

The divergence of traditional Aboriginal and contemporary fire management practices on Wik traditional lands, Cape York Peninsula, Northern Australia

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Summary Fire has been a critical component of Aboriginal culture and natural resource management in Australia for millennia. Aboriginal fire management in Northern Australia is widespread and, in some more remote areas, has continued relatively undisturbed despite widespread changes in tenure and land use. For the Wik people of Western Cape York, there has been a continued connection to their culture and traditional lands. Recently, Wik traditional owners have formed a ranger program which has secured funding to manage contemporary land management issues. This includes the landscape-scale management of fire for biodiversity conservation and greenhouse gas abatement. Because the work is being conducted by Aboriginal people, with consent from traditional owners and on their traditional lands, there is an assumption that the activities are compatible with historical traditional land management and cultural practices. In this study, we use participatory action research to compare contemporary fire management with the current understanding of traditional Aboriginal fire management to assess objectively the compatibility of these two paradigms. We do this by combining the experience and understanding of traditional owners with anthropological and ecological perspectives. We find that contemporary fire management is applied across traditional cultural boundaries using methods such as aerial incendiaries. Financial incentives and contractual obligations associated with fire management are externally driven or include modern considerations such as the protection of infrastructure. In contrast, traditional fire management was the prerogative of traditional owners and was applied at fine scales for specific outcomes. Fire management was governed by rules that determined how people moved across the landscape and how resources were partitioned and shared. Supporting the implementation of Aboriginal burning alongside current fire management practices could lead to significant community engagement in such activities and is likely to have much better biodiversity and social outcomes.

Key words: biodiversity, carbon credits, co-benefit, fire management, northern Australia, Wik.

Introduction

Australian Aboriginal people have been using fire to manage the Australian landscape for millennia (Russell-Smith *et al.* 1997; Vigilante 2001; Bowman *et al.* 2011). This traditional burning has changed, adapted and in some cases been oppressed across the continent, particularly in the past century. In the vast monsoonal tropics, fire is a critical natural part of ecosystem function due to the annual cycle of wet and dry seasons which promotes rapid vegetation growth and curing every year (Felderhof & Gillieson 2006).

Despite the ubiquitous presence of fire and intact Aboriginal knowledge, there is still significant debate about the best way to manage fire in this region, particularly in the context of biodiversity conservation (Parr & Brockett 1999; Andersen *et al.* 2005, 2006; Whitehead *et al.* 2005; Driscoll *et al.* 2010; Ziembicki *et al.* 2014). A common thread across fire management paradigms is to develop a system that most closely relates to the predominant system instated by Aboriginal people over thousands of years (Horton 1980; Yibarbuk *et al.* 2001; Vigilante & Bowman 2004; Bliege Bird *et al.* 2008; Russell-Smith *et al.* 2009, 2013). From a biodiversity

perspective, Aboriginal burning presumably most closely replicates the evolutionary processes underlying niche selection by plants and animals that have co-evolved with this particular disturbance regime (Bliege Bird *et al.* 2008).

There has been a general acceptance by conservation land managers in the Australian monsoonal tropics that patchy, early dry-season burning is the best proxy for traditional burning practices, and this has been the dominant ecological burning regime for several decades on the conservation estate (Burrows 1991; Parr & Andersen 2006). The pastoral sector on Cape York Peninsula has also historically

favoured early wet-season fire, termed locally as 'storm burning', with the aim of reducing woody vegetation cover (Crowley & Garnett 2000). More recently, the emergence of a carbon market in Australia has seen the introduction of broad-scale prescribed burning with the aim of shifting the predominant fire regime from the late dry season (defined as after August 1) to the early dry season with quantifiable greenhouse gas emission benefits (Russell-Smith *et al.* 2013). This methodology evolved through collaboration with Aboriginal fire managers in western Arnhem Land in the Northern Territory, Australia, where significant emphasis was placed on participatory approaches to planning and implementation of fire regimes (Russell-Smith *et al.* 2009).

However, whilst increasing early dry-season burning frequency has been shown to reduce greenhouse gas emissions, the biodiversity benefits are less clear (Parr & Andersen 2006; Perry *et al.* 2016). Although there have been demonstrated benefits for no burning for some taxa, especially mammals (Woinarski *et al.* 2004; Andersen *et al.* 2005), the benefits of frequent early burning and patchy burning have not been universally quantified although the theory is intuitively sound (Murphy & Bowman 2007). There is ample evidence that fire frequency affects aspects of biodiversity such as reducing tree biomass (Murphy *et al.* 2015) and reducing reptile and small mammal abundance and richness (Andersen *et al.* 2005).

In the Arnhem land context, there is evidence that fire management that aims to abate greenhouse gas emissions emulates traditional burning and supports the retention of cultural practices (Russell-Smith *et al.* 2009). For practical reasons, the implementation of Savanna burning is generally carried out using incendiaries deployed from helicopter or light plane and includes fighting fires in the late dry season. Burning in this manner is efficient and reduces the reliance on maintained roads and tracks, which are largely absent in remote Northern Australia. However, much of the evidence for biodiversity and cultural cobenefits are in the context of nuanced traditional burning practices (Yibarbuk *et al.* 2001; Vigilante &

Bowman 2004; Murphy & Bowman 2007). Understanding the link between the practical implementation fire management and its cultural legitimacy is important (Petty *et al.* 2015) as cultural cobenefits are increasingly becoming a critical metric for demonstrating triple bottom line outcomes associated with ecosystem service payments and reporting on government funding (Robinson *et al.* 2016a; Barber & Jackson 2017). There is also opportunity to leverage substantial financial benefit on open carbon markets if cobenefits (benefits accrued above the greenhouse gas abatement) can be established (Mason & Plantinga 2013).

Here, we explore an example of modern fire management on the West Coast of Cape York Peninsula, comparing the description of traditional burning from authors (HW, SW, DM) with the practical implementation of prescribed burning for carbon abatement and biodiversity. We discuss the issues of practically implementing a traditional burning regime in the complex matrix of decisions and external influences that are associated with modern land management.

Methods

The study area

The study area is located in the Archer River Basin (Cape York Peninsula, Qld) which includes the region's largest river (the Archer River). This study focuses on those traditional lands of the Wik people which lie between the Archer and Kendall Rivers (which include the traditional land of authors BM, HW and SW) (Figure 1). The area is dominated by open Savanna woodlands with a heterogeneous matrix of extensive marine plain grasslands, littoral dune forest, riverine gallery forest and open woodlands (Neldner *et al.* 2017) (Figure 1). The study area has a monsoonal climate with an annual cycle consisting of a long dry season (usually April–December) followed by a short and intense wet season (usually January–March). The average annual rainfall is 1777 mm with a high mean annual temperature of 26 degrees Celsius (BOM 2017). The combination of high annual

temperatures and highly seasonal rainfall makes this area one of the most fire-prone ecosystems in the world (Parr & Andersen 2006).

Study methods

The cultural information presented in this study are drawn from published works and anthropological notes of author (DM) (Martin 1993). In addition, information on historical implementation of fire management is presented from traditional owner authors (HW, SW), other Wik traditional owners and Wik rangers recorded during ongoing interactions with researchers (JP, MS) during participatory action research (PAR) activities such as conducting burning, undertaking environmental monitoring and during planning workshops.

Between 2010 and 2015, the core-searchers of this study worked together to establish biocultural management of southern Wik homelands using interdisciplinary PAR. We selected this approach to facilitate joint knowledge creation with indigenous land managers, traditional owners and researchers (Fals-Borda & Rahman 1991; Kindon *et al.* 2007). By working together over two adaptive management cycles, the approach sought to provide practical assistance and capacity development to support delivery of strategic objectives, contractual obligations and adapt biocultural management and institutional processes as the research community learned by doing. The researchers facilitated participatory review and planning workshops, implementation of program actions, development of monitoring methods and practical problem-solving of specific program issues. Researchers worked collaboratively with traditional owners and rangers to design a fire management strategy that aimed to merge modern and traditional burning regimes in the context of Wik people's values and aspirations. It was through this experience of planning and implementing fire management with Wik rangers that the research community became aware of the gap between the contemporary and traditional Wik fire management strategies. Here, we use the historical cultural

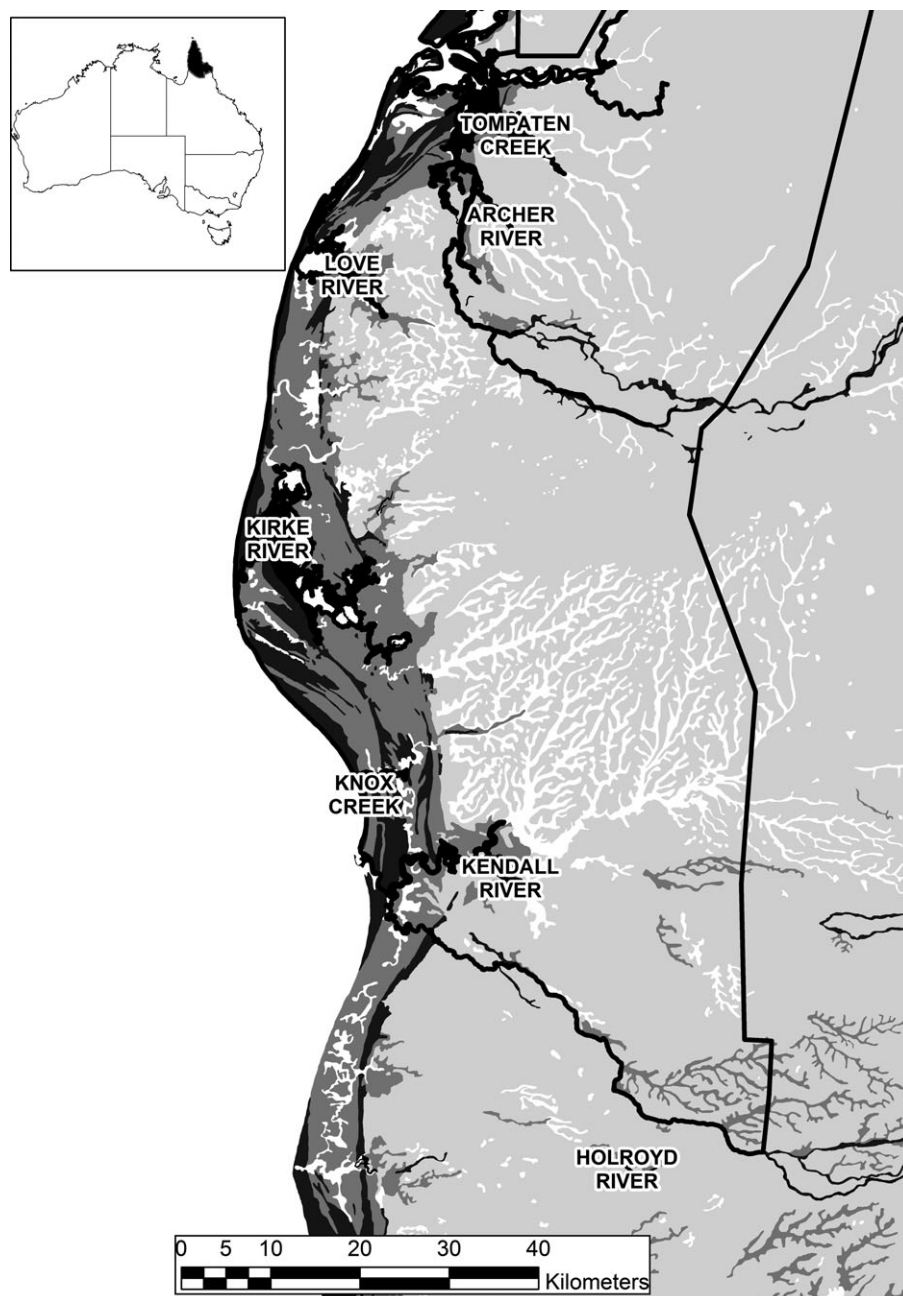


Figure 1. The study area and Wik traditional lands located south of the Archer River to the Kendall River and to the Aurukun boundary (dark polygon). The dominant broad vegetation types are displayed (open Savanna woodlands – light grey, tropical grasslands – mid-grey and littoral dune scrubs – dark grey).

information from anthropological studies (from author DM), summarise notes from primary researchers (authors MS, JP) collected during PAR activities and use quotes from several interviews with selected traditional owners (authors HW and SW) to demonstrate the contemporary and historical context of fire management.

Wik people and tenures of their lands

Wik people together with their Northern Wik Way kin lodged a native title claim in June 1993 over an extensive area in Western Cape York Peninsula. In a series of determinations by the Federal Court, their native title had been recognised over

some 28,000 square kilometres, including the study area, in a form of inalienable freehold title under Queensland's *Aboriginal Land Act* (Figure 1).

In accepting that Wik and Wik Way people had native title, the Federal Court and other parties such as the Queensland Government accepted the evidence of the continuing strength and vitality of

Wik and Wik Way cultural connections to their country. Wik people's culture and language were maintained throughout the 20th century despite movement of people into the Aurukun Mission (Martin 1993). A cattle industry in the 1980s, along with a federally funded outstation support service in the mid-1970s, helped maintain such knowledge and connections. This facilitated forms of customary land and resource utilisation and management practices including through burning country. Consequently, whilst there had been a significant change in traditional knowledge amongst younger Wik generations (Martin 1993; Martin & Martin 2016), there is still a core of mostly senior individuals who retain traditional Wik environmental and cultural knowledge.

Traditional Wik burning practices

Under traditional Wik law, rights and responsibilities for country were held primarily at the local level, traditionally by clans whose members traced their connections to country and to sub-regional ceremonial cults through the male line. Whilst each of the clans had responsibilities for a particular estate, clan members did not live solely within their own estates. Resources were exploited seasonally across the multiple environmental niches and zones of this region by bands typically comprised of close kin drawn from several clans (Sutton 1978).

The movement of other Wik people across clan boundaries, particularly strangers or more distant relations from outside local kin networks, was vigilantly monitored under Wik law and custom. There was a network of named tracks along which those traversing others' country could legitimately do so, designated wells, and specified camping places (Sutton 1978).

There were also in the past, and still are in more attenuated form today, a complex of laws and customs concerning the use and sharing of resources amongst kin and with others.

Below, author (HW) describes (to JP) his understanding of rules around resource use and travel within another clan's lands.

HW See, more food see, he maybe hunt, spear some extra fish they told him to hunt around that area, and how much he gonna get, like maybe five fish or something like that.

JP Yeah, so you come up with a contract. You say you're going to be on my country, you're allowed to take five fish.

HW See you're bringing the traditional owner something, like emu or wallaby to pay to them.

The traditional Wik laws that governed resource use and movement of people across the landscape influenced fire management. Traditionally, Wik fire management was undertaken at the local level, in accordance with fine-grained local knowledge of both cultural geography and environmental factors and was seen as largely the prerogative of those whose country it was (Green & Martin 2017). At this local scale, fire management was undertaken selectively and nonrandomly to protect and promote resources.

Here, authors HW and SW describe a nonrandom approach to fire management for the protection of resources in coastal dune scrubs to JP. HW is discussing an important yam (*may wathiy*, *Dioscorea transversa*) after finding dried vines during fieldwork:

HW When it starts, when it's ready for harvesting, they burn around the areas, around the ridges (HW describing coastal sand dune forest), so the fire won't come into the ridge you know and burn the vines...

JP So if you were going to try and protect that yam would you burn just around this tree here?

HW No no no, burn the whole ridge around, then when the fire starts to come in they put out the fire with leaves. Fighting the fire, whole ridge protected because protect the bush tucker.

JP Would these ridges ever burn?

HW No, maybe today, because a long time when the old people were still alive, ... protecting their areas for yams...

...they dig the ground and put their long yams in one ground and cover it up with sand...then they store it that way so people can't find it, stranger people

Today the younger people are staying in Aurukun which means the fire can go through the scrub.

(note: 'stranger people' refers to people from other clans visiting without permission).

Above, the author (HW) described two traditional practices that would have determined the location and timing of fire in these landscapes. Firstly, the protection of plants that provide food at particular times of the year, and secondly, the traditional law that governed travel across clan boundaries and resource utilisation. It is likely that this management regime (annual burning around resources) would have culminated in a nonrandom fire regime distributed around the key resources that people were using.

Contemporary fire management on Wik lands

With the increasing government focus on the township of Aurukun and the withdrawal of support for outstations (Peterson & Myers 2016), it has become progressively more difficult for those Wik people whose lands lie south of the Archer River to access their homelands (Martin & Martin 2016). Currently, the only way to access traditional homelands involves either a helicopter or a light plane trip, a 12-hour journey by four-wheel drive or via boat across the Archer River from Aurukun. This relies on a vehicle and equipment being available across the river (Figure 2).

With the lands south of the Archer River largely empty of their traditional owners, contemporary land management is undertaken by the Wik and Kugu Ranger service managed through a



Figure 2. The location of the township of Aurukun (black outline – north) demonstrating the challenge Wik people face accessing their traditional estate. The boat route commonly used is displayed (dashed grey line) starting at the Aurukun landing (north) and terminating at the Wik landing (south).

Wik-owned company (Aak Puul Ngantam, APN) founded by traditional owner, author (BM). Ranger positions, and the projects they undertake, are largely resourced through Federal and State Government funding and via individual, mostly short-term, contracts.

Funds received from greenhouse gas abatement through implementation of the Savanna burning methodology (Department of the Environment 2015) and

activities undertaken as part of Queensland state funding for land management provide the means for APN rangers to burn large areas of the Wik homelands. The broad aims of these burning programs are to shift large parts of the landscape from a frequent late dry season to an early dry season dominated regime. This method can earn carbon credits if the Savanna burning methodology is adhered to but it is also claimed to emulate Aboriginal burning

regimes and is assumed to have positive biodiversity benefits (Russell-Smith *et al.* 2013). In the past 2 years, the Savanna burning methodology has dominated the fire management strategy due to the direct financial benefit associated with it.

Practical implementation of the chosen fire management strategies is rendered difficult by access constraints (Figure 2). This severely limits access to the study

area, particularly for the majority of Wik traditional owners of these lands who cannot resource their own access to country due to lack of appropriate transport, fuel and equipment. This has caused an imbalance in the way country is accessed and by whom. For example, APN rangers are resourced to access the region through their employment with APN, but the organisation does not have adequate resources to support access to country for all traditional owners.

Due to access constraints and the requirement of the Savanna burning methodology to undertake most fire management in the early dry season, fire management over the great majority of the estate is carried out using aerial incendiaries via helicopter. The implementation of this strategy has been endorsed by relevant traditional owners through APN's informed consent processes. The formal consent process was developed as part of the PAR process. Researchers found that traditional owners mostly did not object to the APN rangers managing fire on their country. However, conflicts have arisen when a traditional owner passed away and access to large areas was restricted until areas were ritually opened up by those with the cultural authority to do so.

Comparing traditional Wik burning practices and contemporary fire management

Wik burning practices and the responsibilities of individual clans for their own lands have been compromised. In most cases, the imperatives of external values are usually negotiated via formal contracts with the State and Federal Governments or, in the case of carbon credits, a fixed methodology and associated contract with a private carbon broker are the primary drivers of fire management. Supporting traditional burning practices (and the values that underlie them) is especially difficult under externally contracted land management and requires significant consideration when imposing landscape-scale or regional approaches in areas that are owned by Aboriginal peoples. This is not just the case for Wik lands but is relevant

to Northern Australia more generally. For example, over 60% of Cape York Peninsula is held under Aboriginal freehold (Figure 3) and traditional knowledge and practices remain important.

In contrast to the regional and landscape-scale approach to fire management described above, traditionally Wik fire management was undertaken at the local level and was seen as largely the prerogative of those whose country it was (Green & Martin 2017). At this local scale, fire management was undertaken selectively and nonrandomly to protect and promote resources.

Importantly, authors (HW, SW) refer to traditional burning in the past tense,

..... a long time when the old people were still alive, still doing, protecting their areas for yams,

When old people passed away traditional burning stopped,

Today young people don't know bush foods, they are in Aurukun.

This suggests that traditional burning has been relegated to an historical rather than continuing practice. Although traditional knowledge has been retained, at least by contemporary senior generations, access constraints and external influences have largely removed traditional burning from the landscape in recent history. Acknowledging this as a deficiency in contemporary fire management that aims to approximate traditional burning is an important step to appropriately resourcing the re-implementation of traditional burning alongside fire management for infrastructure management, constraining fire within tenure boundaries and burning for carbon abatement (Petty *et al.* 2015).

Challenges in using traditional burning practices for ecological management

The integration of traditional burning with contemporary land management poses an important philosophical challenge. Traditional burning was carried out for specific reasons by Aboriginal people who were ranging across their own and others' traditional lands without the need for

transport, housing, potable water and electricity, and in the absence of bureaucratic and legal requirements to settle in one location such as school attendance for children. As has been discussed, the contemporary landscape in the study region is largely empty of permanent residents, and furthermore, there is a generational gap in the practical implementation of traditional burning.

There are significant and much needed financial benefits (Robinson *et al.* 2016a,b) which can accrue to Aboriginal landowners from burning for carbon abatement and for the protection of biodiversity, and it is more efficient to conduct such activities on a regional or subregional scale. However, this approach risks the unintended consequence of eroding the rights and responsibilities of traditional owners for managing their own lands (Petty *et al.* 2015). The issues raised here are symptomatic of a generational shift where Aboriginal decision-makers are now required to negotiate the contemporary pressures and responsibilities of contracted land management, but with limited economic support for cultural practices and the transfer of these skills and knowledge to succeeding generations.

Compounding the already complex matrix of decisions for fire management is the emerging imperative and desire for economic independence. This is a key goal of APN who see enterprise development as both a central necessity to create productive livelihoods for upcoming generations, and as an independent source of funding to enable Wik people to re-establish and reproduce meaningful connections to country (Martin & Martin 2016; Green & Martin 2017).

Enterprise development entails additional complexity for environmental and fire management goals. The emergence of ecosystem service payments, carbon credits and economic incentives for meeting international and national targets for biodiversity conservation (e.g. Australia's obligations as a signatory to the Convention on Biological Diversity Aichi biodiversity targets) could have perverse impacts on retaining Aboriginal burning practices unless they are given equal value or if the cobenefits are contextualised within

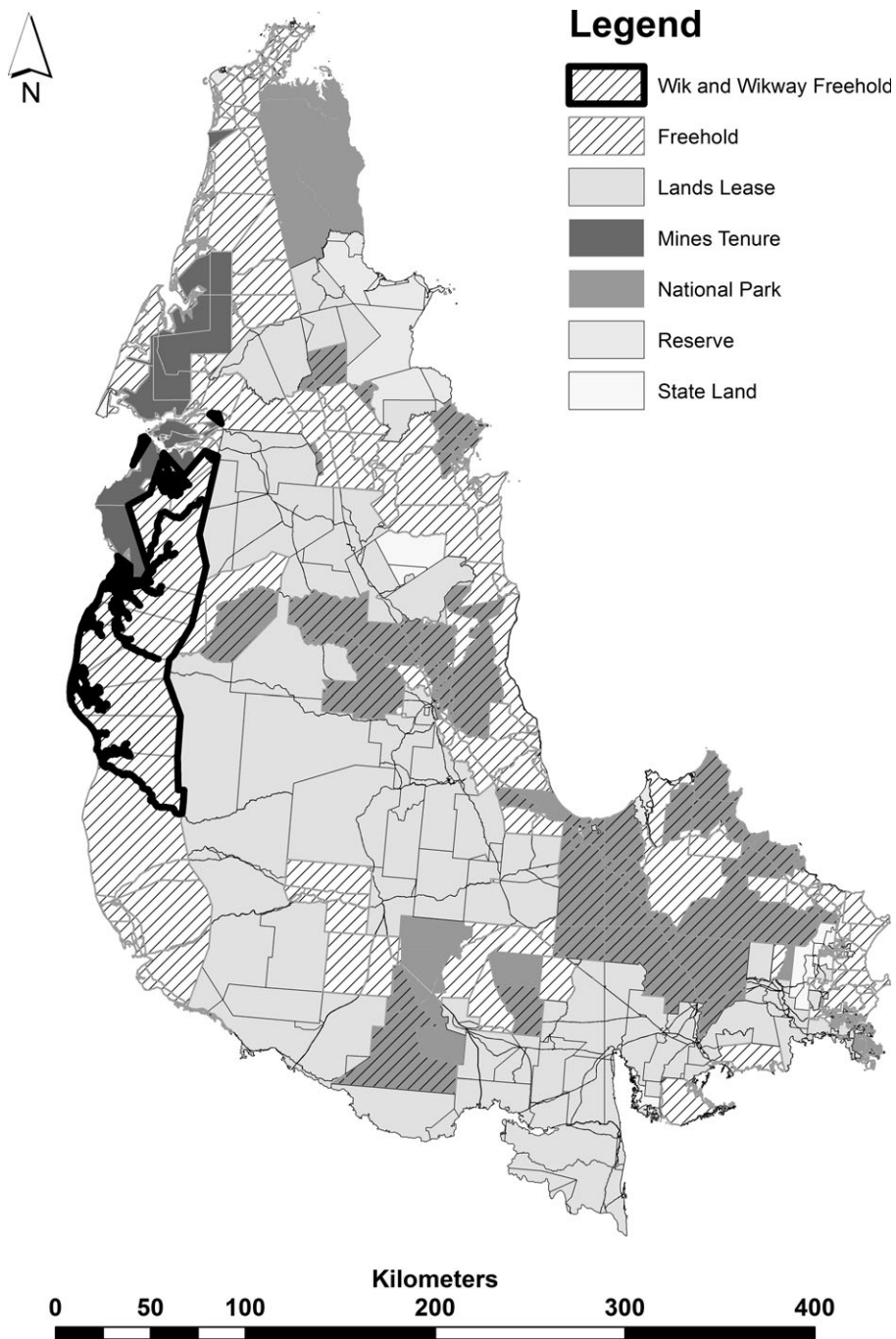


Figure 3. Cape York Peninsula bioregion, highlighting Indigenous freehold land (cross-hatch) and the total freehold land owned by Wik and Wik Way people (hatch with bold outline).

an environmental and carbon economy (Robinson *et al.* 2014).

Conclusion

The successful implementation of a fire management system that more formerly

acknowledges the complexity of traditional burning could lead to substantial biodiversity conservation and cultural cobenefits. Pragmatically, a combination of more recent fire management strategies combined with local-scale traditional fire management will be required to meet

the multiple objectives of contemporary natural resource management.

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