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The Solicitor Assisting the Commission  
King & Wood Mallesons  
Level 61, Governor Phillip Tower,  
1 Farrer Place, Sydney, NSW

Friday, 24 April 2020

***RE: Response pursuant to section 2(3C) of the Royal Commissions Act 1902 (Cth)***

Dear Commissioners,

Thank you for the opportunity to contribute to the Royal Commission into National Natural Disaster Arrangements.

The Indigenous Carbon Industry Network (ICIN) is a network of Aboriginal organisations that operate across north Australia to develop and deliver carbon projects through savanna fire management.

Members of the network, made up of Indigenous-owned carbon businesses, Aboriginal land management organisations and Aboriginal support agencies, seek to maximise benefits generated to Indigenous communities through the Indigenous savanna carbon farming industry.

The Network's core objectives are:

- Building capacity through knowledge sharing among Indigenous practitioners.
- Setting best-practice standards and guidelines for Indigenous engagement.
- Facilitating engagement and collaboration with state, territory and Australian governments in policy development.
- Increasing access and engagement by Indigenous projects with the corporate sector.
- Strengthening the role of the Network.

Through the attached submission, we hope to demonstrate the importance of Aboriginal rights and empowerment, partnerships, legislative frameworks and resourcing as key drivers and indicators of success in relation to fire management and wildfire mitigation in northern Australia. The Indigenous Carbon Industry supports these outcomes directly through its core objectives (as described above).

This submission relates to fire management undertaken by Indigenous organisations through the implementation of the Savanna Burning Carbon Methodology and at least partly funded through the generation and sale of Australian Carbon Credit Units (ACCUs).

It is important to note that ICIN is not an Indigenous fire management network and many of ICIN's member organisations will be better placed to directly answer specific questions in relation to Indigenous fire management from an operational perspective. Please refer to the list of ICIN organisation members (*Attachment 2*) for details.

It should be also be noted that the Indigenous carbon industry does not represent all Indigenous fire managers. For example, outside the savanna carbon project areas, there are many more Indigenous Ranger groups and Traditional Owners also carrying out fire management without having registered carbon projects.

Please do not hesitate to get in contact should you have any further questions.

Yours sincerely,

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## **Royal Commission into National Natural Disaster Arrangements**

### **Submission by the Indigenous Carbon Industry Network**

#### **Introduction**

Our submission focuses on Indigenous fire management in northern Australia.

Northern Australia encompasses a broad variety of tenure types with a multitude of management objectives. In the absence of management, fire regimes are typified by annual to biannual severe wildfire events occurring in the late dry season when weather and fuel conditions are most volatile and resulting in large uncontrolled wildfires across multiple tenures (Ansell et al, 2019). In recent decades, the growing capacity of Indigenous people and their organisations has seen a resurgence in active fire management across Indigenous controlled estates in northern Australia. This has resulted in a dramatic turnaround where, through the careful application of fire management, primarily via Indigenous-guided prescribed burning, these estates have transitioned from being the most frequently impacted by severe wildfire events to the least frequently impacted in most jurisdictions (Fisher and Altman, 2020).

In reference to these positive outcomes, we provide background information on Indigenous fire management in northern Australia. We then focus on key contributing factors to the successful reinvigoration of Indigenous fire management programs in northern Australia: (1) the recognition of Indigenous land rights and the empowerment of Aboriginal people to undertake fire management (2) the development and role of key partnerships (3) enabling legislative frameworks (4) resourcing arrangements to support Indigenous fire management. Specifically, we discuss the development of the carbon industry in Australia and the ability for Indigenous savanna burning carbon abatement projects to generate and sell carbon credits. The revenue generated is being reinvested into fire management and has been instrumental in effecting landscape scale change on Indigenous estates in northern Australia – whilst also entailing broader environmental, social, cultural and economic benefits for indigenous communities. We present a number of recommendations to the Royal Commission based upon experience gained through reinvigoration of Indigenous fire management in northern Australia. We address specific question as presented by the Solicitor assisting the Royal Commission in Appendix 1.

#### **Indigenous Fire Management**

For tens of thousands of years, Indigenous people in Australia have used fire to manage their land, increase food availability, fulfil cultural obligations to care for country, assist with hunting and increase access to country. During colonization, many Aboriginal and Torres Strait Islander people were either dispossessed of their lands or had their land management traditions severely disrupted.

Across northern Australia, the impact of colonization on Aboriginal people was highly varied. However, the consequence of colonization was the same – Aboriginal fire management practices began to break down over much of northern Australia. In the absence of Indigenous fire management, fire regimes became dominated by extensive wildfires occurring during the severe fire weather conditions of the late dry season (August – November). This altered fire regime is recognized as a key driver of species loss across northern Australia, particularly amongst small mammals and granivorous birds (Evans and Russell-Smith, 2019).

Indigenous fire management is different to mainstream fire management because of its focus on deliberately using fire as the primary tool to manage country, rather than trying to avoid fire altogether. Whilst varying across regions and undertaken for different management goals, Indigenous fire management in northern Australia broadly describes a regime where fires are applied to the landscape as soon as the vegetation starts to cure after the end of the wet season. At this time of year, fires tend to burn cooler, only burn smaller areas, and leave more remnant vegetation, including large trees, for wildlife to shelter. Whilst these fires effectively reduce fuel loads, they then extinguish during the night whilst there is sufficient dew (moisture remaining in the ground and vegetation). The fire scars created through early season burning help prevent and contain large wildfires in the late dry season when they would otherwise burn hotter, more intensely, at a larger scale, and for longer durations.

“Right-way fire” includes what is known as “prescribed burning”, but it is far more nuanced and combines traditional knowledge with modern tools, including aerial burning:

***“Fire is a tool and it’s something people should see as part of the Australian landscape. By using fire at the right time of year, in the right places with the right people, we have a good chance to help country and climate.”***

***“Importantly, people need to listen to science - the success of our industry has been from a collaboration between our traditional knowledge and modern science and this cooperation has made our work the most innovative and successful in the world.”***

***Willie Rioli, Senior Mentor/Ranger Tiwi Land Council and ICIN Steering Committee member***

## **Indigenous Rights and Interests in Land**

Australia comprises hundreds of Aboriginal and Torres Strait Islander nations, each with their own language and cultural protocols. (AIATSIS, 1996).

Aboriginal land rights were legally recognised in 1976 (*Aboriginal Land Rights Act (Northern Territory) 1976*) and Native Title rights were recognised in 1993 (*Native Title Act 1993*). Since then, Aboriginal people have been slowly getting back their land. Whilst Indigenous people now have recognised rights and interests in around 85% of lands across north Australia (*see Map below, National Native Title Tribunal*), a complex range of natural and cultural resource management issues such as weed infestations, feral animal populations, as well as altered fire regimes have to be managed.

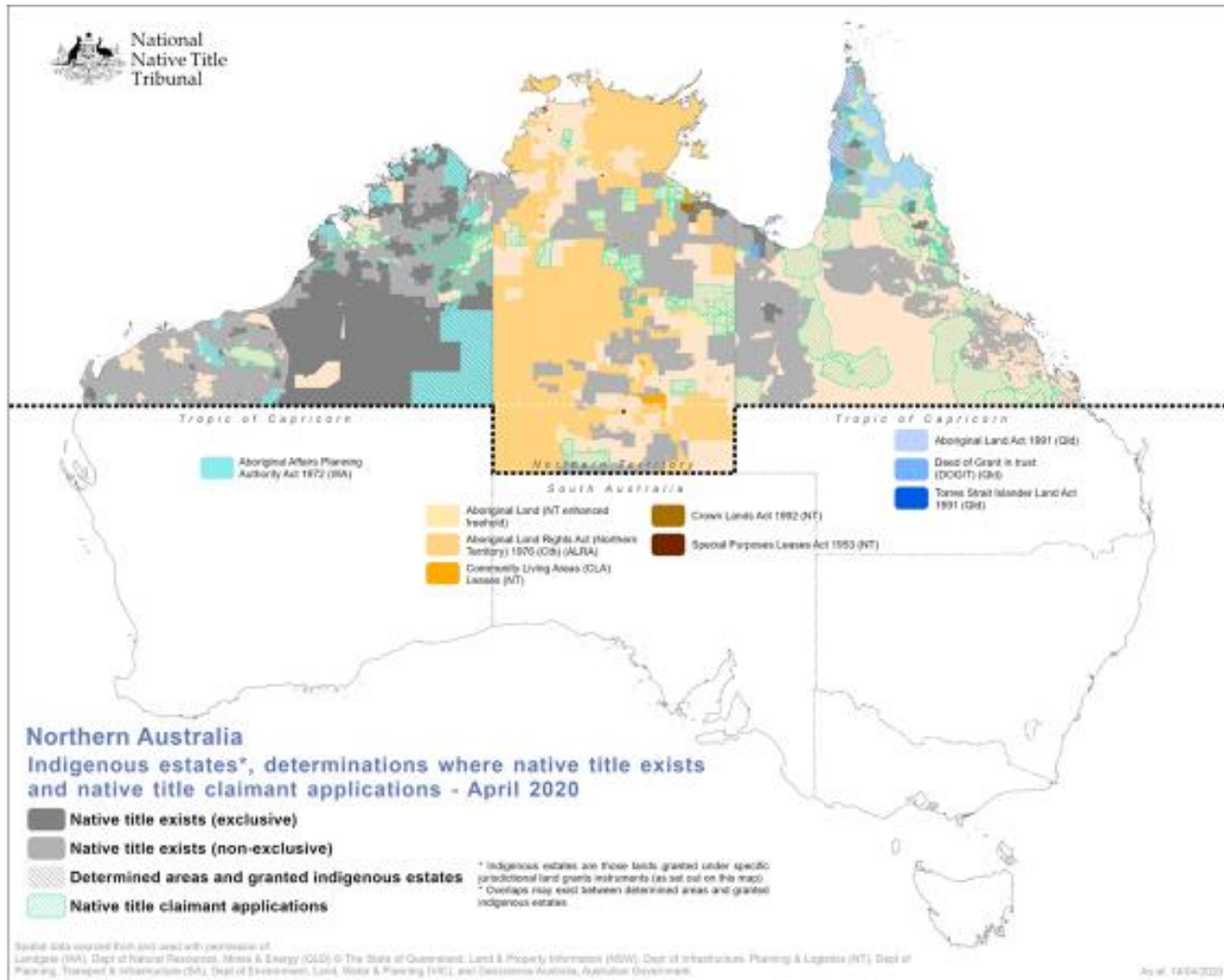


Figure 1: Indigenous estates / Native Title determinations in Northern Australia, April 2020. Source: National Native Title Tribunal, 2020

Altman and Markhan (2014) distinguish three principal forms of Indigenous land tenure: land rights, exclusive possession native title and non-exclusive possession native title. Recognition of Indigenous tenure rights, particularly those in carbon, is critical to empowering Traditional Owners to engage in the savanna carbon farming industry and to support their work managing country. Some Traditional Owner groups are also choosing to exercise their rights and cultural obligations to manage country through the declaration of Indigenous Protected Areas (IPAs).

IPAs are defined by the Australian Government as “areas of land and sea managed by Indigenous groups as protected areas for biodiversity conservation through voluntary agreements with the Australian Government”. IPAs can encompass a variety of land tenures. They are an essential component of Australia’s National Reserve System, which is the network of formally recognised parks, reserves and protected areas across Australia. There are currently 75 dedicated IPAs covering approximately 67 million hectares. These account for more than 44% of the National Reserve System. IPAs support improved fire management including the delivery of registered savanna burning projects. Many ICIN members either manage declared IPAs, or are engaged in the consultation processes to declare an IPA.

## **Partnerships and knowledge sharing**

### *Indigenous Ranger Groups*

In response to the many land management challenges facing northern Australia, a network of Indigenous ranger groups has been established across Australia to assist Traditional Owners to address these new challenges over vast tracts of land. These ranger groups play an important role in Indigenous fire management across northern Australia where they support fire management by Traditional Owners, bringing resources and capacity to effectively manage fire on a landscape scale.

The remote nature of this work means that networks which support knowledge sharing and operational collaboration are critical. Land Councils such as the Kimberley Land Council and Northern Land Council play an important role in hosting and supporting ranger groups and facilitating this network. The North Australian Indigenous Land and Sea Management Alliance (NAISMA) and the Queensland Indigenous Land and Sea Management Program are other examples, while ICIN specifically focuses on the indigenous carbon industry.

### *Western Science*

Unmanaged fire is recognized as a key threatening process in the northern savannas (Evans and Russell-Smith 2019; Worinarski et.al 2011) and over the past decades much research has been completed into exploring both the impacts of fire management and the long-term trends in fire regimes under a variety of management types.

Of particular note is the impact of early season fire management in northern Australia. Scientists have found that both the total area burnt and the area experiencing hot late dry season wildfires have approximately halved when comparing the period 2013-2019 to 2000-2006 – a result of the restoration of early season burning and the inception of the Indigenous savanna carbon farming industry (*see Figure 2 below*) (Fisher and Altman (2020)).

Research also found that, despite experiencing severe fire weather conditions, extensive fuel management and fire suppression activities over several years - predominantly by Indigenous ranger groups - meant that Northern Australia didn't see the scale of destruction experienced in the Southeast during the 2019/20 Bushfire Crisis.

*“The success in northern Australia is the result of sustained and arduous on-ground work by a range of landowners and managers. Of greatest significance is the fire management from Indigenous community-based ranger groups, which has led to one of the most significant greenhouse gas emissions reduction practices in Australia.”*

Rohan Fisher, Darwin Centre for Bushfire Research, Charles Darwin University

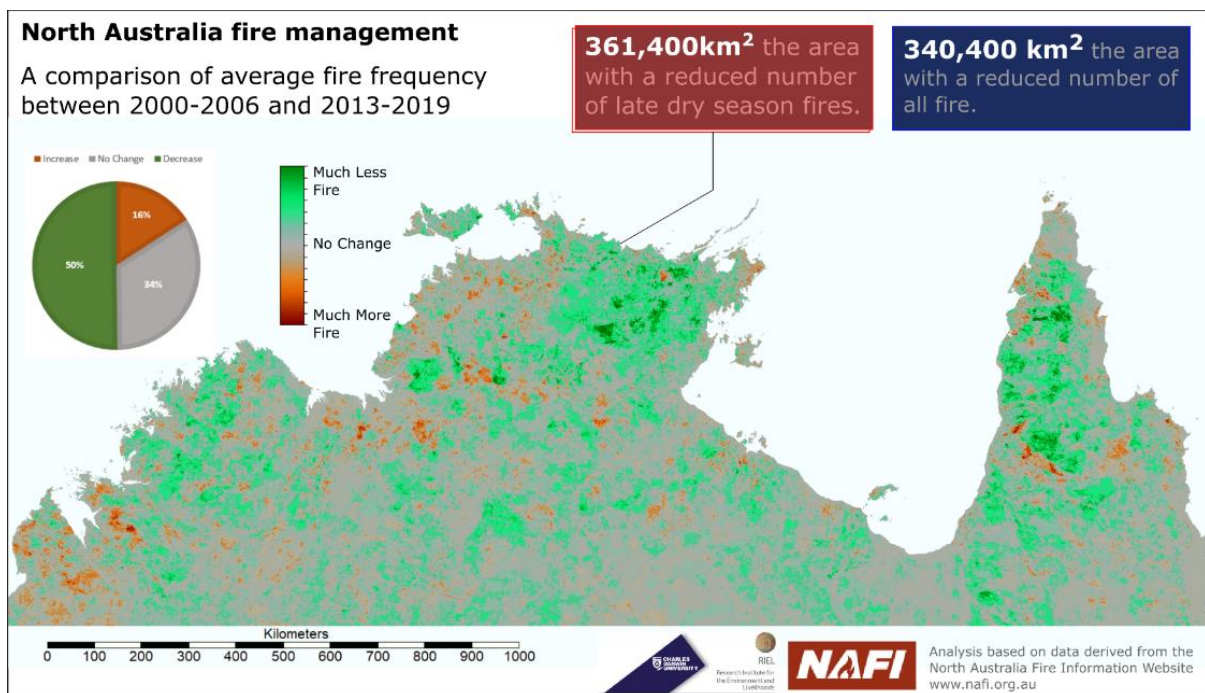


Figure 2: A comparison of average fire frequency between two time periods in northern Australia, 2000 – 2006 and 2013 – 2019. Source: NAFI (via Savanna Fire Forum website), 2020

The success of early season fire management, largely indigenous-led, suggests that “two-way learning” - recognizing both Indigenous traditional knowledge and western scientific knowledge – is important for optimizing fire regimes. It requires respect for indigenous cultural protocols and the principle of free, prior and informed consent.

## Government

### Federal

The success of Indigenous fire management in northern Australia in responding to the changing climate conditions and embracing new opportunities to resource improved fire management is also dependent on a raft of empowering legislation, including the Native Title Act (1993) and the Aboriginal Land Rights (Northern Territory) Act 1976, we well as supporting funding, such as through the Indigenous Ranger Program and the Indigenous Protected Areas Program, which support employment of Rangers to carry out fire operations.

## State/Territory

Benefits are further maximized where State and Territory fire management legislation actively empowers landholders to be responsible for fire management in a permissive and enabling manner. This is best demonstrated in the *Bushfires Management Act 2016* of the Northern Territory which places the onus of responsibility for fire management on the landholder and is supported by an enabling culture where Indigenous fire management is respected and encouraged.

## *Information and Remote Sensing Technology*

All effective fire management requires accurate and real-time spatial information regarding the location of current fires and the fire history of the area. The North Australian Fire Information (NAFI) website is a free-to-access, high quality fire management tool available to the general public, including fire and land managers across northern Australia. The adoption and ongoing refinement of this tool has been a major factor in the success of Indigenous and non-Indigenous fire managers in both understanding their fire management challenges and responding to these throughout each year.

NAFI's service additionally supports the tools required to calculate and report on the abatement of carbon equivalent emissions from Savanna burning carbon projects and underpins this industry which has driven so much recent improvement in fire management outcomes (see NAFI website).

## **Resourcing fire management and the development of the carbon industry**

### *Context of remote Aboriginal communities*

Indigenous communities are particularly vulnerable due to their remote location, high rates of social and economic disadvantage, a lack of, or aged, infrastructure and housing, and high incidence of chronic disease. Despite this disadvantage, Aboriginal people have established a remote Indigenous carbon industry to support significant fire management outcomes and thereby help mitigate climate change (NCCARF). Because of their strong connection to country, community and culture, and thousands of years of experience in managing their lands and waters, Indigenous communities have much to contribute in responding to climate impacts if supported to do so (Green D, S Jackson and J Morrison, 2009) - including effective fire management.

### *Indigenous ranger programs*

Two federal government funded programs, the Indigenous Rangers (formerly Working on Country) program and the Indigenous Protected Areas (IPA) program, deliver essential environmental services for all Australians and major employment and social benefits in Indigenous communities in accordance with Federal Government national priorities (Pew Charitable Trust 2019).

Presently, the Australian Government provides funding to support 123 Indigenous Ranger programs in Australia supporting over 800 full time Aboriginal ranger positions (Pew Charitable Trust 2019). These programs have formed the basis of a remote Indigenous land management economy on-country, by providing essential capacity building for Indigenous people to use their traditional knowledge to look after country, including responding effectively to fire management challenges at a landscape scale and to engage with the emerging carbon markets.



### *Australian Carbon Credit Units (ACCUs)*

Some Indigenous ranger groups fund (some of) their fire management activities through Australian Government-registered carbon projects under the Emissions Reduction Fund. Eligible offsets projects operating under the Savanna Carbon Methods reduce the size and extent of late season wildfires through good early season burning practices. In turn, this reduces greenhouse gas emissions and increases the amount of carbon dioxide sequestered in the landscape. Savanna carbon projects can thus generate and sell Australian Carbon Credit Units (ACCUs) either to the Government or to other organisations seeking to offset their carbon emissions.

This has led to the emergence of a new Aboriginal carbon economy, supporting environmental, employment, training, social, cultural and economic outcomes in remote communities.

***“This fire management program has been successful on so many levels: culturally, economically and environmentally. Through reinstating traditional burning practices, new generations of landowners have been trained in traditional and western fire management, hundreds of thousands of tonnes of greenhouse gas have been abated, and the landscape is being managed in the right way.”***

***Dean Yibarbuk, Fire ecologist and Senior Traditional Owner, West Arnhem Land***

**ICIN urges the Commission to view the following videos, developed by or in collaboration with ICIN members to showcase Indigenous savanna carbon farming. These provide important context to this submission by showing how Indigenous savanna burning is done.**

1. [Northern Australia fire management with the Emissions Reduction Funding](#) (Australian Government/ Bush TV, 2020, 8 mins)
2. [Right-Way Fire](#) (Kimberley Land Council, 2020, 2 mins)
3. [Fighting Fire with Fire](#) (Conoco-Phillips/WALFA partners, 2015, 15 mins)

Nearly three quarters (73%) of savanna burning carbon abatement, or over 5.2 million tons of emissions (CO<sub>2</sub>-equivalent), has been generated by Indigenous carbon projects (ERF website, 2020) since 2012, equivalent to around 7% of Australia’s total annual credited carbon abatement. Over this time, the indigenous carbon industry has generated an estimated \$63 million<sup>1</sup> to \$92 million<sup>2</sup> in carbon credit revenue. Indigenous carbon businesses are able to attract a premium for their ACCUs in recognition of the multiple co-benefits delivered by Indigenous carbon projects to the environment and Indigenous communities. Revenue from the projects is directly reinvested into improved fire management, Aboriginal employment and governance and capacity building support for PBCs and Aboriginal Corporations.

### **Key Recommendations**

1. That the success of Indigenous-led fire management in northern Australia be recognised and supported by the Australian Government, and other fire management authorities and agencies, through the following:

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<sup>1</sup> based on the average ERF price since 2012, \$12.06, [www.cleanenergyregulator.gov.au/ERF/Auctions-results/march-2020](http://www.cleanenergyregulator.gov.au/ERF/Auctions-results/march-2020)

<sup>2</sup> based on a voluntary market spot price of \$17.50 in Jan 2020, [www.accus.com.au/](http://www.accus.com.au/)

- a) Supporting exchanges between Indigenous ranger groups, fire authorities and agencies across Australia to support closer relationships, understanding and better communication with the goal of improving fire management.
  - b) Providing long-term funding support (\$150,000 per year) to the Indigenous Carbon Industry Network (ICIN) beyond June 2020. The savanna carbon industry has directly enabled improved fire regimes across northern Australia, and ICIN is crucial to its further growth.
  - c) Re-instating a fund to support indigenous savanna burning project start-up costs and operational expenses until carbon revenue can be generated
2. That the Australian Government and other fire management authorities and agencies commit to empowering and enabling Indigenous fire management across Australia, drawing on traditional knowledge and practice wherever possible, through the following:
    - a) Inclusion of reference to Indigenous fire management in strategic and operational plans, and emergency responses in consultation with local Indigenous groups, subject to the principles of Free, Prior and Informed Consent.
    - b) Support for and resourcing of Indigenous-led training programs which recognize the benefit of land managers managing their own fire management programs, ensuring that Indigenous groups can build their capacity to teach fire management to others.
    - c) The recent extension of Commonwealth ranger funding to 2028 is welcome. However, a substantive boost to funding for Indigenous ranger groups would provide even greater returns in outcomes from Indigenous fire management.
  3. That the Australian Government include in its response to this Royal Commission a reference to a trend of worsening fire weather as result of climate change and the important role of supporting Indigenous land managers to manage these risks and respond to these significant impacts in remote areas of Australia.
  4. That the Australian Government provide long-term funding support for the North Australian Fire Information service (or NAFI) beyond June 2020. NAFI is a critical tool for fire managers as it maps satellite derived hotspots and fire scars – information needed by fire managers on a daily basis. At a cost of just \$1.5 million a year this represents a highly effective investment in the future of fire management in Australia (*see NAFI website, [www.firenorth.org.au](http://www.firenorth.org.au) and Attachment 1*).
  5. That, in response to the Bushfire Crisis, the Australian Government take stronger action to limit climate change by setting more ambitious targets to reduce Australia’s greenhouse gas emissions.
  6. That all fire management agencies and research agencies commit to engaging with and consulting Indigenous people and supporting Indigenous-led fire management, recognizing the rights of Traditional Owners as described in the UN Declaration on the Rights of Indigenous People, including the principle of Free, Prior and Informed Consent and Intellectual Property rights to traditional knowledge.
  7. That the Australian Government increase the availability of resources to support the research and development of carbon abatement methods which account for the positive impact of indigenous land and sea management in abating emissions from fire, as well as storing carbon in the landscape. Such resources need to be available not only for development of new methods, but also for the refinement of existing methods to facilitate their adoption by the industry.

## Appendix 1: Response to Questions posed by the Solicitor Assisting the Royal Commission

**1. Describe what is meant by, and involved in, Indigenous fire management, from the perspective of:**

- a. ecosystem management; and**
- b. bushfire risk mitigation.**

*Please refer to pages 1 and 2 of this submission for a response to this question.*

**2. Describe any key land management trends over the past 5 - 20 years (as relevant), which you consider are material to the risk of occurrence and/or severity of bushfire, and/or the capability to mount an effective initial response to any outbreak of bushfire, in the case of the following areas of land:**

The most significant land management trend in northern Australia has been the reintroduction of fire management over vast areas of Aboriginal land, resourced partly through engagement with the carbon industry.

As described in the above submission, Aboriginal people in northern Australia have been able to exercise their rights to country, brokering and maintaining key partnerships that have enabled them to carry out fire management and participate in the emerging carbon industry. Carbon projects have in turn provided additional resourcing underpinned by a positive feedback loop where fire management that is successful in reducing the extent and frequency of large-scale wildfires is recognised and rewarded through the issuing of ACCUs, funding further improvements in fire management. Inherent in this type of fire management, which is recognised under the savanna burning carbon methodologies, is the creation of early season fire scars which reduce both the risk and severity of late season fires, while facilitating suppression efforts through the ability to back-burn off such scars.

For example, as demonstrated in Figure 3, the West Arnhem Land Fire Abatement (WALFA) over the past decade has shifted the fire regime from predominantly hot, late dry season wildfires, to predominantly cool, early dry season prescribed burns.

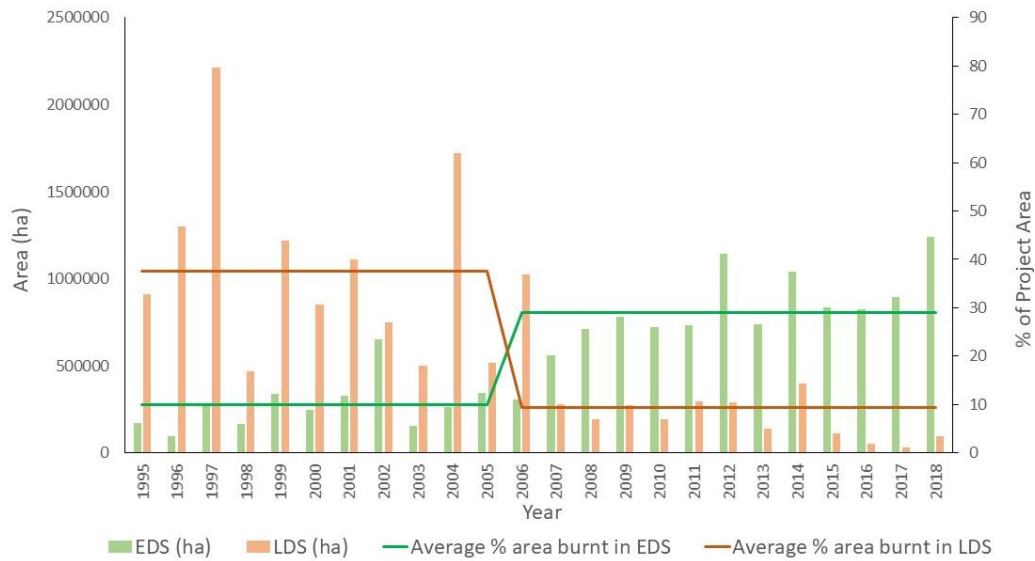


Figure 3: The impacts of fire management in terms of area of early dry season and late dry season fire.

However, there are other trends that are negatively impacting upon the ability of fire managers to deliver successful fire management in northern Australia. These include:

- The spread of high fuel load invasive grasses such as Gamba Grass (*Andropogon gayanus*)
- Worsening fire weather due to the impacts of climate change (see Figure 4)

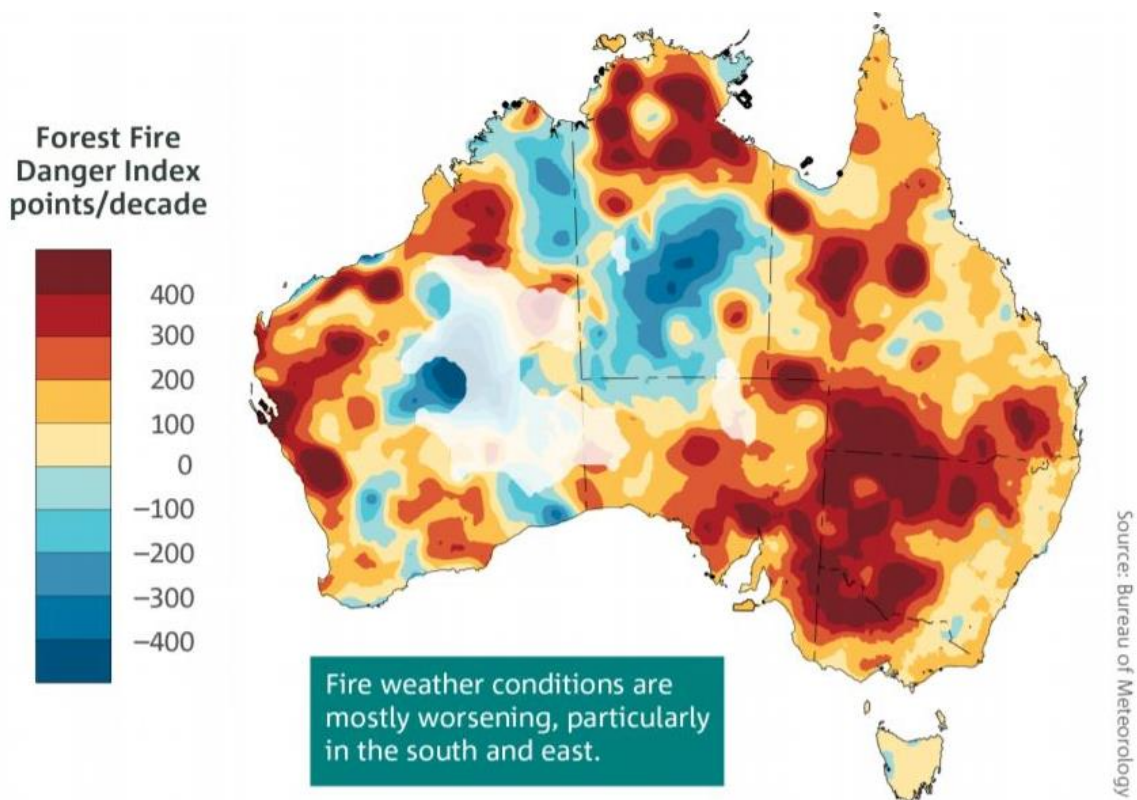


Figure 4: Fire weather trends for Australia. Source: Bureau of Meteorology.

Whilst covered in the above comments, we also reference the below specific tenure types as listed by the Solicitor assisting the Royal Commission.

*a. State Forest, National Parks and other Crown land reserves*

More support for engagement with and leadership by Traditional Owners in fire management and fire planning in National Parks in recent years is welcome, although this varies widely both across and within States and Territories. Positive evidence of this can be seen in joint-managed National Parks in the Northern Territory, including Kakadu National Park (Parks Australia) and Nitmiluk National Park (Northern Territory Parks and Wildlife). In both these instances, federal and state parks service have engaged with Traditional Owners to develop savanna burning projects on these estates providing additional resources and drivers for fire management.

In the Kimberley, collaboration and recognition of indigenous skills and contributions are also leading to positive change – such as increased multi-stakeholder cooperation between Indigenous Rangers, DFES, DBCA, private conservation organisations and pastoralists via various Forums and Working Groups and operational collaboration.

However, there is still much room for improvement in engaging Traditional Owners in managing national parks and reserves across states and territories, including joint-managed parks (Smyth, 2018).

It is important to note that fire management comprises both early season burning and late season response (suppression). While the former often takes place in collaboration between government agencies and Traditional Owners, suppression becomes more complex – for example, in WA, Rangers are separated into DBCA-trained rangers who are able to respond, and non-DBCA trained rangers who are unable to respond on national parks tenure as a result of procedural requirements. Ideally, there might be a framework to allow indigenous ranger groups to assess and respond to wildfires that threaten their native title areas (including any carbon projects) using operational and financial support from DBCA. Overall, it is important to avoid bureaucratic processes of larger government agencies impeding effective fire management, and to ensure that government agencies understand and support fire managers to manage the risks inherent in fire operations in line with established procedures – such as the Kimberley Land Council’s Fire Operations Manual which is used by Kimberley indigenous Ranger groups and is accredited by the WA State Government’s Office of Bushfire Risk Management (OBRM).

ICIN notes that in general, fire management on Indigenous estates has delivered better outcomes than fire management in the conservation estate (Figure 5).

### Area burnt across jurisdictions/tenure.

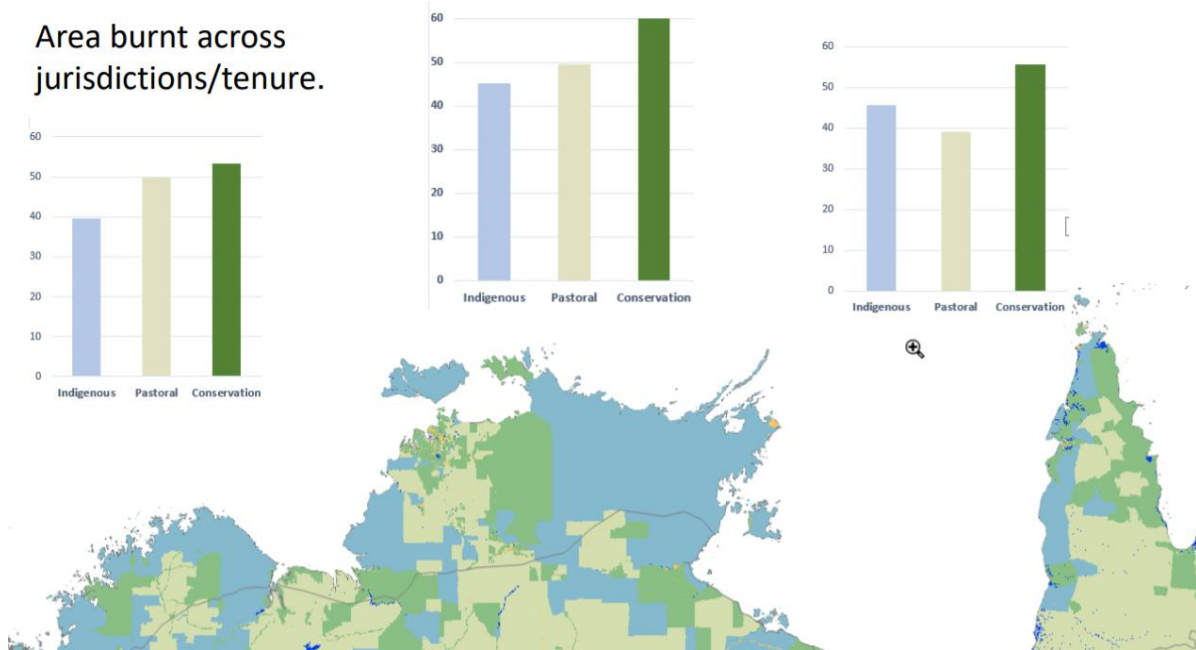


Figure 5: A comparison of the average area burnt in 2019 across Indigenous, pastoral and conservation land tenures in Western Australia, the Northern Territory and Queensland. Average areas are presented as a percent of total area. Source: Fisher 2020 from NAFI derived data

#### b. commercial plantations

There are only limited areas of commercial plantations across North Australia. However, on the Tiwi Islands, fire managers have successfully managed their commercial Acacia forestry operation (as a separate project) alongside their savanna carbon farming project (Willie Rioli, Tiwi Land Council, NAFM Field Trip, 2019).

It should also be noted that plantations are not an eligible vegetation type for the purposes of registering savanna burning carbon projects – it is therefore crucial that they are managed to avoid fires crossing boundaries (and to limit environmental impacts).

#### c. roadside vegetation

It is particularly important to manage roadsides using prescribed burning as roads are often one of the main sources of fire ignition. However, roadsides are often unmanaged for fire risk and mitigation works where they are complicated by gazetting and governance issues. For example, in Western Australia, Indigenous ranger groups need to apply for permission from MainRoads WA or the relevant shire to be able to burn gazetted roads. Depending on the location they may also need to have a traffic management plan and undertake different levels of traffic control training in order to complete protective burning.

An additional concern is managing and containing the spread of highly flammable weeds, such as Gamba Grass (*Andropogon gayanus*), which have the ability to transform landscapes due to their higher fuel loads and later curing. A primary vector for the spread of such weeds is along roadsides by wind or vehicles. It is important that land managers are empowered to manage such weeds.

An overall future trend towards further complicating or restricting the ability of Indigenous and non-Indigenous land managers to prescriptively burn gazetted road corridors will reduce the effectiveness of management along these key areas. Instead, Indigenous Rangers and agencies

responsible for gazetted roads should collaborate and obtain funding to maintain safe and effective mitigation works on roadsides across both native title areas and other areas.

#### *d. private land*

In general, there is an opportunity to support better collaboration between landholders to ensure integrated management of both fire and weeds. Fire is “tenure-blind” and will cross boundaries, such that collaboration should include all landholders and stakeholders across tenures (pastoral, conservation, Aboriginal lands, agencies and governments).

It is important to note that there has been an ongoing trend of private land holders in northern Australia initiating savanna carbon farming projects, mostly on pastoral leases. It is critical that private land holders recognise the rights and interests of Indigenous people and their right to provide Free, Prior and Informed Consent before a project is registered with the Clean Energy Regulator (*see native title section below*).

#### *e. native title land*

Aboriginal people had been undertaking traditional fire management for thousands of years, until the practice was interrupted by colonisation and the removal of Aboriginal people from traditional lands, leading to the emergence of large, uncontrolled wildfires, usually occurring late in the dry season.

In the last 25 years, with the introduction of native title and the recognition that western fire prevention methods have not been working effectively, the reinvigoration of traditional fire management on native title lands has become possible. Under the *Native Title Act 1993*, Native Title holders have certain rights over their determination areas, which usually include fire management. This is in line with traditional rights and obligations for Traditional Owners to look after their country.

Over the past 10-15 years, Indigenous Ranger teams have thus re-established traditional fire management approaches, now complemented by Western science, to manage country the way they had done for tens of thousands of years before colonisation – by planning and lighting ‘cool’ fires during the early dry season, thereby reducing fuel loads and creating fire breaks, with the end result a mosaic of burnt and unburnt country. This has created a landscape more similar to when Kimberley Aboriginal People walked the country and lit small fires at the right time of year for hunting, ceremony and other cultural purposes.

The method removes fuel for larger fires late in the dry season when the weather is very hot, at the same time as maintaining and protecting habitat for mammals, reptiles, insects and birds. With the professionalisation over Ranger programs over the last ten years, and the more recent registration of carbon projects based on Traditional Owners exercising their Native Title rights, positive shifts in fire regime back to a predominance of early season fires have been consolidated. This has significantly reduced the risk of wildfires and improved the ability to respond when they do occur, using early season firescars in the landscape.

ICIN calls for all governments and other agencies to be fully cognizant of the Native Title rights and interests of the Traditional Owners of Australia. Specifically, in relation to Native Title lands, there is a legal and moral responsibility to engage and consult with Traditional Owners for the relevant area(s), for example through the Native Title representative body for that region. Any engagement

should happen under consideration of the principle of Free, Prior and Informed Consent (FPIC), including the establishment of carbon projects by third parties on native title lands. To assist, ICIN, in collaboration with three land councils, has published the *Best Practice Guidelines to Seeking Free, Prior and Informed Consent from Indigenous communities for carbon projects* (2020). The guidelines, are, however, relevant to anyone seeking to undertake an activity on Native Title land.

*f. Aboriginal freehold land*

There is an ongoing trend of improvement in fire management outcomes on Aboriginal freehold lands that is driven by the establishment of Indigenous ranger groups and their engagement with the savanna carbon farming industry as described above for Native Title lands. These projects are highly successful because they leverage existing rights related to Aboriginal lands granted under the *Aboriginal Land Rights Act (Northern Territory) 1976*, or similar legislation in other states to engage proactively with the carbon market to better resource the management of their own lands.

**3. Describe your position as to the following (from a national perspective, but focusing upon, or differentiating between, individual States, Territories or regions as necessary):**

**a. the effectiveness (including having regard to availability and cost effectiveness) of prescribed burning in preventing and/or mitigating bushfire (including having regard to the objectives and priorities of hazard reduction activities, competing risks, and trends in climate-related variables);**  
**b. the effectiveness (including having regard to availability and cost effectiveness) of the following as hazard reduction activities (including within State Forest, National Parks and other Crown Land reserves): i. grazing; and ii. mechanical clearing.**

Prescribed burning is very effective in preventing and mitigating wildfires. This is borne out by the successes achieved by Indigenous savanna carbon businesses. The savanna carbon industry has driven a significant decrease in the area and frequency of wildfires in project areas (Figure 2 above). It is important to note that the importance of deliberately using fire to reduce the area and frequency of wildfires was well recognized before the creation of the savanna carbon methods to account for the emissions reduction benefits. However, the savanna carbon farming industry has become a strong positive economic driver for improved fire management that has allowed Indigenous people to gain financial empowerment and operational capacity through reinvigorating and implementing traditional burning practices at a landscape scale.

Effectiveness of fire management in northern Australia has to be considered in the context of well-documented long-term climate trends that are impacting fire weather. These include increasing temperatures, contraction of the wet season leading to longer dry seasons, strengthening south easterly winds and an overall increase in the Forest Fire Danger Index (Figure 4 above; Bureau of Meteorology 2020). All of these factors impact upon the fire management decisions and on-ground outcomes achieved by both Indigenous and non-Indigenous fire managers in northern Australia.

For example, many Indigenous groups across the North reported confronting challenges due to extreme fire weather in 2019, the likes of which many Traditional Owners and rangers had not experienced before. A combination of drought, high temperatures and strong winds also meant that for many areas, there was only a small window of opportunity to carry out early dry season savanna burning. Ranger groups also spent many weeks defending their fire scars to prevent the spread of destructive wildfires. (2019 ALFA NT End of Fire Season Meeting, December 5, 2019 & NKFAP



Steering Committee Meeting, November 18, 2019). However, there is no doubt, that in the absence of savanna fire management by Indigenous groups, the extent of wildfires would have been much worse (NAFI video, 2020).

In relation to the question of effectiveness of grazing or mechanical clearing as hazard reduction activities, these methods are not commonly used by our members to reduce fire risk, except to create fire breaks around remote communities.

**4. Describe key programs that you are aware of that promote collaboration between Aboriginal and Torres Strait Islanders (Traditional Owners) and any Commonwealth, State and Territory or Local Government (including emergency services and national parks agencies) with respect to Indigenous fire management, including:**

**a. key location(s)**

**b. key agency(ies) involved;**

**c. key traditional owner organisations involved.**

ICIN members are involved in a range of programs which promote collaboration between Traditional Owners and Commonwealth, State and Territory or Local Government in regards to fire management. A number of examples that illustrate successful collaborations are outlined below:

a)

Name	WALFA (West Arnhem Land Fire Abatement) Project
Project Description	The first savanna burning carbon farming project, the WALFA (West Arnhem Land Fire Abatement) project, was a partnership between five Aboriginal ranger groups in Western Arnhem Land, the Northern Territory Government, the Northern Land Council, Northern Territory-based research scientists and ConocoPhillips (a global oil and natural gas company) with the goal to reinstate Aboriginal-led fire management regimes over the remote Arnhem Plateau (see Question 5 below for further details)
Location	Western Arnhem Land, Northern Territory
Agencies involved	Northern Territory Government (Bushfires NT); Clean Energy Regulator; Emissions Reduction Fund; Indigenous Advancement Strategy (Working on Country ranger funding)
Traditional Owner Organisations involved	ALFA (NT) Limited, Warddeken Land Management Limited, Demed Aboriginal Corporation, Jawoyn Association Aboriginal Corporation, Mimal Land Management Aboriginal Corporation, Bawinanga Aboriginal Corporation

b)

Name	Dampier Peninsula Fire Working Group
Project Description	Collaboration between the indigenous ranger groups, the Kimberley Land Council (KLC), pastoralists, researchers and government agencies to improve fire regimes on the Peninsula through operational collaboration and knowledge sharing.
Location	Dampier Peninsula, West Kimberley, WA
Agencies involved	Department of Fire and Emergency Services (DFES), Department of Biodiversity, Conservation and Attractions (DBCA), Shire of Broome,

	Shire of Derby West Kimberley, MainRoads WA, Country Downs Station, Yeeda Pastoral Co, Sheffield Resources, Rangelands NRM, Environs Kimberley, WWF, KLC, WaterCorp, National Landcare Program, NESP
Traditional Owner Organisations involved	Bardi Jawi Rangers, Nyul Nyul Rangers, Nyamba Buru Yawuru, Jabirr Jabirr, Binbunbur, Nyikina Mangala Rangers, Kimberley Land Council

c)

Name	Indigenous Carbon Industry Network (ICIN)
Project Description	Supports information sharing and facilitates policy responses by groups operating savanna carbon farming projects.
Location	Darwin, with membership across northern Australia
Agencies involved	Northern Territory Government, Queensland Government Department of Environment and Science, Australian Government Department of Industry, Science, Energy and Resources
Traditional Owner Organisations involved	34 Aboriginal organisations across north Australia

d)

Name	North Australia Savanna Fire Forum
Project Description	An annual event to bring together fire managers, fire ecologists, government representatives and conservation agencies to discuss the latest research and tools supporting savanna fire management.
Location	Darwin (to date)
Agencies involved	Indigenous Carbon Industry Network (host), Darwin Centre for Bushfire Research Charles Darwin University, Bushfires NT, Queensland Government Department of Environment and Science, Australian Government Department of Industry, Science, Energy and Resources, Natural Carbon, Gamba Grass Roots, NAILSMA, Kimberley Land Council, Warddeken Land Management, ALFA NT, Wunambal Gaambera AC, Tiwi Land Council
Traditional Owner Organisations involved	ICIN members, Indigenous ranger groups and Indigenous land management agencies from across the north

e)

Name	Kakadu National Park Savanna Fire Projects
Project Description	Kakadu National Park hosts three Indigenous-led Savanna Carbon Farming Projects.
Location	Kakadu National Park
Agencies involved	Parks Australia, Northern Land Council
Traditional Owner Organisations involved	Mirrarr people (Gundjeihmi Association), Minitja clan, Bolmo clan (Gunlom Land Trust)

f)

Name	WA Centre for Bushfire Excellence (proposed)
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Project Description	Planned centre of excellence to consolidate best practice in fire management and bring together practitioners from across government, indigenous organisations and other stakeholders, with a focus on training.
Location	Perth, with State-wide coverage
Agencies involved	DFES-led. <i>In planning.</i>
Traditional Owner Organisations involved	

g)

Name	WA DFES Office for Bushfire Risk Management (OBRM) Assurance Program
Project Description	Accreditation and annual review of the KLC Fire Operations Manual under which indigenous ranger groups in the Kimberley carry out their fire operations. Collaboration combining traditional land management practices and western risk management principles, comprising process development, assurance scheme, and on-ground implementation reviews.
Location	Kimberley, WA
Agencies involved	DFES / OBRM
Traditional Owner Organisations involved	Kimberley Land Council (KLC), Kimberley indigenous Ranger groups

**5. Describe any key practical examples of Indigenous fire management reducing the risk of and/or mitigating the impacts of bushfire, or of promoting ecosystem features which are desirable from the perspective of bushfire.**

*Example 1: ALFA projects in Arnhem Land*

The first savanna burning carbon farming project, the WALFA (West Arnhem Land Fire Abatement) project, was an initiative of Traditional Landowners to reinstate control of fire over a vast and largely uninhabited landscape of the Arnhem Plateau region in west Arnhem Land.

To impose fire at such a scale was beyond the financial capability of Traditional Landowners and Aboriginal ranger groups. However, the emerging carbon economy provided an opportunity to build partnerships to control fire at the scale of the WALFA project. The subsequent WALFA partnership consisting of the five Aboriginal ranger groups with responsibility for that part of Western Arnhem Land, the Northern Territory Government, the Northern Land Council, Northern Territory-based research scientists and ConocoPhillips (a global oil and natural gas company) were successful in their goal to reinstate Aboriginal-led fire management regimes over the remote Arnhem Plateau, in part to offset greenhouse gas emissions from ConocoPhillips Liquefied Natural Gas plant in Darwin Harbour (Whitehead et al 2009).

WALFA provided the landscape scale model for the savanna burning method enabling eligible offsets projects to earn Australian carbon credit units through fire management.

The Indigenous Ranger groups with responsibility for the WALFA project came together to form their own Indigenous carbon business - Arnhem Land Fire Abatement (NT) Limited (ALFA). ALFA registered

the WALFA project as an eligible offsets project in 2014. Since then, ALFA has expanded to register and support projects in central, north-east and south-east Arnhem Land. Today, nine Indigenous ranger groups operate five ALFA fire projects, delivering sophisticated fire management over a contiguous and culturally and environmentally significant area of over 80,000 km<sup>2</sup> - an area much larger than the size of Tasmania.

Results from a recent research paper demonstrate that the adoption of the savanna burning method has been the direct cause of the recent positive changes in fire management regimes in Arnhem Land (Ansell et. al. 2019). Specifically, through fire management activities, the total area burnt has generally declined across the five projects. However, these trends are defined by:

- significant increases in area burnt during the early dry season (EDS)
- significant decreases in area burnt during the late dry season (LDS)
- marked change in burnt area size class distributions on commencement of active fire management in the project areas. For all five project areas, relative to baseline years, smaller fires have become more numerous and longer unburnt areas appear increasing

Ecological research results suggest that these contemporary fire regimes in Arnhem Land (which demonstrate a high level of patchiness, areas of unburnt vegetation and a reduction in the extent and frequency of late dry season fires) are likely to be favourable for a broad suite of existing biodiversity (Ansell et al 2019).

#### *Example 2 – North Kimberley Fire Abatement Project (NKFAP)*

In the North Kimberley, Dambimangari, Wilinggin, Wunambal Gaambera Unguu and Balanggarra Indigenous Rangers and Traditional Owners are managing the land and sea country of their respective Native Title areas – including through “right-way” fire.

The four groups, via their PBCs, registered savanna burning carbon projects in 2014 with start-up funding provided by the federal Department of the Environment, and have since worked together as the North Kimberley Fire Abatement Project (NKFAP).

Fire management is carried out in line with Healthy Country Plans, using a combination of Western science and traditional knowledge, with the objectives of looking after country and culture, limiting late season wildfires, driving biodiversity conservation, protecting cultural sites, and facilitating intergenerational transmission of traditional knowledge. The carbon projects were registered under the Emissions Reduction Fund (ERF) in order to generate revenue that could be reinvested to ensure the sustainability of these operations, continue providing access to country to Traditional Owners, provide jobs, skills and training opportunities, and create other economic opportunities.

As is evidenced in the success of the projects to date, healthy country fire operations carried out by the NKFAP partners in the early dry season have significantly reduced the average extent, severity and frequency of late season wildfires, while also leading to a reduction in the average total area burnt. This has significantly reduced the threat to lives and property from wildfires. Revenue from the projects has enabled a maturing of fire operations while supporting capacity building, governance and growth of the four organisations. Relatedly, the Ranger groups also manage invasive plants in order to prevent the incursion and spread of fire weeds across their Native Title / carbon project areas that could adversely impact fire regimes and increase the risk of late season wildfires.

The NKFAP projects are nationally and internationally acclaimed both for their fire management outcomes and the social, environmental and economic benefits they have brought to remote indigenous communities – far beyond the value of carbon credits earned. As a result, indigenous

Rangers have participated in two-way exchanges to share their skills and knowledge in Botswana, Africa, as part of the International Savanna Fire Management Initiative (ISFMI website).

*Example 3 - APN Cape York Savanna Carbon Farming Project (www.apncapeyork.org)*

APN Cape York engages local Wik and Kugu Traditional Owners as project rangers in traditional Indigenous fire management practices, carrying out strategic 'cool' burns in the tropical winter to reduce emissions from larger, late-season wildfires.

Bounded by the Ward and Watson Rivers about 630 km northwest of Cairns, the community of Aurukun in the Western Cape York is home to over 1200 people. For tens of thousands of years, Traditional Custodians the Wik and Kugu people managed the area's savannas strategically with fire. Without this management, intensely destructive fires tear through these ecosystems in the dry season – threatening wildlife, livestock and human communities.

Operated by Indigenous-owned & directed not-for-profit Aak Puul Ngantam (APN Cape York) in partnership with Balkanu Cape York Development Corporation, the Aak Puul Ngantam Savanna Burning project comprises 370,000 hectares of land on Traditional Homelands. Project rangers implement planned 'cool' fires early in the dry season to reduce fuel loads, preventing more intense wildfires later on – thereby reducing emissions. APN Cape York have extensive skills in strategic savanna burning, with aerial and onground burning operations since 2013. The property is broken into zones, depending on how often areas need management; high traffic zones require burning every year, while others are burnt less frequently.

As well as reducing emissions by controlling and preventing large, intense and uncontrollable wildfires, the Aak Puul Ngantam Savanna Burning project employs local Indigenous people as project rangers, engaging Wik and Kugu people in traditional practices to care for and connect with their ancestral homelands. Revenue raised from the sale of carbon credits supports a range of activities that APN Cape York runs alongside the carbon project – such as funding the installation of two communications towers to increase connectivity in the region. Rangers and others out on country can now travel knowing that they can call for assistance and keep in touch with family, even in extremely remote areas.

*Women Ranger Networks*

Recently, the role of women in Indigenous land management has been increasingly recognized and supported through the formation of Women Ranger Groups and Networks which are actively involved in fire management.

For example, in 2019, the role of women in fire management was discussed at Mimal Land Management's Women's Healthy Country Forum and the Kimberley Land Council and Bunuba Women's Ranger Forum. At the 2020 North Australia Savanna Fire Forum, women fire managers spoke up strongly to ask for support to engage more women in fire management.

**“As women we have something to offer to our country. We want to work together and seek new opportunities to grow and learn and to increase our capacity to contribute to healthy country.”**

**Annette Miller, Mimal Land Management Ranger**

**6. Describe any opportunities which you can identify for additional Commonwealth involvement in:**

- a. Promoting additional Indigenous fire management activities and initiatives;**
- b. encouraging relevant State and Territory and/or Local Government land management and emergency services agencies to obtain additional input from relevant Aboriginal/Torres Strait Island persons as to Indigenous fire management activities; and**
- c. supporting the transfer and utilisation of Aboriginal/Torres Strait Island knowledge of ecosystem and bushfire management techniques relevant to bushfire mitigation, preparedness, response and recovery.**

The achievements of Indigenous fire managers across northern Australia over the past 10-15 years in delivering significant reductions to the area of land burnt by bushfires in the face of worsening climatic conditions demonstrates the significant value of these activities to the nation. There is an opportunity to build upon these achievements not only to further improve the capacity of Indigenous fire managers directly but to also inform and support the growth of a national culture of fire management excellence and achievement that empowers both Indigenous and non-Indigenous fire managers alike.

Opportunities to realise this objective include:

- Acknowledgement of and respect for the success of Indigenous-led fire management in northern Australia and indigenous fire management skills, and a commitment to draw on these skills to improve fire management on a national scale
- Development of key partnerships to support Indigenous fire management, including close collaboration between State Government agencies and Indigenous fire managers, such as ranger groups, comprising both early season burning and late season wildfire suppression. This could include exchanges, two-way training, processes to request operational and funding support for critical operations, joint suppression teams etc.
- Funding support for the Indigenous Carbon Industry Network (ICIN) and other regional networks supporting fire and carbon management – in addition to the ongoing commitment to supporting the Indigenous Rangers and Indigenous Protected Areas Programs
- Start-up funding to assist Indigenous groups with savanna fire project set-up (including governance) and initial operational costs to the point of carbon revenue generation
- Better recognition of the right of Indigenous people to not only be included in fire management discussions, but a commitment to empowering them to lead fire management in light of the valuable contribution they have to make
- Inclusion of reference to Indigenous fire management in strategic and operational plans, and emergency responses in consultation with local Indigenous groups, subject to the principles of Free, Prior and Informed Consent.
- Government support and resourcing for Indigenous-led training programs in fire management and indigenous-led fire operations on-country, including operational budgets
- An acknowledgement by all levels of Government of the adverse impact of climate change on fire weather, and its effects on indigenous people in remote areas, as well as their crucial role in effectively addressing and managing it
- Funding for the North Australia Fire Information (NAFI) Service, which provides indispensable real-time information on hotspots and current and historical firescans to fire managers across the North, enabling effective planning, early season burning operations and late season wildfire suppression (refer attachment: NAFI Funding Case)

- Greater Federal and State Government commitment to climate change mitigation and adaptation efforts both through more ambitious emissions reduction targets overall and adaptation support for remote areas
- Commitment by fire management agencies and research bodies to engaging with and consulting Indigenous people and supporting Indigenous-led fire management, recognizing the rights of Traditional Owners as described in the UN Declaration on the Rights of Indigenous People, including the principle of Free, Prior and Informed Consent and Intellectual Property rights to traditional knowledge.
- Improved availability of resources for refinement of existing and research and development of new carbon abatement methods accounting for emissions abatement from fire, as well as carbon storage in the landscape.

***7. Describe (in summary terms) any other matters which you consider relevant to your responses to the above questions, or to the Commissioners' inquiries regarding bushfire risk mitigation within Australia, in response to the Terms of Reference.***

*See broader submission above.*

## References

- AIATSIS (1996) AIATSIS map of Indigenous Australia. <https://aiatsis.gov.au/explore/articles/aiatsis-map-indigenous-australia>
- Ansell et. al. (2019) Contemporary Aboriginal savanna burning projects in Arnhem Land: a regional description and analysis of the fire management aspirations of Traditional Owners. *International Journal of Wildland Fire*. <https://doi.org/10.1071/WF18152>
- Australian Government (2020) Indigenous Protected Areas. Department of Agriculture, Water and the Environment. <https://www.environment.gov.au/land/indigenous-protected-areas>
- ERF website, Australian Government (9 April 2020): Emissions Reduction Fund Project Register
- Evans Jay, Russell-Smith Jeremy (2019) Delivering effective savanna fire management for defined biodiversity conservation outcomes: an Arnhem Land case study. *International Journal of Wildland Fire* 29, 386-40. <https://doi.org/10.1071/WF18126>
- Fisher and Altman (2020) The world's best fire management system is in northern Australia, and it's led by Indigenous land managers. *The Conversation*, March 10, 2020. <https://theconversation.com/the-worlds-best-fire-management-system-is-in-northern-australia-and-its-led-by-indigenous-land-managers-133071>
- Green D, S Jackson and J Morrison (2009) Risks from Climate Change to Indigenous Communities in the Tropical North of Australia. Department of Climate Change and Energy Efficiency: Canberra
- Indigenous Carbon Industry Network (ICIN) (2020) Best Practice Guidelines to Seeking Free, Prior and Informed Consent from Indigenous communities for carbon projects, [https://a62efcec-3d67-4043-80a5-4dbbe9fe53f1.usrfiles.com/ugd/a62efc\\_4025ec9b11524ab2ae415882e1f92bbf.pdf](https://a62efcec-3d67-4043-80a5-4dbbe9fe53f1.usrfiles.com/ugd/a62efc_4025ec9b11524ab2ae415882e1f92bbf.pdf)
- Kimberley Land Council (KLC) (2020) Indigenous Fire Management <https://www.klc.org.au/indigenous-fire-management>
- ISFMI website, International Savanna Fire Management Initiative. [www.isfmi.org](http://www.isfmi.org)
- NAFI (2020) A comparison of average fire frequency between two time periods in northern Australia, 2000 – 2006 and 2013 – 2019. Savanna Fire Forum website: <https://www.savannafireforum.net/fire-map-graphics/>, and NAFI Facebook page: <https://www.facebook.com/FireNorth/photos/a.476674479066393/2896057150461435/?type=3&heater>
- NAFI (2020) A Comparison of Two Extreme Fire Condition Years in Northern Australia. Savanna Fire Forum website: <https://www.savannafireforum.net/fire-map-graphics/>, and NAFI Facebook page: <https://www.facebook.com/FireNorth/videos/2632918813443156/>
- NAFI website, funding summary. <https://www.firenorth.org.au/nafi3/views/about/Funding.htm>
- NAFI website. <https://www.firenorth.org.au/nafi3/>
- National Native Title Tribunal (2020). Map: Indigenous estates / Native Title determinations in Northern Australia, April 2020. <http://www.nntt.gov.au/assistance/Geospatial/Pages/Maps.aspx>
- NCCARF (National Climate Change Adaptation Research Facility), accessed 2020. <https://www.nccarf.edu.au/sites/default/files/6.Indigenous-Impacts.pdf>



Smyth (2018) Joint management of national parks in Australia.

[https://dermotsmyth.com.au/site/wp-content/uploads/2018/04/Joint\\_Management\\_of\\_National\\_Parks\\_in\\_Australia.pdf](https://dermotsmyth.com.au/site/wp-content/uploads/2018/04/Joint_Management_of_National_Parks_in_Australia.pdf)

Whitehead PJ, Russell-Smith J, Cooke PM (2009) Fire management futures: new northern directions for environmental and socioeconomic benefit. Culture, ecology and economy of savanna fire management in northern Australia: rekindling the Wurrk tradition. (Eds J Russell-Smith, P Whitehead, P Cooke) pp. 379–394.

Woinarski J, Legge S, Fitzsimons J, Traill B, Burbidge A, Fisher A, Firth R, Gordon I, Griffiths A, Johnson C, McKenzie N, Palmer C, Radford I, Rankmore B, Ritchie E, Ward S, Ziemnicki M (2011) The disappearing mammal fauna of northern Australia: context, cause and response. Conservation Letters 4, 192–201. doi:10.1111/J.1755-263X.2011.00164.X