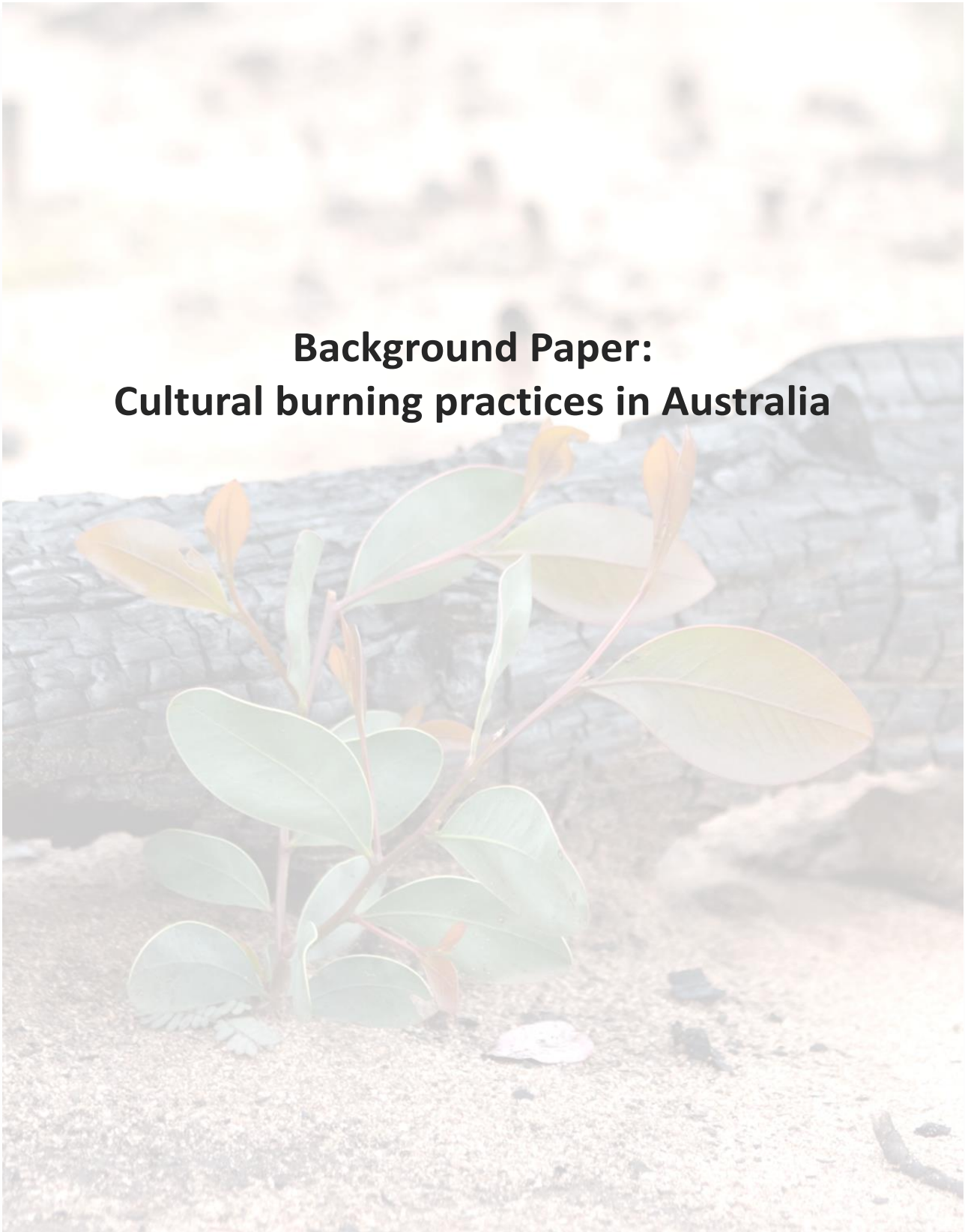
Royal Commission
into National Natural
Disaster Arrangements

Background Paper:
Cultural burning practices in Australia



The Royal Commission into National Natural Disaster Arrangements was established on 20 February 2020 in response to the extreme bushfire season of 2019-20 which resulted in devastating loss of life, property and wildlife, and environmental destruction across the nation.

The Letters Patent for the Royal Commission set out the terms of reference and formally appoint Air Chief Marshal Mark Binskin AC (Retd), the Honourable Dr Annabelle Bennett AC SC and Professor Andrew Macintosh as Royal Commissioners.

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Terms of Reference

We direct you, for the purposes of your inquiry and recommendations, to have regard to…

(g) any ways in which the traditional land and fire management practices of Indigenous Australians could improve Australia's resilience to natural disasters.

Introduction

Indigenous Australians have used fire to shape and manage the land for over 60,000 years. While these practices have been widely disrupted over a number of generations, there is a growing recognition of the value of cultural burning, including as a way to mitigate the effects of bushfires. Partnerships with industry, research institutions and governments are reinvigorating the use of cultural burning, and hybrid systems of land management are being developed.

In many parts of Australia, pure cultural burning cannot be undertaken due to the change in climate and the presence of settlements. Modern cultural fire practices are developed using a blend of customary and western techniques to manage land and waters to the benefit of Country and communities across Australia.

Many of these practices are relatively consistent in design, such as the use of the mosaic system of burning, however these practices vary in application, due to factors such as the type of vegetation, the presence old growth forests and localised weather effects.

This paper provides some background on cultural burning practices in Australia. All views and statements are drawn from publicly available literature and do not necessarily represent the views of the Commission.

Fire

There is much evidence of Indigenous use of fire in early-colonial art work, letters and journals. In 1788, Governor Phillip wrote to Viscount Sydney:

> In all the country thro' which I have passed I have seldom gone a quarter of a mile without seeing trees which appear to have been destroyed by fire. We have seen very heavy thunderstorms, and I believe the gum-tree strongly attracts the lightning, but the natives always make their fire, if not before their own huts, at the root of a gum-tree which burns very freely, and they never put a fire out when they leave the place.[1]

In 1802, Francois Peron also recorded evidence of Indigenous use of fire:

> Fire… seems to be esteemed as something very superior to all other objects of nature.[2]
> The forests in this part of Diemen's Land are not so thick and large as in the interior of the channel; they appeared also to have been partly destroyed by fire.[3]
> It was about two o'clock when we arrived off a small bay… from hence we beheld a similar spectacle to that which we saw at the time of our entrance in the port N.W. In every direction, black columns of smoke arose; and wherever we turned our eyes, we beheld the forests on fire.[4]

[1] Noeleen McNamara 'Australian Aboriginal Land Management: Constraints or Opportunities' (2017) *James Cook University Law Review* 26.

[2] Francois Peron, 'A voyage of discovery to the southern hemisphere, performed by order of the Emperor Napoleon during the years 1801, 1802, 1803, and 1804' (1809) 211.

[3] Ibid 189.

[4] Ibid 191.

In the early 1820s, Charles Sturt noted that fire was used to remove underwood in New South Wales:

> [T]he growth of underwood, so favourable in other countries to the formation of soil, is wholly prevented... There is no part of the world in which fires create such havoc as in New South Wales, and indeed in Australia generally. The climate… which dries up vegetation … induce them to clear the country… by conflagration.[5]

In 1836, Charles Darwin visited Sydney and commented on the sparsity of the trees and the prevalence of grasslands, much of which is now thick scrub:

> The extreme uniformity in the character of the Vegetation, is the most remarkable feature in the landscape of the greater part of New S. Wales. Everywhere we have open woodland, the ground being partially covered with a most thin pasture.[6]

Recent scholarship shows that Indigenous Australians have used fire to crack rocks,[7] form or temper tools and weapons,[8] develop hunting grounds,[9] to keep trade routes and travel corridors open, [10] keep water ways clear,[11] or to ensure the germination of seeds.[12]

Burning for land management may be conducted throughout the year, except during summer/the Dry Season, however there are times when cultural burning is more common:

Region	Indicator/Season	Months
Northern Australia	Wet to Early Dry Season	January – June
NSW/ACT	Late Autumn and Winter	May-August
Western Australia	Mid-Late Winter	July-August
South Australia	Late Autumn	May
Tasmania	Mid-Late Autumn	April-May
Victoria	Autumn	March-May

Regardless of the time of year, cultural burns require decisions to be made on the day, taking into account factors including the condition of the vegetation and the prevailing weather. For example, the Ngadju of south-west Western Australia note that fires must be lit early in the morning before the sea breezes rise as the breezes spread fire and allow it to grow out of control.[13]

Cool and hot fires and the importance of the canopy

At the most general level there are two types of fires:

- hot fire: large, intense and sweeps across the land leaving little behind;
- cold fire: 'trickles' through ground vegetation and burns at a relatively low temperature.[14]

According to the Ngadju if a fire leaves nothing but powdery grey ash behind, the fire was too hot; but where the fire leaves lots of charcoal and stick, the fire was the right temperature.[15] Cool fires are slow

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[5] Charles Sturt, *Two expeditions into the interior of southern Australia during 1828, 1829, 1830 and 1831: with observations on the soil, climate and general resources of the colony of New South Wales, Volume 1* (Smith, Elder ad Co. 1834) xxix.

[6] Charles Darwin, *The Works of Charles Darwin, Volume 1: Diary of the Voyage of the H.M.S. Beagle* (New York University Press, 2010) 343.

[7] Suzanne Prober, Emma Yuen, Mike O'Connor, Lez Schultz, 'Ngadju Kala: Ngadju fire knowledge and contemporary fire management in the Great Western Woodlands' (2013), 18.

[8] Mbantua, Fire art gallery and cultural museum, *Weapons* (2020) <https://mbantua.com.au/weapons/>.

[9] Multiple, including: <https://landcareaustralia.org.au/project/traditional-aboriginal-burning-modern-day-land-management>; <https://www.aboriginalheritage.tas.gov.au/cultural-heritage/aboriginal-cultural-burning>.

[10] Aboriginal Heritage Tasmania, 'Aboriginal Cultural Burning' (13 November 2017) 2 <https://www.aboriginalheritage.tas.gov.au/cultural-heritage/aboriginal-cultural-burning>.

[11] McNamara (n1) 35.

[12] T Vigilante, K Dixon, I Seiler, S Roche, and A Tieu, 'Smoke Germination of Australian Plants' (October 1998) *Rural Industries Research and Development Corporation* <https://www.agrifutures.com.au/wp-content/uploads/publications/98-108.pdf>.

[13] Prober, Yuen, O'Connor and Schultz (n7) 19.

[14] University of Melbourne, *Is Indigenous burning the key to reducing bushfires in Australia?* (31 August 2016) <https://blogs.unimelb.edu.au/sciencecommunication/2016/08/31/black-and-good-more-fires-more-biodiversity/>.

[15] Prober, Yuen, O'Connor and Schultz (n7) 18.

moving and do not burn everything, resulting in a mosaic of burnt and unburnt country which removes fuel for the larger fires late in the dry season.[16] These practices do not stop the late season fires, but may reduce their severity.[17]

A common phrase repeated about cultural burning is 'the canopy is sacred', or that 'you do not burn the canopy'. The canopy provides shelter and shade, habitat for animals, flowers and the seedbed for the next season. A cool fire shouldn't touch the canopy, a hot fire may destroy it.

Cultural burning and prescribed burning

Cultural burning is the term used to describe burning practices developed by Indigenous Australians to enhance the health of the land and its people. This included burning, or prevention of burning[18], of Country. Like cultural burning, non-Indigenous "prescribed" or "hazard reduction burning" is the process of planning and applying fire to a predetermined area, under specific environmental conditions, to achieve a desired outcome – usually the mitigation of the presence or severity of bushfires. While there are crossovers between the two practices, Indigenous burning has a cultural outcome, purpose or significance.

Application of Indigenous Fire Management Practices

This section discusses examples of cultural burning in parts of Australia, including examples of its historical use in some jurisdictions.

Northern Australia

Despite extensive media coverage of bushfires in the southern parts of Australia, most Australian fires occur in the northern tropical savanna. The majority of cultural burning also occurs in Northern Australia, with 71% of projects occurring in the Northern Territory, Queensland or Western Australia.[19]

The Australian tropical savanna covers approximately 25% of the Australian mainland and is primarily composed of sporadic eucalyptus trees and understorey grass. Rapid growth during the wet season and a prolonged dry season allows fire to quickly spread across the savanna.[20]

Cultural fire practices are important to maintain the biodiversity of the tropical savanna. This involves the lighting of cool fires during the early dry season maintaining and protecting habitat for wildlife while allowing native seeds that normally bake during a wild fire, to propagate.[21]

In Arnhem Land, fire management has been a part of the culture and landscape for over 50,000 years.[22] In the late 1990s, traditional owners and scientists discussed the importance of fire in the landscape, leading to the development of the Western Arnhem Land Fire Abatement project. The project commenced in 2006 and is a partnership between the five Aboriginal ranger groups responsible for Western Arnhem Land, the Northern Territory Government, Northern Land Council, Northern Territory-based scientists and ConocoPhillips. The project aims to reinstate Aboriginal-led fire management regimes over the Arnhem Plateau,[23] supported by carbon farming incentives.

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[16] Kimberly Land Council, *Indigenous Fire Management* (2020) <www.klc.org.au/indigenous-fire-management>.

[17] Ibid.

[18] Firesticks, *What is cultural burning?* <https://www.firesticks.org.au/about/cultural-burning/>.

[19] Kirsten Maclean, Cathy Robinson and Oliver Costello (eds) 'A national framework to report on the benefits of Indigenous cultural fire management' (2018), *CSIRO* 17 <https://publications.csiro.au/rpr/download?pid=csiro:EP188803&dsid=DS1>.

[20] McNamara (n1) 33.

[21] Central Land Council, *Indigenous Ecological Knowledge* (2020) <www.clc.org.a/articles/info/indigenous-ecological-knowledge>.

[22] Jennifer Ansell, Jay Evans, Adjumarllarl Rangers, Arafura Swamp Rangers, Djelk Rangers, Jawoyn Rangers, Mimal Rangers, Numbulwar Numbirindi Rangers, Warddekken Rangers, Yirralka Rangers and Yugul Mangi Rangers 'Contemporary Aboriginal savanna burning projects in Arnhem Land' (2020), 29(1) *International Journal of Wildland Fire* 1 <https://www.publish.csiro.au/WF/pdf/WF18152>.

[23] Ibid 2.

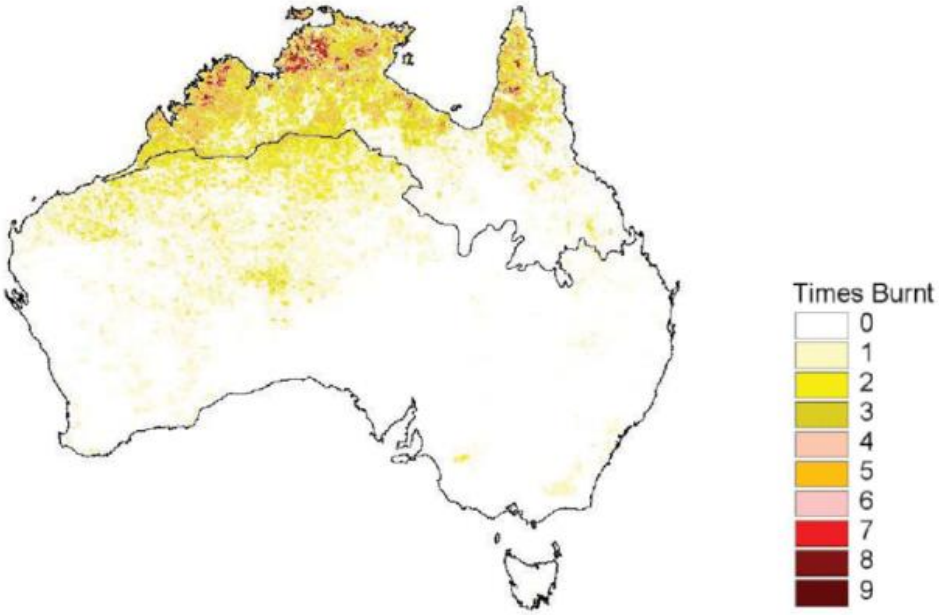

Figure 1: Frequency of large fires (> 4km²) from 1997-2005 from NIAA-AVHRR satellite imagery. Line identifies the tropical savanna.[24]

Traditional owners are involved in the delivery of cultural burns in Arnhem Land, both on the ground and via aerial burning. Aerial burning is the use of an aerial ignition system to burn regions that are difficult to access by land-based vehicles or on foot. It reduces fuel loads and establishes a network of strategic fire breaks across the landscape and is commonly complemented by on-ground burning. The two techniques create more effective barriers, particularly around sensitive vegetation and cultural sites.[25] This approach integrates customary and western systems in what is often referred to as the 'two toolbox approach.'[26]

Kakadu National Park has the added complexity of managing wetlands. The spread of grasses limits access to water and threatens species used for food by traditional owners and birdlife. Traditional owners manage this by burning multiple times over several weeks at the edge of the floodplain, preventing fire from spreading into the surrounding savanna woodland. In 2014, the CSIRO reported that cultural fire practices enhances biodiversity and the cultural value of the wetlands for Traditional Owners. For example, researchers found an increased variety of water birds in the wetlands after burning.[27]

Western Australia

The land and habitats of Western Australia are vast and varied, and have been cared for by many Indigenous peoples. The Great Western Woodlands are cared for in part by the Ngajdu Nation and the Ngajdu Rangers Group. The Woodlands in the south-west of Western Australia comprises a 16 million hectare mosaic of temperate woodland, heathland and mallee[28] vegetation. It is the largest remaining intact Mediterranean woodland[29] in the world and is unique in being able to survive on as little as 250mm annual rainfall.[30]

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[24] Jeremy Russell-Smith and Cameron P. Yates 'Australian Savanna Fire Regimes: Context, Scales, Patchiness' (2007) 3(1) *Fire Ecology* 51.

[25] Ansell, Evans and Ranger Groups (n22) 6.

[26] Rosemary Hill, Petina L Pert, Jocelyn Davies, Catherine J Robinson, Fiona Walsh and Fay Falco-Mammone, 'Indigenous Land Management in Australia' (May 2013) CSIRO 53.

[27] McNamara (n1) 35.

[28] Mallee is the growth habit of certain eucalypt species that grow with multiple stems springing from an underground lignotuber, usually to a height of no more than 10m.

[29] Mediterranean woodland refers to any biome characterized by dry summers, rainy winters, with broadleaf trees, such as the eucalyptus forests of southwest Australia.

[30] TERN, *Great Western Woodlands Supersite* (2020) <https://supersites.tern.org.au/supersites/gwwl>.

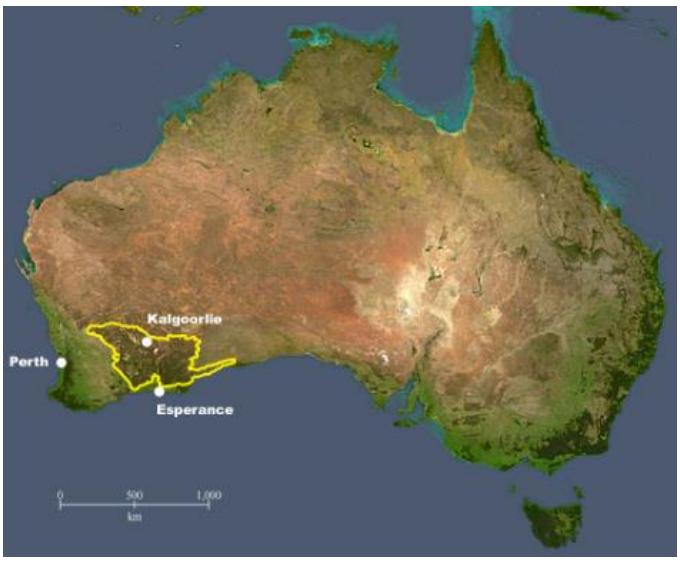

Figure 5: Location of the Great Western Woodlands[31]

The Ngadju use many tools, including cultural burning, to manage the Great Western Woodland and prevent uncontrolled fires. These tools include collecting sticks and logs for the campfire and sweeping the litter with broom bushes. Sweeping is also utilised during the summer when the cockatoos cast down flowers and leaves, and strip off rough bark to stop goannas from climbing to their nests.[32]

While bulldozers can be used to stop fires and create manual fire breaks, they can crack the land (covered in a layer of algae, lichen and moss)[33] creating future issues, including allowing invasive plant species to gain footholds in the land through the cracks, removing seeds from the top soil and causing dense regrowth.[34] The Ngadju reported that invasive plants tend to burn hotter, which lead to larger and hotter fires reducing the surroundings to ash. Additionally, it is against Ngadju customary law to leave the ground disturbed. Even cooking pits have to be completely filled in after use.[35]

The Ngadju take advantage of natural fire breaks present in the Woodlands, including vegetation such as the salt and blue bushes, which are naturally fire resistant, clay pans, soaks, lake systems and rock holes that are periodically burnt. These natural fire breaks create a mosaic pattern[36] in the Woodlands and allow the Ngadju to plan cultural burns at the right time (identified as when the grass is green, or a few days after rain, or when rain is coming, and in the warmer seasons, the fire must be started in the morning before the sea breezes rise). Other areas, such as the sandplains burn without human intervention.[37]

[31] Vivi Lins, Image: Great Western Woodlands location within Australia, (4 May 2016) <https://en.wikipedia.org/wiki/Great_Western_Woodlands#/media/File:Great_Western_Woodlands_location_within_Australia.jpg>.

[32] Prober, Yuen, O'Connor and Schultz (n7) 19.

[33] TERN (n30).

[34] Prober, Yuen, O'Connor and Schultz (n7) 20.

[35] Ibid 20.

[36] Ibid 20-21.

[37] Prober, Yuen, O'Connor and Schultz (n7) 20.

The Ngajdu, with the CSIRO, have developed the following summary of fire regimes in the different elements of the Great Western Woodlands:

Habitat	Needs planned fire?	Frequency of planned fire	Description of planned fire	Prone to regular wildfire?	Other management
Rockholes	Yes	c. 3–10 years	Cool, smoky fire 1 ha	Yes*	Protect assets such as fruit trees by scraping up litter
Grasslands (spinifex or spear grass)	Yes	Keep grass less than 20 cm, e.g. annual	Cool, smoky fire	Yes*	-
Mallee (open or scrubby)	Yes (open)	Annual to infrequent	Cool fire that doesn't burn the canopy, e.g. patches up to 1 ha	Yes (especially mallee scrub)	-
Coastal scrub	Yes	c. 5–10 years	Hot if overgrown, cooler if regular	Yes*	-
Sandplains	Some	?	Burn limited areas for access or greenpick, and to protect important sites	Yes	Check for mallee fowl mounds and other assets before burning
Old growth woodland	Minimal	-	If camping in woodland, burn small (less than 0.5ha) patches with a cool fire (or sweep) to clear around campfires	No	If burning the ground layer, scrape up litter around trees and logs. If trees are burnt they take hundreds of years to recover — protect by burning away from woodland edges (e.g. in grassland) or clearing out scrub (for firewood) abutting woodland
Regrowth woodland	Minimal	-	Potentially burn to encourage grass or for access, but mostly 'go somewhere else'	?	Lower priority for management than old-growth woodland
Tea-tree	Minimal	-	Cool ground-fire if aiming to encourage tubers and grasses	No	-
She-oaks	Minimal	-	She-oak country around Fraser Range was burnt regularly during the pastoral era	No	-
Saltbush, bluebush plains	No	-	-	No	-
Stony or rocky ground	No	-	-	No	-
Paperbarks	No	-	-	No	Collect up dead wood for the campfire to help prevent bushfire
Succulents (salt lakes)	No	-	-	No	-

*managed with planned fire

Figure 6: Summary of the fire regimes[38]

Victoria

Traditional Owners are working to re-introduce cultural burning in Victoria, and are increasingly being recognised by the Victorian government as partners in land and water management. With this shift, many parties support public land managers involving Traditional Owners in land management activities.[39]

For example, the Gunditjmara people work with the Forest Fire Management Section of the Department of Environment, Land, Water and Planning, and the Victorian Country Fire Authority, to undertake cultural fire management as part of an overall fire management plan for the Budj Bim National Park.[40]

Traditional Owners across Victoria are keen to work with government and the CFA to reintroduce cultural fire practices, such as vegetation removal and cool burning, around aboriginal art sites. Hot fires can damage culturally significant sites, including by cracking or destroying granite rock faces and destroying art and artefacts.[41]

While traditional owners are keen to reintroduce cultural burning, they note that much of the land may not ready for it and that roughly three years of fuel reduction burning must happen before cultural burning can

[38] Prober, Yuen, O'Connor and Schultz (n7) 26.

[39] Victorian Traditional Owner Cultural Fire Knowledge Group, 'The Victorian Traditional Owner cultural Fire Strategy' (2019) 4. <https://knowledge.aidr.org.au/media/6817/fireplusstrategyplusfinal.pdf>.

[40] Uncle Denis Rose, Testimony provided for the Royal Commission into National Natural Disaster Arrangements (2020) 116-127 <https://naturaldisaster.royalcommission.gov.au/system/files/2020-05/Hearing%20Block%201%20Day%203%20-%20Final.pdf>.

[41] Victorian Traditional Owner Cultural Fire Knowledge Group (n39) 20.

begin.[42] They also note that cultural fire management can only happen in cooperation with the CFA and the fire brigades, using more common fuel reduction burning techniques, and that it is going to take time to relearn cultural fire management and adapt it to the current environment.[43]

SICK COUNTRY	→	HEALTHY COUNTRY
Landscapes with high fuel load.	**Creation of firm policy and structural governance relationships reflecting partnership, with appropriate bodies (DELWP/CFA/Parks Victoria etc.).**	Landscapes with normal fuel load.
Public safety is the first consideration.	**Development of complementary practices and processes.**	Public safety is the first consideration.
Management to largely a single objective (fuel reduction).	**Reducing harmful effects on Country due to 'hot burns'.[30]**	Management to multiple objectives and values (healing Country and culture).
The risks of introducing a cultural burning regime are high.	**Development of culturally appropriate learning (education, training) and research relationships.**	The risks of introducing a cultural burning regime are low.
Practices need to be developed in order to reduce fuel load while lessening the impact on Country.	**Development of practices in order to transition to cultural burning whilst working with fuel reduction regimes.**	Authentic cultural burning on a Country level involving groups of Traditional Owners as part of a Community of Practice.

Figure 7: Transitioning to cultural fire management in Victoria[44]

Tasmania

Traditional Owners, through the Tasmanian Aboriginal Centre, have partnered with the *Firesticks Alliance Aboriginal Corporation* to undertake training to develop knowledge and skills of cultural burning.[45] Cultural burning is undertaken on Aboriginal managed land to assist with fuel reduction, to discourage weeds, and encourage seeds to sprout, bringing back native fauna to areas which have been recently burned.[46]

New South Wales, South Queensland, South Australia, Australian Capital Territory

The New South Wales, Parks and Wildlife Services Cultural Fire Management Policy[47] sets out the ways in which Parks and Wildlife Services staff should work with Traditional Owners to engage in cultural fire management.

The Murri Rangers in South East Queensland combine ancient fire techniques and modern drone surveillance[48] allowing them to monitor sites and the effect burning is having on the Bunya Mountains, especially the endangered grassy balds.[49]

In South Australia the City of Adelaide is working with local Traditional Owners to re-introduce traditional fire management to the Adelaide Park Lands,[50] while the Murrumbung Rangers have worked with

[42] Ibid 16.

[43] Ibid 16.

[44] Ibid 17.

[45] Tasmanian Aboriginal Centre, 'Land Management Update, March 2020' (March 2020) <http://tacinc.com.au/wp-content/uploads/2020/04/Land-Management-Update-March-2020.pdf>.

[46] Aboriginal Heritage Tasmania (n10) 2.

[47] Office of Environment & Heritage, 'NPWS Cultural Fire Management Policy' (2016) <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Fire/cultural-fire-management-policy-160504.pdf>.

[48] National Indigenous Australians Agency, 'Cool burning and high flying at Bunya Mountain Murri Rangers' (21 April 2020) <https://www.indigenous.gov.au/news-and-media/stories/cool-burning-and-high-flying-bunya-mountain-murri-rangers>.

[49] Silvie Moravek, Jon Luly, John Grindrod and Russell Fairfax, 'The origin of grassy balds in the Bunya Mountains, southeastern Queensland, Australia' (2013) 23(2) *The Holocene* <https://journals.sagepub.com/doi/10.1177/0959683612460792>. Grassy balds are patches of grasslands in forested landscapes. In the Bunya Mountains, these balds are embedded in a rainforest, vine thicket and eucalypt woodland matrix.

[50] City of Adelaide, 'Park Lands Cultural Burn' (6 March 2020) < https://living.cityofadelaide.com.au/cultural-burn-park-lands/>

ACT Parks and Conservation since 2016 to reintroduce cultural fire management to the national parks around the ACT.[51]

Carbon farming through fire management

Cool burns set in the early dry season emit approximately half the amount of greenhouse gasses produced by the hotter, later, fires and burn less organic matter. For this reason, cool burns can be a source of carbon credits.[52] In 2019, savanna fire management projects accounted for 10% of Australian carbon credits issued, providing economic, social, cultural and environmental benefits to participants.[53] It is estimated savanna fire management carbon farming is providing around $15 million income each year for Indigenous land managers across the north by generating and selling carbon credits.[54] Researchers have found that cultural fire practices reduce greenhouse gas emissions, and the reductions can be used to offset greenhouse gas emissions by other sectors.

Carbon farming remains a popular and viable option for reintroducing cultural burning to many areas of Australia, with organisations and foundations providing training and support to traditional owners and landholders to develop community-based solutions under the Emissions Reduction Fund.[55]

Government partnerships

While the Australian Government is the largest investor in Indigenous land management,[56] Schultz and others have noted that Indigenous perspectives may have been historically under-represented in policy development.[57] Governments have incorporated Indigenous perspectives into some policy and programs. For example the Caring for our Country Program established in 2008 to develop national priorities to focus multi-year investment on the protection of the environment and sustainable management of our natural resources.[58] While not indigenous specific, one of the national priorities was Indigenous land management and Working on Country (Indigenous Land and Sea Ranger Programs).

Indigenous Australians have reportedly struggled to obtain equitable or timely access to government resources and consideration[59] and report that they are asked to co-implement, rather than co-design, programs.[60]

The Victorian Traditional Owners cultural fire knowledge group acknowledges that cultural burning practices could be taught to non-indigenous people. While they are concerned that the same level of care in land management may not be exercised by those without the cultural connection to country, they are keen for these practices to become more mainstream.[61]

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[51] Tom Lowrey, ABC News, 'Indigenous fire practices used in hazard-reduction burns at significant ACT cultural sites' (1 April 2016) <https://www.abc.net.au/news/2016-04-01/indigenous-fire-practices-used-in-hazard-reduction-burns-in-act/7293212>.

[52] McNamara (n1) 33; Clean Energy Regulator, 'Fighting fire with fire in Fish River' (2016) <http://www.cleanenergyregulator.gov.au/Infohub/Media-Centre/Resources/erf-media-resources/fighting-fire-with-fire-in-fish-river>.

[53] Ansell, Evans and Ranger Groups (n22) 2.

[54] The Nature Conservancy, 'Indigenous fire revolution' (20 February 2020) <https://www.natureaustralia.org.au/newsroom/indigenous-fire-revolution/>.

[55] Aboriginal Carbon Foundation <https://www.abcfoundation.org.au/>.

[56] Ansell, Evans and Ranger Groups (n22) 2. A list of federally funded projects is set out in the Appendix.

[57] Schultz, Rosalie, Tammy Abbott, Jessica Yamaguchi and Sheree Cairney, 'Indigenous land management as primary health care: qualitative analysis from the Interplay research project in remote Australia' (2018) 18(960) *BMC Health Services* 7.

[58] Department of Agriculture, Water and Environment, 'Previous programmes' <http://www.nrm.gov.au/news-and-resources/resources/previous-programmes>.

[59] Hill, Pert, Davies, Robinson, Walsh and Falco-Mammone (n26) 53.

[60] National Indigenous Australians Agency, 'NDIS East Arnhem Land Co-Design Project Evaluation - Final Report' (2018) 24 <https://www.niaa.gov.au/sites/default/files/publications/ndis-east-arnhem-codesign-project-evaluation_1.pdf>.

[61] Victorian Traditional Owner Cultural Fire Knowledge Group (n39) 19.

Next steps

The Royal Commission will hear from Indigenous cultural burning practitioners, researchers and organisations during the course of its inquiry, and will not make findings or draw conclusions on how such practices may improve Australia's resilience to natural disasters, until it has completed this process.

Appendix

Indigenous Land and Sea Management Projects[62]

* = public sources do not indicate fire management is undertaken.

No	Region	Project	Administrative Organisation
001	NSW	Barkindji Maraura Rangers	Barkindji Maraura Elders Environment Team Ltd
002	NSW	Boorabee and The Willows IPA	Glenn Innes Local Aboriginal Lands Council
003	NSW	Brewarrina Ngemba Billabong IPA	Brewarrina Local Aboriginal Land Council
004	NSW	Dorodong IPA	Dorodong Association Inc
005	NSW	Gamay Botany Bay Rangers	La Perouse Local Aboriginal Land Council
006	NSW	Githabul Rangers	Border Rangers Contractors Pty Ltd
007	NSW	Gumma IPA*	Nambucca Heads Local Aboriginal Land Council
008	NSW	Mid North Coast Aboriginal Rangers	Taree Indigenous Development and Employment
009	NSW	Minyumai IPA and Jahnala Yenbalehla Rangers	Minyumi Land Holding Aboriginal Council
010	NSW	Ngulingah Nimbin Rock Rangers	Ngulingah Local Aboriginal Land Council
011	NSW	Ngunya Jargoon IPA	Jali Local Aboriginal Land Council
012	NSW	Tarriwa Kurrukun IPA and Rangers	Banbai Business Enterprises Inc.
013	NSW	Toogimbie IPA	Nari Nari Tribal Council
014	NSW	Wattleridge IPA and Rangers	Banbai Business Enterprises Inc.
015	NSW	Weilmoringle IPA	Murrawarri Local Aboriginal Land Council
016	NSW	Willandra Lakes World Heritage Area Rangers	NSW National Parks and Wildlife Services
017	NSW	Worimi Green Team	Worimi Local Aboriginal Land Council
018	NT	Anangu Luritjiku Rangers	Central Land Council
019	NT	Angas Downs IPA and Rangers	Central Land Council
020	NT	Anindilyakwa IPA and Rangers	Anindilyakwa Land Council
021	NT	Anmatyerr Rangers	Central Land Council
022	NT	Asyrikarrak Kirim Rangers	Deewin Kirim Aboriginal Corporation
023	NT	Bulgul Land and Sea Rangers	Northern Land Council
024	NT	Crocodile Islands Rangers	Milingimbi and Outstations Progress Resource Association
025	NT	Dhimurru IPA and Rangers	Dhimurru Aboriginal Corporation
026	NT	Djelk IPA and Rangers	Bawinanga Aboriginal Corporation
027	NT	Ganalanga-Mindibirrina IPA and the Garawa and Waanyi/Garawa Rangers	Northern Land Council
028	NT	Garngi Rangers	Northern Land Council
029	NT	Jawoyn Rangers	Jawoyn Association Aboriginal Corporation
030	NT	Katiti-Petermann IPA, Kaltukatjara Rangers and Mutujulu Tjakura Rangers	Central Land Council
031	NT	Laynhapuy IPA and Yirralka Rangers	Laynhapuy Homelands Aboriginal Corporation
032	NT	Malak Malak Land Management Rangers	Northern Land Council
033	NT	Mangarrayi Rangers	Jawoyn Association Aboriginal Corporation
034	NT	Mardbalk Marine Rangers	Northern Land Council

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No	Region	Project	Administrative Organisation
035	NT	Marri-Jabin IPA and Thamarrurr Rangers	Thamarrurr Development Corporation
036	NT	Marthakal IPA and Gumurr Marthakal Rangers	Northern Land Council
037	NT	Mimal Rangers	Mimal Land Management Aboriginal Corporation
038	NT	Muru-warinyi Ankkul Rangers	Central Land Council
039	NT	Njanjma Rangers	Djabulukgu Association
040	NT	Northern Tanami IPA and North Tanami Rangers	Central Land Council
041	NT	Numbulwar Bumburindi Amalahgayag Injung Rangers	Northern Land Council
042	NT	South East Arafura and Gurruwiling Rangers	Northern Land Council
043	NT	Southern Tanami IPA and Warlpiri Rangers	Central Land Council
044	NT	Tiwi Islands Land and Marine Rangers	Tiwi Land Council
045	NT	Tjuwanpa Rangers	Central Land Council
046	NT	Tjuwanpa Women Rangers	Tjuwanpa Outstations Resource Centre Aboriginal Corporation
047	NT	Wagiman Guwardagun Rangers*	Northern Land Council
048	NT	Wanga Djakamirr Rangers	Northern Land Council
049	NT	Wardaman IPA	Northern Land Council
050	NT	Warddeken IPA and Rangers	Warddeken Land Management Limited
051	NT	Warnbi Rangers	Warnbi Aboriginal Corporation
052	NT	Werenbun Rangers	Werenbun Aboriginal Corporation
053	NT	Yanyuwa IPA and li-Anthawirriuarra Sea Rangers	Mabunji Aboriginal Resource Association
054	NT	Yugul Mangi Rangers	Northern Land Council
055	Qld	Angkum IPA	Angkum Aboriginal Corporation
056	Qld	Apudthama Northern Peninsula Area Rangers	Northern Peninsula Area Regional Council
057	Qld	Bunya Mountains Murri Rangers	Burnett Mary Regional Group Ltd
058	Qld	Eastern Kuku Yalanji IPA and Eastern Yalanji Rangers	Jabalbina Yalanji Aboriginal Corporation RNTBC
059	Qld	Gidarjil Bundaberg Land and Sea Rangers	Gidarjil Development Corporation
060	Qld	Girringun IPA and Girringun Land and Sea Rangers	Girringun Aboriginal Corporation
061	Qld	Guanaba IPA	Ngarang-Wal Gold Coast Aboriginal Association Incorporated
062	Qld	Gunggandji Land and Sea Rangers	Gunggandji Prescribed Body Corporate Aboriginal Corporation
063	Qld	Jamba Dhandan Duringala IPA	Kooma Traditional Owners Association Incorporated
064	Qld	Kaanju Ngaachi Wenlock and Pascoe Rivers IPA	Chuulangun Aboriginal Corporation
065	Qld	Kalan Rangers	Kalan Enterprises Aboriginal Corporation
066	Qld	Kowanyama Rangers	Kowanyama Aboriginal Shire Council
067	Qld	Lama Lama Rangers	Yintjingga Aboriginal Corporation
068	Qld	Mandingalbay Yidinji IPA and Rangers	Djunbunji Limited
069	Qld	Mapoon Land and Sea Rangers	Mapoon Aboriginal Shire Council
070	Qld	Nanum Wungthim Land and Sea Rangers	Napranum Aboriginal Shire Council
071	Qld	Nijinda Durlga IPA and Gangalidda-Garawa Rangers	Carpentaria Land Council Aboriginal Corporation
072	Qld	Normanton Rangers	Carpentaria Land Council Aboriginal Corporation
073	Qld	Pulu IPA	Torres Strait Regional Authority
074	Qld	Quandamooka Rangers	Quandamooka Yoolooburrabee Aboriginal Corporation

No	Region	Project	Administrative Organisation
075	Qld	Queensland Murray-Darling Rangers	Queensland Murray-Darling Committee
076	Qld	Thuwathu-Bujimulla (Wellesley Islands IPA)	Wellesley Island Land and Sea Social Economic Development PTY LTD
077	Qld	Torres Strait Islands Rangers	Torres Strait Regional Authority
078	Qld	Warraberalgal and Porumalgal IPA	Torres Strait Regional Authority
079	Qld	Warul Kawa IPA	Torres Strait Regional Authority
080	Qld	Yirrganydji Indigenous Land and Sea Rangers	Dawul Wuru Aboriginal Corporation
081	Qld	Yuku-Baja-Muliku Rangers	Yuku-Baja-Muliku Land Owner and Reserves Limited
082	SA	Antara-Sandy Bore IPA	Anangu Pitjantjatjara Yankunytjatjara
083	SA	Apara-Makiri-Punti IPA	Anangu Pitjantjatjara Yankunytjatjara
084	SA	Arabana Rangers	Arabana Aboriginal Corporation RNTBC
085	SA	Gawler Ranges Rangers	South Australian Native Title Services
086	SA	Kalka-Pipalyatjara IPA	Anangu Pitjantjatjara Yankunytjatjara
087	SA	Mount Willoughby IPA	Tjirilya Aboriginal Corporation
088	SA	Nantawarrina IPA and Rangers	Nipapanha Community Incorporated
089	SA	Ngarrindjeri Rangers	Ngarrindjeri Regional Authority
090	SA	Oak Valley Rangers	Oak Valley (Maralinga) Aboriginal Corporation
091	SA	Raukkan Rangers	Ngopamuldi Aboriginal Corporation
092	SA	Riverlands Rangers	South Australian Murray-Darling Basin Natural Resources Management Board
093	SA	Walalkara IPA	Anangu Pitjantjatjara Yankunytjatjara
094	SA	Wardang Island IPA	South Australian Aboriginal Lands Trust
095	SA	Warru Kaninytjaku APY Rangers	Anangu Pitjantjatjara Yankunytjatjara
096	SA	Watarru IPA	Anangu Pitjantjatjara Yankunytjatjara
097	SA	Yalata IPA and Rangers	Yalata Community Inc.
098	SA	Yappala IPA	Aboriginal Lands Trust South Australia
099	Tas	Babel Island IPA	Tasmanian Aboriginal Centre
100	Tas	Badger Island IPA	Tasmanian Aboriginal Centre
101	Tas	Big Dog Island IPA	Tasmanian Aboriginal Centre
102	Tas	Iungatalanana IPA	Tasmanian Aboriginal Centre
103	Tas	Mount Chappell Island IPA	Tasmanian Aboriginal Centre
104	Tas	Preminghana IPA	Tasmanian Aboriginal Centre
105	Tas	Risdon Cove and Putalina IPA	Tasmanian Aboriginal Centre
106	Tas	Tasmanian Aboriginal Centre Rangers	Tasmanian Aboriginal Centre
107	Tas	Tasmanian Aboriginal Trainee Rangers	Department of Primary Industries, Parks, Water and the Environment
108	Tas	Truwana Rangers	Aboriginal Land Council of Tasmania
109	Vic	Deen Maar IPA	Framlingham Aboriginal Trust
110	Vic	Framlingham Forest IPA	Framlingham Aboriginal Trust
111	Vic	Kurtonitj IPA and Budj Bim Rangers	Gunditj Mirring Traditional Owners Aboriginal Corporation
112	Vic	Lake Condah IPA and Budj Bim Rangers	Gunditj Mirring Traditional Owners Aboriginal Corporation
113	Vic	Tyrendarra IPA and Budj Bim Rangers	Gunditj Mirring Traditional Owners Aboriginal Corporation
114	WA	Balanggarra IPA and Rangers	Kimberley Land Council
115	WA	Bardi Jawi IPA and Rangers	Kimberley Land Council
116	WA	Birriliburu IPA	Central Desert Native Title Services
117	WA	Dambimangari IPA	Dambimangari Aboriginal Corporation

No	Region	Project	Administrative Organisation
118	WA	Goldfields Land Management Rangers	Goldfields Land and Sea Council
119	WA	Gooniyandi Rangers	Kimberley Land Council
120	WA	Karajarri IPA and Rangers	Kimberley Land Council
121	WA	Kija Rangers	Kimberley Land Council
122	WA	Kiwirrkurra IPA and Rangers	Desert Support Services
123	WA	Marduthuni Rangers	Yaburara and Coastal Mardudhunera Aboriginal Corporation
124	WA	Matuwa Kurrara Kurrara IPA	Central Desert Native Title Services Limited
125	WA	Midwest Aboriginal Rangers	Northern Agricultural Catchments Council
126	WA	Miriuwung Gajerrong Rangers	Yawoorroong Miriuwung Gajerrong Yirrgeb Noong Dawang Aboriginal Corporation
127	WA	Ngaanyatjarra IPA and Rangers	Ngaanyatjarra Council Aboriginal Corporation
128	WA	Ngadju Rangers	Ngadju Conservation Aboriginal Corporation
129	WA	Ninghan IPA	Pindiddy Aboriginal Corporation
130	WA	Nyangumarta Warrarn IPA and Rangers	Yamatji Marlpa Aboriginal Corporation
131	WA	Nyikina Mangala Rangers	Walalakoo Aboriginal Corporation RNTBC
132	WA	Nyul Nyul Rangers	Kimberley Land Council
133	WA	Paruku IPA and Rangers	Kimberley Land Council
134	WA	Spinifex Land Management Rangers	Pila Nguru Aboriginal Corporation RNTBC
135	WA	The Western Desert Martu Ranger Programme	Kanyirninpa Jukurrpa
136	WA	Uunguu IPA and Rangers	Wunambal Gaambera Aboriginal Corporation
137	WA	Warlu Jilajaa Jumu IPA and Ngurrara Rangers	Yanunijarra Aboriginal Corporation RNTBC
138	WA	Wilinggin IPA and Wunggurr Rangers	Kimberley Land Council
139	WA	Yawuru IPA	Nyamba Buru Yawuru Ltd

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