor to Bushfire Mitigation', 11 *Natural Resources* 307 (2020), 308; Royal Commission into National Natural Disaster Arrangements, *Background Paper: Cultural Burning Practices in Australia* (Canberra: Commonwealth of Australia, 2020).

48 G. W. Morgan, et al., 'Prescribed Burning in South-Eastern Australia: History and Future Directions', 83(1) *Australian Forestry* 4 (2020); Phillipa C. McCormack, Jan McDonald, Michael Eburn, Stuart J. Little, David M. J. S. Bowman, and Rebecca M. B. Harris, 'An Anatomy of Australia's Legal Framework For Bushfire', 46(1) *Melbourne University Law Review* (forthcoming, 2022).

49 There have been hundreds of severe bushfires in that time, including two million hectares burnt and at least 71 human deaths in the 1939 Black Friday bushfires in Victoria, and 173 lives lost in the 2009 Victorian Black Saturday bushfires, which set 45,000 hectares on fire and cost AU$1.07 billion in insurance payments. See, Australian Institute for Disaster Resilience (AIDR) Knowledge Hub, 'Black Friday Bushfires, 1939' (n.d.), <https://knowledge.aidr.org.au/resources/bushfire-black-friday-victoria-1939/>,

Australian bushfires in recent times have broken global records for frequency, intensity, and scale.[50] For example, the 2019–2020 Black Summer fires were the largest fires on record, by area, globally, burning more than 24 million hectares, including 23 per cent of the temperate forests of southeast Australia.[51] They caused 33 direct human deaths and approximately 417 smoke-related deaths,[52] killed more than three billion native vertebrates (including mammals, reptiles, birds, and frogs),[53] and destroyed 3,000 homes, costing the economy an estimated $10 billion.[54]

Climate change has caused rainfall to decline in southeast Australia in recent decades; warming and drying trends are predicted to continue.[55] Droughts, heatwaves, intense winds, and dry lightning storms are becoming more frequent and extreme, and increasingly likely to coincide with each other, creating catastrophic fire conditions more often.[56] The increasing likelihood of

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and AIDR, 'Bushfire: Black Saturday' (n.d.), <https://knowledge.aidr.org.au/resources/bushfire-black-saturday-victoria-2009/>.

50 Climate Council of Australia, supra note 10; Abram, et al., supra note 45.

51 Matthias M. Boer, et al., 'Unprecedented Burn Area of Australian Mega Forest Fires', 10 *Nature Climate Change* 171 (2020), 171. In that paper, the authors note that approximately 2–3% of continental forest biomes burn each year, globally, with the exception of fires in tropical and sub-tropical dry broadleaf forests in parts of Africa and Asia which may burn areas of up to 9%. In 2019–2020, 21% of mainland Australia's temperate, broadleaf, and mixed forest areas burned – which is probably an underestimate because the figure excludes large fires in the island state of Tasmania.

52 Smoke plumes from the fire gave Australia the worst polluted air in the world for short periods, blanketed New Zealand in thick smoke, and circumnavigated the globe: Nicolas Borchers Arriagada, et al., 'Unprecedented Smoke-Related Health Burden Associated with the 2019–20 Bushfires in Eastern Australia', 213 *The Medical Journal of Australia* 282 (2020).

53 This estimate includes native vertebrates in the path of the destructive bushfires in the summer of 2019–2020; it does not include potential impacts from cultural and other prescribed burns conducted that year, nor the impact on invertebrate species: Lily M. van Eeden, et al., *Impacts of the Unprecedented 2019–2020 Bushfires on Australian Animals*, report prepared for WWF-Australia (Sydney: WWF-Australia, 2020). The report updates an original estimate that one billion native vertebrates were killed by the Black Summer fires. That estimate only considered areas in New South Wales and Victoria, and was calculated before the end of the bushfire season in 2020.

54 Lesley Hughes, et al., supra note 11.

55 For example, 2018–2019 was the driest two-year period on record, and 2019 was the warmest year on record: Hughes, et al., supra note 11.

56 Josep G. Canadell, et al., 'Multi-Decadal Increase of Forest Burned Area in Australia Is Linked to Climate Change', *Nature Communications* 6921 (2021); Bureau of Meteorology (BOM) and Commonwealth Scientific and Industrial Research Organisation (CSIRO), *State of the Climate 2020* (Canberra: Australian Government, 2020); Richard P. Allan, et al., 'Summary for Policymakers', in V. Masson-Delmotte, et al. (eds.), *Climate Change 2021: The Physical Science Basis: Working Group I Contribution to the Sixth Assessment Report of*

such events as the Black Summer fires is amongst the clearest effects of climate change in Australia; it has been projected in every IPCC report since 2001.[57] Climate change is also making bushfire seasons longer, reducing opportunities for fire agencies and land managers to safely conduct hazard-reduction burning.[58]

Despite the clear climate signals in Australia's experience of intensifying bushfire seasons, fire risk is not determined simply by fuel and weather conditions. Risk is also affected by who and what is in harm's way. In Australia, as in many other countries, human exposure and vulnerability to fire is driven by demographic shifts, changing lifestyle expectations, and the ongoing expansion of urban areas into high fire-risk environments.[59] Housing developments along Australia's coasts and in forested areas outside of urban centres have grown rapidly in the past fifty years; peri-urban developments now account for 15 per cent of Australian settlements.[60] Fire hazards in such areas are notoriously difficult to manage, not least because hazard-reduction activities conflict with the aesthetic, biodiversity, and other values that are the primary appeal of these areas. Limitations on the capacity of fire agencies to manage fuel loads around peri-urban areas safely, and without triggering conflict with residents, compounds the risk of bushfire in these already heavily exposed communities.

3.2 *Fire Risk Management Strategies*

Managing the risk of bushfire in Australia requires attention to measures across the Prevention, Preparedness, Response, and Recovery emergency-management cycle, involving laws and policies for land-use planning, vegetation management, crime, and emergency management. While the prevention of bushfires is hard to guarantee given the heightened risks from climate change, laws prohibit activities that pose ignition risks. This includes obvious ignition sources such as arson, but also the use of outdoor machinery on fire-ban days.

Even if fires themselves cannot be prevented, their extent and consequences can be mitigated in a range of ways. Some Australian states have planning provisions requiring that planning schemes and decisions under those

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the Intergovernmental Panel on Climate Change (IPCC, 2021), <www.ipcc.ch/report/sixth-assessment-report-working-group-i/>, A.3.5.

57 Canadell, et al., supra note 56; Norman, et al., supra note 15.

58 E.g. M. R. Grose, et al., 'Changes to the Drivers of Fire Weather with a Warming Climate: A Case Study of Southeast Tasmania', 124 *Climatic Change* 255 (2014); BOM and CSIRO, supra note 56, 3.

59 Norman, et al., supra note 15; *NSDR*, supra note 3, 1; V. C. Radeloff, et al., 'Rapid Growth of the US Wildland-Urban Interface Raises Wildfire Risk', 115(13) *Proceedings of the National Academy of Sciences of the United States of America* 3314 (2018).

60 Norman, et al., supra note 15.

schemes facilitate preparation for, and responses to, the impacts of climate change. In Victoria, for example, the Victorian Planning Provisions introduce risk-based planning to minimize the impacts of natural hazards and to adapt to the impacts of climate change.[61] Exposure to fires can be limited by restricting new development in bushfire-prone areas. It is very rare for development to be completely prohibited in such areas. Rather, areas of high bushfire risk are mapped and made subject to higher levels of development control, which require that the risk to life and property be reduced to an acceptable level.[62] Such controls include requirements for planning schemes to specifically consider bushfire risk, approval of applications by fire authorities or certification by fire professionals, guidance on the siting and design of subdivisions and buildings in bushfire-prone areas, heightened restrictions on sensitive land uses (e.g. schools, hospitals, and aged-care facilities) compared to areas of lower risk, and conditions attaching to the approval of other uses, such as safe access, water supply, and clearance of defendable space around structures.

Building standards are set in the Building Code of Australia and the 2018 Construction of Buildings in Bushfire Prone Areas Standard and are incorporated by reference in state building legislation.[63] Recent research has emphasized the need – and opportunity – to improve on current requirements for bushfire preparedness in new residential developments, while also improving sustainable design and community-amenity outcomes.[64] Recommendations include ensuring that peri-urban communities have multiple access (and

61 Victorian Department of Environment, Land, Water and Planning, *Victoria Planning Provisions Planning Scheme* (Melbourne: Victorian Government, 2018), 13.01-1S.

62 Victorian Department of Environment, Land, Water and Planning, *Victorian Planning Provisions 44.06: Bushfire Management Overlay* (Melbourne: Victorian Government, 2018); Constanza Gonzalez-Mathiesen, et al., 'Integrating Wildfire Risk Management and Spatial Planning: A Historical Review of Two Australian Planning Systems', 53 *International Journal of Disaster Risk Reduction* 101985 (2021). What constitutes an 'acceptable level' of risk is inherently subjective and not defined by any Australian fire law, nor by overarching risk policy statements, such as the Australian Institute for Disaster Resilience, *Australian Disaster Resilience Handbook 10: National Emergency Risk Assessment Guidelines* (Melbourne: AIDR: 2015), or Standards Australia, *AS/NZS ISO 31000:2009 Risk Management: Principles and Guidelines* (online: International Organization for Standardization, 2009), <www.iso.org/standard/43170.html>. Some Australian states offer guidance on who should determine acceptability and the factors to take into account; e.g. Government of Western Australia Department of Fire and Emergency Services, 'Guidelines for Preparing a Bushfire Risk Management Plan' (2015), <www.dfes.wa.gov.au/site/documents/OBRM-Guidelines-for-Preparing-a-Bushfire-Risk-Management.pdf>.

63 The Standard prescribes a methodology for setting building standards based on six possible bushfire attack levels (BALs). The location and use of a proposed development will determine which BAL standards must be followed.

64 Norman, et al., supra note 15.

escape) routes; promoting community design that places houses closer together to reduce biodiversity impacts from clearing while maximizing fire-hazard mitigation in the immediate vicinity of homes; and requiring underground electricity cables.[65] While local governments have enforcement powers in relation to building and planning standards – including in relation to bushfire-prone areas or areas that are subject to management overlays, where particular management standards or outcomes are designated in a planning scheme – those standards may not be effective at actually reducing bushfire risks unless they are actively monitored and enforced.[66]

The potential for planning laws to manage the risks facing existing properties is heavily constrained. If there is little appetite for restricting new development in bushfire-prone areas, there is even less appetite for relocating existing communities away from hazardous locations. The Australian Standard 3959 building code applies to all new construction; however, there is no requirement that existing infrastructure be retrofitted to comply with the code.[67] For those extensive parts of Australia that are already in harm's way, adapting to heightened bushfire risk involves hazard mitigation outside of fire season, across the landscape. Hazard-mitigation activities include fuel reduction, accomplished by controlled burning or clearing brush and timber, and the construction of fuel breaks, which are areas cleared completely of vegetation with the goal of stopping or slowing the spread of bushfire.[68] In fire season, adaptation requires clear public information about the level of bushfire risk, advice on recommended response measures, and provision of community safe places.[69] Individual landowners are expected to develop and activate fire plans as needed, including actions for remaining in place to defend properties or for early, safe, departure.[70] Public and private insurance against bushfire damage is critically important for the recovery phase, although the availability

65 Ibid.

66 E.g. Victorian Auditor-General's Office (VAGO), *Reducing Bushfire Risks: Independent Assurance Report to Parliament* (Melbourne: Victorian Government, 2020), 8 (hereinafter, *VAGO 2020*).

67 The Australian National Construction Code requires compliance with Standards Australia instruments and applies to all new construction around the country. See Australian Building Codes Board, 'Construction of Buildings in Bushfire-Prone Areas', *Australian Standard AS3959*, NCC Vols 1 and 2 (online: ABCB, 2018), <https://ncc.abcb.gov.au/editions/2019-a1/ncc-2019-volume-two-amendment-1/contents-and-introduction/copyright-and-licence>.

68 *Royal Commission*, supra note 39, ch. 17.

69 Ibid., chapters 10 and 12.

70 Since the 2009 Black Saturday bushfires in Victoria there has been considerable interest in how responsibility should be shared between emergency managers and private individuals in deciding whether to stay or leave. The timing of these questions was considered once

and affordability of such insurance for individuals – particularly those most vulnerable to natural hazards, e.g. with homes or businesses located in bushfire-prone areas – is increasingly constrained in Australia.[71]

Fuel-load management through controlled or 'prescribed' burning or mechanical clearing is a critically important element of fire-risk management.[72] Fire- and land-management agencies both recognize that prescribed burning can reduce the speed and intensity of fire and thus improve the effectiveness of fire-fighting activities and ecological outcomes.[73] However, prescribed burns are not a panacea. They are likely to be most effective when applied strategically, for example when targeted at critical assets or at vegetation close to vulnerable communities.[74] They may have little impact in catastrophic bushfire conditions.[75] Prescribed burning can also be technically difficult and risky, and thus beyond the expertise of private-land managers without the support of fire agencies or other experts. Moreover, the lengthening fire season under climate change narrows the window for conducting hazard-reduction burns, reducing the practical effectiveness of this tool[76] and creating a high demand for contractors during the available cool season.[77]

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again following the 2019–2020 fire season, when the ferocity of the fires in many places rendered many properties undefendable.

71 *Royal Commission*, supra note 39, ch. 20; Chloe Lucas and Kate Booth, 'Privatizing Climate Adaptation: How Insurance Weakens Solidaristic and Collective Disaster Recovery', 11 *WIREs Climate Change* e676 (2020).

72 Prescribed burning refers to 'The controlled application of fire under specified environmental conditions to a pre-determined area and at the time, intensity, and rate of spread required to attain planned resource management objectives. It is undertaken in specified environmental conditions': Australasian Fire and Emergency Service Authorities Council (AFAC), *Bushfire Glossary* (East Melbourne: AFAC, 2012); see also Adam Leavesley, Mike Wouters, and Richard Thornton (eds), *Prescribed Burning in Australasia: The Science, Practice and Politics of Burning the Bush* (East Melbourne: AFAC, 2020).

73 *Royal Commission*, supra note 39, 372–3; AFAC, *Independent Operational Review: A Review of the Management of the Tasmanian Fires of January 2016* (East Melbourne: AFAC, 2016), 5.8.6.

74 James M. Furlaud, et al., 'Simulating the Effectiveness of Prescribed Burning at Altering Wildfire Behaviour in Tasmania, Australia', 27 *International Journal of Wildland Fire* 15 (2017); James M. Furlaud and David Bowman, 'To Fight the Catastrophic Fires of the Future We Need to Look Beyond Prescribed Burning', *The Conversation* (15 December 2017), <https://theconversation.com/to-fight-the-catastrophic-fires-of-the-future-we-need-to-look-beyond-prescribed-burning-89167>.

75 *Royal Commission*, supra note 39, 373, noting submissions to the Commissioners about the limitations of prescribed burning in catastrophic fire conditions, which are driven more by atmospheric coupling (in which a fire interacts with the surrounding atmosphere and generates its own weather conditions) than by fuel loads and topography.

76 *VAGO 2020*, supra note 66, 6–7.

77 Martyn Eliott, et al., 'Planned and Unplanned Fire Regimes on Public Land in South-East Queensland', 29(5) *International Journal of Wildland Fire* 326 (2019); Claudia Baldwin and

Despite its importance, fuel-load management is also one of the most contested fire mitigation strategies. There is a perception among some private-land managers that planning, heritage, and conservation laws operate as a constraint on hazard-management activities, especially mechanized clearing.[78] On the other hand, there is also a concern that fire mitigation may be invoked to justify clearing land for other purposes, such as for agriculture or to enhance views.[79] Many residents who live in bushfire-prone areas have chosen to live closer to nature, and may be expected to resist measures that would affect the area's aesthetics, amenity, or ecological values. Private-property rights are invoked on both sides to assert the right to mitigate fire risk or the right to maintain a property's natural state. In some tenures, fuel-load management may be complicated by, and in some cases even conflict with, statutory obligations to manage land, for example for the purposes of maintaining or increasing biodiversity.[80]

3.3 *Responsibility for Mitigating Bushfire Hazards*

Most Australian jurisdictions impose some form of obligation on land managers or owners to mitigate bushfire risks, and many legal frameworks contain provisions that make it easier for landowners or managers to undertake such work.

3.3.1 Duties to Mitigate

In the Australian Capital Territory (ACT), New South Wales, and South Australia, the duty to take steps to prevent fire and minimize spread is imposed directly through statute. In New South Wales, the requirements of the duty may be elaborated in advice from the Bush Fire Coordinating Committee.[81] The Emergencies Act 2004 (ACT) enumerates the following factors, which are relevant in determining the reasonableness of a rural landowner's or land

Helen Ross, 'Beyond a Tragic Fire Season: A Window of Opportunity to Address Climate Change?', 27(1) *Australasian Journal of Environmental Management* 1 (2020), 2.

78 E.g. *Royal Commission*, supra note 39, 381.

79 Rural Fire Service Amendment (Bush Fire Prevention) Bill 2015, Second Reading Speech by Mr David Elliott, Minister for Corrections, Minister for Emergency Services, and Minister for Veterans Affairs (12 August 2015), <www.parliament.nsw.gov.au/bills/Pages/bill-details.aspx?pk=3169>.

80 Lucy G. Halliday, et al., 'Fire Management on Private Conservation Lands: Knowledge, Perceptions and Actions of Landholders in Eastern Australia', 21 *International Journal of Wildland Fire* 197 (2012).

81 Rural Fires Act 1997 (NSW), s. 63. Tasmania released a Bushfire Mitigation Measures Bill for public comment in 2020. It proposed a similar statutory duty to prevent the establishment of fire or spread of fire from a property. But on the Tasmanian Bill, see discussion below, particularly fn. 99.

manager's efforts: (a) the amount and kind of litter, timber or vegetation on the land (whether alive or dead); (b) the amount and kind of other flammable material on the land; (c) climatic conditions affecting the land; (d) location and use of the land and nearby land; and (e) the possible effect of fire.[82] Curiously, while the obligation is to take *reasonable* steps, the Act stipulates that failure to comply with the obligation is an offence of strict liability. In South Australia, reasonableness is determined by reference to the nature of the land, setting, activities carried out on the land, and other statutory standards or requirements.[83] The Act allows for these criteria to be complemented by codes of practice, and the standard of care is deemed not to have been met if the applicable code of practice is not complied with.[84]

In the Northern Territory, Queensland, Tasmania, and Western Australia, the duty only arises once the prescribed authority (either the local authority or fire agency) has served a notice on a landowner to undertake works.[85] In Queensland, this notice may be specific to a particular landowner or apply generally.[86] In the Australian Capital Territory and New South Wales, any notices are additional to the general statutory obligation.[87] In Victoria, fire legislation imposes the duty directly on public-land managers,[88] but requires the serving of a notice on private landowners or managers.[89] Where a property owner fails to undertake the required fuel-reduction work, every jurisdiction authorizes the relevant authority, be it a local council or a fire service, to enter the land to undertake the work and to receive reimbursement from the occupier for the work done.[90]

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82 Emergencies Act 2004 (ACT), s. 120(4)

83 Fire and Emergency Services Act 2005 (SA), s. 105F (private property); s. 105G (local councils); s. 105H (Crown land).

84 Fire and Emergency Services Act 2005 (SA), s. 105F(3).

85 Fire and Emergency Management Act 1996 (NT), ss. 25 and 92; Fire and Emergency Services Act 1990 (Qld), ss. 68–9; Fire Services Act 1979 (Tas), s. 48 (steps to prevent, minimize, or provide precautions for protecting life and property, if desirable in the public interest); s. 49 (removal of vegetation that constitutes a fire hazard); s. 56(5) (creation of a firebreak); Bushfires Act 1954 (WA), s. 33 (local government may require owner or occupier or all owners or occupiers to plough or clear firebreak, either alone or in cooperation with neighbour – described as a 'Fire Break Order').

86 Fire and Emergency Services Act 1990 (Qld), ss. 68–9.

87 Emergencies Act 2004 (ACT), s. 74(3) (Strategic Bushfire Management Plan may stipulate requirements for owners and land managers to prevent and prepare for bushfire), ss. 81–2, 86–7; Rural Fires Act 1997 (NSW), ss. 65–6.

88 Country Fire Authority Act 1958 (Vic), s. 43.

89 Ibid., s. 41.

90 Emergencies Act 2004 (ACT), s. 120(4); Rural Fires Act 1997 (NSW), ss. 70 and 73; Fire and Emergency Management Act 1996 (NT); Fire and Emergency Services Act 1990 (Qld); Fire

While most jurisdictions impose some form of responsibility or duty for mitigation of bushfire risk, they do not always spell out all the consequences of breaching that duty. For example, the Tasmanian fire legislation currently stipulates penalties for failing to comply with a notice to mitigate fire hazards, but the proposed statutory duty to do so contained in the consultation draft of the Bushfire Mitigation Measures Bill 2020 provides no consequences, whether civil or criminal, for non-compliance.[91]

3.3.2 Statutory Enablers of Mitigation Activities

Most states empower landholders to discharge their fire-mitigation responsibility by exempting mitigation activities from the operation of other legal obligations. Depending on the jurisdiction, the clearing of native vegetation may require approval under land-use planning, native vegetation, or nature-conservation legislation. New South Wales, Victoria, and South Australia generally allow landholders to clear any vegetation from within 10 metres of a building, and vegetation other than trees from within 50 metres of a building (20 metres in South Australia) without the need for a permit.[92] In New South Wales, individuals may be expressly protected from liability that would otherwise apply under legislation on planning, fisheries, heritage, native vegetation, environmental protection, or soil conservation for clearing certain vegetation to protect their property from bushfire.[93] Each of these jurisdictions, as well as the Northern Territory, also allow some level of clearing along fence lines without the need to obtain a permit.

Exemptions from planning and conservation laws in Queensland apply to work undertaken under a permit issued by a local fire warden.[94] In Western

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and Emergency Services Act 2005 (SA); Fire Service Act 1979 (Tas); Country Fire Authority Act 1958 (Vic), s. 42; Bushfires Act 1954 (WA), s. 33(4).

91 Fire Service Act 1979 (Tas), s. 48(5).

92 Referred to as the 10/50 rule. Some protected vegetation cannot be removed under these general exemptions, such as vegetation protected under a court order or conservation covenant. See, e.g., Rural Fires Act 1997 (NSW), s. 100R; NSW Rural Fire Service, *10/50 Vegetation Clearing Code of Practice 2015* (Sydney: NSW Rural Fire Service, 2015); Victorian Department of Environment, Land, Water and Planning, *Victorian Planning Provisions, cl. 52.12*, 'Bushfire Protection: Exemptions' (Melbourne: Victorian Government, 2020). In Victoria, the 10/50 rule applies in areas covered by the Bushfire Management Overlay, and a 10/30 rule applies to other bushfire-prone areas. See also Native Vegetation Regulations 2017 (South Australia), cl. 9(2)(b); Land Clearing Guidelines 2020 (NT), 37; Fire Services Act 1979 (Tas), s. 56(5).

93 Rural Fires Act 1997, s. 100R(9). See also Rural Fire Service, *Bush Fire Environmental Assessment Code for NSW* (2021).

94 Planning Regulation 2017 (Qld), Sch. 21; Nature Conservation (Plants) Regulation 2020 (Qld).

Australia, vegetation within 20 metres of a relevant building can be cleared without a permit, provided that the property is in a bushfire-prone area and the landholder complies with the Bush Fire Risk Treatment Standards, issued under the Bush Fires Act 1954 (WA).[95] Furthermore, in Western Australia, works undertaken in compliance with a notice to mitigate are exempt from planning or environmental-protection permitting requirements,[96] and clearing of regrowth within 20 metres of a building is exempt from clearing laws.[97] South Australia exempts activities to reduce fuel across the landscape conducted in accordance with a local Bushfire Management Plan or with approval from the Native Vegetation Council or the Country Fire Service.[98]

The Tasmanian Bill proposed exemptions to support landholders' mitigation activities, consolidating approval processes for bushfire mitigation by exempting approved Bushfire Mitigation Plans from all other statutory requirements, creating a so-called 'one stop shop'.[99] If it had been implemented in its original form, the Bill would have exempted mitigation works from approval requirements under legislation on forestry, threatened species, planning, national parks and nature conservation, and Aboriginal and historic cultural heritage.[100] As discussed in Section 4 below, there is some concern that if the Tasmanian government seeks to reintroduce Bushfire Management Plans in any new iteration of the Bill, these Plans may authorize extensive vegetation

95 Bush Fires Act 1954 (WA), s. 35AA-AB; Bush Fire Risk Treatment Standards 2020 (WA). This exemption does not apply to important environmental or heritage sites.

96 Described in Western Australia as 'Fire-break Orders', these notices are issued under the Bush Fires Act 1954 (WA), s. 33. Penalties apply for failing to comply with an order: s. 33(3).

97 Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (WA), reg. 5, Item 15. This exemption does not apply in environmentally sensitive areas.

98 Native Vegetation Regulations 2017 (South Australia), cl. 9(2)(b).

99 Bushfire Mitigation Measures Bill Exposure Draft 2020 (Tasmania), cl. 16. On 16 September 2021, the Tasmanian government announced that it no longer intends to introduce the Bill to Parliament, but, rather, that the Bill's content and purpose will be considered as part of an ongoing review of the Fire Service Act 1979 (Tasmania). The government intends that review to result in new legislation but no draft legislation has been published (as at 18 April 2022). See Jacquie Petrusma MP, 'Statement to the Tasmanian House of Assembly by the Minister for Police, Fire and Emergency Management', *Hansard* (16 September 2021), 74 <www.parliament.tas.gov.au/ParliamentSearch/isysquery/0ddec562-a49b-497c-b6b8-73c28fe43e25/PETRUSMA/entity/>. We comment on the original Bill in this article and highlight its shortcomings, so that they are not replicated in new legislation.

100 The statutory obligations that would be exempt are set out in Environmental Defenders Office, 'Submission on the Draft Bushfire Mitigation Measures Draft Exposure Bill' (online: EDO, 2020), <www.edo.org.au/wp-content/uploads/2020/10/201028-EDO-submission-on-draft-Bushfire-Mitigation-Measures-Bill-2020.pdf>, 30.

modification, which, in the absence of transparent and accountable approval processes, could inappropriately privilege bushfire mitigation and protection over other public values.

3.4 *Liability for Failure to Mitigate Bushfire Risks*

The Northern Territory and Western Australia both have provisions that enable fire authorities to recover from a landowner the full cost of fighting a fire that the landowner illegally or negligently allowed to start on, or spread from, the owner's property.[101] However, no statute expressly imposes civil liability. A clear legislative intention would be required to interpret a statute in this way.[102] Fire legislation does not express the obligation to mitigate fire risk in terms of protecting neighbours as a specific class,[103] although in New South Wales, neighbours are able to make a bushfire-hazard complaint.[104]

The common law imposes a high standard of care on land managers who start a fire that escapes and causes damage.[105] Land managers who light a fire on their property, whether to reduce the fuel load or for other purposes, are expected to exercise care to prevent it from escaping.[106] The duty is non-delegable. In *Burnie Port Authority v. General Jones P/L*, the High Court of Australia held that 'the degree of control that could be exercised by a person who was introducing fire … and the danger meant that the duty amounted to "a degree of diligence so stringent as to amount practically to a guarantee of safety".'[107]

To date, however, no court has imposed liability on the sole basis that the presence of fuel on a property exacerbated fire risk. 'Whoever owns the risk owns the fire' is a platitude of Australian bushfire policy which implies that landholders who fail to treat fuel loads on their property 'own' a fire that spreads to a neighbour, regardless of how it is caused.[108] There are statutory provisions across Australia requiring landowners and managers to take reasonable steps to extinguish fire on their land, whether they started it or not

101 Bushfires Act 1980 (NT), s. 27; Bush Fires Act 1954 (WA), s. 58.

102 *Pyrenees Shire Council v. Day* (1998) 192 CLR 330, para. 15, and *Brodie v. Singleton Shire Council* (2001) 206 CLR 512, para. 326, both cited in Michael Eburn and Geoffrey J. Cary, 'You Own the Fuel, But Who Owns the Fire?', 26 *International Journal of Wildland Fire* 999 (2017).

103 Eburn and Cary, supra note 102, 1004.

104 Rural Fires Act NSW (1997), Div. 7, Subdivision 2A.

105 Eburn and Cary, supra note 102, 1001.

106 Ibid., 1003, citing *Southern Properties v. Executive Director of the Department of Conservation and Land Management* [*No. 2*] (2010) 42 WAR 287, paras 152–88.

107 *Burnie Port Authority v. General Jones* (1994) 179 CLR 520, para. 41.

108 Eburn and Cary, supra note 102.

– but what constitutes reasonable steps depends on the circumstances.[109] All jurisdictions require that fire be reported to the relevant authorities if the land manager is not able to deal with it.

A review of the case law by Eburn and Cary suggests that common law liability for allowing fire to spread is 'almost unheard of'.[110] An occupier owes a duty to take reasonable steps to prevent or minimize the risk of injury or damage to a neighbour's property arising from a hazardous condition on her land.[111] This may extend to containing a fire that she did not light, but the extent of the duty depends on the occupier's individual capacity and circumstances; in some cases it may require only that the occupier notify the authorities.[112] Eburn and Cary conclude that, when faced with a choice between undertaking hazard-reduction burning and doing nothing (noting that there exist fuel-management options that do not involve burning), 'for a gambler, doing nothing is legally safer'.[113] They explain that:

> If a landowner cannot rally the relevant resources and assets to guarantee that any prescribed fire is contained, it may be 'reasonable' to leave the fuel load untreated, or at least untreated by fire (as opposed to actions like slashing, physical removal of fuel, or the application of herbicides).[114]

The scope of a landowner's duty to manage fuel load was clarified by the NSW Court of Appeal in *Woodhouse v. Fitzgerald*.[115] The landowner had engaged the NSW Rural Fire Service (RFS) to undertake a hazard-reduction burn on his property. The roots of a hollow tree reignited two weeks after the controlled burn was concluded, and a burning branch from the tree spread the fire to a neighbour's property and destroyed the neighbour's house. The Court of Appeal rejected a claim based on private nuisance. It held that private nuisance is not established by virtue only of harm resulting from something leaving a person's land. Rather: 'the use of the land must be out of the ordinary,

109 Emergencies Act 2004 (ACT), ss. 121 and 124; Rural Fires Act 1997 (NSW), s. 64; Fire and Emergency Management Act 1996 (NT), s. 33; Fire and Emergency Services Act 1990 (Qld), s. 67; Fire and Emergency Services Act 2005 (SA), s. 91 (requires only that fire be reported); Fire Services Act 1979 (Tas), s. 64 ('diligent' steps); Country Fire Authority Act 1958 (Vic), s. 34; Bushfires Act 1954 (WA), s. 28.

110 Eburn and Cary, supra note 102.

111 *Yared v. Glenhurst Gardens Pty Ltd* (2002) BPR 19485, [2002] NSWSC 11, para. 105.

112 Eburn and Cary, supra note 102, 1001.

113 Ibid., 1000.

114 Ibid.

115 (2021) 104 NSWLR 475.

unreasonable or otherwise inappropriate'.[116] In this case, controlled burning was considered to be a normal, reasonable, and even beneficial part of rural land use, so it did not come under the definition.[117]

The court also considered the relevant standard in negligence. The trial judge had noted that another tree that had been on fire had been bulldozed to extinguish the fire, and inferred from this that failure to so treat the tree from which the fire had spread was negligent. The Court of Appeal overturned this finding. Despite the standard of care being high in respect of fire, mere awareness of a risk and a capacity to take a precaution that was not taken does not in itself constitute negligence:[118]

> The controlled burn was an appropriate exercise to be undertaken … by responsible owners, carried out at the correct time of year (winter), managed by the appropriate authority (the local RFS), which did not get out of control, and was followed by appropriate monitoring.[119]

The Court of Appeal held that, while the landowner had a duty to monitor the activities of the RFS, there was no evidence that he had breached that duty.[120] The court confirmed that the landowner owed a non-delegable duty of care to the neighbour, but there was no evidence that RFS officers had been negligent in conducting the burn, so there was no breach of that duty.[121] The court clarified that the neighbour needed to prove actual or constructive knowledge that the roots of the tree were still alight two weeks after the controlled burn. Since the neighbour had not proved that the landowner knew, or ought to have known, that the fire had re-emerged, the neighbour had not established the necessary causal connection between a breach of the landowner's duty and the damage suffered.[122]

Even though controlled burning on rural land is not an unusual or undesirable use of land according to the NSW Court of Appeal, a landholder may be found negligent if she or he undertakes a controlled burn without the assistance of a dedicated fire crew, or at a dangerous time of year, or if the landowner fails to act in accordance with a permit or fails to properly monitor the controlled burn. *Woodhouse v. Fitzgerald* does not remove the uncertainty

116 Ibid., paras 47–8.
117 Ibid.
118 Ibid., paras 67 and 72.
119 Ibid., para. 72.
120 Ibid., para. 54.
121 Ibid.
122 Ibid.

surrounding the legal consequences of undertaking fuel-reduction burns. This is likely to remain a barrier for landowners who wish to mitigate fire hazard. It also risks the potentially perverse outcome that the most ecologically benign intervention is the one that carries the highest legal risks.

Statutory clarification of the consequences of complying with the statutory duty to mitigate fire risk could address this. Ideally, it would stipulate that fuel-reduction burning undertaken in accordance with a permit or guidelines is deemed to have satisfied a landowner's duty of care.[123] In order to remove perverse incentives to do nothing, Eburn and Carey also advocate for Australian states and territories to impose a statutory duty to manage fuel loads, as in the Australian Capital Territory, New South Wales, and South Australia, without the need for notices to be served by local or fire authorities. They also propose the insertion of provisions that establish liability in a case where a person does not comply with a statutory duty to mitigate fire hazard on his or her land.[124] This would serve the interests of fire management, but, as we discuss below, it does not necessarily account for the diverse factors that influence risk-management practices.

3.5 *Summary*

Australian law has responded to bushfire events and to the prospect of increasing fire risk. Responsibility for both undertaking and paying for hazard-mitigation work on public or private land rests principally on landowners or managers, whether public or private. Duties are imposed either directly under statute or through the issuance of mitigation notices, with the prospect of criminal penalties for non-compliance. Statutory exemptions from requirements of planning, conservation, or heritage approval are aimed at reducing the burden of complying with these obligations. The liability of landowners for fire that causes damage to neighbouring properties is not dealt with under statute. The common law rules of negligence and nuisance have historically set a high standard of care on people who start fires on their property. The expectations have been more nuanced for those who do not start a fire but who permit a fire to spread. There are recent signs that, with the growing expectation that fuel mitigation is a normal and important part of land management in fire-prone parts of Australia, the duty of care on those starting fires will be

123 Eburn and Cary, supra note 102, 1005. This approach is taken in Western Australia, where the Fire Commissioner may prepare a 'bushfire risk treatment standard' that specifies measures for preventing the outbreak or spread of bushfire and provides legal protection to those who follow this standard: Bushfires Act 1954 (WA), s. 35AA.

124 Eburn and Cary, supra note 102, 1004–5.

satisfied if landowners comply with applicable guidelines and permits or if they contract experts who do so.

Having outlined the current state of the law, in the next section we consider the implications of this allocation of roles, responsibilities, and liability for the effectiveness and fairness of bushfire-mitigation policy; what it tells us about the prioritization of risks; and the implementation of shared responsibility for climate adaptation generally.

4 Implications of the Assignment of Responsibility

The way in which responsibility is assigned for adaptation generally, and bushfire in particular, makes important assumptions about the capacity of individuals to understand and act on risks, the influence of factors other than the risk of a particular hazard, and the appropriate role of the state and the individual. The discussion that follows exposes and tests some of those assumptions.

Several scholars have argued that the concept of shared responsibility for adaptation and disaster law and policy is not driven by effectiveness. Rather, it demonstrates the broader shift identified at the outset of this article, towards 'responsibilization' in governance,[125] in which 'shared' responsibility in fact involves a shift in the allocation of responsibility to the individual and *away from* government.[126] This shift privatizes adaptation risk, including for bushfires,[127] and requires 'individuals, not society, to "own" their risk'.[128] On this view, rather than being about empowerment and self-direction to manage complex risks, shared responsibility (in the form of legal duties to mitigate bushfire hazard) is a way of 'managing citizens' expectations of government'.[129] The role of

125 See, Pyysiäinen, et al., supra note 42, and accompanying text.

126 Jonathan Joseph, 'Resilience as Embedded Neoliberalism: A Governmentality Approach', 1(1) *Resilience* 3852 (2013); Raven Cretney and Sophie Bond, '"Bouncing back" to Capitalism? Grass-Roots Autonomous Activism in Shaping Discourses of Resilience and Transformation Following Disaster', 2(1) *Resilience: International Policies, Practices and Discourses* 18 (2014).

127 Beilin and Paschen, supra note 38.

128 Ibid., 515.

129 Ibid., 528, 517; Hazel Kemshall, 'Social Policy and Risk', in Gabe Mythen and Sandra Walklate (eds.), *Beyond the Risk Society: Critical Reflections on Risk and Human Security* (Maidenhead, UK: Open University Press, 2006), 60, cited in Michael Eburn and Stephen Dovers, 'Legal Aspects of Risk Management in Australia', 4(1) *Journal of Integrated Disaster Risk Management* 61 (2014), 64; Karen Reid, et al., 'Communities and Responsibility: Narratives of Place-Identity in Australian Bushfire Landscapes', 109 *Geoforum* 35 (2020).

government is then limited to 'enabling, shaping and supporting' communities.[130] At the very least, the 'sharing' of responsibility is a way for governments to avoid blame.[131] Commentary on floods on the east coast of Australia in early 2022 demonstrate that these concerns about what it means to share – or abdicate – responsibility for reducing individual and community risks from natural hazards extends well beyond the context of bushfire mitigation.[132]

In any case, the effectiveness of shifting responsibility onto individual landholders, measured in terms of bushfire-risk mitigation, is not established. It is not even clear that the effectiveness of this measure is being monitored or assessed.[133] For example, a recent audit focused on bushfire-risk reduction in the state of Victoria, including on private land, found that the relevant Victorian fire agency does not monitor, evaluate, or report on the effectiveness of its own fuel-reduction treatments on private land and that it cannot determine whether its own activities effectively reduce risks, let alone whether private landholders' mitigation activities are effective. Furthermore, Victorian local governments assess the effectiveness of hazard-reduction activities, including those required of landholders, only under risk-reduction notices, at the individual property level. Hence, there is no information about the extent to which the activities of local governments or private landholders reduce broader community or landscape-scale risks from bushfire.[134]

We expect that there are similar shortfalls in the measurement or monitoring of adaptation and resilience-building measures for other natural hazards, despite important differences between reducing risks in the context of bushfires and other natural hazards. For example, there is no flood-, drought-, or storm-related equivalent of the role that prescribed burning plays in reducing bushfire risks. However, maintaining and upgrading drainage infrastructure and retrofitting flood-protection measures could be considered analogous to the task of clearing defensible space around homes and infrastructure in preparation for bushfires. There would be value in assessing whether obligations imposed on individuals to prepare their homes in anticipation of

130 Beilin and Paschen, supra note 38, 521, citing Marc Welsh, 'Resilience and Responsibility: Governing Uncertainty in a Complex World', 180(1) *The Geographical Journal* 15 (2014).

131 Rowena Maguire, Amanda Kennedy, Annastasia Bousgas, and Bridget Lewis, 'Governments Love to Talk about 'Shared Responsibility' in a Disaster – But Does Anyone Know What It Means?', *The Conversation* (21 March 2022), <https://theconversation.com/governments-love-to-talk-about-shared-responsibility-in-a-disaster-but-does-anyone-know-what-it-means-179459>.

132 Ibid.

133 E.g. *VAGO Report*, supra note 66, 7.

134 Ibid.

flooding have been effective at fostering adaptation and resilience, particularly in terms of what that effectiveness might mean for our understanding of the concept of shared responsibility for resilience and adaptation.[135] That analysis is beyond the scope of this article, although we note that repeated flooding in the states of Queensland and New South Wales, suggest that recovery and adaptation measures appear not to have been effective at avoiding community-wide impacts from extreme flood events.[136]

There has been little discussion in the policy or academic literature of the extent to which it is feasible or desirable to expect strategic, landscape-scale, mitigation to occur through the imposition of individual landholder responsibility, especially when no additional resources are allocated to support the task. For example, shared responsibility for fire management assumes 'that those at risk have sufficient knowledge of the risk (or can easily obtain it) and that they are capable of acting on this knowledge to respond to the risk'.[137] It is dangerous to assume that knowledge of risk translates into action. Legal duties can overcome complacency as a recurring problem in Australian fire management, but inaction is not always a result of complacency in the face of known risks;[138] the relationship between increased risk perception and action is not established.[139]

A range of factors beyond complacency also influence the decision to undertake bushfire-mitigation works. Numerous studies in Canada, the United States, and Australia show that direct experience of fire, locus of responsibility,

135 Foerster, MacIntosh, and McDonald, supra note 7.

136 Despite the Queensland Government allocating more extensive power to local governments for 'identifying flood risks and building flood resilience' after severe flooding in 2011, the Government did not assess the capacity or capability of local councils to achieve those outcomes. In October 2015, the Queensland Department of Premier and Cabinet made its final report on progress implementing its Flood Inquiry recommendations, but made no mention (and appears not to have assessed) the effectiveness of those measures for building resilience to future flooding: Queensland Audit Office, *Flood Resilience of River Catchments* (Brisbane: QAO, 2015), 44. See also Maguire, et al., supra note 131.

137 McLennan and Handmer, supra note 19, 9.

138 Christine Eriksen and Nicholas Gill, 'Bushfire and Everyday Life: Examining the Awareness-Action "Gap" in Changing Rural Landscapes', 41(5) *Geoforum* 814 (2010), 814, citing Stuart Ellis, Peter Kanowksi, and Rob Whelan, *National Inquiry on Bushfire Mitigation and Management* (Canberra: Council of Australian Governments, 2004), 254; Päivi Lujala, Haakon Lein, and Jan Ketil Rød, 'Climate Change, Natural Hazards, and Risk Perception: The Role of Proximity and Personal Experience', 20(4) *Local Environment* 1 (2014).

139 Eriksen and Gill, supra note 138, 818.

and opinions on rural life and nature are highly influential.[140] Communities with higher social cohesion are also more likely to be prepared.[141] These perspectives and traits vary between long-term rural residents and recent arrivals (who have never experienced a fire event) or people for whom a rural property is a second home.[142] Day-to-day lifestyle issues are also important. For example, people who have chosen to live in more remote locations (whether for affordability or lifestyle) may have longer commutes and thus less time for hazard-reduction maintenance, such as vegetation management.[143] Areas on urban boundaries that have experienced affordability-led or amenity-led migration therefore become especially vulnerable.[144] There is also ample evidence that, when making decisions about whether and how to mitigate fire hazard, landowners tolerate heightened risk in exchange for the benefits of living close to nature (including privacy, peace, and aesthetics).[145] For them, an obligation to mitigate bushfire risk by managing or removing vegetation may be viewed as being in conflict with more highly valued attributes.[146] Similar drivers influence the perception of risk and decisions to take mitigation action in the context of other hazards, such as flooding[147] and storms.[148]

140 Ibid.; Wade E. Martin, et al., 'The Role of Risk Perceptions in the Risk Mitigation Process: The Case of Wildfire in High Risk Communities', 91(2) *Journal of Environmental Management* 489 (2009); Bonita L. McFarlane, et al., Complexity of Homeowner Wildfire Risk Mitigation: An Integration of Hazard Theories', 20 *International Journal of Wildland Fire* 921 (2011).

141 Sarah M. McCaffrey, 'Outreach Programs, Peer Pressure and Common Sense: What Motivates Homeowners to Mitigate Wildfire Risk?', 48 *Environmental Management* 475 (2011), 477; Tim Prior and Christine Eriksen, 'Wildfire Preparedness, Community Cohesion and Social-Ecological Systems', 23(6) *Global Environmental Change* 1575 (2013); Sarah McCaffrey, 'Community Wildfire Preparedness: A Global State-of-the-Knowledge Summary of Social Science Research', 1 *Current Forestry Reports* 81 (2015).

142 McCaffrey, supra note 141.

143 Eriksen and Gill, supra note 138.

144 Ibid.

145 Eriksen and Gill, supra note 138, 815 and 818; Hillary Faulkner, et al., 'Comparison of Homeowners Response to Wildfire Risk Among Towns With and Without Wildfire Management', 8(1) *Environmental Hazards* 38 (2009), 40; McFarlane, et al., supra note 140, 929. See also Stacey Schulte and Kathleen A. Miller, 'Wildfire Risk and Climate Change: The Influence on Homeowner Mitigation Behavior in the Wildland-Urban Interface', 23(5) *Society and Natural Resources* 417 (2010).

146 Beilin and Paschen, supra note 38, 527–8; McFarlane, et al., supra note 140, 929 and 932.

147 Lujala et al., supra note 138.

148 Magnus Bergquist, Andreas Nilsson, and P. Wesley Schultz, 'Experiencing a Severe Weather Event Increases Concern About Climate Change', 10 *Frontiers in Psychology* 1 (Article 220) (2019).

The allocation of responsibility also has important equity implications. Adaptation literature – and the NCRAS itself – demonstrate that, to be fair and equitable, adaptation responses need to support and engage different population groups differently, especially groups that disproportionately bear the adverse effects of climate impacts.[149] The emphasis on individual response and self-care[150] in the resilience framing of adaptation and disaster management expects individual citizens to 'increase their life skills to facilitate adaptation to adversity, shock or ongoing trauma'.[151] Yet, many are poorly equipped to meet these higher expectations.[152] Like the ability to adapt more broadly, the fairness and overall success of bushfire mitigation is influenced 'fundamentally by the ethics of the treatment of vulnerable people and places within societal decision-making structures'.[153] This was highlighted in the final report of the Victorian Bushfires Royal Commission in 2009,[154] but inequities remain. For example, a key issue is who should bear responsibility for hazard mitigation for rented properties. In the outer suburbs of Australia's large cities, properties may be rented by people pushed into higher-risk areas by the unaffordability of housing closer to the city.[155] Tenants are typically prohibited from modifying a rented property or clearing trees; such measures can only lawfully be undertaken by the landlord. This leaves tenants dependent on landlords undertaking work in a timely and effective manner.[156] These equity issues are also relevant to other climate-related hazards, such as floods and cyclones, particularly

149 W. Neil Adger, et al., 'Successful Adaptation to Climate Change Across Scales', 15(2) *Global Environmental Change* 77 (2005); Ebba Brink and Christine Wamsler, 'Collaborative Governance for Climate Change Adaptation: Mapping Citizen-Municipality Interactions', 18 *Environmental Policy and Governance* 82 (2018); Robert R. M. Verchick, 'Adapting to Climate Change While Planning for Disaster: Footholds, Rope Lines, and the Iowa Floods', 6(10) *BYU Law Review* 2203 (2011); Rosemary Lyster and Robert R. M. Verchick (eds) *Research Handbook on Climate Disaster Law* (Cheltenham, UK: Edward Elgar, 2018).

150 Beilin and Paschen, supra note 38, 522.

151 W. Neil Adger, et al., 'Are There Social Limits to Adaptation to Climate Change?', 93 *Climatic Change* 335 (2009), 350.

152 Beilin and Paschen, supra note 38, 518.

153 Adger, et al., supra note 149, 350.

154 Teague, et al., supra note 38, 353: 'Some people will need more assistance than others, and people with vulnerabilities will probably need different levels of support from the State and from municipal councils'.

155 Similar challenges have been discussed at some length in the context of the US Wildland-Urban Interface; see Michael R. Coughlan, Autumn Ellison, and Alexander Cavanaugh, *Social Vulnerability and Wildfire in the Wildland-Urban Interface: A Literature Synthesis* (Northwest Fire Science Consortium, Institute for a Sustainable Environment, 2019).

156 Lukasiewicz, et al., supra note 38, 306.

given that developments on floodplains or in coastal inundation zones may provide the only affordable housing available.[157]

A further concern about the current allocation of responsibility for hazard mitigation relates to how trade-offs are made between various public and private values.[158] Most Australian jurisdictions impose the same mitigation duties on public-land managers as they do on private owners or occupiers, regardless of competing statutory management objectives. For example, national parks and other protected-area managers must manage the risk of bushfire starting on, or spreading from, these properties. There is little clarity about how new statutory duties or powers to mitigate bushfire risk should be reconciled with existing legal arrangements for managing bushfire risks while protecting important ecological or cultural values.[159] It is inappropriate to leave these choices to a case-by-case determination of whether a response was 'reasonable' in the circumstances, according to the calculus of negligence for public authorities.[160] Similarly, owners of private land under a conservation covenant must balance the private value of mitigating potential bushfire hazards on their property (and potential liability for those hazards) with the public benefit of conserving covenanted values, such as threatened species and habitat or sensitive ecosystems such as wetlands.[161] Obligations to mitigate should not require individual landholders to balance their personal liability against the

157 E.g. Dimuthu Ratnadiwakara and Buvaneshwaran Venugopal, 'Do Areas Affected by Flood Disasters Attract Lower-Income and Less Creditworthy Homeowners?' 29 *Journal of Housing Research* S121 (2020), published in a special issue on Natural Disasters and the Housing Market.

158 Foerster, Macintosh, McDonald, supra note 7.

159 E.g. the National Parks and Reserves Management Act 2002 (Tas), s. 30(3)(ca), empowers the managing agency to undertake any activities it 'considers necessary or expedient for the purposes of preventing, managing or controlling fire in reserved land, having regard to the management objectives for that reserved land'; Victorian Department of Sustainability and the Environment, *Code of Practice for Bushfire Management on Public Land* (Melbourne: Victorian Government, 2012); Queensland Department of Environment and Science, *Bioregional Planned Burn Guidelines* (Brisbane: Queensland Government, 2019), seeking to improve fire management in national parks and balance fire mitigation goals with values such as maintaining healthy ecosystems.

160 See, e.g., Civil Liability Act 2002 (NSW), s. 5B, and *Graham Barclay Oysters Pty Ltd v. Ryan* (2002) 194 ALR 337.

161 E.g., a duty to mitigate a fire hazard on land which is subject to a conservation covenant may entitle (or oblige) a landholder to take actions that would otherwise be prohibited under the covenant. While there may be little risk that a landholder will be prosecuted or penalized for a breach of a conservation covenant for undertaking hazard-reduction activities, there is little transparency or accountability for the possibility of irreplaceable ecological values being lost. See also Halliday, et al., supra note 73.

conservation of legally protected (and in some cases globally significant) public environmental and cultural values.[162]

The approach of Tasmania's draft Bushfire Mitigation Measures Bill 2020 was particularly lacking in nuance on this point. The Bill proposed an exemption for works undertaken in accordance with an approved Bushfire Mitigation Plan, but in assessing an application for such a Plan there was no mechanism for considering any value other than bushfire mitigation,[163] despite the Bill's object clause anticipating the need to balance bushfire mitigation with social and natural values.[164] It is possible, though not clear, that the streamlined approval process for Bushfire Mitigation Plans in the Tasmanian Bill was inserted in anticipation of complaints, such as those made to the media and to the Royal Commission into National Natural Disaster Arrangements in the aftermath of the 2019–2020 fires that legal restrictions are preventing adequate bushfire-hazard reduction.[165] However, the Royal Commission's final report did not accept that processes for approving bushfire-hazard-reduction activities are difficult to navigate, although it did observe that people had *reported* this to be an issue. Instead, the final report makes the following observation:

> We heard that there is room for both increased clarity and greater flexibility. We also heard that ambiguities around approvals and assessments sometimes caused unreasonable delays, or did not align with ideal time intervals for fuel management activities. Some public submissions expressed frustration at the tension between their shared responsibility to manage risk and the limitations on their ability to do so due to approvals required.[166]

The Royal Commission could have responded to these submissions by recommending streamlined approval processes or blanket exemptions from other permitting obligations; but it did not do so. Rather, it highlighted evidence that landowners did not always understand their obligation to reduce bushfire risks on their land or the processes available to them to meet that obligation.[167] The final report recommends that Australian state and territory governments

162 Hazard-mitigation activities in preparation for other natural hazards may also trigger public/private trade-offs. For a more detailed analysis of trade-offs across a range of climate-adaptation contexts, see Foerster, Macintosh, McDonald, supra note 7.

163 Bushfire Mitigation Measures Bill 2020 (Tas), Part 4.

164 Ibid., cl. 4.

165 *Royal Commission*, supra note 39.

166 Ibid., 381, para. 17.80.

167 Ibid., 379–82.

review 'assessment and approval processes relating to vegetation management, bushfire mitigation and hazard reduction, to ensure that there is clarity' about what is expected of landholders when mitigating bushfire risks, and to minimize the time taken for assessments and to obtain approvals.[168] This is a recommendation that the Tasmanian government has an opportunity to implement as it reconsiders how best to share responsibility with landholders for mitigating bushfire risks on private land.

Some jurisdictions have already changed their requirements following this review process. For example, in late 2020, the Western Australian government released new statutory standards exempting vegetation clearing in fire-prone areas from other permitting processes to address complex and opaque assessment processes for mitigating fire risk on private land.[169] The government also produced an accompanying document describing 'exclusions' from the standards, including land that is under a conservation covenant, Aboriginal sites, and riparian vegetation adjacent to wetlands and waterways.[170] New South Wales has also clarified and tightened exemptions for hazard-reduction clearing, recognizing that its vegetation-clearing exemptions had been used to justify clearing for purposes other than fire-hazard mitigation.[171] In applying a blanket exemption for bushfire-mitigation activities, the Tasmanian Bill missed an important opportunity to clarify how competing values should be balanced, while simultaneously replicating mistakes made, and since rectified, in other Australian jurisdictions.

Wider community acceptance is needed of the preeminence of fuel reduction and hazard-mitigation objectives, before we assume that these objectives should always prevail. Areas that are more prone to bushfire because of their vegetation type and extent often contain valuable, and sometimes unique, biodiversity and other natural values.[172] In some cases, the potential damage that could be caused by severe fire may justify clearing threatened vegetation communities and destroying habitat for threatened native species to mitigate the risk. In cases where bushfire mitigation does prevail over other values, that justification should nevertheless be clear and transparent.

168 Ibid., Recommendation 17.2.

169 Bush Fire Risk Treatment Standards 2020 (WA), issued by the Western Australian Fire and Emergency Services Commissioner under the Bush Fires Act 1954 (WA).

170 Department of Fire and Emergency Services, *Bush Fire Risk Treatment Standards – Exclusions* (Perth: Western Australian Government, 2020).

171 Second Reading Speech, supra note 79; and see the NSW Rural Fire Service's 10/50 clearing rule, supra note 92.

172 Foerster, Macintosh, and McDonald, supra note 7.

Legislative exemptions will be problematic, at best, if they provide no mechanism for balancing other important values against the value of mitigating bushfire risk, particularly where they also fail to direct and support mitigation activities that achieve co-benefits for biodiversity and human communities. This applies equally to adaptation- or resilience-oriented duties in the context of other natural hazards. Community debate must precede legal reforms that privilege the value of risk mitigation over threatened-species conservation, planning and development controls, cultural-heritage protection, and other priorities.

Climate change is already increasing the frequency, severity, and duration of bushfires in Australia, to catastrophic effect. We have seen, in recent years, a clear need to accelerate adaptation efforts in the context of fire, as well as in the context of other hazards, most recently in large storms and extreme and repeated flooding on Australia's east coast. While the specific legal and practical characteristics of bushfire risk mitigation will not necessarily be applicable to other adaptation contexts, the pressing need and ongoing complexity of sharing responsibility – in a time of rapidly intensifying and repeated natural disasters – will resonate more broadly than this bushfire case study. Effective adaptation to changing bushfire regimes will necessarily involve 'some form of hybrid system in which control, choice, public values and private interests would all be prioritised and traded off in different ways in different parts of the system and management cycle'.[173] Adapting to climate-driven changes in other natural hazards will require similarly holistic and integrated systems of decision-making.

5 Conclusion

This article has examined the concept of shared responsibility as a key feature of modern adaptation and disaster law and policy. It showed how the language of shared responsibility pervades national-disaster and adaptation-resilience policies and how the concept is also evident in laws governing the mitigation of bushfire risk. As climate change further exacerbates the frequency and intensity of bushfires, the benefits of efforts to mitigate bushfire risk must be constantly re-evaluated. In the face of catastrophic fire risk, no amount of land management is likely to help. At some point, bushfire-mitigation laws must recognize the inevitability of, and the need to accept, heightened bushfire risks.

173 Karen Bosomworth, et al., 'The Role of Social Science in the Governance and Management of Wildland Fire', 24 *International Journal of Wildland Fire* 151 (2015).

Where mitigation measures are likely to achieve a reduction in bushfire risk, assigning responsibility to individuals can only be effective if the individual has the capacity to undertake the required action and there are no competing land-management considerations that should take priority. McLennan and Handmer describe the shift in disaster management towards shared responsibility and a 'resilience-based approach' as 'a new social contract for disaster management', in which half of the contractual terms are missing.[174] As we have demonstrated through this study of bushfire-risk mitigation, in rebalancing rights and responsibilities between the state and its citizens, there has been, in Australia, little formal (or informal) agreement about the rights and benefits of citizens, or the relative weight of various trade-offs.

Even as legal frameworks impose obligations on landholders to keep themselves and their communities safe from bushfire, the implementation and implications of these responsibilities are far from clear. Without allowing for potential inequities or trade-offs between competing values, the allocation of responsibility in existing laws fails to account for the complexity of bushfire-mitigation decision-making and provides a poor basis for adapting to other climate-related hazards.[175]

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174 Blythe McLennan and John Handmer, *Sharing Responsibility in Australian Disaster Management: Final Report for the Sharing Responsibility Project* (East Melbourne: Bushfire Cooperative Research Centre, 2014), 6.

175 The authors gratefully acknowledge the valuable comments of the journal's three anonymous referees. They also acknowledge the contribution of the late Dr Stewart Williams to early thinking on this article.