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Expert knowledge, collaborative concepts, and universal nature: naming the place of Indigenous knowledge within a public-sector cultural burning program

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ABSTRACT. Investigates whether a cultural burning program embedded within a government bureaucracy can meaningfully support Indigenous peoples' landscape fires. In particular, it presents evidence on how Indigenous and non-Indigenous individuals encountered, interpreted, and prioritized the influence of wildfire science, ecological science, and Indigenous expert knowledge communities. All interviewees considered the knowledge and authority of Indigenous people, specifically the Traditional Custodians, as inseparable to the program. Four moves were made to build support for Indigenous expert knowledge: the reconsideration of who has expert evidence; who has systems of knowledge creation; whose knowledge is relevant across time; and whose knowledge is relevant across contexts. The results reveal how some strongly held non-Indigenous precepts about expert evidence shifted, where knowledge sharing challenges persisted, and the constraints of the governance context. The study recommends material investment in Indigenous peoples' expert knowledge communities, and prioritizing reflexive research, learning, and teaching about nature and evidence across academia.

Key Words: *Australia; cultural burning; intercultural environmental governance; knowledge politics; prescribed burning*

INTRODUCTION

Public-sector environmental governance, both area-based (e.g., national parks) and procedural (e.g., wildfire mitigation), has co-evolved with certain kinds of expert evidence in ways that have generated obstacles to understanding the knowledge expertise of Indigenous peoples and has indeed actively worked against this expertise (Hemming et al. 2010, Diver 2017, Latulippe and Klenk 2020, Vásquez-Fernández and Ahenakew 2020). The public sector values access to expert evidence that is judged independent and objective as conducted through rigorous research practices (Pielke 2007). In environmental governance this expertise is almost always the natural sciences, which is relied upon to provide the evidence and methods for decision-making and regulation (Prasad and Michael 2005, Robin 2018, Phillips 2020, Weir et al. 2022). Indigenous knowledge about the environment is also tested and testable as expert knowledge (Whyte 2013:2), but it is usually judged by others as not having similar evidentiary status because it is considered cultural, traditional, and local and/or subjective (Nakata 2007, Smith et al. 2016, Whyte 2018). Indigenous leaders invest significant energy in sorting out these discriminatory knowledge relations; yet, even reflexive approaches to the natural sciences continue to group Indigenous knowledge as akin to local and traditional knowledge, and thus neither modern nor scientific (Latulippe and Klenk 2020).^[1]

This study investigated how Indigenous and non-Indigenous individuals grapple with the roles of three different knowledge communities: Indigenous, wildfire science, and ecological science in relation to a public-sector cultural burning program. Landscape burning is practiced by Indigenous people globally, and has come to be called cultural burning to signify its uniqueness to others (Eriksen and Hankins 2014, Neale et al. 2019, Welch and Coimbra 2019, Fletcher et al. 2021, Marks-Block and Tripp 2021, Smith et al. 2021, Cavanagh 2022, Williamson et al. 2022). I considered whether cultural burning is a “collaborative concept”: one that facilitates respectful learning across Indigenous and non-Indigenous differences (Whyte 2013). This follows arguments made by Indigenous scholar Kyle Whyte about

“traditional ecological knowledge” which, with many meanings and no single definition, nonetheless can be:

... invoked to invite non-Indigenous parties to learn more about how particular Indigenous communities approach fundamental questions of the nature of knowledge and how it fits into their visions of environmental governance (Whyte 2013:10).

The context is temperate “settled” Australia, where Indigenous landscape fire practices have been suppressed by imperial and colonial violence and are now in resurgence, including a cross-continental Indigenous-led cultural burning social movement (Cavanagh 2022).^[2] Alongside, the public sector has expressed enthusiasm about the potential of cultural burning to be a qualitatively different collaborative activity (Smith et al. 2021). The 2019–2020 catastrophic fires intensified societal interest in Indigenous peoples' fire expertise. However, landscape fire debates can be shallow (May 2020). Indigenous leaders argue that this growing interest must be attentive to Indigenous expertise about knowledge, law, and culture, as practiced and held by kinship groups with the Land or Country as known in Australia (Alberts 2021, Cavanagh 2021, Petersen 2021).

My research centers on a group of Indigenous and non-Indigenous public servants in the Australian Capital Territory (ACT), a small jurisdiction established in 1911 within the unceded Lands of the Traditional Custodians who have lived here since time immemorial. About ten years ago, Traditional Custodian Adrian Brown, a Ngunnawal *murringe* (man), was working as an ACT Parks and Conservation Service Ngunnawal Ranger and, as he has shared, “was constantly recognizing areas that needed to be burnt” (Brown 2021:27). Adrian grew up burning on Ngunnawal Country to the north and south of the ACT in surrounding New South Wales, taught by his father Uncle Carl Brown, now deceased (Brown 2021). Adrian recommended that there was a role for Indigenous fire practices within the agency, as judged appropriate by the Traditional Custodians of Country. With institutional support, he began building a cultural fire

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program. On 18 September 2015, Uncle Carl Brown lit what is officially referred to as the first cultural burn supported by ACT Parks. This burn was initially called a cultural-ecological burn to assuage the concerns of some ecologists about the impact on vulnerable species.

In the intimate setting of colleagues working in the same institution on the same burns, the cultural burning program has brought discrimination against Indigenous knowledge into the foreground. Among divergent and aligning Indigenous and non-Indigenous priorities, assumptions, and challenges, this study's focus is with Indigenous knowledge discrimination, with another paper in preparation foregrounding the power asymmetries in current governance arrangements. The results reveal how different individuals identified different ways to reduce Indigenous knowledge discrimination, including shifting some strongly held non-Indigenous precepts about expert evidence. The results also reveal where knowledge discrimination persists, and, further, how the governance arrangements generate problems with sharing Indigenous knowledge out to outsiders, especially the knowledge of the Traditional Custodians. The Traditional Custodians range from being involved and strongly supportive of the program; to conditionally supportive; withholding judgment; not wishing to be involved; openly critical; and/or preferencing opportunities to burn elsewhere with others.

I use the terms Indigenous and Aboriginal people interchangeably as is common practice in Australia by Indigenous and non-Indigenous people. The terms Indigenous and Aboriginal *peoples* refer to the political-legal entities of First Nations, also known as Traditional Custodians or Traditional Owners. I write as a non-Indigenous white scholar descended from colonialists. My scholarship is charged and constrained by my positionality, which includes what I find most interesting to understand.

EXPERT KNOWLEDGE

Qualitative researchers have examined how expert knowledge is created and my analysis draws on intellectual traditions from Indigenous studies, science and technology studies, the environmental humanities, and geography. Specifically, I operationalize reflexivity. Reflexive approaches examine *how* we think, not just *what* we think, and are used to track knowledge assumptions, transgressions, and possibilities. My contribution builds on the collaborative environmental governance literature that examines how different knowledge expertise is authorized and interacts to constrain and facilitate intercultural understanding (e.g., Hemming et al. 2010, Whyte 2013, Reo et al. 2017, Diver 2017).

Knowledge communities

Decades of reflexive scholarship (e.g., Nakata 2007, Pielke 2007, James 2015, Smith et al. 2016, Collins et al. 2020) reveal that expert evidence is created through knowledge communities which:

1. are formed by knowledge holders (individuals, institutions, and others) that have trajectories about what matters;
2. form and re-form knowledge always in the present, re-constituting but not replacing prior forms of knowing, which live on in the new; and,
3. are not in isolation from each other, such that individuals, institutions, and others will identify with, and draw on, different knowledge communities.

Unlike post-truth politics and anti-science positions, taking this reflexive approach to knowledge communities does not require:

1. flattening/ignoring difference such that all evidentiary claims are considered equal to each other;
2. surrendering to the (post-modernist) notion that all knowledge is subjective and thus evidentiary claims (facts) about the world cannot be made; nor,
3. rejecting the falsifiable facts of the natural sciences for not meeting (reductionist) standards of objective truth.

Instead, it affirms that expert evidence is built through knowledge communities, as judged credible by those knowledge communities, and that some evidentiary claims will attract greater purchase than others, as judged both within and between knowledge communities.

Thus, the natural sciences continue to be what it always has been: a source of systemic knowledge within which some falsifiable facts are more certain than others - for example, compare the theory of relativity with the land management sciences (Collins et al. 2020:54-55). And, while Indigenous knowledge has substantive differences to the natural sciences, Indigenous knowledge is nonetheless another form of systemic knowledge with evidentiary claims that have different degrees of certainty. It has theories, practices and protocols, organizational and classificational forms, and training and validation methods that together generate and evaluate expertise (Smith et al. 2016:134-5).

Some reflexive scholarship argues that relationships between knowledge communities are so co-constituted that it is neither possible nor useful to differentiate; instead, I argue it is possible to identify distinct knowledge communities in and among this complexity (aligning with Whyte 2013:8). This involves identifying and analyzing coherence without reducing knowledge communities to a singular bounded form (James 2015:41). It requires taking reflexivity further than approaches that matter-of-factly separate Indigenous and Western/science knowledge as different so as to argue for in/compatibility and/or “integrate”, or plug, Indigenous knowledge into the natural sciences (or vice versa) (Whyte 2013:5). Such approaches can obscure and misrepresent the knowledge premises, practices, and priorities at hand (Copes-Gerbitz et al. 2021, Smith et al. 2021).

Difference

The literature documents substantial differences between Indigenous and natural science knowledge communities, with my focus being expert evidence creation as formed and informed by understandings of nature. I argue that this research priority is critical for identifying and, hopefully, addressing discrimination against Indigenous knowledge in collaborative environmental governance. Note, my descriptions of Indigenous and natural science knowledge communities are less nuanced and diverse than reality; instead, these are “simplifications” to facilitate navigating complexity (after Ang’s “cultural intelligence” 2011).

Indigenous peoples’ knowledge about nature arises out of cosmological understandings of nature as co-constituted with society, such that the people and the Land are formed together and known *through* their relationships with each other (Kwaymullina 2016, Smith et al. 2016, Tynan 2020). This is an ethical inter-being-relationality with the Land (Vásquez-Fernández and Ahenakew 2020). For people, the most important

relationships are with the Land and then between the people themselves (Graham 2008). Hypothesis, observation and experimentation are undertaken within this relational accountability, and thus expert knowledge is foregrounded as value laden and situated, as held by knowledge holders (Reo et al. 2017). Further, people are different from nature but not so different that they are the only knowledge holders and creators (Latulippe and Klenk 2020). Nature has law, knowledge, and culture, and it also sustains and forms human law, knowledge, and culture through relational accountability, whether these relations are strong, weak, important, insignificant, and so on. This multi-being expertise is neither neutral nor independent, but it seeks to understand what matters, and to whom, with differentiated roles understood within that.

In comparison, the natural sciences are renowned for “objectivism” - that the world is comprised of facts, and natural scientists develop empirical laws and theoretical positions that are designed to provide literal descriptions of these facts (paraphrased from Knorr-Cetina 2017(1984):223). This viewpoint separates the world into subjects (humans) and objects (everything else). The iconic natural science approach seeks to minimize subjectivity (human influence) so that methods can be replicated anywhere by anyone to generate a universal knowledge and, simultaneously, a universal nature (Mitchell 2000, Hulme 2018). This universal knowledge can be stereotyped as coming from nowhere. However, it is established natural science practice to acknowledge subjectivity in, for example, prioritizing fields of research, method selection, and analyzing results: work that is central to its success (Knorr-Cetina 2017(1984):224). Yet, such subjectivities, and their uncertainties, are often glossed over by users of natural science expertise who desire clearer terms. This includes bushfire inquiries and practitioners seeking to reassure the public about bushfire risk (May 2020:149-50, Weir et al. 2022). Furthermore, a lot of natural science research is funded by the public sector to specifically meet policy objectives.

Nature-as-object is such a definitive expression of contemporary academic knowledge that, with important exceptions, it is sustained across the natural sciences, social sciences, humanities and inter- trans-disciplinary studies - whether from reflexive or reductive academic standpoints. The relevance here is how it constrains over-turning Indigenous knowledge discrimination.

Discrimination

As a consequence of the coupled universal-nature/knowledge viewpoint, Indigenous expert knowledge becomes placed as subjective, local, and unscientific. It does not meet the evidentiary standards. The *real* nature is known through the authoritative natural science method. For example, after the 2019–2020 catastrophic fires in Australia, the Royal Commission firmly positioned cultural burning’s hazard-reduction contribution as “local knowledge” (Binskin 2020). Whereas, Indigenous peoples’ relational accountability re-orders the risk. The public-sector risk-mitigation hierarchy of protecting humans, property, and then the environment is reversed; instead, the Land must come first, and human lives and property are protected within that (Steffensen cited in Weir 2020).

At the same time, universal-nature/knowledge discrimination is intertwined with the discrimination wrought by imperialism and colonialism that positions Indigenous peoples as savages and non-

Indigenous people as civilized (Nakata 2007:28–30). The literature documents how the seizure of Indigenous lands was justified by social science and humanities theories of progressional civilizations and racial hierarchies (eugenics) (Rigney 1999, Nakata 2007). Euro-American (white) scholars argued that Indigenous people were inferior and would necessarily give way to the superior (white) Euro-American modern world (Miller et al. 2010).

While largely discredited after World War II, these discriminatory logics remain influential today, including in collaborative environmental governance; for example, the assumption that Indigenous knowledge is archival knowledge (Whyte 2013). When Indigenous knowledge is set in the past, once lost it is lost forever, and if it changes, it is no longer authentic and is “made-up”. This is evident when Indigenous cultural burning knowledge is considered not relevant because of landscape and demographic change since colonization (Eriksen and Hankins 2014:1291); needing to be imported from “remote” locations where it is assumed closer to pre-colonial Indigenous knowledge sets; and/or is only about protecting values from the past (e.g., rock art) and not also about futures (Neale 2018).

The global reach of imperialism and colonialism built and affirmed universal-nature/knowledge and secured resources to perpetuate these logics as “modernity” (Mitchell 2000, Nakata 2007). The sheer quantity of environmental research generated in line with these logics sustains extractive approaches to Indigenous knowledge, removing it from relational accountability to serve the purposes of others (Welch and Coimbra 2019). In response, Indigenous scholars have prioritized influencing research and public-sector agendas (Rigney 1999, Hemming et al. 2010, Williamson et al. 2022).

Analyzing knowledge communities through Indigenous landscape fires

This potent combination can and does derail collaborative environmental governance; however, Indigenous landscape fires offer potential for disruption. First, distinct to negotiations in policy forums, Indigenous fire practitioners can lead by lighting burns as appropriate with the Country and the Land, if access is possible and as public-sector regulations allow. Second, thereby demonstrate relational accountability to teach others. Third, Indigenous landscape fire is influential in existing tensions between two public-sector environmental governance responsibilities - biodiversity conservation and natural-hazard mitigation.

Catastrophic fires are placing pressure on governments for more hazard-reduction burns, with many ecologists (and conservationists) concerned about the consequences for ecological life (May 2020). Hazard-reduction burns are supported by wildfire science expertise in wildfire likelihood and behavior, which spans from mathematics to ecology (Bell et al. 2020, Penman et al. 2020). Their purpose is to protect people and property (or assets). They may or may not protect biodiversity conservation, however protecting assets can include ecological communities. This approach is emblematic in the casting of grass, leaf litter, bark, and small bushes as “fuel” or “flammable organic matter”. Researchers interested in alternatives to simply more hazard-reduction burns include ecologists investigating more strategic approaches and/or, as shared here, cool-burning techniques. Both the ecological sciences and the wildfire sciences have recruited

Indigenous peoples' historic fire practices to their landscape burning arguments (Neale 2018, 2020, May 2020). Indigenous landscape fires include techniques to allow wildlife to escape, with cooler burning temperatures protecting the canopy and organic life in the soil and their regular application reducing bushfire risk (Fletcher et al. 2021, Marks-Block and Tripp 2021, Cavanagh 2022).

However, Indigenous leaders reiterate that these fires must be understood *within* relational accountability. Burning can also be about “cleaning” Country for well-being, food, protecting specific sites/places, demonstrating ownership, passing on knowledge, and more. Specific roles are involved for different people (e.g., women, men, children, and Elders), who may have specific practices (e.g., differentiated hunting roles), learning *from* and respecting Country through lighting fires *with* Country (Alberts 2021, Cavanagh 2021, Petersen 2021).

The possibilities for change are as extensive as the discrimination. For example, Cabrogal woman Mikaela Jade, a former ACT Parks ranger and now digital entrepreneur, has explored how change is possible with satellite maps:

They collect data on the landscape, but the algorithms only process that data through Western knowledge systems. Indigenous communities see patterns in the environment and connectivity within ecosystems. This can be applied to developing new algorithms that look at the world through a different lens. (cited in Mudditt 2021:79)

PRESCRIBED BURNING IN THE AUSTRALIAN CAPITAL TERRITORY (ACT)

In Australia, public-sector landscape burning is called prescribed burning, as defined as:

The controlled application of fire under specified environmental conditions to a predetermined area and at the time, intensity, and rate of spread required to attain planned resource management objectives. (AFAC 2012:24)

Initially, non-Indigenous people learned to burn here from Indigenous people, and they valued landscape burning for promoting pasture for stock and protecting property (including twentieth-century forestry resources) (Eriksen and Hankins 2014, Neale 2018; for comparison Vinyeta 2022). From the 1960s–1980s the fire sciences rapidly grew and “[natural] science-based fire management” was developed with “reintroducing Aboriginal burning culture” becoming a public-sector activity in the twenty-first century (Morgan et al. 2020:7-8, 20-21). Concomitantly, the twentieth-century conservation movement sought to minimize humanity’s impact on nature, including challenging the purpose (and legitimacy) of hazard-reduction burns (May 2020, Morgan et al. 2020).

Until recently, the purpose of prescribed burning has almost exclusively been hazard reduction, with the Australian Capital Territory (ACT) no exception. In the ACT, most hazard reduction burns are undertaken by ACT Parks, which has hazard reduction and biodiversity conservation responsibilities for nearly all nature reserves. ACT Parks sits within the Environment Directorate of the ACT government and hosts the Fire Management Unit (FMU) who conduct the burns, usually in the cooler months and responding to bushfires in the hotter months. The 2003

catastrophic fires in Canberra led to new laws, policies and practices focused on bushfire-risk mitigation. As common at the time, the post-bushfire inquiry report only mentioned Indigenous people in historical terms, and the new regulations did not mention Indigenous people at all (Freeman et al. 2021:116, Williamson et al. 2020:13-15). Nonetheless, these regulations have facilitated the use of government vehicles, staff and equipment for cultural burns. Periodically reviewed strategic plans have enabled regulatory flexibility to diversify fire practice, initially to include environmental protection and then Indigenous peoples’ priorities. During my fieldwork, about thirty hazard-reduction burns were planned annually, the smaller ecological burns about half of that and two to four cultural burns. All prescribed burns are undertaken on public nature reserves, noting that the ACT has neither Indigenous land rights nor native title (Freeman et al. 2021:4-5).

This is intensely regulated work. Prescribed burns are planned and budgeted a year in advance in the Bushfire Operations Plan (BOP), which lists location, size, works needed, dates, staff etc. Individual burn plans prescribe “specific parameters (weather, fuel moisture, fire intensity), detailed information about the site (controlled lines, lighting procedures, unique features), and objectives.”^[3] Fuel-hazard assessments are based on 700 permanent fuel plots monitored by Environment Directorate ecologists. Then, the FMU must wait until the burn area is within prescription. If this does not happen, the planned burn is not lit. Both the annual planning and individual burns require hazard reduction and ecology expertise in their creation and regulation, which includes guidance from the international risk management standard (ISO 31000). Cultural burns must meet these prescriptions and also standards set by the Traditional Custodians.

My understanding is that, at a minimum, cultural burns at ACT Parks are fires lit as considered appropriate by Traditional Custodians and as aligned with Indigenous expert fire knowledge. Adrian Brown has shared his father’s legacy in bringing this cultural burning program into existence:

Always in the back of my mind, I think about dad. How powerful is that, that this man in his quietness, in his humbleness, has influenced hundreds, and now probably thousands, of people. I don’t know what that impact is, but whenever I hear people talk here about cultural fire management, I know it stems from those conversations that we started back a very long time ago. (Brown 2021)

The ACT Parks approach began with learning through lighting cultural burns, and guidelines “for fuel and fire management operations” documented this emerging practice (ACTPCS 2015), with both conducted in consultation with the Traditional Custodians. The guidelines were intended to be revised regularly, although this did not happen during my fieldwork.

The guidelines identify differentiated roles for cultural burns:

1. An Aboriginal ACT Parks staff member be involved in every phase (identification of potential sites, planning, pre-burn works, burning, monitoring, and rehabilitation), and they must work closely with the FMU and the Traditional Custodians; and,

2. Traditional Custodians must be given the opportunity to be involved in all or any steps within these phases, noting that specific training and equipment is required to be present on the fire ground and with provision for that training in the BOP.

Also, an Aboriginal Fire Management Officer position was created within the FMU, by which time Adrian Brown had left ACT Parks to establish his own business.

The guidelines state that cultural burns can be for any purpose within the primary purpose of cultural renewal. Individual cultural burn plans might announce “ongoing commitment to Caring for Country” or “culture” as the purpose, with culture both the “reason” and “mission” (e.g., Attachment A, Weir and Freeman 2019:40-55). There is little additional detail provided in the fifteen pages of prescription. Significant cultural burns include a men’s site in a mountainous nature reserve which was only attended by men and began with a smoking ceremony led by Adrian Brown (2016), and an ochre quarry within suburban Canberra which was the first with all lighting roles held by Aboriginal people (2018) (Freeman et al. 2021:10-11). Both burns were identified and lit by Traditional Custodians.

The diversification of burning practice first appears in the ACT Parks paper work as an Additional Fire Burn conducted in October 2013: a category for burns not listed in the BOP. Motivated non-Indigenous staff with ecological expertise filled in the burn plan differently, with the purpose listed as “ecological objectives”. Also documented is a scheduled site meeting with the Indigenous fire crew the day beforehand, although the post-burn report comments only concern ecology. At the same time, the Environment Directorate secured Commonwealth grant monies (2014–2017) to conduct ecological burning trials in grasslands. They are listed in the BOP as ecological burns. In recognition of the relationship between ecological burns and cultural burns, these grant monies employed an Indigenous staff member and were planned and lit by the FMU Aboriginal Fire Management Officer. As distinct categories, “ecological burns” first appeared in the 2015–16 BOP and “cultural burns” in 2016–17.

METHODOLOGY

This research was negotiated with Aboriginal and other staff at ACT Parks. It is one of two case studies within a larger project about Indigenous peoples and the natural hazard sector in southern Australia, funded by the Bushfire and Natural Hazards Cooperative Research Centre. The design of this larger project was workshopped with natural hazard agencies, Indigenous individuals and institutions, who also participated as research and end-user team members, and co/authors, and co/presenters. This has iteratively informed the research development, although the funding body, research, and end-user teams are dominated by non-Indigenous people and institutions.

Between 2017–2019 I conducted 18 semi-structured interviews:

1. eight people identified as Aboriginal, including three Traditional Custodians;
2. ten people identified as non-Indigenous;
3. eleven people identified as male, seven as female, and nil as other;

4. fifteen people were public servants in the Environment Directorate spanning roles as field officers, scientists, project managers, and executive staff; and

5. three people were community leaders/consultants/former public servants who had in/formal relationships with the Environment Directorate.

Individuals rarely fit neatly within an expert knowledge community. At least half of the non-Indigenous interviewees and at least two of the Indigenous interviewees held either undergraduate or post-graduate qualifications in ecology, forestry, geography, and/or environmental management. Several fire officers were trained in ecology.

Interviewees were identified through the snowball approach, with both interviewees and me checking for exclusions. The interviews occurred in nature reserves, offices, depots, and my home; were between 40 to 90 minutes with transcriptions ranging from 4500 to 12,000 words. My interview analysis identified and synthesized common themes and topics, initially in two groups of Aboriginal and non-Indigenous interviewees and then together. The interviewees are coded with a numerical placing and A for Aboriginal interviewees and N for non-Indigenous interviewees. To protect anonymity, I have not distinguished Traditional Custodians and sometimes not coded an interviewee. The quotes cited here were shared with each interviewee prior to publication. Interviewees could leave the research project at any time. I complemented the interviews with participant observation at workplaces, Indigenous fire events, and when presenting, writing, and traveling with research participants in industry, research, and community contexts. I have also lived in the ACT for 25 years.

Aboriginal and other interviewees requested that I undertake the fieldwork and analysis independently because of the intimate work context. I have otherwise prioritized supporting publication outlets for Aboriginal people involved in the cultural burning program (e.g., Weir and Freeman 2019, Brown 2021, Freeman et al. 2021) and more generally (e.g., Weir et al. 2021). As a non-Indigenous scholar, Indigenous leadership is always teaching me how to respectfully step back, step up, and walk alongside. This includes learning from at least one Traditional Custodian who kept putting off my interview invitation, whether they were saying not yet, not now, not on these terms, and/or not ever (Tuck and Yang 2014). Note also, I did not undertake research activities with Adrian Brown or his family during fieldwork. Later, Adrian contributed a celebration of his father’s work to a collection of cultural burning stories I co-edited (Weir et al. 2021).

RESULTS

The interview results center on how Indigenous and non-Indigenous individuals encountered, interpreted, and prioritized the influence of wildfire science, ecological science and Indigenous expert knowledge communities. This required navigating legacies of Indigenous knowledge discrimination; the privileging of natural science expertise; and the importance of hazard reduction and biodiversity conservation objectives. The results are organized as:

1. presence, expertise and framing
2. addressing discrimination, building reflexivity
3. (re)regulation

4. moves and counter moves
5. within/without Country?

Presence, expertise, and framing

To greater or lesser degrees, the rationale for introducing the cultural burning program was understood by all interviewees as addressing historic and contemporary discrimination against Indigenous peoples:

... fundamentally we don't own the land, we're just managing it. It's not ours. The Aboriginal people have far more right to the land than we do. N24

... we know that a lot of our ancestors did a lot of burning heavily, and we can see that was stopped for a long period of time - for reasons that we know of - but why hasn't that been reinvigorated? That's why that project came about, to re-kickstart that back up again and do a lot of partnerships with local mob [the Traditional Custodians] to try and get them back, on Country, to do the burning, be involved in that program... A15

This acceptance of Indigenous peoples' presence and authority reflects societal shifts made over the last two decades that have moved discussions about collaborative environmental governance from *why* to *how* (Cavanagh 2021). For Indigenous interviewees, knowledge sharing is an accepted part; yet, the public-sector governance context heightens the risks:

How are you supposed to educate non-Indigenous people if you don't let them in? A12

There is a lot of knowledge that a lot of mob [the Traditional Custodians] don't want to give away - which is understandable - but also at the same time that impacts on the way fire - this agency does fire... I'd be guarded with my knowledge - well, we all are. Because it can be exploited in so many ways. A15

I highlight two overarching matters about the *how* of collaboration: knowledge/governance incongruity and framing the risk. First, the cultural burning program requires working more closely with Indigenous knowledge expertise, specifically, burning Country as informed by the Traditional Custodians. The public servants, however, found relying on an external knowledge authority for direction and content added new complications to their regulatory work:

I don't want to write all the policy and stuff; I don't want to put words in the mouths of the Traditional Custodians or our staff who are consulting with the Traditional Custodians. So what will happen? What we are observing happen is slower progress than you might want. N23

Because we're putting the white, scientific, traditional ecology overlay on to that grassland and I guess then we've got to find out what is the cultural overlay on that and I can't speak for them, I can't speak for the community [the Traditional Custodians]. Bringing those two together is the challenge or is the work to be done or I don't know where we go, I mean that's - I can't speak for what they want. N22

Second, Indigenous interviewees were aware of the consequences beyond individual burns to understanding the matter at hand:

It's all about change. It's changing people's thoughts processes. It's changing the way they look at the environment. It's changing the way they implement fire on the ground. A13

Non-Indigenous interviewees were grappling with this. One interviewee shared a joke about travelers asking for directions and being unhelpfully told that if they wanted to get there, then they could not start from here, with the interviewee finding the advice held wisdom:

Maybe sometimes we should pay attention to where we start. N29

This interviewee thought all the burns should be cohesively brought together:

I still think we can't silo cultural burning, ecological burning, asset protection burning. We've got to work out what the common language is here, because it's not helping anyone having the different - we've got to work out what's our shared knowledge and shared objectives. N22

While this interviewee described cultural burning as opening a new field:

... it's almost like an entire field's opened up, if you put it that way. We talk about burning, and people focus on that, but there's [an agency] commitment to Indigenous culture and there's a commitment to having [Indigenous] people involved and embedded within that agency, and recognizing what the importance of that is and how that gets promulgated to the rest of the agency. N26

Addressing discrimination, building reflexivity

Within this complexity, most interviewees identified clear moves to address public-sector discrimination toward Indigenous knowledge. These are arranged here as four steps. First, the reconsideration of *who has expert evidence*, as argued by Indigenous people for generations:

... they should at least treat the same practices that we've been doing for thousands of years, and treat that just as valuable. A14

... it's not the fact that we're saying that it's not important to have evidence-based methods but it is also important to understand that - I guess, trust in the knowledge that it is evidence-based, it's just not written down. A17

This reconsideration requires non-Indigenous interviewees to be reflexive about current prescription:

With climate change going on anyway, who says that a prescriptive written down knowledge would be correct? N23

[Ecologists] say, "you can't burn because this flower's doing this or doing that." ... I say, "Well, what's Spring? What is Spring? Is that a day of the year or is it a weather thing?" ... As we know, trees, plants, shrubs respond to climatic or weather [conditions], not the day on the calendar probably. So we're told, "Oh 1 August, you can't

do anything from this date to that date,” and it drives me crazy. Whereas, we need to start incorporating the knowledge and lessons from the Traditional Owners of the land we work on. N28

Second, many interviewees were also aware of reconsidering *who has systems of expert knowledge creation*. The mentoring network “Murumbung Rangers” was established about five years ago to support Indigenous staff within the Environment Directorate. Prior to this:

There was nothing. There was no opportunity. They were expected to lead ranger-guided activities or give cultural advice in whatever capacity they were working in, whether it be field staff - GSO we call them - or rangers. They were expected to just know it all because they live in the community [laughs] and their Elders would give them that knowledge, wouldn't they? So why would they have to meet? N20

Indigenous staff involved in the cultural burning program were also funded to attend a week-long Indigenous-lead cultural burning workshop in 2018, the first ever in south-eastern Australia to build and share fire knowledge. This was valued for its Indigenous methodologies:

... it's like old ways, you know what I mean? We'd all get together, we'd share that knowledge and that system, and now - we're doing it now. We all get together, and we're sharing it again, and we're learning. We - rather than just always talking about it, we're actually doing it. A14

Third, the reconsideration of *whose knowledge is relevant across time*:

... some people just always talk past tense. I would like to see more people are going to start knowing that these things are still here. It's not always in the past. It's here now. A14

In a way I had not heard before, this non-Indigenous ecologist addressed archival knowledge discrimination by interrogating assumptions within their natural science tradition, while identifying similarities between methods:

Traditional [Indigenous] knowledge has been lost from this part of the world, but there's no reason why we can't redevelop it both as ecologists and Aboriginal people. They're still having those interactions; those things are still pollinating those plants. Let's rebuild that knowledge over time and to me that's an option. It's not invalid to do that. If we don't have that knowledge - then what? That's what we do in science all the time. If we don't know something we go and do some research, find out about it and build the body of knowledge. That's what presumably Aboriginal people did for thousands and thousands of years but having lost some of that knowledge through white invasion doesn't mean we can't rebuild it again over time together. I'd like to see more of that. N21

Fourth, *whose knowledge is relevant across contexts* to address the discriminatory treatment of Indigenous knowledge as discretely local and/or cultural:

If you attend some of the training here [ACT Parks circa 2017-18], you won't hear anything about Aboriginal fire, but yet we have a cultural fire program. ... it's all about Western science - which is, yes, definitely helpful - a good way to learn those things, but why don't - why isn't the Aboriginal fire incorporated in the training? ... I feel it's a bit token, sometimes. It's like, “I will include you in this, but this is - so now let's get to the real business.” A15

(Re)regulation

Reconsidering who has knowledge expertise requires reconsidering regulations built around expert knowledge. Re-regulation is a term used by some cultural burning proponents in Victoria to communicate that cultural burning is not relinquishing regulation but revising it and/or adding more regulation. This is to address fears that “*you won't sort of have conflagrations, with Canberra burning down.*” N23

Some interviewees sought a specific definition of cultural burns to support its presence *within* the regulations, including how they differ or align with other prescribed burns:

Once we're all clear on what a cultural burn is then we can all achieve that. We can set targets and we can make sure that burn - is it classified as cultural burn, or is it an ecological one that has cultural advantages? Or is just a hazard-reduction burn that happens to also have other values? N24

However, this assumption of different burns being comparable entities was then countered by the consequential presence of Country:

I mean the whole area is Aboriginal. So every burn we do is basically a cultural burn. N24

Not to be misinterpreted as cultural appropriation, this interviewee is paying respect to the pre-eminence of Country and all activity falling within that.

Confusion was common:

I don't think [non-Indigenous] people have got any idea, concept, of what it - what cultural burning is. I'm not even sure what I know, what it is, and I am often involved with descriptions and see it and stuff. N23

Indigenous interviewees also found it difficult to codify for the regulations:

... [defining cultural burns is] difficult but I think it's supposed to be difficult when you're learning and when you're practicing. A17

Some Indigenous interviewees were frustrated with the prescriptions, especially compared with the greater autonomy to burn on Indigenous land rights lands in NSW:

We can't even go out and burn Country unless it's on the BOP or it's on the cards to be being burnt you know. A11

... the only reason you're allowed to burn is from a predetermined methodology designed by white fella science, which is perfectly reasonable. Science isn't white

fella or black fella, it's using evidence to support something, we understand that. But it's a methodology that's been predetermined, that's the last decision of whether you can burn or not. ... [with cultural burning] you burn based on your senses. Whereas when you're not burning on your senses it starts to degrade or erode that integrity of the work culture and your burn. A17

Moves and counter moves

There are moves and counter moves as individuals explore together *what was, what is, and what will be*.

Addressing discrimination can generate resentment because it unsettles privileges enjoyed at the expense of Aboriginal people, but not understood as such. For example, an Indigenous interviewee shared how a non-Indigenous colleague criticized Aboriginal staff attending the Indigenous fire workshop as “special treatment.” This derogatory term perceives Aboriginal people getting something for nothing from the government just because they are Aboriginal.

There is also resistance from the status quo of natural science expertise:

We have people who are in our agency that have been there for a very long time and this being the new space that it is, people can become uncomfortable when you're changing the reasons for burning. They're very ecologically focused and if something is being done in a land management sense that doesn't tick, or it's not quantifiable in the way that they want it to be, then you can get some resistance in the space. A17

In comparison, some non-Indigenous public servants see the work as part of public-sector responsibility for systemic discrimination and violence:

I feel like we [public servants] should all of us have that obligation to acknowledge and incorporate as much [Indigenous knowledge] as we can and provide opportunities. I think that's even more so because of the suffering and the pain. And the healing that needs to occur ... N27

I think we really have to go back to basics and say, “This is your knowledge, and we recognize that we've taken it away. Our ancestors took it away and we want it to look like what you want now.” ... to try and bring up more knowledge about blending that science and monitoring and what's been going on in the decades that, when people, since people were moved off the ACT over the border and put in reserves and missions. N20

Similarly, one Indigenous interviewee described learning ecological science knowledge as “repatriation” so as to “adapt that to Aboriginal ways of doing fire.” A15

Yet, if the program is not meaningful enough, Indigenous people can assert their authority and call it out, as these interviewees did:

So, at the moment some of the burning that happens here is a prescribed burn that they've just put the title cultural burn on. They've brought in a community member to light the fire and that's it, but there's a lot more to burning than just that. A10

If they were real about stopping all these bushfires, stopping anything, when they do a land management plan, cultural law would be at the forefront of that. A12

Within/without Country?

The different understandings of nature were highlighted in the uneasy aligning and diverging relationship between ecological burns and cultural burns.

On the one hand, respect for ecological life is a common element as compared to the “make-the-ground-black” stereotype of hazard-reduction burns:

...it's got ecological value. It's a home for something, food for us, or food for animals. I guess calling it a hazard, are you really respecting it? A14

Ecological burns were also an opportunity to share and learn cooler-burning methods together:

... they [the Aboriginal people] are knowledge-sharing among themselves but also, they are knowledge-sharing with all the other crews and anybody else that's there as well. N27

They're learning as much as we are in terms of the timing of the burn. N25

On the other hand, alignment can mask divergence:

... one's saying we're going on Country to improve the Country; we say we're going into a grassland to improve the condition of the grassland. To me that's the same, that should be the same, we've got this shared objective which is to improve the grassland condition and therefore we should work together with it. N22

Indigenous interviewees articulated difference and its importance through foregrounding relational accountability:

What the ecological burning space doesn't have that the cultural burning space does, is the ability to give back a system of knowledge and power and respect to the community that that was taken away from. That's a very powerful element to it. A17

... this cultural burning is more than about burning, as I mentioned. It's about Aboriginal people with a bit of determination about contributing to caring for Country. Caring for Country might not seem much to other people, but when your people have been doing it for at least 100,000 years, then it is instilled in you. A13

So if we keep burning Country the wrong way ... our kids are going to grow up, they go “oh yeah that's the way them old fellas did it back in them days.” But that's not the right way. We don't want that to go on for generations. We want to change so - well I do anyways. I want to see change within our burning practices. A11

Yet, the risks with the cultural burns remain because of the asymmetrical governance arrangements:

... at the moment if they have a lean year and they don't get around to that [the planned cultural burns], that's all the opportunity that the larger bureaucracy would need to say, “It makes no difference if you guys do this work or not.” A16

The biggest fear is that people are just going to say that's just another burn that the Fire Unit or non-Aboriginal people can undertake. A13

Basically, everything we've come up with to date has been taken. This is something we'd like to keep for ourselves and lead Australia in the resurgence of proper land management. ... we started with the cultural burning and then somebody came up with, "that's a cool burn" [ecological burn]. A13

When asked specifically about the difference between cultural burns and ecological burns, this interviewee stopped articulating difference and instead responded flatly about co-option:

I don't know really. I think Aboriginal people have been doing ecological burns forever. I don't really know. A13

The persistent discrimination toward Indigenous knowledge-governance was appreciated as not necessarily malicious but a legacy of the education system (Rigney 1999):

... unfortunately, sometimes the cultural laws, they can't get on side by side with the Western laws, because Western people don't understand the cultural laws. But how are they supposed to understand them when they don't teach them and let them understand the cultural laws? A12

DISCUSSION

From my results, I find that cultural burning worked as a collaborative concept. It had enough traction for diverse individuals to collaborate on this Indigenous-identified priority and learn about Indigenous knowledge discrimination, despite not quite understanding what cultural burning is. Overall, two factors supported these learnings. First, acceptance that discrimination against Indigenous people is unacceptable, and to move from *why* to *how*. Second, the setting aside of public-sector hesitancy to consider *how* through *doing*, which required iteratively unpacking contested matters of expertise and authority.

All non-Indigenous interviewees revealed they understood that Indigenous people are required as leaders and experts, specifically the Traditional Custodians, otherwise the cultural burning program has no content. This was usually followed by two additional learnings (or deepening of existing understandings) that Indigenous knowledge is consequential for the content and direction of cultural burns and public-sector environmental governance, and thus the current regulatory arrangements needed to be re-considered.

Most Indigenous and non-Indigenous interviewees explicitly acknowledged that the natural sciences have limits, whether wildfire or ecology, and also that *the use of* the natural sciences in the public sector is value laden. Both moves were critical to unsettling the default privileging of natural science expertise as the evidentiary standard about nature, which, further, is necessary to authorize public-sector use of other expertise about nature. The justice premise to accept that Indigenous peoples' landscape fires should be supported, meant that the public sector was required to take Indigenous knowledge seriously, without requiring hazard reduction nor biodiversity conservation claims to be made for these burns to be considered worthy, although these goals were still very important.

However, across all interviews, universal–nature/knowledge was present as either the pragmatics of public-sector environmental governance or the assumed reality. It was rare for Indigenous interviewees to elaborate on the many other priorities embedded with supporting ecological life and reducing large fires (e.g., health, economy, art, and so on), although the language of Country and caring for Country signalled this. All Indigenous interviewees had concerns about the longevity of the program given the power asymmetries in the governance arrangements.

The majority of interviewees understood that these cultural burns required systemic change in the public sector to be more meaningful, and, or, that cultural burns would facilitate that change. These understandings ranged from unfamiliar to long-rehearsed. Unsurprisingly, confusion and frustration arose when the knowledge-governance of the Traditional Custodians was expected or hoped to be contained within discrete cultural burns.

I summarize the key results:

1. *Indigenous knowledge communities face a resistant knowledge-sharing context: universal–nature/knowledge.* This is unfamiliar with their knowledge expertise and works against it.
2. *Indigenous knowledge has broad reach and evidentiary practices* because it holds nature–society in relation and foregrounds the Land. Cultural burning thus has adaptive power to go beyond land management regulatory frames (Marks-Block and Tripp 2021:14).
3. *Knowledge discrimination is suppressed but does not go away* when not addressed. Reflexivity can iteratively build narratives and language to assist the respectful co-creation and sharing of knowledge.
4. *However, addressing knowledge discrimination requires addressing the skewed political-economy.* Otherwise, Indigenous knowledge is less likely to be maintained, renewed, and shared within Indigenous knowledge communities, and it is at greater risk of being co-opted, dismissed, tokenized, and erased when shared out to others.
5. *Natural scientists can and are valuing Indigenous knowledge as evidentiary* without debasing the natural sciences, through being more reflexive about methodology, the reach of relational accountability is less understood.
6. *Positionality influences reflexivity about expert knowledge.* Indigenous interviewees had no choice but to be reflexive; most non-Indigenous interviewees were learning about Indigenous knowledge while also learning to be reflexive about non-Indigenous knowledge.

In this study, individual burns were highly valued by many, but they were not themselves sufficient for what is at stake: the “collective failure to care for Country” as stunningly expressed by the 2020–21 catastrophic bushfires (Fletcher et al. 2021:7). This study has revealed how a certain kind of reflexivity is required to reconsider who has facts about nature and thus who has regulatory power. The predominance of universal–nature/knowledge is such that, even in good-faith collaborations, the non-Indigenous assumption persists that, at some point, it will be

possible to separate Indigenous knowledge out into exclusive nature and culture categories (Reo et al. 2017).

Given the academy's role in knowledge generation and transmission, and the public-sector's legacy as imperialism's domestic form, I identify two areas for systemic change:

1. Teaching and learning knowledge reflexivity across academia, as especially important for natural science educators and for environmental studies across all disciplines. This will incrementally broaden the expert-knowledge base, including that used and authorized in public-sector environmental governance; and,
2. Material support of Indigenous peoples' knowledge communities and institutions. This includes promoting Indigenous knowledge expertise and leadership within the academy and returning Land where knowledge is built and maintained.

CONCLUSION

The research documents that Indigenous knowledge has a place in public-sector environmental governance as tested and testable evidence about nature that is contemporary, embedded in time-deep traditions with the Land, regulated by Indigenous knowledge communities, and formed and reformed through interactions with non-Indigenous knowledge. But, knowledge sharing to support the cultural burning program is fundamentally hamstrung because it is *within* the public sector, and this removes the Traditional Custodians from the regulation and protection of their knowledge. These are the co-located jurisdictional matters that this study has acknowledged but not substantively addressed.

Many of the gestures made by advocates for the cultural burning program cannot help but be inadequate given the sweeping change needed in the public sector and academia, including taking climate change seriously. I think it is important, flawed, and partial work that can be co-opted, tokenized, and abandoned, and it is demonstrating that change is possible but has to be systemic to be meaningful. In this, the natural sciences will become differently involved in supporting environmental governance by facilitating greater power-sharing with the Traditional Custodians. And this change, I speculate, is part of what some Traditional Custodians are waiting for when they say "no" and "not yet."

^[1] Weir (2021) for my understanding of modern knowledge, and the difference of instrumental and reflexive modern knowledge.

^[2] As led by www.firesticks.org.au and the Cape York Cultural Burning Workshops.

^[3] https://www.environment.act.gov.au/ACT-parks-conservation/bushfire_management/fuel_management/about-prescribed-burns

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