



# Indigenous fire practice in Western Arnhem Land: Lessons for today

Jeremy Russell-Smith, *Bushfires Council of the Northern Territory, Darwin, NT.*

*“A broad deep channel of fresh water covered with Nymphaeas and fringed with Pandanus, intercepted our course; and I soon found that it formed the outlet of one of those remarkable swamps . . . The natives were very numerous, and employing themselves either in fishing or burning the grass on the plains, or digging for roots. I saw here a noble fig-tree, under the shade of which seemed to have been the camping place of the natives for the last century . . .” (Leichhardt 1847)*

To many it appears something of a paradox that the extensive burning evidenced by Leichhardt might now be considered best management practice for conservation in our national parks. Yet there is stark evidence.

In the absence of systematic burning undertaken early in the dry season on the Arnhem Plateau there is potential for vast fires to burn unchecked late into the dry. This can have catastrophic consequences for fire-sensitive communities and species such as rain-forest, heath, Cypress pine (*Callitris intratropica*) and Leichhardt’s grasshopper (*Petasida ephippigera*).

Traditional fire-management practices have been examined in a cooperative project with the Gundjehmi-speaking people of western Arnhem Land. Information was collected over a 20-year period and focused on the country extending from the central reaches of the South Alligator River to the sandstone country of Deaf Adder Gorge in western Arnhem Land. This article briefly describes these traditional practices through the seasonal cycle shown below (boxed text). Further details can be found in Lucas & Lucas (1994), Lucas & Russell-Smith (1993) and Russell-Smith et al (1997).



<b>gunumeleng</b>	early wet season with storms
<b>gudjeuk</b>	the height of the wet season
<b>banggerreng</b>	late wet season
<b>yegge</b>	early dry season with dry south-easterly winds
<b>wurrngeng</b>	mid dry season relatively cool (winter)
<b>gurrung</b>	late dry season with hot winds

## Gunumeleng to banggerreng: a time without fire

During gudjeuk, the height of the wet season, people were widely dispersed across the landscape and batted down against monsoonal deluges. Camps were made around the floodplain edges, where stringybark and paperbark houses provided shelter, or in the rock shelters of clan estates deep in the rugged sandstone escarpment and plateau.

Yams were mainly only available in jungle patches

while *Triglochin procerum* (Bulwutja) was available from local creeks, river and floodplains. If the storms of gunumeleng had brought sufficient early rain, people residing by the floodplain would have access to the eggs of magpie geese and other water birds. If, however, the rains were late, eggs would not be available until banggerreng. Many other animal foods such as fish, goannas, water python and snapping turtle were still available from streams and floodplain margins. On higher ground, hunting continued, but without the use of fire. Such burning was restricted to the short dry spells in yegge and wurrngeng.

In banggerreng, the arrival of the last storms of the wet season heralded a time of plenty. Slowly receding water levels gave greater access to floodplain and riverine resources and yams were abundant. Heavy squalls or ‘knock’em downs’ blowing in from the east or west, wreaked havoc on the tall annual woodland grasses. As the dry season developed, the sorghum and other grasses rapidly dried off, first on the uplands and then progressively down the slope. Burning was only possible to a limited extent.

## Burning in yegge

Dry south-easterly winds marked the beginning of the seven-month-long dry season. Woodland yams were still abundant and large fish were trapped or speared. From yegge through to wurrngeng, people began the task of ‘cleaning the country’. This was typically done under the guidance of senior custodians. People moved through their clan estate setting fire to the curing grasses with smouldering pandanus or banksia firesticks.

*“You start burn’im in banggerreng (end of wet season), then proper in yegge, wurrngeng (cool time, mid dry season) . . . e won’t burn much. But when that anrebel (E. tetrodonta) and that andjalen (E. miniata) bin finish flowering, in gurrung proper (hot time, late dry season), that fire can travel day and night, all week. You gotta be careful, that’s important. Then after, when that first storm come, in gunumeleng, you can burn ’im again. Good story that one? That’s the law”. (Nipper Yapirigi)*

Burning radiated out from the campsites and footpaths creating small patches or ‘wurga’, and places cleaned of grasses. As people burnt farther afield, a mosaic of burnt and unburnt vegetation would be rapidly formed on the landscape.

McKinlay (1866) noted this as he skirted the western rim of Arnhem Land writing “. . . in every direction in the distance from westward to north we see daily innumerable bush fires . . . even on the tops of those rugged walls”.

### Wooded uplands

When upland wooded areas were burnt, care was taken to protect known beds of bush yams. Careless burning would destroy their above-ground parts and make it impossible to find them later. Fruit trees were also conserved by the use of low creeping fires in their vicinity.

Burning early in the dry season encouraged regrowth of perennial grasses, producing ‘green pick’ known as ‘angolde’. This attracted both agile wallabies and antilopine kangaroos that were hunted later in the season.

Men lit kangaroo-hunting fires, using a variety of strategies to trap or drive their prey onto hunters’ spears. Great care had to be taken with such fires. Strategically burnt breaks had to be prepared earlier in the season to prevent the spread of these fires, and physical safety was of concern when burning the highly combustible spinifex grasses of the sandstone country.

Smaller game like bandicoots, floodplain rats and quails were also hunted, mainly by women, using similar burning techniques.

### Floodplain fringes and water courses

In yegge, women started fires along floodplain fringes and watercourses as a hunting strategy for lizards, snakes and small rodents. Relatively small, low-intensity fires were set as soon as vegetation became sufficiently dry. These fires progressed down slope until they reached uncured grasses and sedges. This pattern of burning was employed progressively and systematically over the entire dry season and into the early wet season, ceasing only when floodwaters of the next wet season made burning impossible. Regular burning of floodplains was used to keep fuel loads low, especially where slow burning peat fires or ‘mulurr’ would burn until stopped by wet season rains. Mulurr was used to remove thick stands of native hymenachne (*Hymenachne acutigluma*) and promote the growth of highly prized food species such as water chestnut (*Eliocharis* sp.).

### Burning in wurrngeng

By the cool dry season, woodland yams became hard to find and food came increasingly from floodplains, rivers and creeks. Wurrngeng heralded the flowering of eucalypts (*Eucalyptus tetrodonta* and *E. miniata*) and the peak of the burning season.

Most of the grassy fuels in upland areas were fully cured and windy conditions and low afternoon relative humidities of around 30 per cent prevailed. A considerable level of control could still be exerted, however, given that fires tended to burn out in the cool, dewy night-time conditions.

### Gurrung: end of burning season

As the season got hotter, the eucalypts came to the end of their flowering and most burning ceased. The exceptions were for kangaroo hunting and for burning on the floodplains, or where the fires could be well controlled. Older Aboriginal people are quite clear on this point. It was the season where extreme care had to be taken. Fires could often burn through previously burnt areas and could burn all day and all night fanned by warm sea breezes.

Most people living in the region already resided on permanent lowland billabongs and fast-receding swamps. Food was abundant and included water chestnut, water lily, freshwater mussel, snake, turtle, flying fox, wallaby and best of all, magpie geese. Fish in drying water holes were caught by traps, nets or spearing. People staying in the sandstone country concentrated around soaks and permanent creeks. Leichhardt (1847) reported no wild, uncontrolled fires.

Gunumeleng was dominated by sporadic drenching rains and fires ignited by lightning strikes. There was still plenty of food and only later with the arrival of gudjeuk would people disperse to their wet season camps. The burning cycle could begin anew.

### Lessons for the present

The approach to burning by Aboriginal people in Arnhem Land was essentially conservative, especially in the fire-sensitive, species-rich communities of the sandstone plateau.

This did not hold true everywhere, however. The floodplain of the South Alligator River is likely to have been consistently and thoroughly burnt ever since the plains were vegetated by flammable grasses. This may have kept natural rainforest development at bay. The patchy distribution of Cypress pine between Darwin and the Arnhem Plateau is also a legacy of these practices.



Traditional Aboriginal fire management in western Arnhem Land was clearly effective in breaking up the landscape. Burning started in the early dry season as the country dried out. Burning into the mid and late dry season could be safely carried out as it focused on creek lines and floodplains that had been protected by earlier extensive burning.

The issue for current management is how these traditional practices can be applied in an altered landscape, particularly given the change in balance between grasslands and forests, the presence of weeds and introduced pasture species, and the increasing pressures on land use and management.

### References and further reading

Leichhardt, L., (1847), *Journal of an overland expedition in Australia*, T & W Boone, London.

Lucas, D.E., & Lucas, K., (1994), *Aboriginal fire management of the Woolwonga wetlands in Kakadu National Park*, Report to the Australian National Parks & Wildlife Service, Canberra.

Lucas, D.E., & Russell-Smith, J., (eds), (1993), *Traditional resources of the South Alligator River floodplain*, Report to the Australian National Parks & Wildlife service, Canberra.

Russell-Smith, J, Ryan, P.G., Klessa, D., Waight, G., & Harwood, R., (1998), 'Fire regimes and fire-sensitive vegetation of the sandstone Arnhem Land Plateau, monsoonal northern Australia: Application of a remote-sensed fire history', *Journal of Applied Ecology*, 35, 829-846

McKinlay, J., (1866), *Northern Territory Explorations, 1866*, South Australian Parliamentary papers, No. 82.

**Disclaimer:** Information provided by the TS-CRC for the Prime Notes CD-ROM is general advice only. Professional advice should be sought if seeking to apply the information to specific circumstances. The TS-CRC has tried to ensure this information is accurate at the time of publication.

For more information about land-management issues in northern Australia, go to the Savanna Explorer section of our website at <http://savanna.ntu.edu.au/>

For more information about the Centre's extensive research program go to our research section.



Established and  
Supported  
under the  
Cooperative  
Research Centre  
Program