



Ngadju kala:

Ngadju fire knowledge and
contemporary fire management in
the Great Western Woodlands

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Front Cover: Artwork "Salmon Gums" by Valma Saunders
Right: Sandplain shrublands, photo: Lachie McCaw;
Back Cover: Left: Woodland fire (photo Ryan Butler).
Right: Old growth Salmon gum woodland.





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Summary

Ngadju country covers a significant part of the region known as the Great Western Woodlands in south-western Australia. This region is nationally and internationally significant for its large, relatively intact expanses of eucalypt woodlands, shrublands, salt lake systems and mallee. To enhance Ngadju opportunities to be and work on country, and inform ecological management of the Great Western Woodlands, Ngadju Conservation and collaborators initiated this project to document Ngadju knowledge about fire in Ngadju country. The project also aimed to explore current aspirations of Ngadju around fire management. It was undertaken through a series of workshops and field trips with Ngadju during 2012–13. Historical records were also used to complement what Ngadju told us.

Fire is significant to Ngadju for its many uses, from warmth and yarns around the campfire to cleaning up the country. As a land management tool, fire has a more select role in Ngadju country than in other regions such as tropical savannahs and spinifex country, where large parts of the landscape are frequently burnt. Historically, only specific, relatively small parts of Ngadju landscapes were actively burnt, to maintain open hunting grounds and camping areas, encourage green pick, facilitate travel, and protect people, important places and resources from fire. Management relevant to fire included not only the application of (usually small) fires, but also management of fuels through plentiful use of timber for campfires and sweeping or scraping up bark, leaves and dead wood around important trees or other assets.

This mosaic of management was overlain on a natural vegetation mosaic, including vegetation types of differing flammability, fire sensitivity and need for fire. Large areas of vegetation in Ngadju country, such as extensive old growth woodland, the saltbush and bluebush plains, succulents around the lakes, and stony country, are fire resistant. They don't burn much, and can provide natural firebreaks. But if they do burn they may be slow to recover, especially the old growth trees that take hundreds of years. Fire in these areas might only be applied in small patches to clear around campsites, or to clear up scrub at the edges of woodland to help protect them from wildfires.

Other places need to be burnt regularly — these include the spinifex and spear grass grasslands, around the rockholes, in some types of mallee and in the coastal scrub. Only a small area needs to be burnt at any one time — perhaps the size of a football field. Finally, there is the 'bushfire' country such as the sandplain and mallee scrub, where wildfires are inevitable and that is often left to look after itself. Fire might be applied for specific reasons in these places, e.g. for access or to protect sacred sites, but it is best to stay away from these areas in summer — instead, stay in the woodlands, near lakes or on stony ground that are less flammable.

Together these different fires are likely to augment the natural mosaics in the landscape, that potentially help to slow wildfires. In the old days, Ngadju lived across the landscapes in family groups of perhaps 10–30 people, rotating among rockholes and hunting grounds (to allow them to rehabilitate), travelling longer distances along the 'Ngadju highways' (songlines) to gatherings, and burning along the way. Decisions to light fires tended to be made locally according to need, but it is useful to consider how these might have added together at the broader scale. One estimate was there might be about 20 fires per year per family around rockholes and in grasslands (but every year is different!), and with at least 10 families in some core Ngadju areas this would be at least 200 fires. In addition there were probably even more room-to-football field sized fires to clear around campsites, smoke out kangaroos, and maintain access across densely vegetated areas.

This intersection of the natural vegetation mosaic with the varied uses and goals around fire emphasizes the very fine-grained scale of land management applied by Ngadju across large tracts of country. The challenge for the Ngadju Nation is to consider which elements of this regime are desirable and achievable in the future. Opportunities for Ngadju engagement in fire management have been limited in the past few decades owing to 'white man laws'. However new avenues are opening up that can alter this situation, particularly the native title process and amendments to the Conservation and Land Management Act 1984 (WA).

Ngadju aspirations around fire and country are intimately bound with broader aspirations regarding Ngadju culture, livelihoods and country. They encompass spiritual, cultural, social and ecological values, with spiritual and cultural values at the centre. The latter revolve around strengthening Ngadju identity, ownership and self-governance, with engagement in fire management as one means for achieving these. Aligned with these core goals are the benefits of being on country for regaining spiritual connections to the land, passing on knowledge, restoring social well-being, respecting elders, and acknowledging and protecting sites that themselves are a part of Ngadju identity. Protecting people from uncontrolled fire, using fire to make camping safer, protecting animals, plants and resources are also recognized as important goals. A thread running through these is recognition of the need to move with the times, and meld the best of the old with the new.

Ngadju felt that engagement in fire management offers a timely pathway towards broader Ngadju goals around country and land management. A number of key steps towards building leadership, opportunities and capacity were identified, and some have already begun in conjunction with this project. These include preparing a Ngadju Healthy Country Plan; establishing an Incident Response Protocol; engaging with other agencies in longer-term planning; participating in on-ground fire management through training, volunteer brigades and ranger-type positions; reclaiming rights to light fire on country; and providing cultural awareness training to non-Ngadju.

To conclude, involvement of Ngadju in fire and land management is at a turning point. The convergence of legislative changes, native title decisions, and increasing momentum in both Ngadju and non-Ngadju communities has already led to significant community participation in partnership with agencies. The time is ripe to understand and respect Ngadju ecological knowledge and move to a new era of Ngadju leadership and joint management.



Spinifex and mallee, photo: M. H. O'Connor

How fire was given to the people

Karrgain, a bird (blue pigeon) and Meermeer (sparrow hawk) found the fire. The turkey banjoo had the fire, he was a man. Jangoo [bandicoot] had the fire. Jangoo was Banjoo's wife. Meermeer and Karrgain wanted to steal the fire and kill Jangoo. Meermeer had geej and Kargain had [k]angoola [?wonna]. They went up the sky and didn't let Jangoo see them. Ngoran (sparrow?) and they looked to see where Jangoo was. Jangoo made a hole near the fire to hide himself and then the two came down but Jangoo looked out and couldn't see them. Then they came closer and closer down, and then Jangoo couldn't see their shadow she wanted to dig and dig and put the fire into the sea so they wouldn't bother her again, but Meermeer got close up and hit her with the [geej], and Karrgain got the wanna and chucked the fire east and west and north and south and then all the yungars could get it and she cut Jangoo in half and half and said to him you go and fly about in bush along plain and have no more fire. Mulba had it all. The sand hills are the heaps that Jangoo made as she tried to scoop a hole and bury the fire in.

This was told by Marlpa man Jimmer of Drollinya (possibly Drallinya, Duralinya), near Balladonia, to Daisy Bates about August 1908 (Bates c. 1908a). It appears above as written in Bates' hand at the back of her original field booklet (Bates' spelling retained; our suggestions are in square brackets). Bates later created different versions of this text, and related information, including the following song.

Karrgain goolain bal	Karrgain brought the
nambal nambal, eemalalla	smoke
geen geen, [e]emalalla	and the fire,
geen geen.	the smoke and the fire.

The women of Fraser Range sang this song as the smoke ascended from their fires (Bates 1936).



Woodland regrowth, photo: Lachie McCaw

1 Background and methods

*Fire connects Indigenous people around the world.
Fire is culture: water is number one; fire is second only to water.*
Stephen Rule, Norseman.

1.1 Introduction

Australia's vegetation has been shaped by Aboriginal burning practices over the past 60,000+ years. Understanding of Aboriginal burning regimes in contemporary and historical periods is often poor, but traditional fire knowledge in tropical and arid Australia has become better-known and applied in the past two decades (Russell-Smith et al. 1997, Walsh et al. 2003, Bowman et al. 2004, Gabrys and Vaarson Morel 2008, Cook et al. 2011). By contrast, there has been little direct documentation or contemporary practice of Aboriginal burning in the eucalypt woodlands of southern Australia.

The 16M hectares region of south-western Australia known as the Great Western Woodlands is nationally and internationally significant for its large expanses of eucalypt woodlands, shrublands, salt lake systems and mallee. The woodland component is globally unique in that nowhere else do tall woodlands occur at as little as 250 mm mean annual rainfall (Milewski 1981, Prober et al. 2012). Further, the region is extraordinary in having remained relatively intact since European settlement, partly owing to variable rainfall and lack of readily accessible groundwater (Watson et al. 2008). This contrasts with most other eucalypt woodlands across southern Australia, which have become highly fragmented and degraded because of their occurrence on land productive for agriculture.

Notwithstanding the relative intactness of the region, altered fire regimes have been identified as one of the most immediate threats to the landscape and biodiversity conservation values of the Great Western Woodlands (Great Western Woodlands Strategy 2010). O'Donnell et al. (2011a) estimated a fire

return of c. 400 years in eucalypt woodlands, yet large, intense woodland fires in the five-year period from 2000 to 2005 alone burnt more than 15% of mature woodland across the region (Watson et al. 2008). It is possible that recent fires reflect a natural climatic cycle; alternatively, they may reflect a change in fire regimes associated with climate change, contemporary human activity and/or altered Aboriginal management (Watson et al. 2008; O'Donnell et al. 2011b).

Ngadju people, from the country centred around Norseman in the Great Western Woodlands, are working towards having their native title rights and interests recognized, including greater leadership in contemporary environmental management in their country. Despite these aspirations, the global significance of the region, and the management challenges it faces, there is little documented regarding Aboriginal fire knowledge in the Great Western Woodlands. To enhance Ngadju opportunities to be and work on country, and inform ecological management of the Great Western Woodlands, Les Schultz of Ngadju Conservation initiated this project with support from Goldfields Land and Sea Council, CSIRO, The Wilderness Society, GondwanaLink, and the Western Australian Department of Parks and Wildlife (DPaW). The main aims were to document Ngadju knowledge about fire in Ngadju and neighbouring country. The project also aimed to explore current aspirations of Ngadju around fire management.

Section I of this report briefly summarizes information about the region in which Ngadju country is located, the methodology for this project, and information available about Ngadju fire management and fire-related language in the literature. Section 2 summarizes what Ngadju told us about fire in their country. It touches on the wider importance and use of fire in the Ngadju community, and focuses on the ecological aspects of fire — its use and control from a 'land management' perspective. It also incorporates related references from early historical records. Section 3 includes information relevant to building Ngadju capacity to manage their country and more effective inclusion of Ngadju fire knowledge in fire management today.

1.2 Project context

1.2.1 Study area

This project focused on ‘Ngadju country’ (Fig. 1.1) and information provided by Ngadju people. In addition, many Ngadju people have links outside the exact boundaries of the Ngadju Native Title Claim area that are relevant to very similar ecosystems across the Great Western Woodlands. To avoid loss of information relevant to fire management in the broader region, we did not confine the report strictly to the current boundaries of the Ngadju Native Title Claim area. Consequently, some of the stories, images and knowledge may apply to neighbouring but ecologically similar areas within the Great Western Woodlands.



Fig. 1.1. The red on the map shows the area known as the ‘Great Western Woodlands’. A large part of the Great Western Woodlands is in the Ngadju Native Title Claim Area, as indicated by the yellow line. This report includes experiences and photos from the wider Great Western Woodlands area, with a focus on Ngadju people and country. Map: Ngadju Conservation.

The climate of the region is classified under the Koeppen system (as applied by the Australian Bureau of Meteorology) as mostly within the zone classified as “Grassland” (warm and persistently dry), and by Beard (1990) as within the Sub-Eremaean: Mediterranean semi-desert and Thermoxeric: Extra dry Mediterranean zones. Annual mean maximum temperatures range from c.

23–25 °C and mean minima from 9–11°C. Mean annual rainfall generally decreases towards the north and east, ranging from around 350 mm at Salmon Gums to 290 mm at Norseman, 270 mm at Coolgardie and 260 mm at Balladonia. Seasonality varies from relatively even to mild winter dominance (Australian Bureau of Meteorology).

Despite the climate classification as mostly within the ‘Grassland’ zone, only small parts of the area are grassland. Rather, it is predominated by mosaics of eucalypt woodland, mallee, shrublands, and salt lake and granite outcrop systems (Fig. 1.2). This vegetation patterning is driven by soil and landform mosaics derived from the underlying granitic formation known as the Yilgarn craton, and associated ‘greenstone’ intrusions (Watson et al. 2008). Towards the edge of the Nullarbor and the coastal parts of Ngadju country (e.g. Israelite Bay) there is an influence of limestones and calcretes, supporting mallee scrub near the coast and mallee woodland with a more grassy or open ground layer further inland (See Section 2.5.3 Mallee). The Claim Area also includes some treeless saltbush plains of the Nullarbor ‘proper’, and Banksia scrubs along narrow coastal strips (Tille 2006, Waddell et al. 2010).

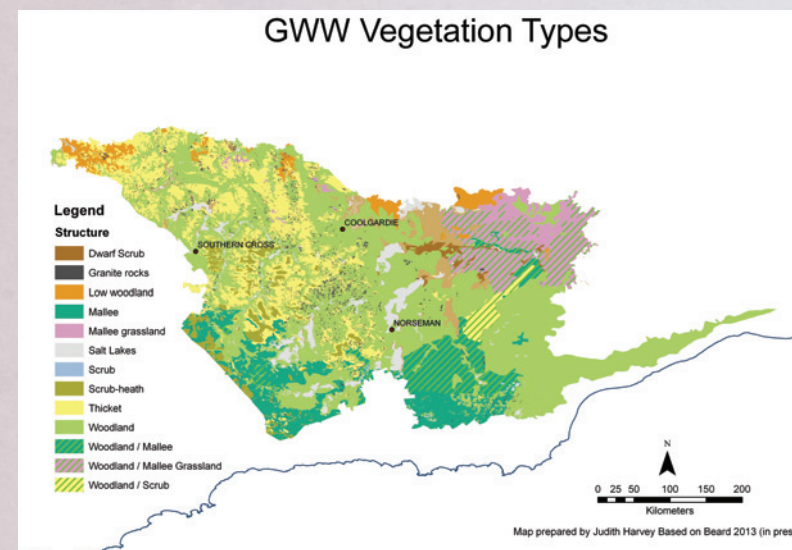


Fig. 1.2. The distribution of major vegetation types in the Great Western Woodlands (after Beard et al. 2013).

1.3 Prior documentation of Ngadju fire knowledge

A precursor to this project was the preparation of the Ngadju (**Kala**) Fire Management Assessment DVD in September 2011, led by Ngadju in collaboration with GLSC, The Wilderness Society, GondwanaLink, Curtin University and others (produced by Victor Steffensen and funded by Caring for our Country). This DVD outlines the importance of fire to Ngadju and illustrates some of the practices and environments where fire management is relevant.

While we know of no other dedicated projects to document Ngadju fire knowledge, some information is available in the form of linguistic terms, early newspaper articles, journals, and memoirs. These are being collated in a background report as a part of this project (O'Connor in prep.), and include words, names for people, places and language groups, dreaming stories, and references to the range of uses of fire in daily life, including cooking, medicinal use, warmth and light. Some of the key Ngadju words relating to fire are summarized in Fig. 1.3, and selected references to use of fire in daily life are incorporated into Section 2.

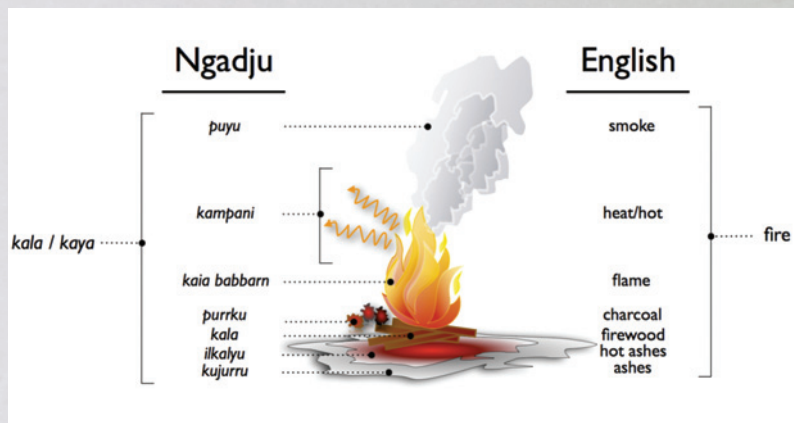


Fig. 1.3. Ngadju words for fire activities, and their translations in English.

There are also occasional historical references to landscape fires in the region, including some that attribute the fires to Aboriginal people in and around Ngadju country. One set of records is concentrated in the south-eastern near-coastal parts of Ngadju country, where the telegraph line ran through Israelite Bay towards Eyre, and around the main pastoral stations (e.g. Fraser Range, Balbinia, Nanambinnia) that were taken up by pastoralists from around the 1860s. These refer to wildfire threatening life and the telegraph line, and Aboriginal fires promoting grass (see Section 2.4.1). Mining activities began in the mid-1890s and led to increases in resident non-Indigenous population, infrastructure and land appropriation.

Fewer records about fire were found for the country west of Norseman, but include the early expedition led by John Septimus Roe in 1848–9, which entered at the south-west corner of Ngadju country, traversed north-westwards through sandplains, thickets and woodlands to Bremer Range, south-east to Peak Charles and Peak Eleanora, then via Mt. Ridley (in Esperance Noongar country) across to the Mt Ragged (Israelite Bay) area. References are made to Aboriginal campfires, burnt scrub and thicket, and signs of burnt grass on the Bremer Range (Roe 1849).

Where sufficiently explicit, these historical records have been incorporated into Section 2 alongside related information reported to us by Ngadju during the workshops (with more detail available in O'Connor in prep.). It is not always possible to distinguish the exact vegetation types referred to in the records but there are frequent references to both bushfire and Aboriginal-lit fires in mallee, mallee scrub, and open grassy patches (see Section 2). It is important to note that pastoralists had taken up some of the country by as early as the 1860s, and hence fire regimes referred to in historical records may have been influenced by goals to promote grass for more intense grazing by livestock. The location of places commonly referred to by Ngadju and in historical records are shown in Fig. 1.4.



Fig. 1.4. Map showing locations referred to in this study and routes of early expeditions of Eyre, Roe, Brooks and Ponton, and Lindsay (Elder expedition) (Eyre 1845, Roe 1849, Brooks & Ponton 1875, Lindsay 1893).

1.4 Methods

The project was undertaken in accordance with CSIRO Social Science Human Ethics procedures. An internal ethics review was undertaken at the beginning of the project, and project methodology was developed in collaboration with the Ngadju Working Group. A research consent agreement outlined the project goals, methodology and expected outcomes, and the rights and responsibilities of participants.

The core information presented in this report was compiled during six workshops/meetings and three field trips held over eleven days from July 2012 to May 2013 (Appendix A). These were as follows:

- Norseman planning meeting, 26 July 2012, to agree on the project methodology

- **Kala** workshop 1, Norseman, 31 October–1 November 2012, 26 community attendees, two agency attendees
- **Kala** workshop 2, Esperance, 26–27 November 2012, field trip from Esperance to Cape Le Grande (to visit coastal scrub, acknowledging this site is in Noongar country), 10 community attendees
- **Kala** workshop 3, Coolgardie, 26–27 February 2013, field trip from Coolgardie to Burra Rocks, 14 community attendees, one agency attendee
- **Kala** workshop 4, Norseman, 20–21 March 2013, field trip from Norseman to Buldania Rocks, 35 community attendees, three agency attendees
- Norseman presentation meetings, 14 and 16 May 2013, to check knowledge documented in the draft report

Opposite page: Ngadju kala workshops at (a) Norseman (October–November 2012), (b) Esperance (November 2012), (c) Coolgardie (February 2013), and (d) Norseman (March 2013). Photos: Suzanne Prober, Darren Forster, Ryan Butler, Emma Yuen.



Ngadju kala: Background and methods

Workshops were augmented by additional activities including:

- two project steering committee meetings held in Kalgoorlie with DPaW, GLSC, CSIRO and Ngadju representatives,
- individual interviews with Dorothy Dimer, Danny Graham, Johnny Graham, Sonny Graham, Betty Logan and Les Schultz,
- additional field trips, including a tour with Betty Logan and Sonny Graham in the Coolgardie region, Dorothy Dimer in the Norseman region and a fire training day at Buldania Rocks near Norseman with DPaW, Department of Fire and Emergency Services (DFES), GLSC and over 30 Ngadju people.



Les Schultz driving participants to Buldania Rocks, Norseman Kala workshop March 2013.

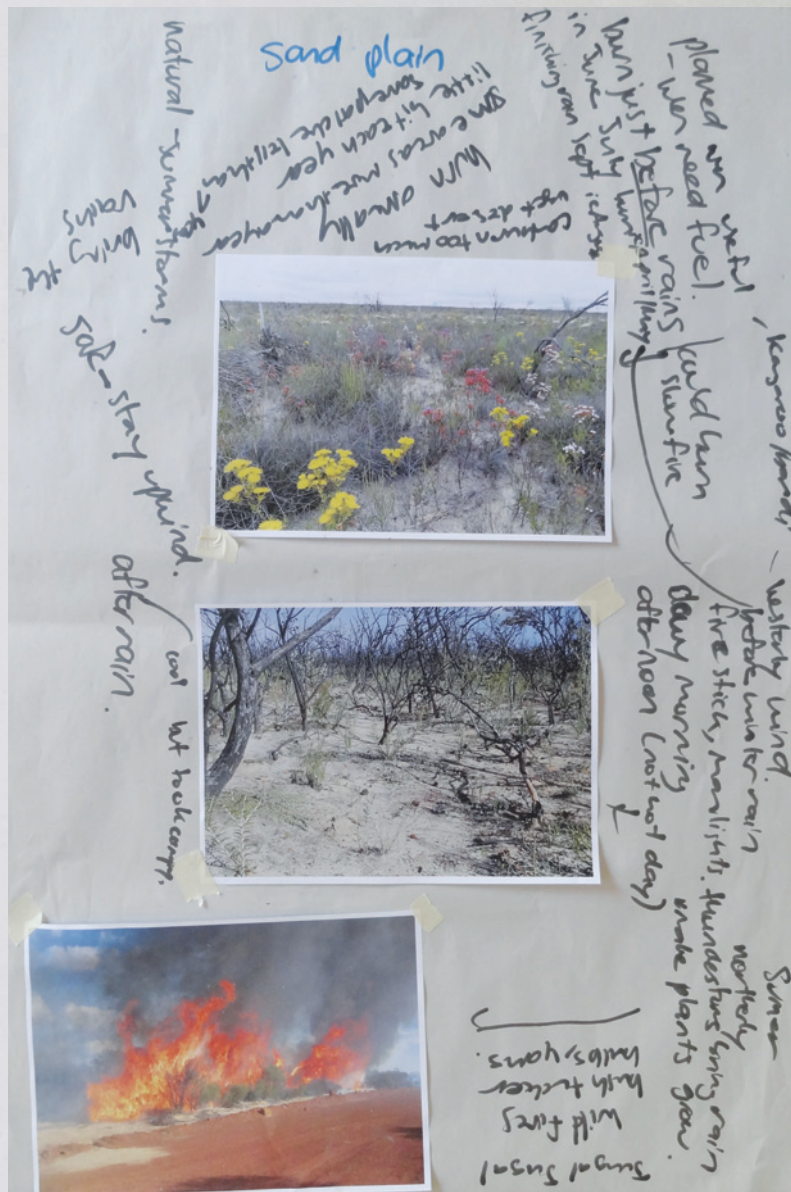
At each workshop we began by ensuring people understood and agreed with the project methods and ethics, and described the project background and aims:

- to document knowledge about fire Ngadju country, and
- to understand contemporary aspirations of Ngadju around fire management.



Workshopping fire in old growth woodlands, Esperance, November 2012.

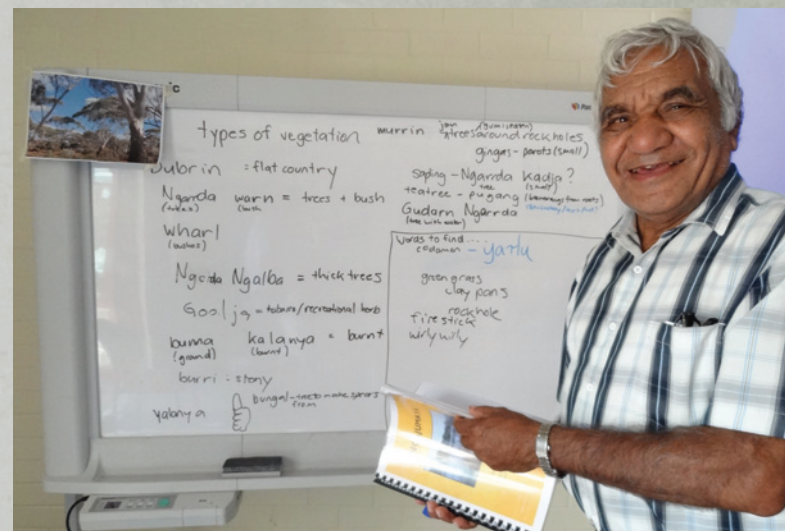
We used a range of approaches to discuss fire in Ngadju country. These included whole-group discussions, and focus groups with men only and women only in recognition that some knowledge is men's business and some is women's business. Sessions including agency staff were held to facilitate understanding among Ngadju and non-Indigenous fire managers. Workshop aids included over 140 printed and digital images from relevant country in the Great Western Woodlands, 1:250,000 topographic maps, google earth images and the Ngadju (**Kala**) Fire Management Assessment DVD. In addition we held informal discussions during walks on country and interviews with individuals. Workshops were recorded and transcribed verbatim where feasible, noting that quotes given in boxes may be abbreviated.



Workshopping fire in the sandplains, Esperance, November 2012.

Some Ngadju terms were provided and spelled out for us by Ngadju participants. These were cross-checked using the draft Ngajumaya Dictionary (Wangka Maya Pilbara Aboriginal Language Centre 2009) or other literature, and in this report are spelt where possible using the phonemic orthography described in the Ngajumaya Dictionary. Words that could not be found documented elsewhere are written in single quotes. For historical quotes, the spelling in the original record is retained. It was unfortunately outside the project's scope to work with a linguist, and future work may require modification or more consistent rendering of the orthography. Further, it is recognized that the Ngadju community is in the process of choosing a spelling system, so spellings in future works might differ.

The documented knowledge represents some of what Ngadju can tell us today about fire in their country, and as such includes a combination of historical and contemporary knowledge. We acknowledge that over this short period of time it would not have been feasible to document all Ngadju knowledge about fire. Further, sensitivity around knowledge only for Ngadju was respected, and hence not all knowledge can be made publicly available.



Sonny Graham (Esperance) helps us learn about Ngadju country and language.

2 Ngadju fire knowledge

This section of the report describes what Ngadju told us about fire in Ngadju country, augmented by occasional references to historical records where available. Compiled knowledge has been written in a narrative form reflecting the way it was conveyed to us. We begin by describing the wider uses of fire, then discuss the use of fire for land management in greater detail.

2.1 Uses of fire

Fire can be a best friend or worst enemy. It was and is important for many things in Ngadju culture. Les Schultz, Coolgardie.

2.1.1 Social life

In day to day life, sitting around the campfire is good for yarns, teaching stories, family meetings, and celebrations such as birthdays. There might be dancing too (Ngadju discos or corroborees). If a few families are in the same area they might have different fires, maybe more than 50 m apart, out of earshot but within eyesight. People might go and talk and hear other stories then run back at night to their own fire.



Campfires are good for social gatherings. Photo: Les Schultz.

Fire is a most important thing. At a meeting, there is always a fire going. We can get warm and it relaxes us. It warms your aching bones. Fire is healing. Danny Graham, Condingup

2.1.2 Cooking

A most important use of fire is for cooking — for kangaroo, damper, tea and so on. Snap and rattle (**nalari**, *Eucalyptus celastroides*) is the best fuel around for cooking. It makes good hot coals.



Cooking is one of the most important uses of fire.

Big mounds of charcoal and shells (middens) around cooking sites are a good record of history. They show where people camped.



Betty Logan with a Snap and rattle (*nalari*, *Eucalyptus celastroides*), a mallee with hard wood that is good for cooking, it makes great coals and lots of heat. It has little ash so you don't need to change campfires as often. Photo: near Coolgardie.

Amy E. Crocker of Balladonia Station, in her unpublished typescript 'The Nullarbor's Doorstep', similarly mentions the **nullaree** as a valuable fire wood: '*When dry, nullaree is one of the best fuels for wood-stoves, too. Yielding easily to the axe, ... It lasts well, burning to glowing coals, and leaving little ash.*' (Crocker 1970, p.29)

2.1.3 Warmth

Fires help people stay warm, especially at night. Pointing the log towards the wind allows it to burn back slowly, so it will keep going all night. A fire can be lit in a pit before bedtime, then the coals swept away to make a warm sleeping place, with a little paperbark to cover you.

*Fire is like a blanket. People would shelter from wind and rain in the country where the tea tree is thick. It was the **pukan** tree that was the thickest windbreak (**yarlka**). They would dig a hole big enough for the family — dig over the soil to soften it. They would light a fire on it, and when it was time they would scrape away the fire and go to bed on the warm ground. This was '**kujera**', our electric blanket. Betty Logan, Dorothy Dimer, Coolgardie*

2.1.4 Communications

Fire is a means of communication. When entering someone else's country, a fire would be lit and the people would come and help navigate through. It's important to let people know you are on their country. Or if you have a problem, the smoke of a fire is used as a signal for someone to come to your aid.

They would send out signals, smoke signal and that's why they liked Mt Burgess hill itself. That's why they call it Muduwanga. They climb up and get up on top of that hill, the top—that's mean it is Mudu. And they light a fire so that the fire smoke signal. That means Wongais talking[,]sending out their signal. The rest of the people when they see that smoke they will get everything prepared for this tribe to arrive there. Then they will have their... it could be a death or whatever. So they will all meet up. That's why it's called the Muduwanga people, Gulagoo [Kalako]-Muduwanga people — it's 'fire-talk people on top of the hill'. Dorothy Dimer, as recorded by historian Bill Bunbury and broadcast in 2004 (Dimer 2004). In the interview Dorothy recalls various fire practices associated with her father, who was a traditional owner of Kalako-Mudawanga ('fire-talk' people) country, who were neighbours of the Ngadju, and through his mother was connected to Fraser Range.

2.1.5 Spiritual protection

Fires can be used for spiritual cleansing and for keeping the evil spirits away. In a sorry camp after someone has passed away, a number of very smoky fires can be lit, to ward off the bad spirits and help with healing.

2.1.6 Health and safety

Fire contributes to health and safety in the bush. It is generally healing as it warms the bones and calms the body. Fire is used to make bush medicine, to heat rocks to hold against the skin and relieve headaches and toothaches, and to make charcoal that can be used as a toothpaste. Fire also helps people avoid stings and bites: smoke keeps mosquitoes, flies and spiders away, fires made on top of bull ants' nests keep the camp free of them, and clearing the ground with fire helps to avoid snakes (e.g. the death adders that hide in the spinifex).

During the Elder Expedition in 1891, Helms also recorded the following use of ashes: *When the children are born they are rolled in ashes to dry them, and are then put into such a bark cradle.* (Helms 1896, p. 302)

2.1.7 Law and discipline

Fire was important for men's business and women's business.

In the old days, it could also be used as a physical punishment for misdemeanours. If a child walked ahead of an elder, or between an elder and the fire, they could be pushed onto it. During a hearing of a man who had broken the law, he might be covered in fat and pushed nearer and nearer to the fire.

2.1.8 Hunting

Fire can help with hunting. It facilitates access to hunting grounds and encourages greenpick for the animals. Goanna burrows tend to have two 'breathing holes', so making smoke at one end will make them come out the other. Tall burning sticks held high attract the bardi moths and bats. A kangaroo can be smoked out of the scrub, and walking behind the line of a fire is a good way to catch the animals — live or dead.

To catch a kangaroo with fire you might have three men stay down wind, then a bunch of 3–10, kids and all, go upwind and light a fire. The kangaroo will hop away from the fire and get close to those waiting for it. He needs to be pretty close to spear him [pointed perhaps 10–15m]. Danny Graham (Condigup).

Fire helps animals to hunt too — they hunt the animals fleeing it. The hawks and eagles are the first to the fire; there is a dreaming story around the hawk and the firestick. The fire attracts the dingoes (**ngurpany**) too, and as soon as there is smoke, the crows will turn up to eat the burnt grasshoppers.

2.1.9 Training the dingo pups

Fire can be used to tame dingo (**ngurpany**) pups. Smoking them (i.e. exposing them to smoke) helps 'take the wildness out'.

2.1.10 Making tools and implements

Green wood e.g. from jam (**murrun**, *Acacia burkitii*, *A. acuminata*) or gums is used to make spears and boomerangs, while it still bends. Then the items are placed in the hot ash to draw out the sap and bake them hard and sturdy. Sandalwood is used in the same way for artefacts.

Burning spinifex exudes a black gum that is used like a glue e.g. to attach a roo tooth to the end of a woomera or for making spears. A pile of spinifex is burnt in the campfire to collect the gum.

Helms (1896) provides a summary of objects created by the 'Fraser Range tribe', in which he makes reference to the use of fire in their production. These include message-sticks and nose-sticks that had been intricately decorated using pointed embers.

Fire is used to make rockholes too. A fire is lit on the rock and the rock cracks and flakes. The fire is moved to one side and the rock scraped away, then the fire is moved back onto it. Putting water on the hot rock can help to crack it. This is done over a long period of time.



Fire was used to help enlarge rockholes. Photo: Buldania Rocks near Norseman.

2.1.11 Looking after country (land management)

Fire in the right place keeps the country healthy, brings back the animals to the hunting grounds and encourages germination and resprouting of plants. It also cleans out thick scrub and facilitates access to important places. In the wrong place however, the bush can take hundreds of years to recover. This report focuses on fire and land management in following sections.

2.2 How to make fire the old way

In the old days if you needed to start a fire you would use a log or branch of something like quandong (**tumpari**, *Santalum acuminatum*). It should be half alive still, so it is still moist. Kindling such as dried grass, kerosene bush (*Exocarpos aphyllus*) or kangaroo droppings are placed on the log, and the log is rubbed rapidly with a thin dry stick by twisting the stick. It can be any dry stick.

Informed by Marlpa man Jimmer of Drollinya (possibly Drallinya or Duralinya near Balladonia) in 1908, Daisy Bates (c. 1908a,b) recorded the term **kaia yoogarrija** for making fire by friction.

Or you could use flint stones to make sparks in the kindling. There is a lot of flint in the ground around here; that is the stony ground (**parna purinya**). Making sparks with flint was an important power for Ngadju, and could be used for punishments, to scare those who had broken the law.



Danny Graham shows us the good kindling under the Kerosene bush (*Exocarpos aphyllus*) at Buldania Rocks. Karl Dimer (Dimer 1989, p.27] in his memoirs of a life in Ngadju country also mentions a kerosene bush, although it is not clear whether it is the same plant as used for kindling '...a kerosene bush, which when lit, flares as if it had kerosene in it.'

But it was better to carry the fire along with you. It takes too long to make by rubbing the stick, and if it rains for a week, you don't have any dry wood to light a fire. The fire used to be carried with a firestick (**kala pilyi**), which has to be hard, with gum in it. It's good to carry a firestick when you go hunting, so you can smoke out a kangaroo or readily cook the meat where you catch it.

In a 1914 article, Daisy Bates similarly noted that various woods that were burnt in camp fires were also used to make torches for transporting fire: *In the early days their fire was always kept alight, and as the wood in these parts is dry, oily, and resinous, it burns to the very last bit, like the banksia cones of the South-West. Myall, or, as the natives call it "kardia," mallee, and nalla make beautiful fires the light from them being as bright as any gas. A torch of one of these woods was generally carried when the camp moved carefully to another waterhole. In fine weather this was an easy matter but in rainy weather, which was sadly seldom in this dry area, the carrying of the torch was an anxious matter. The fire stick must be sheltered either by a wooden scoop or a piece of bark, and as the scoop was not more than 18 in, by 5in. or 6in., it necessitated the fire stick being held close to the body, with the result, in a sudden gust of wind, of some bad burns being received.* (Bates 1914)

Fire is started by lightning too. And these days, from glass bottles concentrating the light and from tourists being careless.

2.3 Who made fire in the old days?

When moving to new camps, cleaning up country or going hunting, it was often the men who would go ahead and decide where to burn. But not just anyone would start the fire. People had their roles, you can't just have anyone going out burning. It was usually the old people, maybe three or four men.

The women would often light or re-kindle camp fires in the morning and keep stoking them. They would collect the wood and work with fire for cooking. They would also carry the firesticks and might do some other burning too.

About eight miles out from Fraser Range on 2 October 1891, Elders expedition leader David Lindsay reported: *It was now dark, and the lubras camped among bushes, having made fires with the firesticks they were carrying. Blackfellows, especially the women, always carry firesticks, when moving about, for purposes of signalling, burning out game, or for camp fire.* (Lindsay 1893)

2.4 Fire and land management

2.4.1 Types of fire

There are two main types of fire to consider in Ngadju landscapes.

- Prescribed or planned fires are deliberately lit. These are mostly cool and smoky, 'creepy crawly' fires, although in thick scrub it takes a hot fire to clear the land and enable a more regular burning regime to be re-established.
- Wildfires are started by lightning. Wildfires are often hot and fast, and usually need to be left to take their course. But they can start small too.

Early records of potential wildfires in Ngadju country

A sketch map showing 'Ponton and Brooks route — 1875' includes a label 'Camp where we got burnt out' on the south side of Lake Lefroy. Whether this was a natural fire, or due to traditional Aboriginal burning is not stated. (Brooks & Ponton 1875)

In Mirning country in 1893 there was a terrible tragedy due to fire, that illustrates the potential speed at which a fire could travel: *The Postmaster-General has received a telegram from Eyre regarding the interruption to the intercolonial telegraph lines. It seems that the interruption was caused by a bush fire, in which a native, with his wife and two children, also four other natives, all women, were burnt to death. The lineman at Eyre only escaped a similar fate by galloping his horse for 13 miles in front of the fire.* (Sydney Morning Herald 1893)

In reference to a pole fire on the telegraph line over 140 kilometres west of Eyre, which occurred on Monday 28 October 1895, an article in The Daily News stated: *...The stoppage was caused by a bush fire which crossed the line 90 miles west of Eyre, and melted the line and burnt down nine poles... The cause of the fire is attributed to the blacks, who were hunting in the locality of the line, and no doubt lighted their camp fires in close proximity.* (Daily News 1895)

Extensive fires were reported in March 1900 in the region between Balladonia and Eyre's Sand Patch (referred to as Graham's station). *[Th]e overland trio, White Brothers and McKay, have arrived safely at the Eucla [Tel]egraph station: South Australia, says a [M]elbourne writer, and have wired as fol[l]ows: "We left Balladonia on Wednes[da]y, last, and did a terrible perish for three [da]ys owing to the fierce bush fires which [we]re raging across the country.* (Morning Bulletin 1900)

A newspaper report made from Norseman in 1901 indicated: *I have just returned from the north-east corner of Lake Cowan... A bush fire started while I was absent from camp at Dinyarinjama, and but for the timely arrival of Harkins and natives, I should surely have lost all my plant and dogs. Harkin and natives, whom I left fencing wells, lost all their clothes, blankets and stores.* (West Australian 1901)

2.4.2 Why burn the country?

Ngadju country is unique. Up north is different to here. Central Australia is different to here. The more you burn that country, the better things grow. The jarrah and black boys in the south-west—they won't grow without fire. But here — if you burn the gimlets (joorderee) or salmon gums (marrlinja) it takes hundreds or thousands of years to come back. So Ngadju didn't burn much in the old growth woodlands. Some areas need to be burnt a lot, but not everything does. Ngadju just burn in specific places. Les Schultz, Coolgardie.

Good reasons to burn are to clean up the country to protect people and important places and resources from wildfire; to keep dense country more open; to maintain access to important places such as the ochre pits across the shrublands, the rockholes and sacred sites; to stop the campfires from spreading (by burning big circles around them); and to bring in the animals — in the right places such as the grassy kangaroo grounds, fire brings up the green shoots and the animals keep coming there.

Burning also encourages particular plants and animals that benefit from fire. These include hawks, eagles, crows, bush turkey (**kipara**) and dingoes (**ngurpany**), that rely on fire to give them food — they are scavengers. The twining fringe lily (**jungkajungka**, *Thysanotus patersonii* or *T. mangliesianus*) and Wild cucumbers or Ngadju bush (**ngadjun**, *Billardiera lehmanniana*) flourish after fire. Wild cucumbers used to be all through. They need fire but haven't come back because there hasn't been burning. Many things germinate after fire too — wattles, quandongs (**tumpari**), sandalwoods. If the fire is too hot, too many things germinate. A cool fire brings on just the right amount of germination.

2.4.3 Important places and resources to protect from fire

Some of the important places and resources to protect from fire by burning or sweeping to clear bark, sticks and leaves around them include:

- rockholes,

Karl Dimer, in his reminiscences about a life lived on and near Ngadju country, describes the effect of wildfire on waterholes: *However, the water in the springs at Mt Ragged and Cundeena disappeared after bush fires had been over them.* This seems to have happened after 1911 (Dimer 1989, p.43).

- caves,
- sacred sites,
- logs that are habitat for many animals (they are the bush larder, where our food lives),
- big trees (**ngarta**), which are like 'mansions' for many insects, lizards, birds and other animals,
- water trees. These include two main types: water trees formed by Ngadju (**wanyarr**), e.g. from salmon gums (marrlinja) and other gums to form a bowl near the base that catches water; and trees with

thick watery roots such as the kurrajongs (*Brachychiton populneus*), Christmas tree (**kunapiti**, *Grevillea nematophylla*), and a number of eucalypts. Eucalypts that have water in their roots were shown to us by Dorothy Dimer in Norseman and Salmon Gums. These were the giant mallee (*Eucalyptus oleosa*) and black morrel (*Eucalyptus melanoxylon*), respectively.

Out Balladonia way they call the water trees pillirri, whereas at Fraser Range they have another name: 'kumbal'. The roots might be found many metres from the tree, from the cracks in the ground, and dug up with a crowbar. Dorothy Dimer, Coolgardie



There are two main types of water tree that need to be protected from fire: those with water in their roots such as Kurrajongs — the roots dry out if they aren't protected by leaves and litter so not too much should be scraped away; and those fashioned by Ngadju to form a bowl to catch water (with Betty Logan). Photos near Goongarrie (S. Prober) and Norseman (M. O'Connor).

- bardi trees such as jam (**murrun**),
- fruit trees, that are important foods, including quandongs (**tumpari**) and sandalwood (*Santalum spicatum*),

- medicine bushes (although if they are old and dry a fire can make them young and juicy again),
- mallee fowl (*Leiopa ocellata*) mounds.



Sandalwoods (*Santalum spicatum*) need protection from fire because they are good fruit trees and are used to make artefacts. Photo near Lilian Rock.



Dorothy Dimer, Phyllis Wicker and granddaughter with a medicine bush, *Scaevola spinescens*. 'Bush medicine heals the inside, the bush out there needs to be protected' (Bonnie Smith, Norseman). Photo at Buldania Rocks near Norseman.

Fire is the worst thing going for the mallee fowl. They get nothing to eat; all the seeds are gone. They fly away. Johnny Graham, Norseman

It is possible that possums, now rare in Ngadju country, were also sensitive to fire. Karl Dimer, droving sheep from Balladonia and Rawlinna in the early 1930s described: 'When we got to what was known as 'Possum Country', I tasted my first possum. Thomas found it and it was killed, plucked, cooked in the ashes. This was called **Barnahbul** by the aborigines, as **Barnah** means dirt or ashes and **Bul** is a mound of earth, or covered in earth, so anything cooked in the ashes was **Barnahbul**. I can tell you that possum was delicious. *I think bush fires would have killed the possums out, as we had learnt to live like aborigines, never taking anything away, but always leaving enough to keep the species going, no matter what it was. Today greed overrides that age-old policy.* (Dimer 1989, p.222–3) This could imply a change in fire regime since Europeans took up the land.

2.4.4 Weeds and ferals

These days fire can also be used to help clear away weeds — especially to get rid of the prickles so the kids can run around. The weeds also close up the gaps, and make the fires burn with more heat than the natural grass. Introduced grasses like veldt grass (*Ehrharta spp.*) are a problem with fire. Kalgoorlie, Fraser Range and Norseman have the worst weed problems, caltrop (*Tribulus terrestris*) for example.

And the camels come along and eat them, then cart the seeds along. They leave droppings about, and seed sticks to their hairy coats. The goats do too. Goats uproot the bush, they rip it up from the roots. They kill the country, they make it dry, make it worse for fire. Ngadju need to get rangers in to manage the weeds and ferals; both the weeds and the ferals make it worse for fire.



Caltrop (*Tribulus terrestris*) and other weeds are problematic in places such as Fraser Range. Photo: Fraser Range.

2.4.5 When to burn

It's important to burn at the right time so the fire doesn't get out of control and isn't too hot. There should be lots of charcoal and sticks left, not just powdery grey ash; that's too hot.



This is an example of burnt ground (**parna kalanya**). Ngadju felt this fire was too hot. There are not enough charcoal and sticks left and there is too much powdery grey ash. Photo: unknown source.

Ngadju have four main seasons, the egg season (**Ngawu**, about September to October) and the hot season (**Nganji**, about November to March) in the 'hot time'; and the hibernating season (**Kupilya ngarrin**, about April to June) and the courting and mating season (**Karrlkunja**, about July to August) in the 'cold time' (O'Connor & Prober 2010). Burning might be conducted at many times of year, but not during the hot season (**Nganji**) unless towards the end (**Maarday**, 'mild days' in March) when the days become cooler. Courting and mating season (**Karrlkunja**) is also a common time, but each decision depends on the condition of the vegetation and the prevailing weather.

When the grass is green, or a few days after rain is good for a cool, 'creepy crawly' fire. Just a small amount of rain, not too much, not a big drenching rain, just so the ground is a little damp. Or, wait until rain is coming and light the fire then. The signs that rain is coming are the clouds, the smell, the animals gathering seeds, the flying ants building up, the ants walking in a line, or birds flying off in one direction in a flock. That's when something big is coming up in 2–3 days. Mother Nature will put out the fire then.

In the warmer times of year the fire needs to be started in the morning before the Esperance Doctor (**winaka**) comes up. Don't burn when it's windy. The sea breeze spreads fire and makes it get out of control.

2.4.6 Other ways to manage fire

Fire is managed by burning to control fuels, but fuels can be controlled in other ways as well. Over small areas, such as around campfires, a cleared area can be created by collecting up the sticks and logs for the campfire and sweeping up the litter with broom bushes (**noondoo**). In summer the leaves of the gum trees thin out and fall to the ground. The cockatoos play a part in increasing the fuel on the ground under the trees too. They nip off the blossoms and leaves, and when they make a nest in a hollow tree, they strip off any rough bark to stop the goannas climbing up to steal the eggs. To make sure fires don't damage sensitive trees, the litter is swept or scraped away from around their base.



To make sure fires don't damage sensitive trees or shrubs, the litter is scraped away from around their base. Photo: Buldania Rocks.

Dead wood is cleared out of overgrown areas to reduce the fuel load and is used for the campfire. This includes the edges between the old growth woodland and more scrubby areas, around the rockholes and among the paper barks. But it's also important to leave enough logs on the ground for the insects, lizards and echidnas who live in them.



Dead wood is cleaned up and used on campfires. But it is important to leave enough logs on the ground for the animals that live in them. Photo: Higginsville.

Historical records from the Ngadju region highlight the many campfires that would have been involved in daily life, and hence their likely contribution to management of fuel loads in the vicinity of camping areas. For example, an 1876 report from the Superintendent of Telegraphs notes: *In Eyre section...I have seen the smoke of as many as thirty of their [the natives'] fires, under the terrace land, within twenty miles from Point Culver, the country where their fires were seen by Flinders seventy years ago;...* (Inquirer & Commercial News 1876)

Once a fire has started, Ngadju can also call the rain the traditional way to put the fire out. Digging up the twining fringe lily (*jungkajungka*, *Thysanotus patersonii*) and leaving the hole unfilled will make rain come. Killing a special type of lizard will too, and the fire itself can create rain.

Today it is important that more is done to stop the slow lightning fires. Small fires need to be put out before they become big fires. This is more of a contemporary goal — it is an ‘adapted process’ because the country is not regularly burnt off today. Worse times are coming so Ngadju need to begin to restore the mosaic.

Another tool today is to use bulldozers to stop fires. There is a role for careful use of bulldozers, but it’s better to use fuel reduction burning and natural fire breaks in preference to disturbing the soil. Natural fire breaks include clear areas like hunting grounds, flats and grasses, clay pans, soaks, lake systems, and rock holes that have been regularly burnt. Soil disturbance such as that from bulldozers causes lots of dense regrowth, may remove seeds from the topsoil, and is against custom. For example, for Ngadju, even a little hole made for cooking a kangaroo had to be filled right back in so it couldn’t be seen. That’s how important it was with regards to not disturbing the ground.

Visitors can be a problem too. They light a campfire and it gets away. A sign needs to be put up at the edges of (e.g.) Marlpa country, saying ‘You are entering Marlpa country. Please be careful with fire.’

You are entering
Marlpa country
Please be careful
with fire

2.5 Fire in different elements of Ngadju country

Ngadju country is very varied. It already has mosaics and natural firebreaks such as salt lakes, but different plants or vegetation types need to be managed in different ways and this creates an even finer mosaic. Some vegetation just doesn’t burn much, it is fire resistant, such as the saltbush and bluebush, the old growth trees, and the succulents around the lakes. In other places, Ngadju need to burn — these include the spinifex and spear grass grasslands and open mallee, around the rockholes and in the coastal scrub. And then there is the country that burns a lot but can be left to look after itself, for example the sandplain. Fire can be used for specific reasons in these places, but it can be best just to stay away from it in summer; stay in the woodlands, near lakes or on stony ground that is less flammable.

This section takes a more detailed look at burning in some of these different types of vegetation typical of Ngadju country. It is organized around the range of landscape and vegetation elements described to us by Ngadju as they know from their country, as summarized in Table 2.1.

Table 1. Summary of fire regimes in different elements of Ngadju country.

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

*managed with planned fire

2.5.1 Rockholes

Around the granites and rockholes is one of the most important places for active fire management. The granite soil is different from the rest. You don't so much get the big trees here. The trees are mainly jam (**murrun**) with bardis underneath them. Gum comes off those trees too, they are lolly trees. It makes a beautiful tonic if boiled up with water. There are also she-oaks (**kurli**, *Allocasuarina huegeliana*), kurrajong trees (*Brachychiton gregorii*) with their watery roots, fruit trees such as quandongs (**tumpari**), medicine bushes, grasses and lots of wildflowers.



The scrub around the rockholes includes jam (**murrun**) and she-oak.
Photo: south of Coolgardie.

Fires are needed to bring up the fresh green shoots for the animals, to encourage germination, to control the fuels when it becomes a hazard, and to maintain good access.

The areas around the rockholes are burnt quite frequently. It depends on the water – how much rain. If there is less rain, it won't grow so much or need burning so much. A patch might be, say, the size of a football field and burnt every 3, 5, 7 or 10 years or so. You would burn one year, and return the next at same time of year for the animals that are attracted by the fresh grass (**yurliki**), burning somewhere else on the way. That place would not be burnt again for say about 7 years .

The fire needs to be a cool fire, it should burn only the ground layer so you can see clearly through underneath the wattles. If it is too hot it can crack the rocks and bring up every seed in the land. It kills everything and they need to start again from seed. A cool fire gets the right seeds germinating.

The bush is now all scrubby again. It has always been kept down in the past, even we did that around the rockholes. The family would go back every few years and do it again... The fires would slowly burn, there was no break, you could leave it to trickle along. Dorothy Dimer, Coolgardie



Les Schultz collecting firewood around the rockholes. 'This kept the bush clear of fire hazards. You should be able to see right through the wattles.'

Photo: Buldania Rocks near Norseman.

Burning at the right time of year, that's how to make a cool, smoky fire. That might be when the grass is green, or it might be when the weather cools down in about March (**Maarday**). The coming rains will produce green shoots quickly after **Maarday**. Clearing up the dead wood and using it on the campfire helps control the fire too, and it can also be important to clear up the bark around special trees to stop the fire damaging them.



The first picture shows a fire which is too high. It will kill the jam (**murrun**).
The second fire is better, it is cool and smoky.
Photo: Buldania Rocks near Norseman.

This is the fire cycle at the rockholes. During the fire the crows and hawks are right there first, to eat the grasshoppers and fleeing animals. The dingoes (**ngurpany**) come in too. Soon after the fire it is charred and grey. Wildflowers come up like mad, then the bees, blossoms and honey follow. Small jams (**murrun**) are coming up too. After about one year there is lots of new growth, it is getting greener and there are new shoots for the grey and red kangaroos (**kulypirr**, *Macropus fuliginosus* and **marlu**, *Macropus rufus*). Lots of animals come in; the insects come back, the grasshoppers, the lizards, the birds, bush turkey (**kipara**), and emu (**jula**), the whole 'food chain' comes back round the rockhole. The rockholes need fire again when it gets too thick. It looks like it is choking, everything is being choked out. You can't walk through it, even animals can't.

2.5.2 Grasslands and grassy areas

Grasslands are good for hunting. The grasses fatten the animals — the red kangaroo (**marlu**) gets fattest on dry grasses and the grey kangaroo (**kulypirr**) gets fattest on green grass.

There are two main types of grassy areas, those dominated by spinifex (*Triodia* spp.), which can be in the open or under mallees, and those dominated by other grasses such as spear grass (including *Austrostipa* spp.). The latter often occur in treeless areas on ridges and dunes at the edges of lakes, or in open mallee woodlands, e.g. towards the fringes of the Nullarbor (see also Section 2.5.3 Mallee).



One type of grassy country is dominated by spinifex. Here it occurs with mallee.
Photo near Norseman: M. O'Connor.

Unlike other places in Ngadju country, grassy areas need to be burnt a lot, sometimes every year — the grass (**yurki**) grows fast when there is rain. Burning keeps the country open for camping and hunting. The kangaroos like the young spinifex, and stock do too. It's also important to burn in patches, for example to leave some spinifex for the emu (**jula**) eggs.

For about the first six months after fire the grassy areas are black, this acts as a fertilizer. The small animals go underground. Soon after, it is green again and this encourages the wildlife back. The grass is only good to about 20 cm high and needs burning again after that. There are also weedy grasses now too; these can burn too hot.

Grassy areas and fire in the historical record

The map of J. P. Brooks and S. Ponton's journey from Lake Cowan to the north-east of Lake Roe in 1875 includes reference to many grassland areas (and to grasses in rockhole or jam country). These include: north-east of Lake Cowan '*high granite rock: jams, grass, water*', '*grassy plain, water courses*'; north and east of Lake Lefroy '*grass*'; '*grass clay pans with water*', '*[Aboriginal] cleared*', '*grassy plain, no water*', '*grassy saltbush plain*'; north-east of Lake Roe: '*grassy hill*', '*large extent jam & grass country*', '*grass plain*'. (Brooks & Ponton 1875)

During the Elder Expedition in 1891 Richard Helms, in general terms, noted the Aboriginal people: *...are always careful to carry a piece of burning bark with them on their day's march, or whenever they go any distance away from camp; this is partly for the purpose of setting the spinifex-grass on fire...* (Helms 1896, p.247).

In a newspaper article in 1887 an (unnamed) traveller noted: *Mount Ridley appears to be a huge mass of intrusive granite rising abruptly from the surrounding country, which is a beautifully clear grassy plain... After going about two miles the country to the North and East (at first sight) bears a melancholy aspect, owing to the density of the mallee scrub with which it is overrun. ... Little or no herbage comes up, which I should imagine is owing to the exclusion of light and heat from the soil, as wherever patches of the scrub have been burnt off by the natives spontaneous grasses spring up in abundance.* (Inquirer & Commercial News 1887)

The rabbit inspector HJ Page observed in 1898: *I then ran the old Israelite track from the Nine-Mile till I struck the old Clear Streak road, passing through country which had been previously burned, and which was then carrying tall, waving grass.* (Page 1898a)

More references to grassy areas and fire are given in Section 2.5.3 Mallee.



Examples of grassy hunting country on dunes at the eastern edge of Lake Cowan, including Spear grasses (*Austrostipa* spp., top) and Bottle-washers (*Enneapogon* spp., bottom). These need regular burning. Other grasses seen by the authors in this area include Wallaby grasses (*Rytidosperma* spp.), Windmill grasses (*Enteropogon ramosus*, *Chloris truncata*), Burr grass (*Tragus australianus*), Five-minute grass (*Tripogon loliiformis*), Paspalidium sp. and Panic grass (*Panicum* sp.).

Early pastoralism, grass and fire in Ngadju country

Aboriginal workers played an important role in the pastoral industry after European pastoralists took up the land, particularly in the east of Ngadju country. As evident from memories and records, regular burning and other activities were important for encouraging grasses for livestock:

The station owners used native grasses too. We rode around on bicycles on Fraser Range. We picked native grass seed, punched holes in the bottom of our panniers, put the seed in and spread it while riding around. Danny Graham, Condingup (recalling the 1960s).

Station hands would ride around Fraser Range station with matches in their pockets. They used to burn the hills, to help germinate the she-oak, and bring up fresh grass and trees. Danny Graham, Condingup.

Karl Dimer, referring to the Balladonia area, describes in 1934:
Every year, whenever there were very hot days, one after another,

some of us would go around, lighting bush fires to burn the scrub, which allowed the better feed to grow. Burning was done every year and one would get a clear patch of grass, but if it was left, the suckers would grow up, and you were in trouble. Fires were always lit in the coastal country as well, ...

(Dimer 1989, p.266)

Karl Dimer, in 1935 (c. late February to early March), also noted that Aboriginal people on the [?Balladonia] station were assisting with annual burning: . . . and Bertha, with two aborigines, was out lighting bush fires, to improve the new grass growth. ...

(Dimer 1989, p.277)

It is not known whether these burning regimes are the same as those used before Europeans arrived, although it is likely the practice was influenced by them. It is notable that some of the stations have become degraded under pastoral management, possibly due to new combinations of livestock grazing and fire.

Fraser Range is an important area for Ngadju but some of it has become degraded under new management regimes.



2.5.3 Mallee

Mallees occur in all sorts of places — on sandplains, on clays, over spinifex, around granites, in mallee scrub near the coast and around Balladonia and Fraser Range. All of the mallees have a use and are worth protecting. For example they are good for artefacts, bardi grow in them, some have water in their roots (e.g. *Eucalyptus oleosa*) and some are important for making spears (e.g. **pungal**, capped mallee, *E. pileata*). Nevertheless, mallees are second priority for protection from fire, it's more important to try to protect the big old growth trees which take longer to regrow.

The more open, grassy mallee country was mentioned under 'grasslands and grassy country'. This country can be burnt quite often. It might be useful to burn along the ground in patches, e.g. about the size of a room for a campsite. Or if there is thick spinifex, light up enough to make a pathway, bring the animals out and get rid of snakes. This might be done once a year in winter for example. However, it's important to try not to burn the canopy if there are mallees growing above the grass: try to keep it low, below the canopy with a cool burn; don't let the mallee catch alight. But if necessary, mallee is expendable.



A 'slow and trickly' fire beneath open mallee. Photo: Ryan Butler.

The more scrubby mallee is dangerous — it's thick and easy to get lost in, the dogs can hurt their feet, and it's hard to chase kangaroos. If the mallee is overgrown and dense a wildfire will just happen and then it has to be left to nature. This includes mallee in the sandplains and mallee scrubs nearer the coast.

After a fire the mallee can be good for bush tucker — all sorts of tubers, fruits and grasses — it's like the fruit trees need pruning. And there are lots of bush turkeys (**kipara**) to catch.

The bush turkeys would run along towards the fire with their mouths open, catching the grasshoppers coming towards them.
Danny Graham, Condingup.

But fire in mallee is not so good for other things — it kills wildlife and is unsafe for people. There is no food or cover left for the mallee fowls. Every tree has a bardi, for example the spear tree has a 'flathead' bardi that is good for chest infections. The bardi doesn't come back until the mallee stem grows back, although there are still other bardi in the roots of trees, grass and bushes. Fire also causes water to be evaporated out of the special mallees that have water in their roots (e.g. Giant Mallee, *Eucalyptus oleosa*).

Historical records of Aboriginal fire management in mallee and mallee scrub

Mallee and mallee scrub in the area around Eyre, Israelite Bay, Fraser Range and Mt Ridley feature the most prominently in the historical record of fire in Ngadju country and surrounds. Records include wildfires (see Section 2.4.1) and apparent Aboriginal-lit fires, and emphasize the potential danger to human life and the benefits of fire for encouraging grasses respectively. Records likely to relate to Aboriginal fires are collated below:

A European travelling near Point Malcolm or Israelite Bay in 1891 recorded: *No houses are passed en route, not a solitary white shepherd on the scrubby plains, not even the smoke of a fire to be seen to mark the presence of a travelling black. ... A few miles further on in a thicket where they are burning bush, I encounter a third blackie, who is shepherding, accompanied by his wife and child ...* (Inquirer & Commercial News 1891)



Mallee scrub towards the Israelite plain (top) and fire-affected (resprouting) open mallee woodland on the Nullarbor fringe around Cocklebiddy (bottom).
Photos: PJ Waddell.

On 10 October 1891 during the Elders Expedition, travelling south-west from Fraser Range, Lindsay reported: *At twenty miles we passed the Clear Streak, a patch of open country... At 2.10 we camped on some good grass in a patch of burnt mallee. ... 12 October: Again we stopped on a burnt patch to let the horses have a mid-day feed. Can see Mount Ridley.* (Lindsay 1893)

HJ Page, while making investigations regarding the rabbit proof fence, noted in early February 1898: *About 22 miles from the Israelite Post Office we struck the first rabbit track and followed it into some three miles of burnt country, where feed was good... When about 50 miles in a direct line N.W. of Israelite Bay, in a patch of burnt country we dropped on evidence of the largest colony of rabbits that I have yet seen... The country about here is as dry as possible; the soil a crumbling limestone dust, covered with ashes on burnt land, where salt and blue bush, dwarf wattle, and other herbage looks really well. The scrub is mostly heavy mallee and dense ti-tree, with salt and blue bush intermixed... The mallee here is the blackbutt variety from which the natives obtain their supplies... In the thousands of square miles of scrub there are small plains and burnt spaces.* (Page 1898b)

In his report in *The West Australian* [newspaper] of 26 September 1898 regarding construction of the rabbit proof fence around Israelite Bay, Page also noted that: *With regard to the nature of the fence, I would like to say that, in view of the prevalence of fires caused by natives, and the presence of white ants, it would be preferable for iron to be used throughout its construction.* (Page 1898a)

A 1910 survey by CE Watkins of potential agricultural land 60–100 km north of Esperance on the road to Norseman, noted: *Large areas of mallee and ti-tree have been burnt at different times, and a new growth is coming up, and is several feet high. Where the fires have occurred during the last few years the land is comparatively clear, and places the native grass has come very thick and tall. As the mallee starts to grow to any height the grass dies off and the country goes back to a condition similar to what it was before the fires occurred. Where no fires have occurred the mallee, ti-tree and blue bush are, and in places, too dense to get a horse through.* (Kalgoorlie Miner 1910)

2.5.4 Coastal scrub

Ngadju country comes down to the coast in the Israelite Bay – Point Culver area. It is good here in summer, there is cool water under the limestones and seafood nearby to eat. The bush on the coastal dunes is scrubby, with characteristic Banksias and other plants. Further in from the coast there are also mallee scrubs (these are discussed under 2.5.3 Mallee).



Sonny Graham in coastal scrub burnt about 5 years ago. 'Cordial could be made by dipping the fresh Banksia flowers in water.' (Sonny Graham, Esperance). This photo was taken in Noongar country near Esperance so may not be identical to coastal scrub in Ngadju country around Israelite Bay.

The coastal scrub can quickly get thick and overgrown and needs regular burning (e.g. every five or ten years). To bring back overgrown scrub it takes a hot burn, but after that, it's better to have more regular, cool burns. Otherwise the flames get too high and do more damage to the occasional bigger trees.

Records (p. 239–240) from Eyre's (1845) historic expedition across the Nullarbor in 1845 describe the Banksia scrub before the party descends the cliffs near Point Culver. The fires referred to could be campfires. *May 2.—We again moved away at dawn, through a country which gradually become more scrubby, hilly, and sandy... The change which I had noticed yesterday in the vegetation of the country, was greater and more cheering every mile we went, although as yet the country itself was as desolate and inhospitable as ever. The smaller Banksias now abounded, whilst the Banksia grandis [possibly Banksia speciosa], and many other shrubs common at King George's Sound, were frequently met with. The natives, whose tracks we had so frequently met with, taking the same course as ourselves to the westward, seemed now to be behind us; during the morning we had passed many freshly lit fires, but the people themselves remained concealed; we had now lost all traces of them, and the country seemed untrodden and untenanted.*

2.5.5 Sandplain (**piriny tarpan**)

Ngadju country has white sand, red sand, yellow sand and pink sand. There is different vegetation on each. This section is about the white and yellow sandplains. The sandplain is nice soft ground to walk on, and a feeding ground for all animals — bush turkeys (**kipara**) go there, bobtails (**yurna**, *Tiliqua rugosa*), goannas (**kalyka**), lizards and snakes. In this country the ladies collect wildflowers, gather bardis, bulbs and yams, and get medicines.



Fires on the sandplain are often big and hot.
Photo near Hyden: Lachie McCaw.

The white and yellow sandplains are bushfire country. There is no tall timber, it is natural to have fire here. Thunderstorms light fires in summer with the northerly breeze. Stay away from the sandplains in summer, shelter in the woodlands. There are stories of the spirits in that sandplain country — if you go there you might not get out.

*There were little people in that sandplain country. My mum used to tell me when they were staying at Eubeenie. At the first railway siding where the sandplain starts and there is a road back to Bullabulling — that breakaway country, it is a creepy place. The old people used to camp out there and one morning the rest of the people got up before my grandmother. She was the last one and was walking and next thing she heard the dogs all barking. She thought it was a kangaroo but the dogs were running back with their tails between their legs. And this little thing was walking towards her. She saw a tiny little woman with long hair, long to the ground, and a stick. My grandmother got scared and screamed out to the other people. That is why lots of people don't go down there in that sandplain country. They called them **murtinykuru**.
Dorothy Dimer, Coolgardie*

Fires started by lightning on the sandplain can get very large. In the early days Ngadju mostly let nature take its course, and wouldn't try to stop too much fuel accumulation. Today, graders, helicopters, trucks and firebreaks can help control fire. Some felt it would be good to divide up the big sandplains with fire breaks. It's better for the sandplain not to burn all at once, smaller patch burning is better.

Although it was often a place to stay away from, Ngadju would sometimes burn the sandplain if people needed to move through it to get to ochre pits, rockholes or sacred sites. For example, there was a walking track that went through big sandplains all the way from Norseman to Southern Cross, and another from Coolgardie to Southern Cross.

If people needed to spend some time in sandplain country, it could be burnt to clear the ground for snakes and to encourage the grass and animals. But it is always important to walk through it first to avoid burning important things like mallee hen nests, and if the sandplain borders against big trees, to burn away from them (although the fire would usually fizzle out if it did reach the big trees). Fires were probably lit every year in the sandplains, but not in the same place. They shouldn't be burnt too much because it becomes a desert.

When burning in the sandplain (or elsewhere), men in the group would use a firestick to light the fires. They would burn just before the rains in either the courting and mating season (**Karrlkunja**, July–August), when the wind is normally westerly, with the finishing rains in the egg season (**Ngawu**, September), or in about **Maarday** (March to early April) before the winter rains so plants shoot up afterwards. The time of day could include the dewy morning when the ground is still damp, or in the afternoon on a cool day. A slow trickly fire might burn for a week, to burn enough country for the animals to graze (but not too much, so you can still catch them!).



Fires bring up the wildflowers on the sandplain.
Photo in Frank Hann National Park.

The next winter after the fire the twining fringe lily (**jungkajungka**) would be up. It only needs a little bit of rain, but the tuber is crisper if there is more rain. The wild cucumber (**ngadjun**) comes up too, around the small trees because it is a climber. By the summertime there are the silky pear (**karlkurla**, *Marsdenia australis*), wild onion, wild potato, quandong (**tumpari**) and wildflowers that haven't been seen for a long time.

Fire is good in this country for promoting native grasses and bringing on flowers. It cleans up the dead plants that have died in the drought and helps plants regenerate. The kangaroos move away if the sandplain is not burnt. But other things don't like fire in the sandplains. The bobtail is too slow to move out of the way. Small animals like little wallabies, mallee hens and other birds don't like fire because they can hide better in the dense bushes.

On JS Roe's expedition through the far south-west of Ngadju country on October 30 1848, he wrote: *On the 30th we pushed on to the N.E. 12 miles, over sand plains, and through much close thicket, including the stubborn burnt sticks of last year 6 to 8 feet high which much impeded our progress, and tore our clothes and packs. After searching many clumps of trees in vain, we at length found good rain water and excellent grass among some burnt thicket, and encamped for the night.* (Roe 1849) It is not clear whether the thickets referred to are sandplain shrubland (e.g. dense Tammar) or dense mallee scrub.

2.5.6 Old growth woodlands (**ngarta**)

Ngarta or **ngarta-waarr** are used as terms for woodland but also mean tree or bush (woody plants). It sounds the same as **ngaata**, the term for white fellas. Betty Logan, Coolgardie

Where the old growth trees are, these are the areas that need to be protected from fire. If they are burnt they take hundreds or thousands of years to come back. The old growth trees include salmon gum (**marrlinja**, *Eucalyptus salmonophloia*), gimlet (**joorderee** or '**tutara**', *E. salubris*), and blackbutts (*E. dundasii*, *E. lescoefii*, *E. clelandii*, e.g. '**kundarn**').



Some things don't like fire on the sandplain. The bobtail (**yurna**) is too slow to move out of the way. Photo: Carl Gosper



These are old growth salmon gums (**marrlinja**, top) and blackbutts (bottom). They take hundreds of years to grow. The woodlands in these pictures have saltbushes underneath and wouldn't burn easily. Photos near Coolgardie and Widgiemooltha.

The parrots and '**kingkas**' (like green budgies, possibly purple-crowned lorikeets) would be up there in these trees eating the honey. Cockies make their nests up high away from predators. Trees like salmon gum (**marrlinja**) can be formed into water trees by training the growth of their branches so that they funnel water into a pool at their base. Gimlet (**joorderee**) gives a red gum that is good for glue or sticky tape.

Fortunately, many of the old growth woodlands don't burn easily anyway. The fire doesn't carry because the trees and bushes are too far apart. The crowns don't touch, and if the shrubs are saltbushes or blue bushes these don't burn well either. So these can be largely left alone, there is not too much to worry about.



Some old growth areas have more shrubs and would burn more easily. This area has broom bushes that could be used to sweep the litter around campfires. Photo near Coolgardie.

Other old growth woodlands have more shrubs underneath them, or the trees might be smaller and denser (**ngartangarri ngalbaru**, thick trees, big mob trees) and might burn more easily. The wind could sometimes push the flames across them.

The best way to help stop fires burning through the woodland is not to burn the woodland itself, but to burn or clear out a buffer around it, around the edges of the tree line. If it is grassland it can be regularly burnt — burn the grass not the trees. If it is scrub the dead wood can be cleared out and used on the campfire.



Dorothy Dimer shows how to make a broom from a broombush (usually **noondoo**, *Eremophila* spp.; or **pukan**, *Melaleuca* spp.). These would be used to clear the ground around campfires, to stop the fire getting away and to help see snakes. Photo near Norseman.

The old people generally wouldn't start a fire in this country but there were some special cases. Small patches might be burnt around significant sites or as a clearing around a campfire, maybe 30 m around. In these cases the hollow logs and old trees need protecting. The litter might be scraped away from around them, or swept with broombush. Small patches, the size of a room or a football field, can then be burnt with a cool, creeping fire. The flames shouldn't get more than 1 m high. This also gives good clean ground for camping, with nowhere for crawling insects and snakes to hide. There wouldn't be many small fires like this, perhaps a few patches in a 5 x 5 km area, but over time they contribute to a mosaic.

2.5.7 Regrowth woodland (**ngarta kaja** — young trees)

Although they usually don't burn much, lightning sometimes starts a fire that spreads into old-growth woodland. If a fire does go up in the trees, then it is a really bad fire. These just need to be allowed to burn out, there is nothing that can be done.



Big trees need protecting: they are like mansions for the animals. Photo: Southern Hills.

Ngadjju kala: Ngadjju fire knowledge



This woodland had a fire burn through it. It will one day grow up as woodland again but it is a lower priority for fire management. Photo west of Lake Johnston.

When a fire goes through, things germinate much more than normal. A hot fire makes all the seeds germinate. The dead old trees laying on the ground help by catching all the seeds. The saplings (**ngarta kaja**) come up densely. It can take five hundred or a thousand years to grow back to old growth.

The saplings (**ngarta kaja**) are more expendable and so are a lower priority for management. Small areas of thick regrowth can be burnt to provide access to important sites. One Ngadju person reported that the old people used to burn the dense saplings to encourage the grass and the kangaroos too. It needed to be a light fire, lower than your knee. A fiercer fire will burn the bark and damage too many saplings (**ngarta kaja**). Other Ngadju felt that the regrowth woodland is good for nothing. Ngadju had a big area, and if some woodland burnt they just went elsewhere. If the regrowth was burnt, it would encourage even thicker regrowth.



Ngadju felt that the regrowth woodland is good for nothing. 'It gets that thick, a kangaroo can't get through it. We just go elsewhere' (Johnny Graham, Norseman). But one person recalled that the old people sometimes used to burn the **ngarta kaja** (sapling regrowth) to encourage the grass.

Photo near Mt Holland: Lachie McCaw.

Ngadju kala: Ngadju fire knowledge

2.5.8 Tea-tree (**pukan**)



Tea-tree (**pukan**) is characteristic of Ngadju country. It makes a good windbreak when camping. Photo near Lake Johnston.

The tea-tree (**pukan**) is a sacred tree. Ngadju know they are home in Ngadju country when they see it. It is one of the Ngadju Christmas trees, with its pale yellow to white flowers in December. The tea-tree (**pukan**) can form a prominent layer in the mid-storey of woodlands and can grow around the granite, amongst the gums, in valleys and on hills. Amongst the tea-

tree (**pukan**) is a good place to camp because it makes a good windbreak and the ground is clean around it. Tea-tree (**pukan**) roots are good for boomerangs and the branches can be used as a broom to sweep up around campfires.

There was some disagreement as to how flammable tea-tree (**pukan**) is. Some felt it burns like rocket fuel if it catches alight. If the leaves burn, the bush dies. Others thought tea-tree (**pukan**) can slow the fire down in the bush. It makes a very slow smoky fire and it's no good for cooking, although it is good to light a fire with.

Fires in tea-tree (**pukan**) should only be along the ground, to make the shoots of things like wild onions and twining fringe lilies (**jungkajungka**) come up, but the fire shouldn't burn through the canopy.



There are several different kinds of tea tree (**pukan**), including a short one, a medium-sized one and a tall one. The medium sized one has multiple stems like this one (*Melaleuca pauperiflora*). The tall one has a single thick trunk. (Les Schultz, Coolgardie). Photo near Burra Rocks.

2.5.9 She-oaks

She-oak trees can be used to make artefacts and fence posts. The wood is soft so is not so good for firewood. It burns to a white powder with no coals. There are several types of she-oak trees, and these occur in different environments.



She-oak (**kurli**) woodlands such as these on red soils near Rowles Lagoon are too open to burn much.

Some she-oaks occur near the lakes on the red dirt (**kurli**, *Casuarina pauper*); they are not so common in Ngadju country but occur for example to the north around Credo way. They are good shade to sit under. The cool wind off the lake whistles through the pencil like leaves, so they are called whistle trees.

She-oak (*Casuarina pauper*) country (**'kurlitharra'**) tends to be open and doesn't burn much — it can usually be left to look after itself. However it is not too good if the she-oaks do burn as they can have difficulty regenerating and it can end up like a desert. The trees can attract lightning and will burn down to the ground. 'Steel' or 'glass' can be dug up where they've burnt into the roots.

She-oak can also be called '**raalinj**'. Fraser Range is called **raalinya** because (rock-)she-oaks (*Allocasuarina huegeliana*) are common on the hills. This name refers to the sound the wind makes blowing through the she-oak leaves, which is like the old people crying. Danny Graham noted that in his time there in the 1960s and '70s Fraser Range would be regularly burnt to encourage the grass and help germinate the she-oak. However, the she-oaks have become sparse on some of the hills, possibly due to livestock grazing and erosion.



She-oaks (**raalinj**) on the hills at Fraser Range. 'The noise the wind makes blowing through their leaves is like the old people crying. Now the soil is getting washed away and they don't get enough water; the wind blows them over.' (Danny Graham, Condingup).

2.5.10 Saltbush and bluebush plains

Saltbush and bluebush can form a dominant low shrub layer on open plains or beneath trees (see Section 2.5.5 Old growth woodlands), especially near the salt lake country and on the Nullabor Plain. They are good healthy feed for animals and help to stop erosion. There are also bards in the saltbush, and it is a source of medicine.

The open saltbush areas are good hunting country — you can see a long way easily, for getting emus (jula), red and grey kangaroos (**marlu** and **kulypirr**), bush turkeys (**kipara**), bobtails (**yurna**), camels and rabbits. But you need cover near it too. The kangaroos are always looking around. You need to be able to hide in the woodland at the edges, or behind big saltbushes.



Open saltbush and bluebush country in mosaic with Salmon gum woodland near Coolgardie. *For hunting it is good to have open ground but it is good to have some cover too, to hide from the kangaroos (Johnny Graham, Norseman).*

Sometimes there are no trees, maybe because of the salt which blows off the salt lakes. But Ngadju ancestors might also have made these plains. It may be that they burnt the country to remove the trees and make the hunting grounds. If a tree was there and fell over, a new tree might be able to grow up in the decaying leaves and branches, but not out in the open now.

Saltbush and bluebush only burn if it is very dry; fire doesn't play a big role in this system. Even when grass grows between the saltbushes the fire would usually go around them. But if they do burn the salt bush could take years to recover. Prescribed fires aren't really needed because the shoots come up naturally when the kangaroos graze.

There are no big trees around some of the lakes. Our ancestors burnt out the big trees.

The bushes are good and thick there – the blue bush (Maireana sedifolia, pictured here) is the same colour as smoke (Dorothy Dimer). Photo near Coolgardie: K. Thiele.



In the district north of Balladonia there are great stretches of treeless plains, and these are said to be the plains where Banju was sent by Mer mer as there is no wood on the plains with which a fire could be made, and so the Banju (turkey) can make no fire. (Bates c. 1908c)

2.5.11 Stony or rocky ground (**parna purinya**)

There are different types of stony ground (**parna purinya**) — for example with white rocks, flints, ironstones or greenstones. The ground is often very bare, there's not enough fuel so fire doesn't run well through this country. It can be a refuge for people to escape danger during a fire, and is good for camping because the ground is clean and there are fewer mosquitoes and snakes. But the camp needs to be the right place in stony country, to avoid the spirits.





Stony country near Norseman with Coral gum (**kunjarr**, *Eucalyptus torquata*, opposite page). This country doesn't burn well so is safer in a fire. But if it does burn (above, near Lake Cowan), the plants can take a long time to recover.

If the stony country does burn, it kills out bardis and medicine areas, and grows back very slowly. For example after the fire near Lake Cowan north of Norseman it's been a long wait. Sometimes they don't even come back, like the bardis trees at Mt. Jimberlana. But fires can help to keep a balance.

On 2 November 1848, travelling along watercourses (with fresh pools) running south-east out of the Bremer Range, JS Roe noted the slopes of the Range had: ... *a total absence of grass at this time, altho. there was reason to believe some good grass*

had covered the hill sides previous to the last fires, which had swept all minor vegetation away, and left standing only that close thicket and scrub we heartily wished had shared the same fate.
(Roe 1849)

2.5.12 Paperbarks

Paperbarks grow in wet places, where there is fresh water or swampy country. There are some towards Lake Johnston and Picnic Lakes (near Norseman). They are good for cooking fish, toilet paper and fence posts, but people might not go there much because of the snakes and mosquitoes.

Ngadju kala: Ngadju fire knowledge



Paperbarks grow in wet places or swampy country. Photo: Lake Cronin to the west of Ngadju country.

Paperbarks usually don't burn because there is a lot of water around them. They have thick bark and might burn only on the outside layer — they are resistant to fire and the inner core can be ok.

When they do burn, fires in paperbarks are smoky. To help stop the fires you can pull out the dead wood into a pile and use it for a campfire. It's also good to clear the brush away so the kangaroos and goannas can access the water. But you need to leave some wood on the ground for the grubs, echidnas and things that live in it. There's usually no need to burn the paperbarks deliberately.

2.5.13 Salt lakes and succulents

Chains of large and small salt lakes form natural fire breaks in Ngadju country. Some of the lake edges support succulent vegetation e.g. samphires ('**kukunjeri**', *Tecticornia* spp.) that are good for bardsis. There are no prescribed burns or wildfires here. The samphire bushes wouldn't burn. It is a safe place to go to get out of the way of a fire.



Small salt lake near Norseman surrounded by plants with fleshy or succulent leaves that don't burn well.

2.6 Fire in the landscape

The previous sections described where and why Ngadju might use fire in particular parts of Ngadju country. It is also useful to understand how all of these small fires might once have added up to affect the landscape as a whole. It is difficult to determine this today, but the way Ngadju people once lived in the landscape can help to give an idea of this.

Most fires lit by Ngadju were strategically placed and relatively small, e.g. from the size of a room to the size of a football field (about one hectare) or so. Ngadju decisions to light fires were mainly made around 'setting up the food chain' for the following years (green pick), keeping an area clear for camping or travelling through, protecting cultural heritage and resources or to help hunt animals. It was felt that the resulting landscape patterns were a consequence of these many smaller decisions: it's just the way it happened, rather than there being an overall plan across Ngadju country. Nevertheless, it is recognized that the resulting fire-mosaics can contribute to the control of wildfires, and this section makes a start at building a picture of how much

fire there might have been in any one year in different parts of the landscape. It was emphasized though that every year is different.

People used to have summer and winter camps. They rotated between camps all the time, spending time for a season or two at one, then they needed to let it rehabilitate. They might do some burning before leaving. Dorothy Dimer, Coolgardie.

Before disruption by Europeans, people lived across the landscape in family groups of say 10–30 people, usually around rockholes with good water supplies. To allow the hunting and camping grounds to rehabilitate, they moved around from one camp to another after spending a season or two there. People would also travel to access resources such as ochre — there was ochre all through the country near the Breakaways (west of Lake Johnston) for instance. And they would walk large distances to various ceremonial gatherings. Gatherings would be held after big rains — there was more food and water then.



Learning about how Ngadju lived and moved about on country helps to understand fire in the landscape.

The **Mirning** and the **Wongais** from neighbouring areas might come in for those ceremonies too. Local family groups could move freely across the country, but the others had to wait and light a fire so the Ngadju could see them. For example out at Fraser Range they would send 2–3 scouts out and check who is there, what is their business and invite them in.

The typical way of moving across country was along the ‘Ngadju highways’ or songlines (Fig. 2.1). It might take, say, two weeks to walk to a gathering. The route would follow a series of rockholes or similar for camping at, with a day’s walk, maybe 25 km between each camp. The group might walk for a day, with some scouts out the front, and women and children behind. There would most likely be water trees along the way; the locations of these were some of the first things young men were taught during their initiation. They might camp for a few nights at the next rockhole. They would walk along carrying a fire stick and lighting fires in dense or overgrown vegetation as needed. This would result in fires in any one patch perhaps every seven years or so. But each fire depended on the conditions.

Law season was after the big rains. It had to be otherwise you perished. One wrong decision by whoever was leading the family group and the whole family would die out. We are blessed we have the Coolgardie pipeline today, but if you took away the pipeline and the fridges and all that from here we wouldn’t last very long now. Our ancestors knew exactly; keep an eye on the weather; watch the clouds. Les Schultz (Coolgardie)

In addition to travelling along the main route, up to 12 men might leave the group and go off another way to catch some meat. They might stay out for 1–7 nights, and burn some rockholes or grasslands on the way. Adding up all of these fires, it was estimated that a family group might conduct at least 20 fires in the granites and grasslands in a year. They would also have small fires in thick scrub to smoke out kangaroos, and to create smaller clearings around campsites.

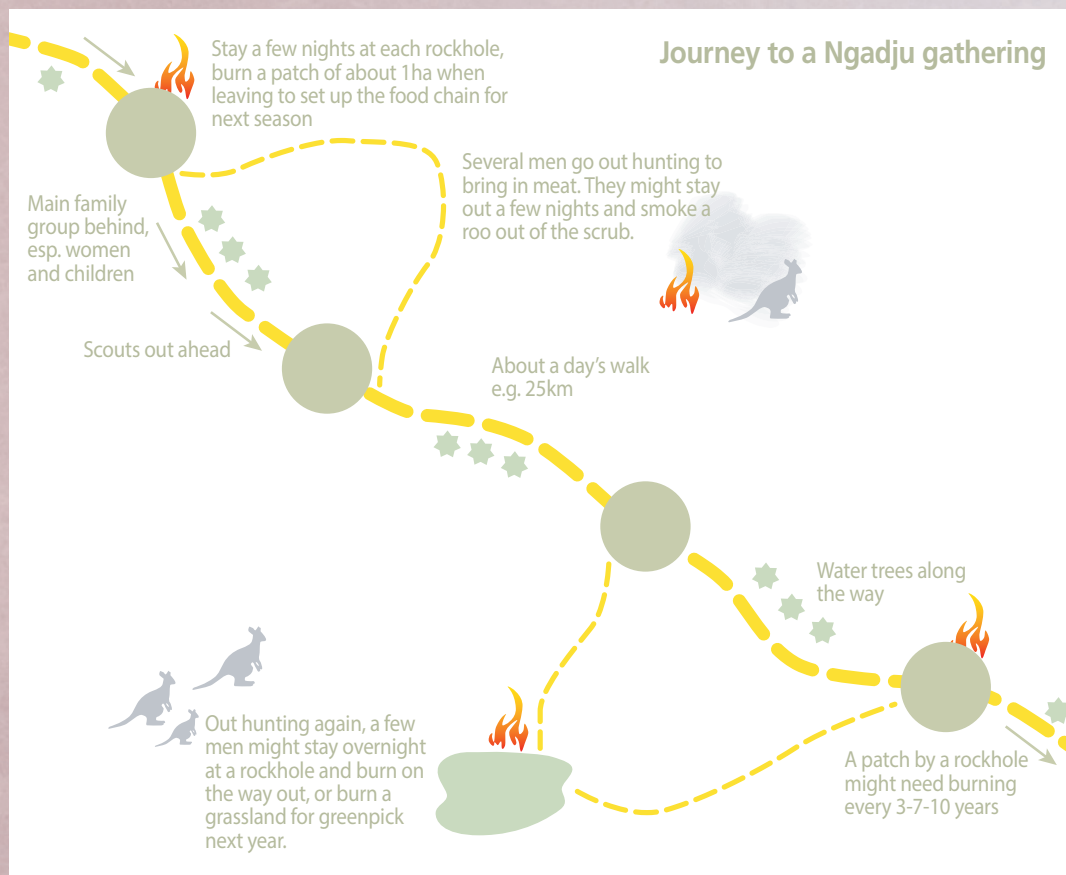


Fig. 2.1. On regular journeys to gatherings, people might light fires for smoking out animals, to clean up the rockholes, to freshen up grasslands, for campfires and for communications.

There is not a lot of information about how many people and family groups once lived across Ngadju country. The travel routes criss-cross between rockholes and around lakes, and at some times, family groups were scattered across the whole region. In the Coolgardie–Peak Charles–Fraser Range area alone we were shown >1500 km of routes that could be mapped today, including 35+ important campsites. One estimate suggested at least 7–10 family groups moving independently across that region in total, but it is emphasized this is likely to be a minimum. With c. 20–30 people per group the total population would have been a minimum of 200, and up to 1000 people was considered possible. Considering

estimates of around 10 families, and 20 fires per family per year, this would suggest at least 200 strategic fires of around 1 ha on average per year in the grasslands or around rockholes.

To add to this, there were probably even more small (room to football field-sized) fires for cleaning up around campsites, smoking-out kangaroos, and improving access and food availability e.g. when travelling through sandplains and thick scrub. Copious firewood collecting would also have contributed to the containment of wildfires, especially when targeted towards clearing up at the edges between woodland and sandplain or in other thick bush. Similarly, sweeping up loose bark and leaves around important trees and around campsites would have influenced local scale impacts of fire.

Collectively, these different burning and cleaning-up activities emphasize the very fine scale at which the land was managed.

We had many more people out on the land in those days so in that way the land was managed well. Les Schultz, Coolgardie

Dr Harvey's notes on Marlpa and population numbers, in Bates notebook of c.1908 are not inconsistent with population size estimates of between 200 and 1000: *Extended from a high mountain [Badling] four days journey west of Norseman (perhaps Mount Holland) to Frazer range touching the sea at Israelite Bay. There were many subdivisions. The Norseman subtribe extended from Mt Jemberlanya (Trig Hill) to Newcannia (Dundas [Rocks]) and west to Mt Badling. The Norseman Subtribe called their country Mree and were about 300 in number though now reduced to 20. (Bates c. 1908d,e)*

3 Contemporary fire management in Ngadju country

3.1 Background

Workshop discussions indicated that up until perhaps the 1970s, traditional-style burning was still a community practice for Ngadju. However, since then the Australian ('white man') laws have become stricter; it is illegal for Ngadju to burn. People have been frightened away from burning off and from the Ngadju point of view this has stopped the proper maintenance of the land. Nevertheless, occasional fires are conducted by Ngadju today.

Opportunities for Ngadju engagement in western fire management have up until now been limited. In the lead up to this project, there were no Ngadju ranger programs or provisions for engagement in fire management planning or suppression activities. Fire preparedness and prevention is the responsibility of DPaW for unallocated Crown lands and unmanaged reserves outside of regional centres and townsites (relevant to most of Ngadju country). This includes the planning and maintenance of fire access tracks and fire breaks. Responsibility for fire suppression on unallocated Crown land and unmanaged reserves (the predominant land tenure in Ngadju country) falls to local government authorities in the first instance, but in practice fire suppression activity is usually undertaken by local government authorities with assistance from the Department of Fire and Emergency Services (DFES) and DPaW. On DPaW lands, DPaW holds the primary responsibility for fire suppression and preparedness.

Invitations for Ngadju involvement in fire management planning have been put forward by relevant agencies in the last decade, but with the exception of contributions to the Great Western Woodlands Strategy (2010), these did not result in effective engagement. However, several avenues are currently opening up that are likely to significantly alter this situation. The March 2012 amendments to the Conservation and Land Management Act 1984 (WA) enable joint management and customary activities on DPaW estate. The native title process is also nearing completion. This is likely to offer further opportunities and responsibilities to the native title holders regarding land management, including potential for establishment of Indigenous Protected Areas. The latter can attract funds to pay for management.

This section aims to inform future directions for building Ngadju capacity and leadership in contemporary fire management, by exploring Ngadju goals and priorities around fire and country, and identifying potential barriers and leverage points for achieving these. This was done through directed workshop sessions, including three attended by western fire managers from Dundas Shire Council, DFES and DPaW. In these sessions, non-Indigenous fire managers explained their roles to Ngadju, and discussions were held around how changes in fire management have affected Ngadju, future aspirations, western vs Ngadju decision making processes and potential steps toward achieving their goals.

Since the 1960s and 1970s it has been difficult for Ngadju to use fire to manage their country owing to the 'Westminster' (white man) laws. Recently, laws in Western Australia changed, opening up opportunities to burn for traditional purposes. Photo: Near Norseman.



Ngadju priorities around fire and land management are centred on cultural and spiritual values (David Graham, Norseman).

Ngadju kala: Contemporary fire management in Ngadju country

3.2 Ngadju goals around fire and country

Ngadju goals around fire are intimately bound with broader aspirations regarding Ngadju culture, livelihoods and country. They encompass spiritual, cultural, social and ecological values, with spiritual and cultural values at the centre (Fig. 3.1). A thread running through these is recognition of the need to move with the times. It was emphasized that 'Ngadju culture is like a living organism that keeps growing' (Sonny Graham, Esperance). The vision is not simply to return to old ways, rather to understand and respect old ways and meld them with the new into the future, and importantly, for Ngadju to have control over this process.



Ngadju wish to meld the best of the old and the new in managing fire and country. This picture shows Ngadju Elder Johnny Graham and grandson Robert taking part in a pre-burn flight in 2013. Photo: Darren Forster.

We can keep some of our old ways but our identity is evolving, it doesn't stay in the past. We have to move forward with the times, you can't keep depending on smoke signals. We need to get our people operating the planes and [using the] satellites. We need to blend in with all that. Sonny Graham, Esperance

Overarching: Good cultural practice — language, singing, traditional burning, bush tucker, traditional medicines, respect

IMPORTANT IN THE FUTURE

Financial values

Indigenous run enterprises — tourism, medicine, harvesting edible species (eg. for wine production)

QUITE IMPORTANT

Social values

- Jobs and contracts — e.g. rangers
- Social life — controlling alcohol and drugs
- Recreation — feeling relaxed on country, around campfires
- Culturally appropriate training and education — one on one in the bush passing on knowledge.

Environmental values

- Protecting animals and plants — harvesting medicines, preventing loss of species

MOST IMPORTANT

Spiritual and cultural values

- Ngadju governance — ownership
- Respect for Ngadju knowledge and balancing (1) keeping knowledge secret for Ngadju — man's and woman's business with (2) respecting and sharing knowledge — before it is too late
- Ngadju respecting and being there or other Ngadju including respect for the Elders (even if they are wrong)
- Protecting yourself and your village
- Acknowledgement and protection of sites
- Being on country

Fig. 3.1. Ngadju goals and priorities around fire and country.

Spiritual and cultural goals revolve around strengthening Ngadju identity, ownership and self-governance, with engagement in fire management as one means for achieving these. This includes building capacity to take the lead, as well as building trust with other major players in fire and broader land management. These goals are rooted not only in the historical disenfranchisement of Ngadju people and ways, but in the more recent divisions associated with the Native Title process. As stated by Betty Logan (Coolgardie), 'One thing we all have in common is bushfire... We are currently divided by Land Council boundaries but we all agree the land and rockholes need to be looked after. Once, everyone did it; now there are boundaries — we feel we shouldn't be touching this or that. We need to work together.'

We need to become Ngajdu again. We had a governance that worked for thousands of years and we need... a unified Ngajdu front going forward. We have to make things happen, stand up and get the job done. Fuel loads are building up out there, country is being damaged by wildfires. We should be out there cleaning the rockholes and so on. We are land managers, the best in the land. Les Schultz, Coolgardie

Everyone speaks for their own families. But all are accountable to the big mob, the Ngadju tribe. There is a process. Lurlene Graham, Norseman

Aligned with these core goals towards stronger Ngadju identity and self-governance are the benefits of being on country (e.g. as facilitated through fire management activities) for regaining spiritual connections to the land, passing on knowledge, restoring social well-being, respecting elders, and acknowledging and protecting sites that themselves are a part of Ngadju identity. Protecting people from uncontrolled fire, using fire to make camping safer (e.g. so snakes are visible), protecting animals and plants (including medicines) are also recognized as important goals.

Given the broader cultural and spiritual importance of engagement in fire management, Ngadju recognize that not all activities relating to fire need to be in a paid capacity. On the other hand, training and employment opportunities are still of key importance from a social perspective. A priority is to train the younger generation in modern methods of fire management, using culturally appropriate approaches but not necessarily abiding by all past traditions. It was particularly important to Ngadju that this training also leads to job opportunities in land management, e.g. through ranger programs. These financial outcomes link also with other goals around country such as establishment of Indigenous-run enterprises, that are more distantly linked to fire management and are also considered more distant (future) goals.

We want to record knowledge, but we want jobs out of it in the end. Les Schultz, Coolgardie

While there was consensus regarding most goals associated with fire and Ngadju country, there were differing views regarding the sharing of Ngadju

knowledge. For some, keeping knowledge secret is important, e.g. for men's and women's business and to avoid appropriation by other groups. For others, sharing, documenting and passing on knowledge before it is too late is a priority. Care thus needs to be taken to balance confidentiality of sensitive knowledge with accessibility of knowledge for applications in partnership with non-Ngadju managers.

Traditional owners, DPaW and DFES should work together as one. Ngadju know the sacred sites, spirits, dreamtime stories. But if we map it all and document it all we need to have trust between Ngadju, DPaW and DFES. This land and these stories [can be] recorded in these databases but are confidential. Danny Graham, Condingup

Not everyone would know everything. Some is for men only and some is for women only. Some is for Ngadju only. We work for Ngajdu, not Mirning or the Esperance Noongar. Loretta Smith, Norseman

Giving away secret information is like placing my head on a chopping block. Ngadju informant, Norseman

3.3 Steps towards Ngadju leadership in fire management

Ngadju felt that engagement in fire management offers a timely pathway towards broader Ngadju goals around country and land management. As described by Les Schultz (Coolgardie): *'You pick the quandong that are ripe at that time. You go to the tree and pick what is right for that time...Fire is like that, it is a talk [conversation] that is ripe now for the picking.'*

Ngadju and collaborating non-Indigenous fire managers identified a number of steps towards building leadership, opportunities and capacity in fire management that are likely to be feasible in the near future, or indeed, have already begun in conjunction with workshop discussions. These are summarized in Table 3.1 and discussed further below.

Table 3.1. Early phase activities that can contribute towards Ngadju goals around fire and land management

Action for Ngadju	Ngadju goals addressed
Prepare a Ngadju Healthy Country Plan documenting a vision for Ngadju fire and wider land management that can guide negotiations with agencies.	<ul style="list-style-type: none"> • Ngadju governance and ownership • Respect for Ngajdu knowledge and Elders • Protecting sites, plants, animals and people • Potential for training and employment
Establish an Incident Response Protocol (currently being developed) for facilitating Ngadju to assist with fire and non-fire related emergencies on Ngadju country.	<ul style="list-style-type: none"> • Protection of sites • Respect for Ngajdu knowledge • Strenghtening relationships
Engage with other agencies in fire planning through regular meetings with DPaW, DFES, and the shire.	<ul style="list-style-type: none"> • Ngadju governance and ownership • Respect for Ngajdu knowledge and Elders • Protecting sites, plants, animals and people • Potential for training and employment • Strenghtening relationships
Participate in on-ground fire management through training days, Ngadju volunteer fire brigades, and paid ranger or career brigade positions.	<ul style="list-style-type: none"> • Training, experience and jobs for Ngadju • Respect for Ngajdu knowledge • Getting back on country • Protecting people • Strenghtening relationships
Reclaim Ngadju rights to light fires on Ngajdu country (provided it is the right way and doesn't create a hazard to others). This has recently become possible through new WA legislation.	<ul style="list-style-type: none"> • Being on country • Maintaining cultural practice • Recreation
Provide cultural awareness training promoting two-way learning between Ngadju and non-Indigenous managers and facilitate future joint management.	<ul style="list-style-type: none"> • Ngadju governance and ownership • Respect for Ngajdu knowledge and Elders

3.3.1 Prepare a Ngadju Healthy Country Plan

Consistent with broader Ngadju aspirations around fire and land management, preparation of a 'Healthy Country Plan' or similar was seen as a way to bring Ngadju together to decide on their own targets for fire and land management. This process in itself would promote ownership and leadership in future management, and the document would provide a bargaining chip to work in more equal partnership with other agencies.

The best way to manage the land is to equip Ngadju to have their own strategic plan. They can then take it to the different agencies... to see where everyone connects, and get out there and do the activity. The first thing from this fire workshop that we are looking for is for Ngadju to get together, regroup and do a Healthy Country Plan based on knowledge Ngadju have brought together. Les Schultz, Coolgardie

Ngadju envisaged that the plan could cover:

- Incident response protocols.
- Planning and fire prevention including prescribed burning, location of roads and tracks, and scrub rolling.
- Protection of cultural and natural heritage e.g. management activities such as raking to protect them.
- Training and employment opportunities.
- Cultural awareness training for non-Indigenous fire managers.
- Components other than fire such as weed management, cleaning out waterholes, signage, place names. For example Betty Logan (Coolgardie) suggested *'We need to change the names of the national parks ... The current names like Frank Hann don't mean much to us.'*

3.3.2 Establish an incident response protocol

Ngadju expressed a desire to be informed of and invited to respond to any emergencies in their country. This includes not just wildfires but other emergencies too. For example, the use of Aboriginal trackers has declined over the years but people felt they still had a lot to offer, for example to find people who are lost or to track arsonists.

A common western approach to planning for emergency response is to map 'assets' that require protection from fire management activities (using GIS mapping software or similar), so the information is readily available during a

wildfire. However, as discussed earlier, not all Ngadju felt it is acceptable to map Ngadju significant sites. On the other hand, emergency fire response involves containment by dozing strategic fire breaks, and Ngadju recognized that without information regarding location of significant sites there was no way of preventing potential damage.

Ngadju developed an interim solution to this dilemma by nominating a committee as a point of contact during wildfires, so that they could check planned paths of firebreaks and indicate more appropriate routes if necessary. Ngadju are developing this plan further with GLSC, DFES and DPaW, into an 'Incident Management Protocol' that is now being considered for wider use across Western Australia.



Mac Johnston from DFES discussing the developing Incident Response Protocol that Ngadju initiated at the first Norseman Ngadju **kala** workshop.

3.3.3 Engage with other agencies in fire planning

Ngadju emphasized that they would like to be involved in a long-term approach to managing fire beyond incident response described above. Ranger jobs were seen an important part of this longer-term planning approach. To achieve this engagement, they suggested regular meetings with DPaW, DFES, and the shire: perhaps two per year, one pre- and one post- fire season, to discuss the works program and its outcomes respectively.

Being 'at the table' was seen as an important process through which Ngadju fire knowledge and current western fire management approaches might be integrated. For example, in discussing the potential for larger planned burns than typical of Ngadju practices (which were generally no more than several hectares), it was considered that a larger fire wouldn't be immediately

supported by Ngadju. However if they could come to the table, get out and have a look, and check for cultural sites, they would consider it (Fig. 3.2). The recently-established 'Ngadju Conservation' was considered a good contact point for initiating this engagement; and the Ngadju Working Group and Claim Group are also potential avenues.

Figure 3.2. How Ngadju don't and do wish to be involved in fire management planning.

Ngadju don't want:
Other knowledge + Ngadju knowledge > Fire Management Plan

Ngadju do want:
Other knowledge + Ngadju knowledge > Discussion at table >
Go out bush to check > Fire Management Plan

3.3.4 Participate in on-ground fire management

Opportunities to build capacity in fire management, including establishment of a Ngadju volunteer brigade, and training sessions with DFES and DPaW, were identified as valuable first steps towards leadership and employment in fire and land management. As a first of these initiatives, Ngadju held a two-day fire training session, supported by DFES, DPaW and GLSC, in Norseman and at Buldania Rocks on 9–10 April 2013.

Over 30 Ngadju people, including many from the younger generations, attended the first fire training workshop to clean up at Buldania Rocks, April 2013. (right and opposite page)

3.3.5 Reclaim Ngadju rights to light fires on Ngadju country

The above initiatives offer new ways for Ngadju to establish capacity and employment opportunities in fire management on Ngadju country. From a more cultural and recreational perspective, Ngadju felt that it is important to be able to have smaller fires, particularly campfires to continue their connection with country. For example, Betty Logan (Coolgardie) indicated 'We feel resentful because we can't light fires so we don't go to the DPaW national parks.' Recent changes to Western Australian legislation now allow customary activities including campfires (subject to provisions of the Bushfires Act 1954 including restricted and prohibited burning times), offering an additional opportunity for re-engagement with fire and country.

3.3.6 Provide cultural awareness training

Cultural awareness training provided by Ngadju to agency staff was recognized as a valuable way to promote two-way learning between Ngadju and non-Indigenous managers, facilitate recognition of Ngadju goals and leadership, and facilitate future joint management.

3.4 Concluding remarks

Involvement of Ngadju in fire and land management appears to be at a turning point. Compared with minimal engagement opportunity in recent decades, the convergence of legislative changes, native title decisions, and increasing momentum in both Ngadju and non-Ngadju communities has already led to significant community participation in partnership with agencies. The time is ripe to understand and respect Ngadju ecological knowledge and move on to a new era of Ngadju leadership and joint management.





Ngadju kala: Contemporary fire management
in Ngadju country

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Preparing for the Buldania Rocks fire training day.

5 Appendices

5.1 Appendix A. Kala Workshop participants

31 Oct to 1 Nov 2012, Norseman

Malcolm Anderson	Norseman
Richard Brooks	Dundas Shire Council, Norseman
Linden Brownley	GLSC, Kalgoorlie
Ryan Butler	DPaW WA, Kalgoorlie
Darren Forster	GLSC, Kalgoorlie
Cheyenne Graham	Norseman
David Graham	Norseman
John Graham	Norseman
Justin Graham	Norseman
Vicki Graham	Norseman
Lucille Jennings	Norseman
Anthea Johnston	Norseman
Jaydon Johnston	Norseman
Ronald Nine	Norseman
Suzanne Prober	CSIRO, Perth
Dianne Rule	Norseman
Stephen Rule	Norseman
Gloria Schultz	Norseman
Jack Schultz	Norseman
James Schultz	Norseman
Les Schultz	Coolgardie
Valma Schultz	Norseman
Barry Smith	Norseman
Bonnie Smith	Norseman
Colleen Smith	Norseman
Gavin Smith	Kalgoorlie
Kevin Smith	Norseman
Loretta Smith	Norseman
Matty Smith	Norseman
Shakira Smith	Norseman
Phyllis Wicker	Norseman
Emma Yuen	CSIRO, Perth

26–27 Nov 2012 Esperance

Linden Brownley	GLSC, Kalgoorlie
Annie Dabb	Esperance
Darren Forster	GLSC, Kalgoorlie
Sonny Graham	Esperance
Demi McCall	Esperance
Suzanne Prober	CSIRO, Perth
James Schultz	Norseman
Les Schultz	Coolgardie
Valma Schultz	Norseman
Cheraze Wicker	Norseman
Jeffrey Wicker	Leonora
Kyle Wicker	Esperance
Phyllis Wicker	Norseman
Emma Yuen	CSIRO, Perth

26–27 February 2013, Coolgardie

Nuna Bero	Coolgardie
Gerard bin-Sarin	Coolgardie
Linden Brownley	GLSC, Kalgoorlie
Ryan Butler	DPaW WA, Kalgoorlie
Gary Darlow	Coolgardie
Dorothy Dimer	Coolgardie
Carmen Dodd	Coolgardie
Clem Donaldson	Coolgardie
Gail Donaldson	Coolgardie
James Ellis	Coolgardie
Darren Forster	GLSC, Kalgoorlie
Betty Logan	Coolgardie
Suzanne Prober	CSIRO, Perth
Joselyn Schultz	Coolgardie
Les Schultz	Coolgardie
Tiara Schultz	Coolgardie
Wendy Schultz	Coolgardie
Danielle Velickovic	Coolgardie
Emma Yuen	CSIRO, Perth

20–21 March 2013, Norseman

Phyllis Alley	Norseman
Malcolm Anderson	Norseman
Gerard bin Sarin	Norseman

Linden Brownley	GLSC, Kalgoorlie
Dorothy Dimer	Coolgardie
Darren Forster	GLSC, Kalgoorlie
Laurent Gaillard	DPaW WA, Esperance
Delvene Garlett	Norseman
Leo Thomas	GLSC, Kalgoorlie
David Graham	Norseman
John Graham	Norseman
John (Danny) Graham	Condungup
Lurlene Graham	Norseman
Sonny Graham	Esperance
Vicki Graham	Norseman
Damien Green	Norseman
Alan Harris	Norseman
Anthea Johnston	Norseman
Mac Johnston	DFES, Kalgoorlie
Kelvin Batty	Norseman
Peter Little	Norseman
Betty Logan	Coolgardie
Laurent Marsol	DPaW WA, Esperance
Eddie McKenzie	Norseman
Anastacia Nudding	Norseman
Suzanne Prober	CSIRO, Perth
Robyn Richards	Norseman
Stephen Rule	Norseman
Gloria Schultz	Norseman
Joselyn Schultz	Norseman
Les Schultz	Coolgardie
Barry Smith	Norseman
Bonnie Smith	Norseman
Colleen Smith	Norseman
Ellin Smith	Norseman
Gavin Smith	Kalgoorlie
Loretta Smith	Norseman
Matthew Smith	Norseman
Iona Stewart	Norseman
Phyllis Wicker	Norseman
Eric Wilson	Norseman
Veronica Wyatt	Norseman
Emma Yuen	CSIRO, Perth

5.2 Appendix B. Glossary

Common, Ngadju and latin names/notes for plants, animals, seasons, Aboriginal groups and other terms referred to in this report. Latin names follow Florabase (<http://florabase.dec.wa.gov.au/>) and the Australian Faunal Directory (<http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/>)

Common name	Ngadju term	Latin name, notes
Plants		
Trees		
Kurrajong		<i>Brachychiton populneus</i>
She-oak	kurli, raalinj	<i>Casuarina pauper</i> , <i>Allocasuarina huegelliana</i>
Blackbutt	e.g. 'kundarn'	<i>Eucalyptus dundasii</i> , <i>E. lescoffii</i> , <i>E. clelandii</i>
Black morrell		<i>Eucalyptus melanoxyton</i>
Giant mallee	kutan	<i>Eucalyptus oleosa</i>
Capped mallee	pungal	<i>Eucalyptus pileata</i>
Salmon gum	marrlinja	<i>Eucalyptus salmonophloia</i>
Gimlet	joorderee , 'tutara'	<i>Eucalyptus salubris</i>
Coral gum	kunjarr	<i>Eucalyptus torquata</i>
Shrubs and climbers		
Jam	murrun	<i>Acacia burkittii</i> , <i>A. acuminata</i>
Banksia		<i>Banksia</i> spp.
Broom bush	noondoo	<i>Eremophila</i> spp., <i>Melaleuca</i> spp.
Snap and Rattle	nalari	<i>Eucalyptus celastroides</i>
Kerosene bush		<i>Exocarpos aphyllus</i>
Samphire	'kukunjeri'	<i>Tecticornia</i> spp.
Christmas tree	kunapiti	<i>Grevillea nematophylla</i>
Tea-tree	pukan	<i>Melaleuca</i> spp. including <i>M. pauperiflora</i>
Quandong	tumpari	<i>Santalum acuminatum</i>
Sandalwood		<i>Santalum spicatum</i>
Silky pear	karlkurla	<i>Marsdenia australis</i>
Grasses		
Spear grass		<i>Aurolistia</i> spp.
Bottle-washers		<i>Enneapogon</i> spp.
Windmill grasses		<i>Enteropogon ramosus</i> , <i>Chloris truncata</i>



Betty Logan (Coolgardie) with Doug Marmion (Research Fellow in linguistics at AIATSIS, Canberra) at Karlkurla rockhole near Coolgardie.



Nicole Evans-Wicker shows us a Banksia in coastal scrub.

Veldt grass
Panic grass

(exotic)

Ehrharta spp.
Panicum sp.
Paspalidium sp.
Rytidosperma spp.
Tragus australianus
Triodia spp.
Tripogon loliiformis

Wallaby grasses
Burr grass
Spinifex
Five-minute grass

Herbs

Wild cucumber
Twining fringe lily

ngadjun
jungkajungka

Billardiera lehmanniana
Thysanotus patersoni, *T. mangliesianus*
Tribulus terrestris

Caltrop

(exotic)

Animals

Flathead

Bird (small, green)
Bush turkey, Bustard
Camel
Dingo
Emu
Mallee fowl
Grey kangaroo (Western)
Red kangaroo
Rabbit
Bobtail
Goanna

kingka
kipara
(exotic)
ngurpany
jula

bardi of mallee stems,
good for chest infections
'parakeet', possibly purple crowned lorikeet
Ardeotis australis
Camelus dromedarius
Canis lupus dingo
Dromaius novaehollandiae
Leiopa ocellata
Macropus fuliginosus
Macropus rufus
Oryctolagus cuniculus
Tiliqua rugosa
Varanus gouldii, unknown

People

Little people
White fella

Kalako
Kalamaia

Marlpa
Mirning
Noongar
Wongai
murtinykuru
ngaata

Fire-talk people (Coolgardie area)
People to the north-west of
Ngadju country
man, person, people, a term for Ngadju people
People to the east of Ngadju country
People to the south and west of Ngadju country
People to the north of Ngadju / Kalako country
Seen on the sandplains

Landscape types

She-oak country
Thick trees, big mob trees
Regrowth woodland, sapling
Trees, woodland
Burnt ground
Stony or rocky ground
Sandplains

Fire

Fire
Fire stick
Smoke
Heat/hot
Flame
Charcoal
Firewood
Hot ashes
Ashes
Cooked in the ashes

Seasons

Egging season
Hot season
Hibernating season
Courting and mating season
The first mild days in March

Other

Blanket
Grass/greenpick
Water tree
Water tree
Esperance Doctor

Windbreak

'kurlitharra'

ngartangarri ngalbaru
ngarta kaja
ngarta, ngarta-waarr
parna kalanya
parna purinya
piriny tarpan

Tree, young child
Trees and bushes
Ground, fire
Ground, little rocks
Sand, flat

kala

kala pilyi
puyu
kampani
kaia babbarn
purrrku
kala
lkalyu, barnah
kujurru
barnahbul

Ngawu

Nganji
Kupilya ngarrin
Karrlkunja
Maarday

About September to October
About November to March
About April to June
About July to August
'Mild days' at the end of Nganji (about March)

'kulura', 'kujera'

yurлки
pillirri, 'kumbal'
wanyarr
winaka

'This was our electric blanket'

Eucalypt with watery roots?
Tree formed to hold water
Sea-breeze coming up from
Esperance, wind

yarlka



Danny Graham and Gavin Smith at Buldania Rocks.



Department of
Parks and Wildlife

