



A calendar of Ngadju seasonal knowledge

Michael O'Connor and Suzanne Prober

A report to the Ngadju people (Edition 1.2)

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Chapter 1

Introduction

1.1 Indigenous ecological knowledge

For millenia the Aboriginal people of Australia have relied on an intimate local knowledge of seasonal cycles for ensuring a year-round supply of food, medicines and resources. The way in which country provides for the continuity of life is understood within an annual framework and the longer-term cycles in which they occur. Plants, animals, stars, landscape changes, weather — all contribute to keeping track of annual cycles.

Aboriginal seasonal knowledge is the collective body of knowledge that Aboriginal people hold about their country, the plants and animals in it. It is linked to law, culture and spiritual belief. The knowledge held today is the successor to that in daily use prior to European annexation of the Australian continent. Many examples of seasonal calendars are from tropical northern and arid central Australia; fewer are known from southern Australia ([Clarke 2009](#)). In south-western Australia, only the Nyungar calendar from south-western Australia is relatively well-documented, and typically recognizes six seasons ([Meagher 1974](#)).

1.2 Calendars, climate change and NRM

Phenological changes, particularly dates of first seasonal flowering in certain plant species, have provided some of the earliest indications of climate change in the Northern Hemisphere (e.g. [Parmesan \(2006\)](#)). In those regions, many long-term private records of flowering events have been available to compare with current patterns. In Australia, such written records are rarely available, and few clear biological indicators of climate change have yet been identified.

However, a potentially powerful indicator of environmental change may rest in Indigenous seasonal calendars, a form of integrated traditional knowledge. First, many Indigenous seasonal indicators include phenological events that are sensitive to environmental change. Secondly,

given their reliance on close associations between two or more unrelated environmental events, Indigenous seasonal indicators are likely to be easily uncoupled.

The importance of including Indigenous ecological knowledge and viewpoints in natural resource management (NRM) is increasingly recognized. In the face of climate change this imperative increases, especially with respect to Indigenous seasonal knowledge (NRM). However not all Indigenous knowledge holders have the opportunity to contribute it to NRM in their region. Documenting this knowledge for the benefit of Aboriginal communities is a key first step in addressing this problem. This report describes our work in documenting calendric knowledge of the Ngadju people.

1.3 The Ngadju calendar project

The Ngadju (also known as the Marlpa) people of Western Australia retain a detailed knowledge about their Indigenous ‘calendar’ of times, seasons and indicators as it pertains to Ngadju country. This report is a summary of elements of that knowledge, as was shared by more than 50 members of the Ngadju community during a series of six workshops held over 11 days during 2009–10. Added to this summary are additional material that describe the operation of the project, the region in which Ngadju country is located, previous research on this topic, the names of workshop attendees, and lists of Ngadju words, plant species, animal species and references that are cited.

1.4 Ngadju ecological knowledge

The correlated Indigenous and ecological science knowledge in this report represents some of the seasonal knowledge held today by Ngadju people about their country. We emphasise that we were not able to fully document in the field (eg. through specimen collection or observation of an indicator) all aspects of the knowledge shared with us at project workshops. Where possible this knowledge has been correlated with scientific literature and other natural history recordings. In most instances the two knowledge systems were found to be well aligned in describing the timing and nature of biological events.

Clearly there is more to be documented about the Ngadju ‘calendar’ and its application to managing natural resources in Ngadju country. There are many reasons for this. Our Ngadju collaborators determined which knowledge they wished to share with us. With the project being of just over 12 months in duration, and given the relatively few opportunities for interaction, there were limits on how much knowledge could be documented. In Aboriginal society the sharing and acquisition of knowledge takes time; a number of aspects are likely available only to elders, and as such we were not privy to them, given we could not meet with all elders.

Chapter 2

Project background and method

2.1 Background

This project came about as a result of the interest of several individuals and their organisations:

- The idea for this project was supported by the Ngadju claim group. The Ngadju people decided they were interested in collaborating on this project through their working group.
- Paul Bowers, a Wongai man and Caring for our Country Facilitator (Land Management) for south-west Western Australia, developed a proposal for research into ‘Indigenous seasonal indicators and climate change’. He saw a research gap involving the following questions:
 1. Are Indigenous seasonal indicators of value for early detection of climate change?
 2. What are the implications of climate change for Indigenous communities in south-western Australia?
 3. How can Indigenous communities and traditional knowledge contribute to NRM outcomes in these regions in the face of climate change?
- Alexander Watson of the Wilderness Society, led a project to collate and present a synthesis of available information about the Great Western Woodlands (GWW). The intent of the report ([Watson et al. 2008](#)) was to highlight the value of the GWW and its lack of management plans and protection. Watson worked with the Ngadju community in compiling the report, and this indirectly led to CSIRO making contact with the Ngadju people and their representative, the Goldfields Land and Sea Council (GLSC).

- Suzanne Prober’s research interest in conservation management of the Great Western Woodlands (GWW). Ngadju country includes a significant extent of the GWW. Suzanne is a senior research ecologist at CSIRO.
- Michael O’Connor’s background in reconstructing a seasonal calendar in the Geraldton area, and experience in working with native title groups. Michael is a research scientist at CSIRO. Both Michael and Suzanne were keen to bring science research into collaborations with Indigenous communities on issues of livelihood, climate change and NRM.
- Vanessa Bray and Phil Drayson of the Land Unit at the Goldfields Land and Sea Council acknowledged gaps in research about **Ngadju** seasonal indicators and future impacts of climate change.

2.2 Aims

The project aimed to:

- Build a collaborative relationship between the CSIRO researchers and Ngadju people.
- Document the Ngadju seasonal calendar using workshops and semi-structured interviews, augmented by any prior research or ethnographic records.
- Identify potential climate change issues by discussions with workshop participants and by analysis of the calendar.

2.3 Project establishment

CSIRO instigated the project under its Indigenous Livelihoods Focal Project (IFLP), which is led by Dr James Butler. The ILFP seeks to investigate opportunities for facilitating sustainable Indigenous livelihoods based on natural resource management.

We developed a Free and Informed Prior Consent form in conjunction with Jim Walker and Greg Davison of the CSIRO Office of Indigenous Engagement. The form set out the ethical standards under which we would conduct the workshops in particular and project in general. Individuals participating at workshops, each of whom were paid a consulting fee as cultural experts, were required to sign the form to indicate they were aware of the way the research would be conducted, and whether they gave permission for tape recording of the workshop audio (see Appendix for summary of details).

2.4 Funding support

Funding support was provided by several sources:

1. The Wilderness Society Wild Country Small Grants program
2. United Nations University
3. CSIRO Indigenous Livelihoods Focal Project

2.5 Six workshops

Knowledge recording was conducted at six workshops held between May 2009 and January 2010 (see Table below). In all, 55 individuals attended at least one workshop (see Appendix [A](#)). The running times for the workshop events ranged from as little as 2.5 hours to as long as 2 days.

Location	Date	Participants
Norseman	May, 2009	14+
Esperance	Nov., 2009	10
Norseman	Nov., 2009	10
Coolgardie	Jan., 2010	18
Kalgoorlie	Jan., 2010	4
Norseman	Jun., 2010	8

Table 2.1: Summary of project workshops.

At each workshop we began by describing the background to the project and set out the aims:

- principally to put together a calendar of seasonal knowledge about **Ngadju** country, and also
- identify perceptions about current and future issues in relation to climate change and natural resource management.

As each workshop started we scoped out the session’s task in the terms that seasonal knowledge might ‘include things you’ve been told about by your relatives and elders’ and ‘things you’ve observed yourself over the years’.

During the first two workshops we collated and reworked information on a whiteboard, supplemented by tape recording and note taking. This led to the development of (i) a circular calendar diagram showing the consistently-communicated structure (in essence the structure reported here — ‘two named parts of the year called times each having two named seasons’),

and (ii) supporting tables of information. For the last three workshops a draft version of the current calendar in circular (see Figure 5.1) and and tabular forms were presented, and changes were then annotated as elicited.

A sixth workshop presenting the collated information to the Ngadju (native title) Working Group is planned for June 2010.

2.6 Report preparation and conventions

In preparing this report the compiled calendar knowledge was written out in a narrative form reflecting the way the information was conveyed to us. We looked for correlations between Ngadju and ecological science knowledge by contributing items from relevant scientific literature. A brief review of historical and ethnographic materials was conducted in relation to prior recording of Ngadju seasonal knowledge.

Ngadju terms were provided and spelled out in English for us by Ngadju participants, and have not yet been standardized against previous recordings of Ngadju people. It was outside the project's scope to work with a linguist on the orthography of the Ngadju terms included here. Future documents about Ngadju seasonal knowledge that utilise any material in this report should have the Ngadju words rendered in a consistent orthography (see [Nash \(2002\)](#) and [von Brandenstein \(1980\)](#)).

Ngadju informants provided the same set of words in language for significant parts of a year. When they expressed these terms in English either 'time' or 'season' was appended, interchangeably. To make the report easier to read we assigned these terms to separate levels of the hierarchy of annual temporal parts. Thus Ngadju seasonal knowledge is reported here as having two 'Time' parts at its top-level of the hierarchy, under which there are four 'seasons'.

2.7 Acknowledgements

The authors wish to thank the following people and groups for their contributions and assistance during the project:

- Ngadju cultural consultants — we thank each and every Ngadju person who participated in the project. We are grateful for the generous way in which our collaborators made themselves available, shared their knowledge, demonstrated patience and goodwill as we documented their traditional knowledge of seasons and indicators. We are also thankful for the opportunity to understand the difference between scientific and Aboriginal traditional ways of knowledge sharing.

- Betty Logan — Betty, a Ngadju woman and GLSC project officer, was immensely helpful throughout the project as she acted as a liaison between us and Ngadju community members.
- GLSC staff — in particular Vanessa Bray, Phil Drayson and Tricia Ranger.
- Arpad Kalotas — for taking time to discuss ethnobotany in the region and how we could approach knowledge collection.
- Staff of the Norseman High School — for providing meeting facilities in November, 2009.
- Reviewers — thanks for taking time to read and correct our draft report.
- The Wilderness Society Inc — with thanks for their financial support through the Wild-Country Small Grants Program.
- Funding agencies — financial support has been essential to our ability to conduct this project.



(a)



(b)



(c)



(d)

Figure 2.1: Participants at four of the six workshops held on and around Ngadju country: (a) Norseman, May 2009, Iragul Hall (b) Esperance, November 2009, GLSC offices; (c) Norseman, November 2009, Norseman High School; (d) Norseman, June 2010, Iragul Hall

Chapter 3

Project context

3.1 Study area

The study area was defined as ‘Ngadju country’ in the broadest sense (Figure [3.1](#)). Several factors influenced our choice of a large and regular boundary for the study area.

- There are many non-overlapping spatial regions associated with Ngadju people eg. language group, placenames, and places of past and present Ngadju residence, and areas subject to native title claim(s).
- The Ngadju native title claim is still before the Federal Court.
- It was beyond the resources and scope of this project to attempt to coalesce these definitions.
- The boundary was intended to facilitate the inclusion and gathering of calendric information.

In this project we were intent on capturing the broad knowledge remaining in the Great Western Woodlands region rather than confining ourselves too strictly to boundaries.

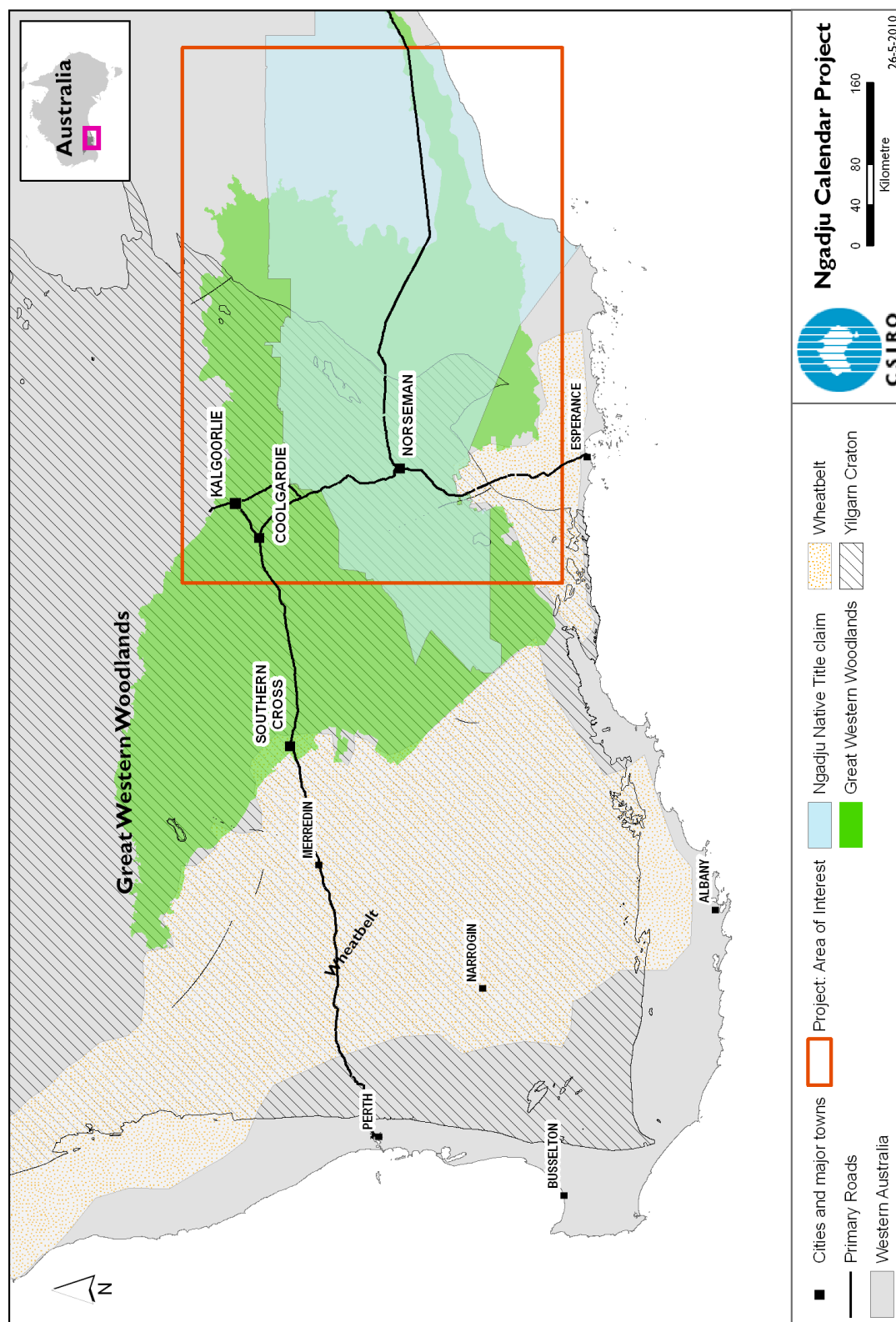


Figure 3.1: Location of the project area within south-western Australia.

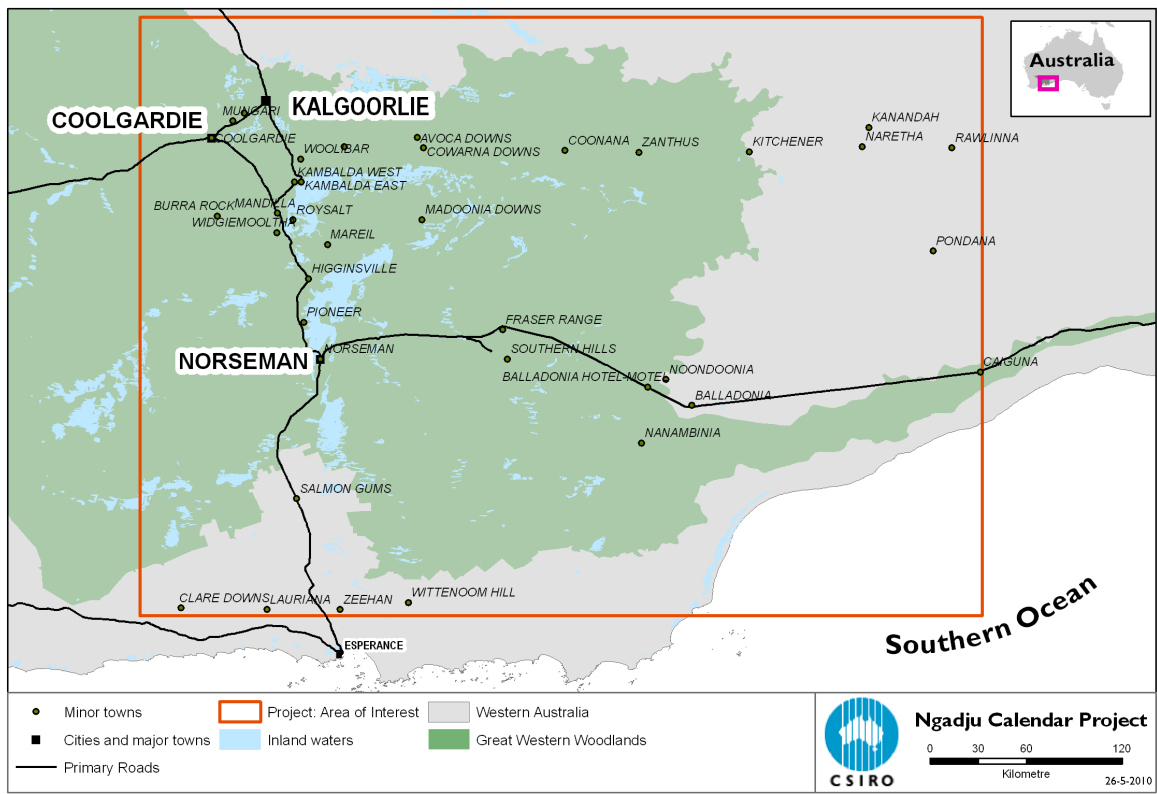


Figure 3.2: Geography of the calendar project area

3.2 Climate averages

Averages were obtained from the Bureau of Meteorology (BOM) website for four population centres within the project area — Coolgardie, Norseman, Salmon Gums and Balladonia. The temperature monthly averages were similar for all four centres. In contrast, from north to south across the project area, the rainfall monthly averages show a shift towards a definite pattern of December–January minimal rainfall and June–July maximum rainfall (see Figure 3.3).

The climatic averages and the climate zones map in the next section suggest that Ngadju country covers quite a broad range of ecological zones; this may be the reason for some of the diversity of indicators in the Ngadju calendar and seasonal information.

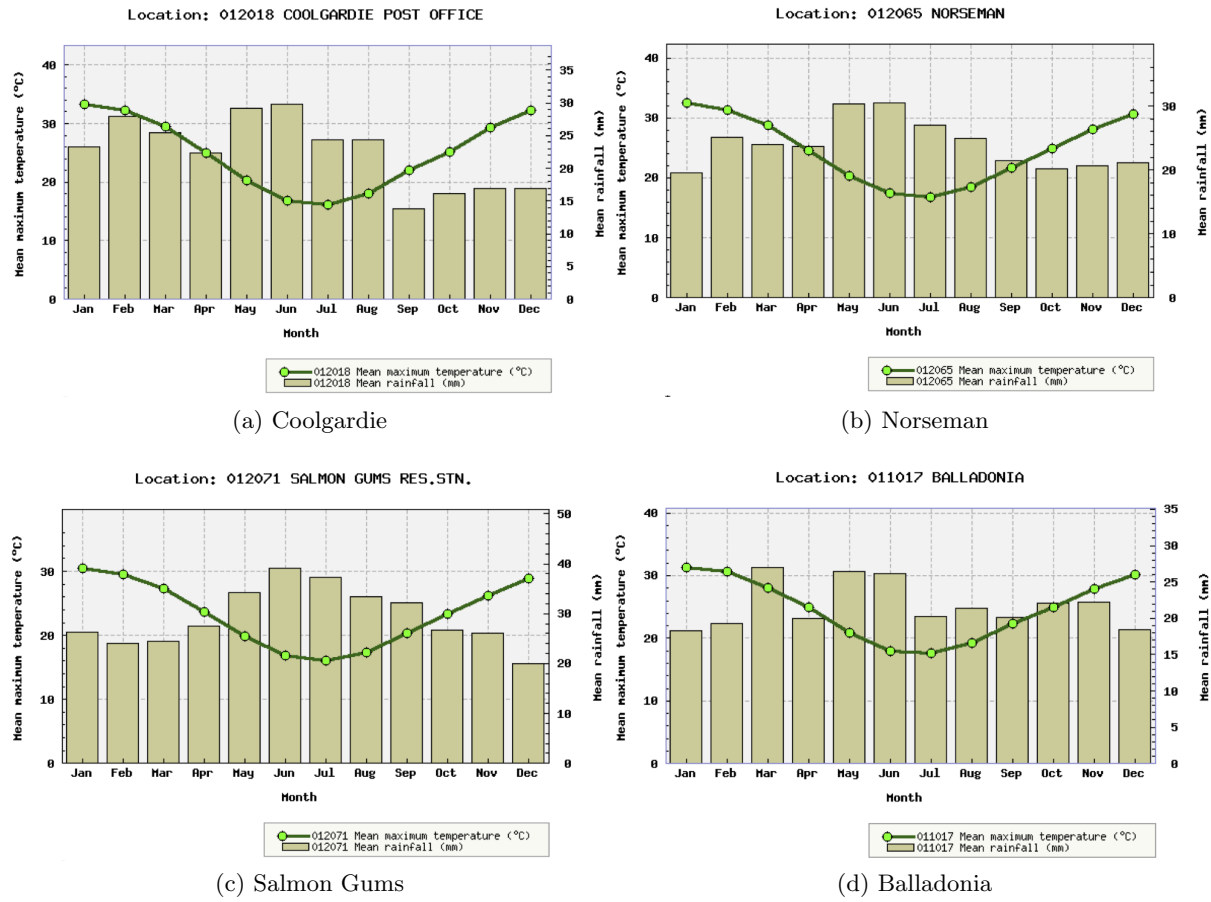


Figure 3.3: Mean monthly rainfall and mean maximum temperature averages for four towns within the project area. Data collection periods: (a) rainfall (1897–1953) and temperature (1893–2010); (b) rainfall (1951–2010) and temperature (1897–2010); (c) rainfall (1932–2010) and temperature (1932–2010); (d) rainfall (1901–2010) and temperature (1901–2010).

3.3 Climatic zones

Another means of understanding the project area is through an established climate classification scheme. The Koeppen scheme has been applied to Australia by the Bureau of Meteorology (BOM). An extract of this scheme for the region in and around the Ngadju native title claim shows climate classification.

It is interesting to note that much of the region is classified as a ‘grassland climate zone’, yet supports eucalypt woodland (see Figure 3.4). This is consistent with the lack of woodland vegetation in similar climates around the world, and perhaps suggests a likely vulnerability of the woodlands to climate change.

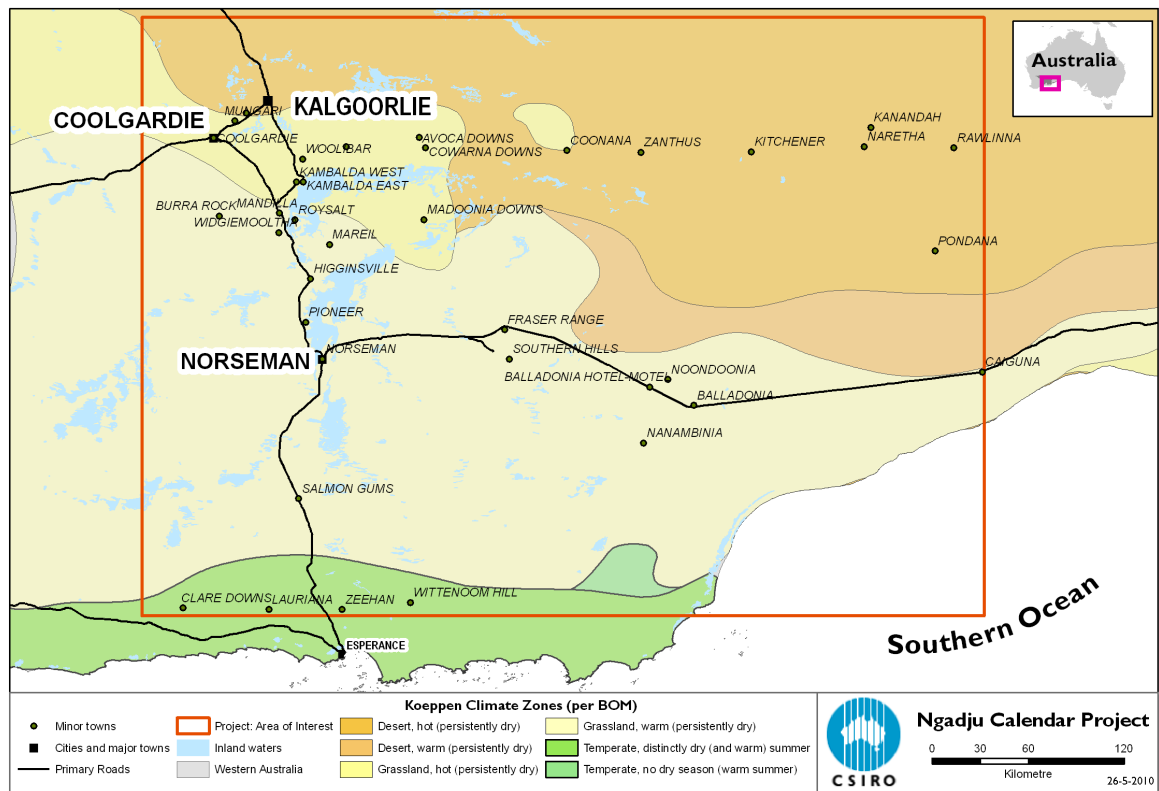


Figure 3.4: Koeppen climate classification for the area of focus in the Ngadju calendar project.

3.4 Biogeographical zones

Scientific study of Australian landscapes has led to mapping schemes. These schemes group together areas that have similar features — repeating combinations of features such as vegetation, surface hydrology. NVIS and IBRA regions are two mappings that can be examined for Ngadju country (see Figure 3.6.)

3.5 Plant and animal species

Plant and animal species in the region have been reported in surveys of the *The Biological survey of the eastern goldfields of Western Australia* (see part 2 Widgiemooltha – Zanthus (Newbey et al. 1984), part 4 Lake Johnston – Hyden (How et al. 1988) and part 9 Norseman – Balladonia (Hall and McKenzie 1993)), many smaller studies (eg. Whitlock (1937)), and online databases such FloraBase (WA Herbarium 2010) and the Australian Biological Resources Survey (Australian Biological Resources Survey 2010).

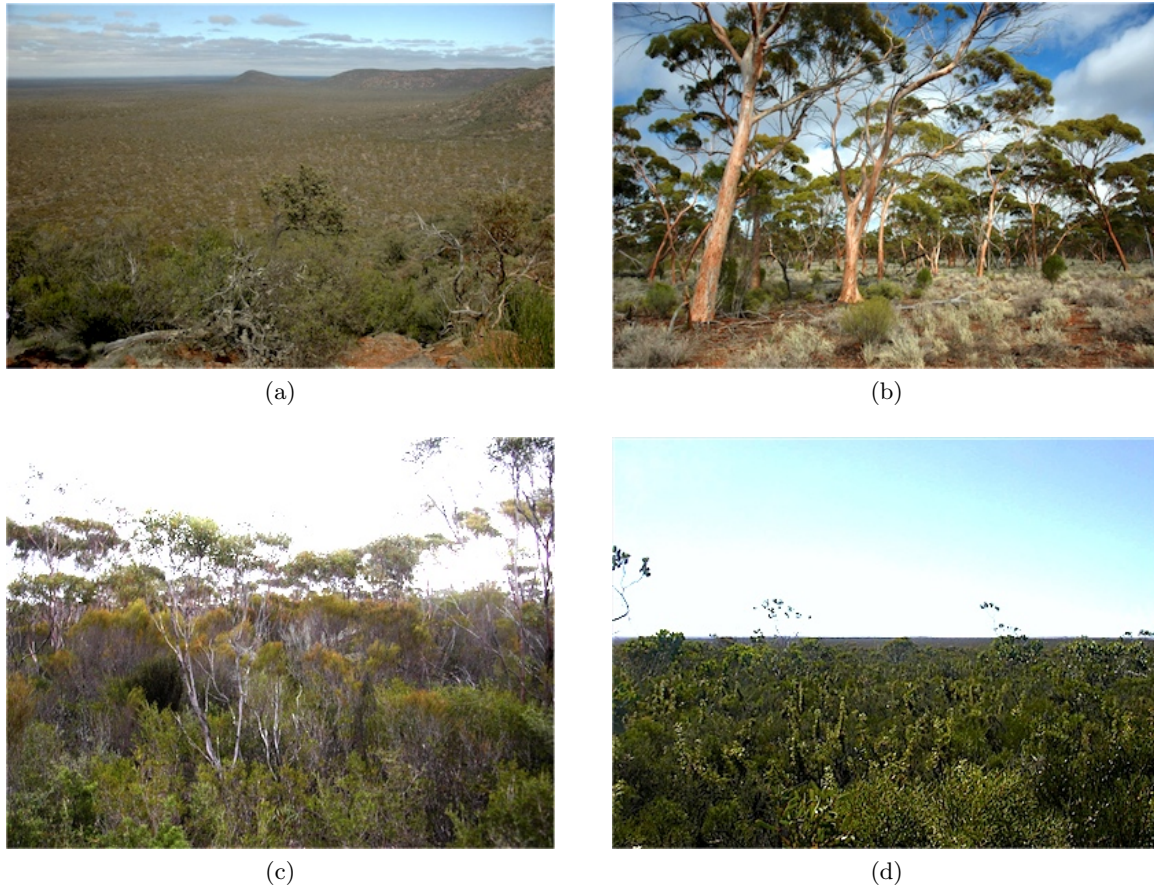


Figure 3.5: Landscapes typical of Ngadju country (but not necessarily from within it): (a) Extensive woodland plains from Helena and Aurora Range; (b) Woodlands near Lake Johnston with saltbush understorey; (c) Mallee near Lake King; and, (d) Sandplain heath near Lake King. Photos © S. M. Prober and K. Thiele

3.6 Landscape Types

Landscapes are the surfaces over which seasonal knowledge is applied. Repeating patterns of landscapes and their coverage (plants, animals, geology, water) are termed 'landscape types'. Landscape types that were previously identified in the study area are mosaics of woodlands, sandplain heath, mallee (Figure 3.5). Further details are recorded in [Newbey et al. \(1984\)](#), [How et al. \(1988\)](#) and [Hall and McKenzie \(1993\)](#).

3.7 Calendars of neighbouring groups

Calendar and seasonal knowledge have been recorded for several Aboriginal peoples who's country neighbours the country of the Ngadju. These include various Nyungar groups (mostly 6 seasons, with 1 reported calendar of 5 seasons; Western Desert people (4 seasons — see

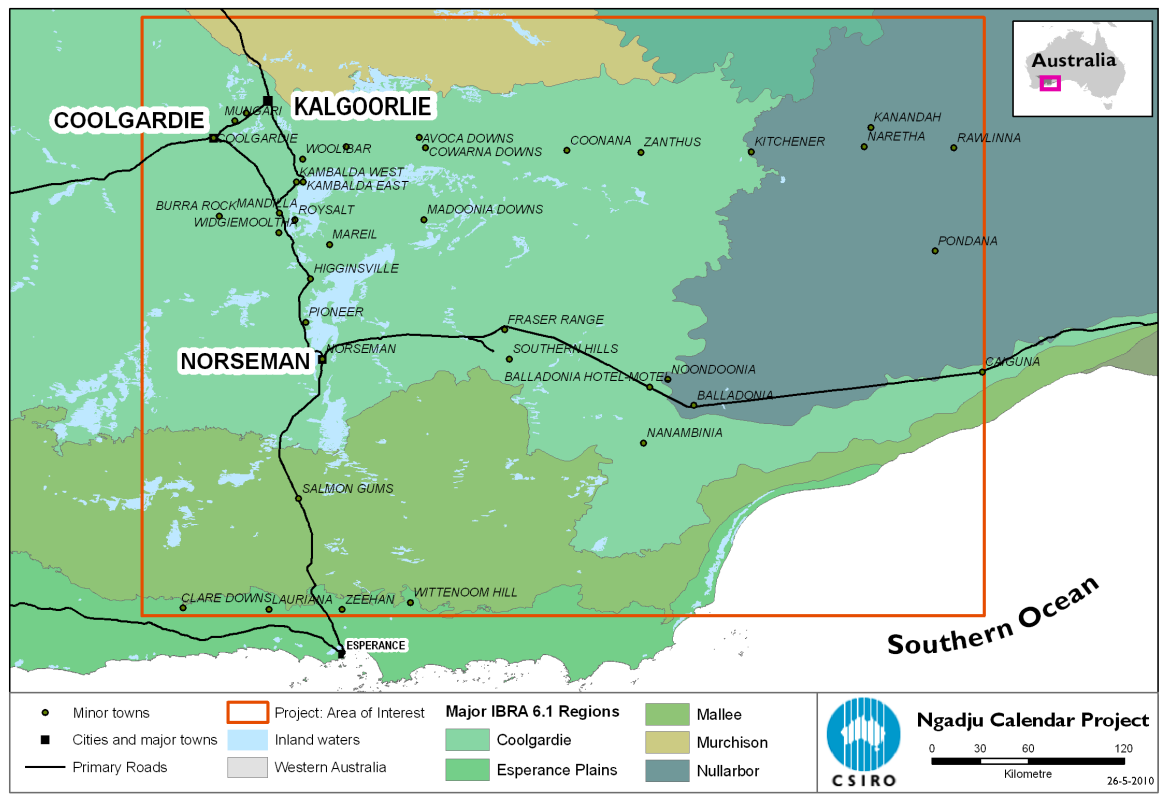


Figure 3.6: Biogeographic zones of vegetation communities and land systems within the project area, based on Interim Biogeographic Regionalisation of Australia (IBRA) version 6.1.

W.H.Douglas), as well as a four- or five- season calendar for the Mirning to the east along the Great Australian Bight recorded by Daisy Bates in the period prior to 1913. We are aware of many historical and contemporary sources that record aspects of country of Ngadju and their neighbours (eg. maps in (Tindale 1974); Tindale's manuscripts and field notes at the SA Museum; Bates maps and manuscripts at the NLA). It was outside the scope of this project to analyse these materials in relation to Ngadju seasonal knowledge.

Chapter 4

Prior studies of Ngadju ecological knowledge

This project is perhaps the first time that Ngadju people have chosen to collaborate with others in recording traditional and ongoing knowledge about their ‘calendar’, its seasons and indicators. At times in the past there have been fragments of this knowledge recorded about Ngadju interactions with plants, animals, weather, the land and each other. In this chapter we summarise earlier work that is about, or is related to calendars, seasons and indicators of Ngadju and, where relevant, their neighbours to fill in some gaps.

4.1 Recent relevant research

During 1999 David Nash conducted linguistic research in the Ngadju area. Nash also analysed available historical sources of Ngadju language material. He concluded that these materials could be divided into three relatively distinct groups (from across the wider Goldfields to Eucla region), as follows:

The various historical vocabularies are records of a ‘dialect web’ or ‘family-like language’ with three discernible clusterings. The three clusters correspond fairly well with the word for ‘person’ in each vocabulary, words which have been in long use as language names, namely Mirniny, Marlba, and Kabun. [Nash \(2002\)](#)

The authors are aware that ethnobotanist Arpad Kalotas has conducted field work with the Ngadju and has prepared a report setting out his findings in relation to traditional and contemporary Ngadju knowledge of plants, animals and the country. The authors understand that

this report is being used in the Ngadju native title proceedings currently before the Federal Court.

Most recently the linguist Jessica Dennis at the Wangka Maya Language Centre has been developing a Ngadju Dictionary for publication, drawing on the work of Nash, Marmion, von Brandenstein, Helms and others. A number of Ngadju elders have contributed their knowledge and time to this project over a number of years.

4.2 Earlier studies

Until the development of modern anthropology and linguistics, the collection of ethnographic and language materials was conducted incidentally in pursuit of other objectives. Often the collectors were interested amateurs, and as such their materials suffer from a range of deficiencies that require careful interpretation in order to be useful. Historical materials that could prove useful to Ngadju people working further on this topic include:

Helms, 1891: The Elder Exploring Expedition of 1891 travelled through Ngadju country. During the expedition the travellers reached Fraser Range Station and spent some time there recovering from crossing the Nullarbor. Richard Helms wrote a detailed account of anthropological ‘discoveries’ with an emphasis on observations and inferences relating to Aboriginal people he met at Fraser Range ([Helms 1896](#)).

Brooks, 1894: Another early record of seasonal activity is the description of water trees by J. P. Brooks, manager of Balbinia station (located within the Ngadju claim area). Brooks’ 1894 account of the structure and use of these trees is quoted in the section that describes Kubilya ngarrin season. These details correspond with information provided to us by many Ngadju people, and with our observation of several surviving water trees on Tjirntu-Parapara (formerly the Norseman Mission) we were shown in May 2009.

Bates, 1908–1912: Daisy Bates visited parts of the Ngadju claim area on at least two journeys between 1908 and 1912. Daisy Bates also recorded wordlists and genealogies from Aboriginal people in the Norseman region that may have been Ngadju ([Figure 4.1](#)). In some of these word lists the informants communicated to Bates that ‘Ngadju’ or ‘Mulba’ was their word for Aboriginal man.

No.	Informant	Location	NLA Ms. 365	Word for man
1	Jimmer	Drollinya (near Balladonia)	365/39/190–212	Mulba
2	Yalguru et al	Jinyila (Eucla)	365/39/78–121	Mining
3	Compilation (informants not named)	Eucla District	365/39/61–77	Mulba; Mining
4	Bijarda, Gauera	Yaluwarra (“70 mile”); Jijila ngandi (Israelite Bay)	365/39/34–48	Mulba
5	Gauera	Jijilandi etc.	365/39/1–33	Mulba; badu
6	a few words from Ballagalea	Jijilandi etc.	365/39/54–60	Mining

Table 4.1: Wordlists and other information communicated by Aboriginal people to Daisy Bates.

We obtained season names from two word lists, one obtained at Eucla and the other at Balladonia. The Eucla wordlist has the names of five seasons while four seasons are listed for Balladonia. We note that Bates lists two Mulba words at Balladonia for ‘winter’, ‘spring’ and ‘autumn’. It is not clear what these terms mean and whether they indicate two named parts of the year.¹

European term		
Bates’ term	Eucla words	Balladonia words
‘Blackfellow’	Mirning	Mulba
Winter	kaluru	Kallaroo, kallooroo
Spring	bulbaga*	Willo, nginya
Summer	bardingara*	Nganjee
Autumn	kanjimula*	Wandagur, burdingurra
March fly season (November)	yalalonga	Not recorded; may not be applicable

Table 4.2: Words about seasons in two Bates wordlists. Balladonia words are from her informant Jimmer of Drollinya near Balladonia.

Kaluru, the name given to us by Ngadju people for the part of the year known as ‘Cold Time’ appears very similar to the terms that Bates recorded for ‘winter’ at both Eucla and Balladonia. Also, the reference to the March fly season has a resonance with the Ngadju use of the appearance of March flies as an indicator that **Nganji** season has begun.

¹**Note:** Each bold term in this report without an asterisk appended was stated to be a **Ngadju**/Mulba term, and is recorded here as spelled out by **Ngadju** workshop participants. Any bold term with an asterisk (‘*’) appended is a word from a previous publication or manuscript source, and may or may not be a **Ngadju**/Mulba term.

There is scope for future investigations of Bates materials in relation to seasonal matters. Bates' notes and wordlists for the following informants may be relevant; it was beyond the scope of the current project to study these materials in any detail. They need careful consideration by experts that know the material and understand its limitations. The following quote is an example of the type of material that is contained within the Bates' materials. Appended to Bates list of season names at Eucla were a few notes about the annual cycle of plant foods — presumably staple foods — several of which we also recorded as Ngadju foods at similar times of the year.

The kalgula ripens in March. Ngabula (white ants) are ready for gathering in July and August. Ngura comes next (December), then malgara, then birgala and guyana come late in the summer. Nala (edible roots of a species of mallee) are found at all times. Ngoora, January, February (ripe). Gooyana, February, March (ripe. Only comes when ground has been burnt.) Mulgara, February, March (ripe). Bates (1912)

1938–39: N. B. Tindale: In 1938–39 Norman B. Tindale spent time on Ngadju country while on anthropological field research in Western Australia. Tindale recorded word lists, noted genealogies and took photographs. Two of his word lists, no. 86 and no. 99 are relevant to Ngadju (Tindale (1939) — word lists extracted by D. Nash): neither includes words for seasons or times of the year, however there are pertinent words for fire, water, wind and some animals. These records are held in the South Australian museum.

1966: N. B. Tindale: In 1966 Tindale again visited Ngadju country and other areas in south-eastern Western Australia. During this visit he recorded and took notes during interviews with various Aboriginal people who self-identified as 'Ngadjunma', 'Mulba' or had knowledge of Ngadju (Tindale 1966). These records are held in the South Australian museum.

1974: N. B. Tindale: Tindale compiled the result of his lifelong work with Aboriginal people over many decades (Tindale 1974). It contains both a map and a detailed accompanying memoir. The Ngadju are mentioned.

Chapter 5

An overview of the Ngadju calendar

5.1 Introduction

The annual journey of **Ngadju** people and country around the sun is divided by them into two parts:

- **Ngarnngi**, the *Hot Time* (also spelled as *Ngurrngi* by some participants). It takes more than half the solar year, making it slightly longer than **Kaluru**, and is further divided into:
 - **Ngawu** season, followed by
 - **Nganji** season.
- **Kaluru**, the *Cold Time*, is typically less than half the solar year. It also contains two seasons:
 - **Kupilya ngarrin** season, followed by
 - **Karrlkunja** season.

The sequence of the two times and their four seasons is shown in Figure (5.1). This chapter contains a brief summary of each time and each season. Later chapters describe these in more detail.

5.2 Timing

The **Ngadju** ‘calendar’ is an annual cycle of events in the biophysical landscape and their implications for **Ngadju** people. The timing of these changes is not tied to the European

annual 12-month calendar, although the approximate timings were frequently conveyed to us in both months and seasonal indicators. It is important to note that timing varies from year to year, and from coastal to inland. We were told that Old Rule, a deceased **Ngadju** elder, knew the time of year from the stars (see the chapter about **Ngawu** season for more information).

5.3 Longer-term cycles

A number of contributions during the workshops made reference to multi-year indicators. Collected together they suggest another aspect of seasonal knowledge — signals of the start, end or qualities of the next period of years. Two examples are:

- If pelicans (*Pelecanus conspicillatus*) arrive in Norseman and other places, they herald drought-breaking rains. The swans (*Cygnus atratus*) and grey crane (probably white-faced herons, *Egretta novaehollandiae*) can come as well. The wet cycle lasts about seven years. Then there may be seven years of dry. Some of the frogs can stay underground for seven years and can be dug up for water in dry times. They come out with the drought-breaking rains too.
- At the other end of the cycle, dry times are predicted by changes in emus and kangaroos. They seem to have few young ones before the drought comes.

5.4 Year-round indicators

Similarly, some indicators did not refer to any particular time of the year. Rather they were used to predict weather events or to time activities appropriately. These included:

- Indicators of weather change: At any time of year, **jimparlu** the Squeaker bird (Grey currawong, *Strepera versicolor*) sings when a big rain and wind are coming (this bird is good eating too). Termites and ants (**minya**) start flying before rain too. A big circle around the moon indicates rain and cold temperatures.
- Time of the new moon: The new crescent moon is a good time for hunting — when it is shaped like a boomerang. The kangaroos travel then, and animals come out and move around freely because it is dark. There is also an abundance of fish down at the coast before the new moon.
- The butcher bird, **kalykurti** (*Cracticus torquatus*) is a harbinger of bad news, and so is the Willie Wagtail (Ngadju name **jirti-jirti** *Rhipidura leucophrys*).



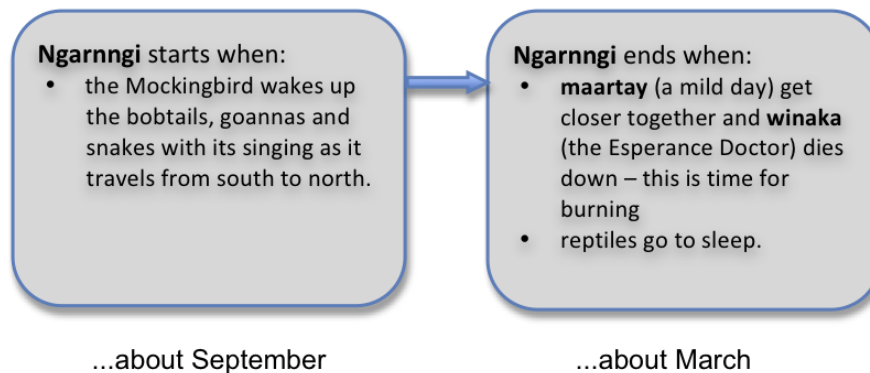
Figure 5.1: An overview of the Ngadju annual calendar. More easily read close-ups of the two Times can be seen in the last Appendix of this report.

Part I

Ngarnngi — hot time



First part of the year



Ngarnngi contains two seasons:

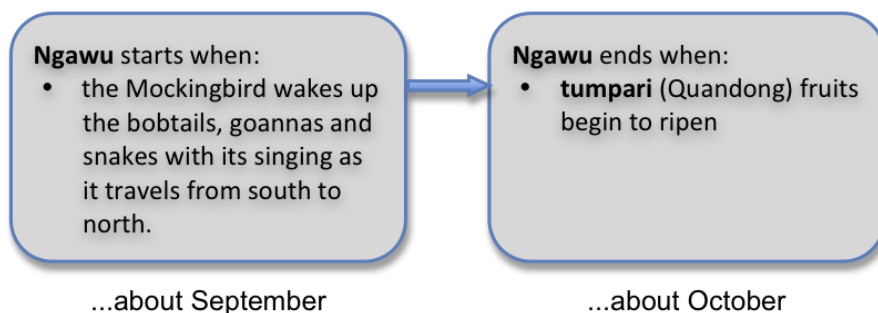
- Ngawu
- Nganji

Chapter 6

Ngawu — egging season

*First season in **Ngarnngi** (hot time)*

This season is warming up, a windy time. People eat lots of birds' eggs and cooked bobtails with poached eggs inside



6.1 Weather

Ngawu is the time the weather warms up and the rain drops off. The winds start up again in October and knock the weak fruit off the trees.

6.2 Plants

Lots of things are flowering during **Ngawu**, including the Wild hibiscus (*Alogyne hakeifolia*), the everlasting daisies and many sandplain species.



Figure 6.1: Wild hibiscus (*Alogyne hakeifolia*) near Salmon Gums, shown by Edward (Snowy) Dimer.

Hunting with Hibiscus . . .

People used to dry the large purple hibiscus flowers (*Alogyne hakeifolia*), pound them to a powder and throw the powder into a rockhole. It makes the emus go to sleep, and kangaroos and fish too.

Edward ('Snowy') Dimer

The powder from purple hibiscus flowers is poisonous; when the emu drinks the water it falls down dead. You have to quickly cut down the belly and remove the innards or the meat becomes poisonous and will kill you if you eat it.

John Graham

Meat was processed as soon as possible as there was no storage available for it.

Betty Logan

At the end of **Ngawu** (about October) the **tumpari** (Quandong, *Santalum acuminatum*) fruit begin to ripen. The trees ‘take it in turns’ to flower — if one flowered last year, people don’t go back to it this year because it probably won’t have fruit. Each individual tree might only fruit every two to seven years; if it rains a lot you may get more fruit. It is easy to see which trees will have fruit because they have flower buds up to a year before. **Tumpari** fruit ripening moves in the same direction as the sun: around the desert way first, then Coolgardie, then Merredin. **Tumpari** seeds are transported by emus as they eat the fruit.



Figure 6.2: A small **tumpari** in fruit (Quandong, *Santalum acuminatum*) at Norseman.

6.3 Animals

The grey Mocking bird (possibly *Cacomantis pallidus*, the Pallid Cuckoo) heralds the beginning of **Ngawu**. It travels from south to north, waking up the bobtails, goannas and snakes with its singing, and telling us it is Grand Final time! The Martin swallows (e.g. Tree martins, *Petrochelidon nigricans*) also arrive from the north.

This is the time that the reptiles are shedding their skins, and many animals are giving birth or hatching. There are plenty of eggs to eat. The mallee hen lays continuously from about September to December. People can take some but not all eggs — if there are 12, take six. We were told that Old Rule, a deceased **Ngadju** elder, is remembered as having looked at the stars while camping and announcing that mallee hens would soon lay eggs.

At this time too, the plovers (*Vanellus miles*) lay riddles and tricks to draw people away from their place of eggs. The young emu can be hunted, and traditionally it was the right time to eat wombats (*Lasiornis latifrons*). These are rare now around **Ngadju** country but are more common to the east.

Just after **jutumul** has flowered, signalling the end of **Karrikunja** (see Section 9.2), is a good time to eat the **yurna**, Western bobtails, *Tiliqua rugosa*). They are a delicacy then

because when cooked you will usually find one or sometimes two poached eggs inside. There are plenty of **yurna** and they get fatter as this season goes on. They are fattest just before they hibernate and skinny after hibernation. The **ngapaya** (termites), that become available to eat in **Karrikunja**, can still be eaten now too.

By the end of **Ngawu**, the young ones of all the animals have hatched out. The mallee fowl chicks take about a week to hatch; they have to dig their way out of the mound.

6.4 Water

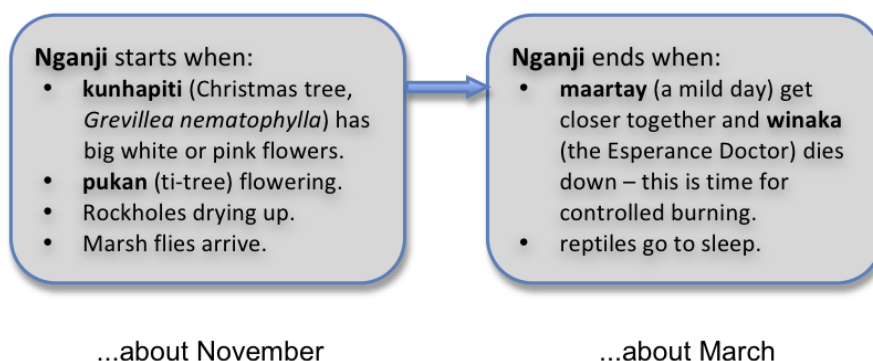
There is still plenty of water in the rockholes, and the **jungkajungka** (*Thysanotus patersoni*; Twining fringe lily) tubers are sweet and watery if needed when travelling. There is also a little orchid (with flat leaf) that can be eaten before it seeds. The taste is bitter rather than sweet.

Chapter 7

Nganji — hot season

Second season in Ngarnngi (hot time)

*This season is hot and dry. People eat lots of bush fruit and maybe go to the coast for big meetings and marine foods. **Marlu** start eating dry grass and fatten up.*



7.1 Weather

This is the hot time of year when people sit all day in the shade. They get up to do things when it gets cool as **winaka** (the Esperance Doctor) comes up. **Winaka** starts in Esperance in the mid-afternoon, gets to Norseman a few hours later and to Coolgardie a few hours after that. You will hear it before you see it — howling through the tops of the trees.

This season is dry except for the occasional thunderstorm. A change in the wind indicates when big rain or hail storms are coming, and it might be time to move to higher ground of the breakaways. Sometimes the storms are dry, and they can start fires in scrubby country.

At the end of the hot season, **winaka** starts to die down. There is more often a **maartay** (mild day) and people can go out. An increasing number of these mild days signifies the transition to **Kupilya ngarrin** (sleeping and hibernating season).

7.2 Plants

When the **kunhapiti** (Christmas tree, *Grevillea nematophylla*) has big white, cream or pink flowers this indicates the start of **Nganji**. **Karlkula**, the Silky pear (*Marsdenia australis*) and **pukan** (the ti-tree, possibly *Leptospermum* or *Melaleuca*), flower around the same time. The blossoms of **Karlkula** are very nice to eat — there are lots after good rains, and fruit can be eaten later in the season. Many other fruit are ripe in **Nganji** too. **Tumpari** fruit (Quandong, *Santalum acuminatum*) are at first still red and ripe on the tree (not many left by December), and when they have fallen they can be eaten sun dried from the ground. They keep right through, even to winter. They are oiler when dried; rub skin with them for moisturising. The Sandalwood fruit (*Santalum spicatum*) are the same, or better, eat the nut inside. Pigface fruit ripen later in the hot time. The little one in the granite rock country (probably *Sarcozona praecox*) is the good-eating one. It has big edible fruit. The one on the salt lakes, **punjeri** (probably *Disphyma crassifolium*), has smaller fruit so is no good to eat, but the leaf is a cure for warts. There are **ngura** (wild grapes), **kutarla** (yams) near rock country, and **ngaajunh** (wild cucumbers)¹, too. Booya beans (*Rhyncharrhena linearis*) flower then fruit (edible beans) — it comes out about March.

7.3 Animals

At the coast the Salmon (*Arripis truttaceus*) and Herring (*Arripis georgianus*) are passing during their migration, and it's time to 'sing them up'. The porpoises chase the salmon, the crayfish stay in close to shore, and you can also get periwinkles, abalone and crab.

Back on the land, insects in the bark or wood of fine-leaved eucalypts produce **jarranh** ('honey'). The tree looks glistening and it is sweet to lick the branches, birds lick it too. Honey from European bees is also running best in the warm times (in the north) in some places; there are not so many bees in Norseman. The best hives are in grasstree trunks (*Xanthorrhoea* spp.). The Blackbutt trees (possibly *Eucalyptus clelandii*) flowering on the hills indicate bees too, but you must be near fresh water.

The **pikurta** (Euro' kangaroo, *Macropus robustus*) is fat and good to eat now and at all times of year. The **kipara** (Bush turkeys also known as the Australian bustard, *Ardeotis australis*) come down when seeds are dry or when smoked out of the scrub by bushfires (it comes to look for insects). Porcupines (*Tachyglossus aculeatus acanthion*) can be eaten around this time too, as they have no babies in their pouches. Bats are active and can be caught by lighting tall sticks with fire and holding them up in the air. The light attracts the bats, and they burn their wings and fall down. **Marlu** (Red kangaroo, *Macropus rufus*) feeds on the dry grass so is fat now — in the cold time he is skinny. Some people feel that **marlu** is more a Mulga species. He only came down into this country since the 1940s.

¹This plant is important to **Ngadju** people; a namesake plant

Climate change . . .

Once, the dreaming controlled where the animals went. Dreamtime would tell ‘em to stop, like the marlu. Law forbade them to go further. Now the introduced animals have no dreaming, they move everywhere — camels, horses, sheep, foxes, rabbits. Climate change will upset the balance of it all too.

Trevor Donaldson

In early **Nganji** the snakes are mating and the goannas are laying their eggs. **Karulka**, the small goannas, dig very deep trick nests with false tunnels so the eggs are hard to find. **Kaalhuny**, the big goanna (*Varanus gouldii*) lays its eggs in termite nests. When the snakes and lizards go underground and go to sleep, this tells you it is the end of the hot season.

7.4 People

The Marsh (March) flies arrive at the start of **Nganji** — smoke them away by burning the greenest, stinkiest bushes!² The flies, which arrive when rockholes are drying up and kangaroos are moving away, indicate when people used to travel from Fraser Range way to the coast (near Israelite Bay) to take advantage of marine foods. Other people lived there all the time. This time of bounty was a gathering time of Ngadju from all around: trading, marriages etc; maybe some Mirning came too. Brush shelters and windbreaks could be built out of sticks and bushes for the coastal camps (**mirnta**). When shellfish in coastal shallows were seen to be decreasing, salmon had gone on, and the days were cooling, it was time to start moving inland again. People from up north didn’t go all the way to the coast, they dispersed in smaller groups, clustering around small water holes and following the rains.

This is the bushfire season, so the heathlands are avoided for safety from fire — it is safer in the woodland country. There is no deliberate burning off until conditions are good, in the time of **maartay** (about March) between **Nganji**, the end of hot time, and **Kupilya ngarrin**, the start of cold time. The time of **Maartay** is a good time to burn because the coming rains will soon produce regrowth, and it is before the emus lay their eggs and other animals are breeding.

Burning is done in places where grass builds up and that will give good greenpick (new plant shoots that are tender for animals to eat). The animals will come to you then. People can’t remember doing widespread burning in the tall woodlands — there is not much grass. Burning is more on grassy hills and ridges, maybe in mallee, and particularly in low woodlands around waterholes and rock holes. Fire in the sandplain country brings the bustards up too.

²There was a little uncertainty about the timing of these flies — one or two people felt that they arrived at end of season.

If you burn in one year, you can come back the next for the good grass and animals, burning somewhere else along the way. You can keep hunting this place and not burn again for say three or five or even seven years. Only small patches are burned around rockholes, but it might be necessary to look after the trees by scraping away the fuel from around their trunks. Letting the fires get too hot around the rockholes (by not burning often enough) can cause the rocks to crack.

7.5 Water

The hot, dry conditions in **Nganji** limit the availability of surface water for drinking and other uses. Down at the coast there is plenty of fresh water in the limestone rock springs, the water table is only a metre or so down although sometimes it is brackish. Inland, rock holes can still support small groups of people, and when travelling there is water to be found in the roots of some plants. Cracks in the ground indicate that roots of various trees are swelling and these can be dug up for water. These include mallee and wattle roots, as well as the roots of Kurrajong, (*Brachychiton gregorii*).



Figure 7.1: Kurrajong (*Brachychiton gregorii*) at Goongarrie between Kalgoorlie and Menzies. In the second photo the smooth and rough bark is shown

The Kurrajong leaves are bright green in summer (at other times they are olive green), and the roots are like coconut: you can chew on them for a long while, taking them with you travelling. The Kurrajong can tell you where north is, because its bark is often smooth on one side and rough on the other. The roots of **kunhapiti** (Christmas tree, *Grevillea nematophylla*) have water also. Find them by listening for the hollow sound when tapping the soil. The **jungkajungka** tubers are getting bitter by now, but if you can find plants that have died back, they can save your life in an emergency.

Ngadju people have another interesting solution to lack of water in dry times: the water tree. The water tree is a special tree that has a deep bowl at the base of multiple stems, mostly



Figure 7.2: Knowledge of water trees and their making was shared when several water trees on Tjirntu Parapara were visited after the first project workshop in May 2009: (a) Water-holding ‘bowl’ being examined by Betty Logan; (b) The multi-stem form of an old water tree behind Betty Logan, Maxine Dimer, and Valma Schultz.

created by careful training. Clay or sticks are packed in to form the bowl. Some naturally-formed water trees are also known. The rain runs down the stems into the bowl, and the pool of water can be covered with bark to stop it drying out. It is usually a **marrlinja** (Salmon gum, *Eucalyptus salmonophloia*), or sometimes something else like a **pilerli** (Black morrell, *Eucalyptus melanoxydon*). These are especially found along travel routes.³

³Information from Dorothy Dimer and Betty Logan

Water past and present. . .

The following is an early description of water trees (which may be one of several species) by J. P. Brooks of Balbinia Station:

Of the four kinds of water found in the river-less interior I need not describe “bring gabby” (soakages), or “karo gabby” (rockholes), but pass on to “womar gabby”. Let those in need of water, while travelling through a forest, keep a lookout for trees with three or more large branches springing from one butt; should there be a dead stick protruding from the fork, pull it out, and nine times out of ten water will be found within; to reach it, roll a thin piece of bark into a tube and suck the water through it. The aborigines are adepts in the art, and in their natural state carry a hollow bone stuck through the nose for the purpose. After drinking replace the stick, not only to keep away dogs, emus, etc., but to prevent impurities from accumulating in the receptacle. I have found numbers of trees containing from ten to fifteen gallons, though more frequently only a few pints. Many of the trees have never been opened; by tapping them with the finger a native knows at once if they are good or not; if it gives a hollow sound cut a small hole in the fork, having attention to drainage, and generally water will be found. Every forked tree has not a cavity; every will not hold water; trees which have held water perfectly for years will suddenly cease to do so. When the rock holes and “womar” water are exhausted as they always are after a long spell of dry weather, the natives fall back on “cooran gabby,” the best of all, obtained from the roots of the tree.

Brooks names the water trees as ‘womar’, which is either a Wongai word, or an unusual attempt to spell the Ngadju word **wanyarr** meaning the ‘red heart gumtree’ (von Brandenstein 1980). Interestingly, Balbinia pastoral station is situated within Ngadju country.

A recent study of the many sources of water utilised by Aboriginal people in desert regions (Bayly 1999) describes water trees in similar ways to that of Brooks (1894). However both articles make no mention of Ngadju methods for improving the water-carrying capacity of these trees.

The West Australian [newspaper], 30 April 1894 (Brooks 1894)^a.

^aJohn Graham recalled that his dad spoke about John Paul Brooks

Part II

Kaluru — cold time



Second part of the year

Kaluru starts when:

- Reptiles go to sleep.
- **jula*** (emu) males get fat and shiny.
- **pikurla** (white scale) appears on gum leaves.

...about April

Kaluru ends when:

- **walatuttut** (butcher bird) calls out.
- **jutumul** flowering says the food of **gnawu** is ready.

...about August

Kaluru contains two seasons:

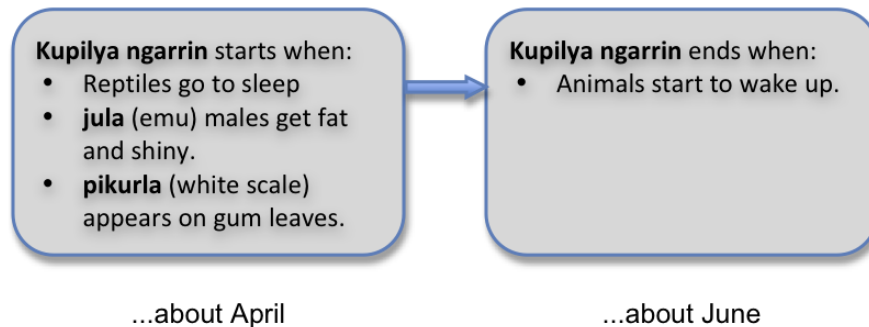
- **Kupilya ngarrin**
- **Karrlkunja**

Chapter 8

Kupilya ngarrin — sleeping and hibernating season

*First season in **Kaluru** (cold time)*

*This season is cold and rainy. People are resting up; it's good for mushrooms. Meeting and trading is held during the part called **ngurpany** (dingo pup) time; the Seven Sisters are in the north-west sky just after sundown to indicate that female **jula*** (emus) will start egg laying.*



8.1 Weather

Kupilya ngarrin is cold and rainy. Cold snaps of three to four days can start in April or May, and it can be frosty; the moon can have a ring around it. Because the night air is cold the campfire smoke lays flat — it doesn't rise up. **Ngadju** people had a system for keeping warm at night — by use of a wind break and warming soil with fire to make a place to sleep upon. This was often amongst the **pukan** (ti-trees) near the coast or around Norseman.

8.2 Plants and fungi

This is the wild grass time. The grass starts growing and makes the **kulpirr** (Grey kangaroo, *Macropus fuliginosus*) fat and good to eat. When the ground becomes damp in the cold time the mushrooms come up. The **muntaar** is best; it turns bluish on frying and is as good as meat. It grows especially between Salmon Gums and the flats around Norseman, or along the creeks further north. The dingoes and emus eat it too — you have to beat them to it.

8.3 Animals

Pikurla, white scale-like insects (manna) can be scraped from eucalypt leaves from about the start of **Kupilya ngarrin**. They last a while, maybe to September in some years.

The Emu (*Dromaius novaehollandiae*) males start getting shiny feathers and fat at the beginning of **Kupilya ngarrin** so they can sit on their eggs — they go without much to eat for about eight weeks. The female emus start to lay about when the Seven Sisters are in the north-west just after sundown. This is usually after the first big rains. There's an emu made of stars of the Orion, that looks like it is sitting at this time; there's another emu up there too but it's not for all to look at. The female emus make many false tracks, and they walk on 'tip-toe' so their eggs are hard to find. But the emu can't count — you can take most eggs and leave just one! Chicks hatch around June or July. There can be two lots of eggs in a year because the male does the work of minding the eggs; females can have two mates in the same year. You need to be a fast runner when getting the eggs as the father will come after you. If there are few chicks it means drought may come 12–18 months later. It's the same for the kangaroos — if there are few babies it means drought ahead.

After the emu eggs comes a part of **Kupilya ngarrin** called the time of the **ngurpany**, dingo pups (*Canis lupus dingo*). This is about June, about nine weeks after the dingoes mate. They are very selective about where they have their pups — they retreat to breakaway country.

The snakes and lizards are all fat and sleepy during **Kupilya ngarrin** — just dig them up to eat. The goanna is smart, he makes holes under rocks and is hard to dig up. The carpet snake/python **pula** (*Morelia spilota*) are especially big and were once an important food in some parts. These and other reptiles were not cut up, rather they were cleaned out with a long stick or hook from both ends. Removing the innards makes them good and tasty; this practice is also part of Ngadjju law/dreaming. A carpet snake/python can close off a water hole overnight by coiling up in the water and filling the space in the hole.

Kupilya ngarrin ends when the reptiles start waking up.

8.4 People

Cold time was a resting time — time to sit around the fire making spears, boomerangs, big wooden scoop bowls and so on. There is plenty of water in the rock holes at this time of year. When travelling people might want to use the water trees (see box) or the **jungkajungka** tubers that are underground beneath a leafless vine (Twining fringe lily, *Thysanotus patersoni*) which are 90% water. Nowadays the first cold snaps are an important time to make sure everyone has blankets and warm soup to avoid chest infections. Today **Ngadju** continue to make a medicinal drink and chest rub from a prickly bush (species not recorded).



Figure 8.1: **jungkajungka** is a tuber food: (a) Digging for **jungkajungka** (Twining fringe lily, *Thysanotus patersoni*); (b) The tubers are small, and have a watery, slightly crunchy tuber that is good for water.

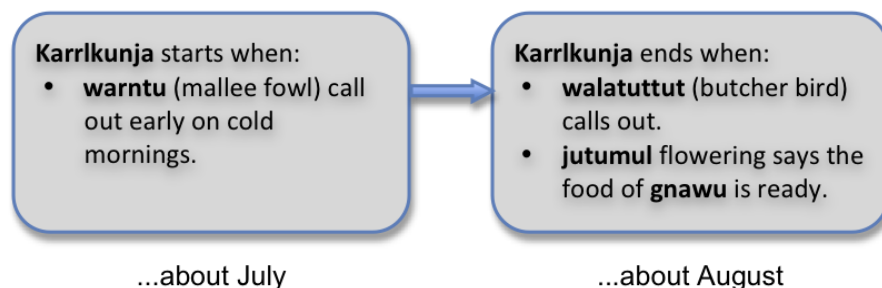
The time of **ngurpany** ('dingo pups time', the pups being born between June and August) was a meeting and trading time around Norseman (probably Fraser Range) in most years. Neighbouring people came, and it wasn't just **Ngadju**. The dingoes from north-west and north-east of Coolgardie way were prized as the best hunting dogs around, and were traded to **Ngadju** in exchange for a special type of spear.

Chapter 9

Karrlkunja — courting and mating season

*Second season in **Kaluru** (cold time)*

*This season is cold and rainy, but starting to warm up. Collect **ngapaya** (termites).*



9.1 Weather

It is still cold and rainy, but it is starting to warm up. August is the windy month. In this early windy time, the weak blossoms are knocked off the trees.

9.2 Plants

The new shoots and wildflowers are starting to appear. **Wananga**, yam-like wild potatoes around the lake and granite country, are best eating around this time (but they go through to the hot time). There are little round tubers, **kurrul**, around the granites too.

The white flowers of **jutumul** (*Olearia muelleri*) mark the transition from **Karrlkunja** to **Ngawu**. When it flowers it says the food is ready. **Jutumul** is a widespread shrub through the woodland and rocky country.



Figure 9.1: **Jutumul** (*Olearia muelleri*), flowering just finished, at Norseman.

9.3 Animals

Warntu*, (Malleefowl; *Leipoa ocellata*) call out only at this time — early on cold mornings, heralding the start of **Karrikunja**. It's the time of coming alive — all kinds of birds and animals are getting together, mating and building nests. The young emus eat the new shoots and bugs.

Mallee fowl . . .

The mallee fowl mostly have their young in **Ngawu** season. They make a mound (typically on sunny west side of a hill) and keep the ground clean around around it. They lay about every two days and cover the eggs right over, testing the temperature with their beaks. Chicks are hatching all through the season until October. The chick can already run about when it hatches. We don't see them much now.

Esperance workshop participants, November 2010

There are different kinds of bardi grubs at different times of the year but **munpark** (bardi moths) are good when the ground is soft, from June to August, although not every year. Each type of bardi grub has a specific tree it lives in. For example, the **munpark** emerges from trees such as the Jam (an *Acacia* sp., referred to as *Murrumbark*). When the young moths come out, people could make a big fire to attract more, and have a big feast. Bardi grubs that turn into beetles often come out later, in the **Ngarnngi** (Hot Time); they are all sorts of different

colours. People feel that the **munpark** are similar to the Bogong moths that are well known in the Eastern States.¹

Ngapaya, the termites, can be eaten now. The top can be knocked off a nest or they can be dug up with a stick, and the good is winnowed from the bad using a special dish. They can be rolled into a ball and eaten, pounded with seed of spinifex (*Triodia* spp.), and perhaps long-leaf Mulga (*Acacia aneura*) in some parts, to make a type of damper, or mixed in with the manna from the gum trees.



Figure 9.2: Mulga, (*Acacia aneura*) seed pods. Image courtesy of Bruce Maslin.

Towards the end of **Karrlkunja** the **kipara** (bush turkey, *Ardeotis australis*) does a courting dance, usually at dawn and dusk; dances may be seen through until about September.² Later, parent birds protect their young chicks from danger by carrying them under their wings as they run away across the ground.³ The end of **Karrlkunja** season is heralded by **walatuttut** (possibly *Cracticus nigrogularis*, the pied butcher bird) calling out.

9.4 People

There is still plenty of water in the rockholes at this time of year. It's a good time to clean them out, but it's good to leave in some sediment and rocks to keep in the water in dry times. Sticks are placed into the rockhole so that lizards and birds can drink and then escape. People can put a lid on the ngamma holes (either a rock or sticks) to reduce evaporation during the Hot Time, and to keep the water clean. Also at this time of year the tubers of the **jungkajungka** vine are still sweet for eating.

¹There could be further collation of **Ngadju** people's knowledge of the details of the many types of bardi grubs, moths and the tree species with which they are associated

²Information from James Schultz.

³Information from Betty Logan.

Chapter 10

Discussion

It is notable from the previous chapters that Ngadju people retain a wide knowledge of their seasons and seasonal activities and generously discussed it with us. Notwithstanding it is likely that there is more to be documented about the Ngadju ‘calendar’ and its application to managing natural resources in Ngadju country. There are many reasons for this. We left it to our Ngadju collaborators to determine which knowledge they wished to share with us, and respect that we are not acceptable recipients of some knowledge. Further, there were limits on how much knowledge could be documented over the short timeframe of the project.

The Ngadju ‘calendar’ is largely an annual cycle of events in the biophysical landscape and the implications of these for Ngadju people. We emphasize that the timing of events is not tied to the European calendar system of 12 months; and it was a matter of chance whether particular events and indicators could be shown to us on the days of our visits to Ngadju country. In some cases we were able to identify and correlate, in the field, Ngadju knowledge and names of indicators or resources to corresponding knowledge and names in ecological science. Otherwise, we added further details found through cursory searches of the scientific and natural history literature. Any uncertainty about features of the calendar does not imply that Ngadju people are uncertain about their Indigenous ecological knowledge. On the contrary we have highlighted topics where we did not clearly identify how some features integrated into the complete system. Clearly, more time, being on country at the right time, and systematic consideration of the scientific literature, are ways to resolve questions about, and gaps in, the information we have recorded.

10.1 NRM, climate change, calendars and communities

Documentation of the Ngadju seasonal calendar provided important opportunities to discuss with Ngadju people their aspirations regarding natural resource management (NRM) in their

country, and their thoughts about potential impacts of climate change.

10.1.1 NRM issues

Across most of the workshops there was a notable desire, especially from respected elders, for pathways that would facilitate the greater involvement of Ngadju people in NRM. General concerns raised included limited funds available to pursue meaningful joint management with the Department of Environment and Conservation (DEC WA), a lack of jobs for young people, and a generally negative impact of the mining industry. Some aboriginal elders retain a working knowledge of Aboriginal fire regimes within the local region, and expressed frustrations that they could not be involved in contemporary fire management. As well, there was a strong sense that mining and related activity have led to a decline in groundwater, contributing for example to tree die-back around mines.

10.1.2 NRM solutions

Potential solutions offered by community members were to continue discussions in relation to joint management arrangements with DEC, to employ local Ngadju (as opposed to other) Aboriginal rangers through DEC or other programs, and for the community to take on the management of a prior station e.g. through the Indigenous Land Corporation (ILC). The Fraser Range area was seen as a particularly desirable option in this regard, as it was traditionally important country to many Ngadju. Previous attempts to purchase this property through the ILC have been unsuccessful. It was felt that an opportunity like this could help the younger members of the community avoid drug and alcohol problems, and would need to be led by community elders.

10.1.3 Signs of climate change

Climate change was a recognized issue, although opinions on its potential impacts were varied. One participant noted that sea levels have gone up and down in the region already, as evident from the old cliff-lines, and that climate change wasn't too different from these past changes. Many felt that they are already noticing changes:

- Some things don't flower,
- Gum trees aren't blossoming,
- Flowers are smaller,

- Animals are gone after long drought. For example, ‘dig into sand, rainbow coloured Geckos missing, lots of other things’.
- The heat is getting hotter,
- Bush foods are becoming scarcer, and water sources are drying up,
- Birds are dying out. Examples included ‘used to go and find nests of parrots and cockies in certain places but they are not there anymore’ and ‘Used to have pretty colourful Kingfishers coming when season good; haven’t seen now for 15–20 years’. Even crows and pigeons are declining.
- Many of these things could potentially affect apiarists and tourist operations.

There were also changes that were noticed over longer time-periods. **Marlu**, the red kangaroo is a traveller that moves in and out of regions. After 1942, Dorothy Dimer recalled, this animal started moving down from the north towards Fraser Range. People had to learn how to use them, as the grey kangaroo was a more typical source of food and skins.

10.1.4 Climate change and Ngadju identity

A further issue we raised about climate change concerned Ngadju identity. The boundary between Ngadju country and northern groups was explained to us as near the boundary between the eucalypt woodland and the Mulga/Spinifex country, and Ngadju elders often spoke of themselves as ‘the tall woodland people’. A not unlikely outcome of climate change is that the eucalypt woodlands will not persist in some areas. On asking what this might mean to Ngadju people they expressed that they would still define themselves by the waterholes, the granite rocks, the stories and dreamings, and so this place would still be their country.

10.2 Extending the project

This project has provided a preliminary collation of Ngadju seasonal knowledge. We hope that this might form the basis of a number of future community-based projects. Some suggestions are as follows:

- A Ngadju calendar — seek funding to prepare the calendar in the form of a colourful illustrated booklet, poster, calendar or other format.
- Monitoring indicators — school or community based projects might select elements of the calendar to monitor in the field. This might include noting the first flowering dates

of **jutumul** and **kunhapiti**, and the first ripe fruit of the **tumpari**, in different locations over a number of years; listening for and recording the date of the first call of the **walatuttut** (butcher bird); looking out for the **muntaar** (wild mushrooms); or identifying when the Seven Sisters are in the north-west sky just after sundown, and at this time looking for signs of emus laying eggs. In the short term this would help to solve questions about some of the indicators on the calendar. In the long-term, say over ten years or more, this might help identify trends in a changing climate.

- Adding other information — document other seasonal knowledge on the calendar as it is recalled or re-discovered. For example, the Mutitjulu Community at Uluru have words in their language for longer-term cycles such as drought ([Richards and Baker 1996](#), Chap. 1, page 4). Such terms were not recorded as part of this project but they may still be known or can be recovered from historical materials.
- Investigating where further research is required — such as identifying species names where there is uncertainty.
- Telling directions from Kurrajongs — examine many Kurrajong trees (*Brachychiton gregorii*) of differing ages and locations and note in which directions their bark is smooth or rough. Workshop participants reported that the smooth bark should be on the north side of the trunk.
- Mapping water trees — a series of field visits to Ngadju areas to map and photograph old water trees. Aim is to (a) flag these trees for priority fire protection, and (b) map cultural heritage of Ngadju.
- Making new water trees — a student-based long-term experiential project to maintain and pass on the skills for creating the traditional water tree.
- Documenting the many types of bardi grubs (each having its own colour and markings), their moths and the trees with which they are associated.

REFERENCES

- Abensperg-Traun, M.: 1989, Some observations on the duration of lactation and movements of a *Tachyglossus aculeatus acanthion* (Monotremata:Tachyglossidae) from Western Australia, *Australian Mammal Society* **12**, 33–34.
- Australian Biological Resources Survey: 2010, *Australian Faunal Directory*. Australian Biological Resources Study, Canberra., <http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/index.html>.
- Ayvazian, S. G., Bastow, T. P., Edmonds, J. S., How, J. and Nowara, G. B.: 2004, Stock structure of Australian herring (*Arripis georgiana*) in southwestern Australia, *Fisheries Research* **67**(1), 39 – 53.
- Bates, D. M.: 1912, Notes from Eucla district, National Library of Australia, Ms. 365, folio 28/71–74. Section VIII:Food. . . .
- Bayly, I. A. E.: 1999, Review of how Indigenous people managed for water in desert regions of Australia, *Journal of the Royal Society of Western Australia* **82**, 17–25.
- Brooks, J. P.: 1894, Water trees: To the Editor, *The West Australian* **30 January**, 6.
- Clarke, P. A.: 2009, Australian Aboriginal ethnometeorology and seasonal calendars, *History and Anthropology* **20**(2), 79–106.
- Davies, S.: 2003, Emus, *Grzimek's Animal Life Encyclopedia*, 2nd edition edn, Vol. Volume 8 Birds. I Tinamous and Ratites to Hoatzins, Gale Group, Farmington Hills, MI, pp. 83–87.
- Denniss, J.: 2010, *Ngajumaya dictionary [in preparation]*, Wangka Maya Pilbara Aboriginal Language Centre, Port Hedland.
- Department of Agriculture and Food WA: 2008, Dingo [Western Australia], *Technical Report Farmnote 133/2000*, Department of Agriculture and Food WA.

- Hall, N. and McKenzie, N. (eds): 1993, Part 9. Norseman – Balladonia study area. *The Biological survey of the eastern goldfields of Western Australia*, Records of the Western Australian Museum, Supplement No. 42, Western Australian Museum, Perth.
- Helms, R.: 1896, Anthropology, *Transactions of the Royal Society of South Australia* **16**(3), 237–332.
- How, R., Newbey, K., Dell, J., Muir, B. and Hnatiuk, R. (eds): 1988, Part 4. Lake Johnston – Hyden study area. *The Biological survey of the eastern goldfields of Western Australia*, Records of the Western Australian Museum, Supplement No. 30, Western Australian Museum, Perth.
- King, D. and Green, B.: 1993, Family Varanidae, in C. e. a. Glasby (ed.), *Reptilia — Squamata*, Fauna of Australia 2A, Australian Government Publishing Service, Canberra.
- Malecki, I. A., Martin, G. B., O'Malley, P. J., Meyer, G. T., Talbot, R. T. and Sharp, P. J.: 1998, Endocrine and testicular changes in a short-day seasonally breeding bird, the emu (*Dromaius novaehollandiae*), in southwestern Australia, *Animal Reproduction Science* **53**, 143–55.
- Meagher, S.: 1974, The food resources of the Aborigines of the south-west of Western Australia, *Records of the Western Australian Museum* **3**(1), 14–65.
- Nash, D.: 2002, Historical linguistic geography of south-east Western Australia, in J. Henderson and D. Nash (eds), *Language in Native Title*, AIATSIS Native Title Research Unit, Aboriginal Studies Press, Canberra, pp. 205–230.
- Newbey, K., Dell, J., How, R. and Hnatiuk, R. (eds): 1984, Part 2. Widgiemooltha – Zanthus study area. *The Biological survey of the eastern goldfields of Western Australia*, Records of the Western Australian Museum, Supplement No. 18, Western Australian Museum, Perth.
- Norbury, G. L., Coulson, G. M. and Walters, B. L.: 1988, Aspects of the demography of the Western Grey Kangaroo, *Macropus fuliginosus melanops*, in semiarid north-west Victoria, *Australian Wildlife Research* **15**, 249–255.
- Nowara, G. and Lenanton, R.: 2003, Western Australian Salmon managed fisheries status report, *Technical report*, Fisheries [Department] WA.
- Parnesan, C.: 2006, Ecological and evolutionary responses to recent climate change, *Annual Review of Ecology, Evolution, and Systematics* **37**(1), 637–669.
- Richards, E. and Baker, L.: 1996, *Minghiri: a natural history of Uluru by the Mutitjulu Community*, IAD Press, Alice Springs, N.T.

- Simpson, K. and Day, N.: 1999, *Field guide to the birds of Australia*, 6th ed. edn, Penguin Australia, Ringwood, Victoria.
- Thompson, G.: 1994, Activity area during the breeding season of *Varanus gouldii* (Reptilia : Varanidae) in an urban environment, *Wildlife Research* **21**, 633–41.
- Tindale, N. B.: 1939, Harvard and Adelaide Universites Anthropological Expedition, Australia. 1938-1939. Journal and notes by Norman B. Tindale. 2, South Australian Museum: Archives, AA 338/1/15/2.
- Tindale, N. B.: 1966, Journal of a trip to Western Australia in search of Tribal Data by Norman B. Tindale, 15 Mar to 21 Apr 1966, South Australian Museum: Archives; South Australian Museum, AA 338/1/27.
- Tindale, N. B.: 1974, *Aboriginal tribes of Australia*, Australian National University Press, Canberra.
- von Brandenstein, C. G.: 1980, *Ngadjumaja: an Aboriginal language of south-east Western Australia*, Institut für Sprachwissenschaft der Universität Innsbruck, Innsbruck.
- WA Herbarium: 2010, *FloraBase — The Western Australian Flora*. Department of Environment and Conservation, <http://florabase.calm.wa.gov.au/>.
- Watson, A., Judd, S., Watson, J., Lam, A. and MacKenzie, D.: 2008, *The extraordinary nature of the Great Western Woodlands*, Wilderness Society of W.A., [Perth, W.A.] :.
- Whitlock, F. L.: 1937, Birds of the Norseman District, Western Australia, *Emu* **37**, 106–114.

Appendix A

Workshop attendees

Table A.1: Attended one or more project workshops, May 2009–January 2010

Name	Location of first Workshop attended
Vanessa Bray	Goldfields Land & Sea Council, Perth
Paul Bowers	Dept. of Environment, Water, Heritage & Arts, Perth
Diane Clinch	Esperance
Allison Dimer	Coolgardie
Christopher Dimer	Coolgardie
Dorothy Dimer	Coolgardie
Edward Dimer	Boulder
Henry Dimer	Coolgardie
Maxine Dimer	Coolgardie
Nedelia Dimer	Norseman
Norma Dimer	Coolgardie
Rachael Dimer	Esperance
Rebecca Dimer	Esperance
Seann Dimer	Coolgardie
Warren Dimer	Esperance
Alison Donaldson	Coolgardie
Clem Donaldson	Coolgardie
Iris Donaldson	Coolgardie
Elizabeth Donaldson	Coolgardie
Phillip Donaldson	Coolgardie
Regina Donaldson	Leonora
Trevor Donaldson	Coolgardie

Fred Edwards	Esperance
Craig Evans	Tjirntu
Ronald Freeman	Coolgardie
David Graham	Norseman
John Graham	Norseman
Lurlene Graham	Norseman
Peggy Graham	Norseman
Rebecca Graham	Esperance
Shane Graham	Norseman
Sonny Graham	Esperance
Leon Green	Norseman
C. Hanon	Norseman
Veronica Hogan	Coolgardie
Yvonne Lawson	Norseman
Betty Logan	Coolgardie
Eddie McKenzie	Norseman
Michael O'Connor	CSIRO, Perth
Suzanne Prober	CSIRO, Perth
Tricia Ranger	Goldfields Land & Sea Council, Kalgoorlie
Charlotte Richards	Norseman
Robyn Richards	Norseman
Steven Rule	Norseman
Adrian Schultz	Norseman
Jack Schultz	Esperance
James Schultz	Tjirntu
Leslie Schultz	Coolgardie
Rick Schultz	Coolgardie
Valma Schultz	Tjirntu
Wendy Schultz	Tjirntu
Bonnie Smith	Norseman
Janice Tamwoy	Kalgoorlie
Bevan Thompson	Norseman
Phyllis Wicker	Norseman
Rule Wicker	Norseman
Terry Yorkshire	Esperance

Appendix B

Words in Ngadju (and neighbouring languages)

Each bold term in this report without an asterisk appended was stated to be a **Ngadju**/Mulba term, and is recorded here as spelled out by **Ngadju** workshop participants. Any bold term with an asterisk (*) appended is a word from a previous publication or manuscript source, and may or may not be a **Ngadju**/Mulba term.

bardingara* [Bates \(1912\)](#) recorded the term at Eucla as “the season of summer”. The correct orthography per the system in [Denniss \(2010\)](#) would be ‘partingara’. [19]

bulbaga* D. M. Bates recorded the term at Eucla, glossed to “the season of spring” ([Bates 1912](#)). The proposed **Ngadju** orthography for this term is ‘pulpaka’ ([Denniss 2010](#)). [19]

jarranh A honey-like sticky substance produced on Eucalypt leaves by insects. Referred to by Ngadju informants as ‘honey’. Spelling recorded at project workshops was ‘jarran’. [30]

jimparlu The squeecker bird. The exact species has not yet been identified. See **yimbalu***. Spelling recorded at project workshops was ‘jimbarlu’. [22, 56, 61]

jirti-jirti The Willie Wagtail, *Rhipidura leucophrys*. [22, 61]

jula* Emu (*Dromaius novaehollandiae*). This Ngadju term was not obtained during the workshops; this word is from [Denniss \(2010\)](#). See also **tulla***. [36, 61]

- jungkajungka** The tubers of this plant contain water that is drinkable. Possibly *Thysanotus patersoni*. Spelling recorded at project workshops was ‘junga junga’. [28, 32, 38, 41, 57]
- jutumul** Goldfields Daisy, flowering in the period August–January (*Olearia muelleri*). Spelling recorded at project workshops was ‘judumul’. [27, 39, 40, 46, 58]
- kaalhuny** Big goanna. (*Varanus gouldii*). Spelling recorded at project workshops was ‘gal-lung’. [31, 62]
- kaluru** The cold time of the year (typically has a duration of less than half of a solar year). D. M. Bates also recorded this term, prior to 1913 at Eucla from a Mirning informant, as meaning “the season of winter” (Bates 1912). [2, 19, 21, 35, 36, 39, 53]
- kalykurti** The butcher bird (*Cracticus torquatus*), a harbinger of bad news. Spelling recorded at project workshops was ‘kalgurie’. [22, 60]
- kanjimula*** D. M. Bates recorded term at Eucla, prior to 1913 at Eucla from a Mirning informant, as meaning “March fly season (November)” (Bates 1912). [19]
- karlkula** The Silky pear (*Marsdenia australis*). Orthography not determined. [30, 57]
- karrlkunja** The season of courting and mating. Second part of **Kaluru** time. Orthography not determined. [21, 27, 28, 35, 39–41, 60, 61]
- karulka** Small goannas. Uncertain whether this is the term for a single species or a generic term for goannas. Spelling recorded at project workshops was ‘garulga’. [31]
- kipara** The Australian bustard bird, also known as the bush turkey (*Ardeotis australis*). Spelling recorded at project workshops was ‘gibara/gibbara’. Orthography is from Dennis (2010). [30, 41, 60]
- kulpirr** Western grey kangaroo (*Macropus fuliginosus*). Spelling recorded at project workshops was ‘kulybirr’. [37, 62]
- kunhapiti** The Christmas tree — *Grevillea nematophylla*. Spelling recorded at project workshops were ‘kunabiddie’ and ‘gunabiddy’ (the latter per Betty Logan). [30, 32, 46, 58]
- kupilya ngarrin** The season of sleeping and hibernating. First part of **Kaluru** time. Spelling recorded at project workshops was ‘kubilya ngarrin’. [21, 29, 31, 35–37]
- kurral** Little round tubers found around the granites. Spelling recorded at project workshops was ‘gural’. [39]

kurrpartu* Helms (1896) records this term as ‘gurbarru’ at Fraser Range as meaning “small magpie (*Cracticus nigrogularis*)”. [60]

kutarla A species of yam found near rock country. Spelling recorded at project workshops was ‘gudarla’. [30]

maartay Days with mild weather that occurs at the end of season **Nganji**. This may be a borrowing into **Ngadju** from the English ‘mild day’. Spelling recorded at project workshops was ‘maarday’. [29, 31]

marlu The red kangaroo (*Macropus rufus*). Orthography is consistent with the scheme in Denniss (2010). [29, 30, 45, 62]

marrlinja Salmon gum (*Eucalyptus salmonophloia*). Orthography is consistent with the scheme in Denniss (2010). [33, 58]

minya Ants. Orthography is consistent with the scheme in Denniss (2010). [22]

mirnta A coastal camp. Spelling recorded at project workshops was ‘mindah’. [31]

munpark Bardi grubs. Spelling recorded at project workshops was ‘munbark’. [40, 41]

muntaar A sandplain mushroom that turns bluish on frying. It is as good as meat. Spelling recorded at project workshops was ‘moondaar’. [37, 46]

ngaajunh A species of plant commonly called ‘wild cucumber’. Spelling recorded at project workshops was ‘ngadjun’. [30]

Ngadju An Aboriginal language group of the south-eastern goldfields of Western Australia. The spelling of this term is used in the Native Title claim and throughout the workshop was ‘Ngadju’, however the more correct orthography, per the scheme in Denniss (2010), would be ‘Ngaju’. [5, 6, 19, 21, 22, 27, 30, 34, 36, 38, 41, 52, 54, 58]

nganji The hot season; occurs as the second part of **Ngarnngi** time. Spelling recorded at project workshops was ‘ngantji’. [19, 21, 24, 30–32, 54]

ngapaya White ants. Spelling recorded at project workshops was ‘ngabia’. [28, 39, 41]

ngarnngi The hot time of the year (typically has a duration of more than half of a solar year). Also spelled as *Ngurrngi* by some participants. Orthography is probably to be consistent with the scheme in Denniss (2010). [2, 21, 24, 25, 29, 40, 54]

ngawu The egging season. The second part of **Ngarnngi** time. Spelling recorded at project workshops was ‘ngow’. [21, 22, 24, 25, 27, 28, 39, 40]

- ngura** A species of plant commonly called ‘wild grapes’. Spelling recorded at project workshops was ‘ngurra’. [30]
- ngurpany** Pups of the dingo (*Canis lupus dingo*). Spelling recorded at project workshops was ‘ngubarno’. [36–38, 61]
- parrul*** Helms (1896) records the term ‘barrul’ at Fraser Range as meaning “turkey (*Otis australis*)”. [60]
- pikurla** An insect-made white scale that appears on gum tree leaves. Spelling recorded at project workshops was ‘bigurla’. [37]
- pikurta** The Euro kangaroo (*Macropus robustus*). Orthography is consistent with the scheme in Denniss (2010). [30, 62]
- pilerli** Black morrell tree (*Eucalyptus melanoxydon*). Spelling recorded at project workshops was ‘billerli’. [33, 58]
- pukan** A ti-tree. Probably a species of *Leptospermum* or *Melaleuca*. The manuscripts of (Bates 1912) contain the spelling as ‘pukany’ (J. Denniss, pers. comm.). [30, 36, 58]
- pula** Carpet snake/python (*Morelia spilota*). [37, 62]
- punjeri** A species of pigface. Probably *Disphyma crassifolium*. Spelling recorded at project workshops was ‘boonjeri’. [30, 57]
- tulla*** A term recorded in 1891 at Fraser Range as meaning “Emu” (Helms 1896). [52]
- tumpari** Quandong tree (*Santalum acuminatum*). Spelling recorded at project workshops was ‘doombari’. [27, 30, 46, 56, 59]
- walatuttut** Probably the pied butcher bird, possibly *Cracticus nigrogularis*. Spelling recorded at project workshops was ‘walladooddoot’. [41, 46, 60]
- wananga** Yam-like wild potatoes growing around the lake and granite country. Orthography is consistent with the scheme in Denniss (2010). [39]
- wanyarr** A water tree. A newspaper report from 1891 gives the spelling as ‘woma’ (Brooks 1894). [34]
- warntu*** Mallee fowl bird, *Leipoa ocellata*. This term is similar to one recorded by Daisy Bates. In the project the participants determined a spelling of ‘gnow’, which appears similar to south-west and Western Desert terms for this bird. [40, 61]

winaka A regular southerly wind that blows through Esperance on the south coast and northwards through Norseman and to Coolgardie. Known in the region as the ‘Esperance Doctor’. Spelling recorded at project workshops was ‘winaga’. [29]

yalalonga The female fruit of the **tumpari** (*Santalum acuminatum*) tree. Ngadju informants stated this term to derive from their word for female. Appears consistent with scheme in [Denniss \(2010\)](#). [19]

yimbalu* [Helms \(1896\)](#) records this term at Fraser Range as meaning “black magpie (*Strepera* sp[ecies].)”. See **jimparlu**. [52]

yurna The Balladonia name for the Western bobtail lizard (*Tiliqua rugosa*). Spelling recorded at project workshops was ‘yurrna’. [27, 28, 62]

Appendix C

Plant and Fungi species

The following section is a list of plant species that are mentioned throughout the report. Species names and other details were checked using Florabase ([WA Herbarium 2010](#)).

Latin name	Ngadju name	English common name	Notes	Page List
Creepers→				
<i>Marsdenia australis</i>	karlkula	Silky pear	Identity confirmed from specimen sent by Betty Logan. Species doesn't grow in southern half of project area. Betty also noted that the blossoms are very nice to eat, and are now (in November 2009) very plentiful due to good rains.	30 , 53
<i>Rhyncharrhena linearis</i>		Bush bean	Also named as 'booya bean' which may be a hybrid Ngadju-English term. Doesn't occur in the southern half of the project area.	30
<i>Thysanotus patersoni</i>	jungkajungka	Twining fringed lily	A leafless climber with watery tubers that provide water in times when surface water is scarce.	28 , 38 , 53
Ground cover→				
<i>Disphyma crassifolium</i>	punjeri	Round-leaved pigface	A species of pigface; assumed identity given distribution match to FloraBase description (coastal dunes, saline areas inland, samphire flats); flowers at most times.	30 , 55

Latin name	Ngadju name	English common name	Notes	Page List
<i>Sarcozona praecox</i>		Sarcozona; Pigface	A species of small pigface found in the granite rock country (and also around salt lakes). Said to be ‘a good eating one’. Flowers from July to September. Assumed identity given distribution match to FloraBase.	30
Trees and Shrubs→				
possibly <i>Eucalyptus clelandii</i>			Eucalypt that flowers on hills when honey is ready.	30
possibly <i>Leptospermum</i> or <i>Melaleuca</i>	pukan	Ti-tree	A type of ti-tree.	30
<i>Acacia aneura</i>		Mulga	Long-leaf Mulga tree	41
<i>Alogyne hakeifolia</i>		Wild hibiscus	Wild hibiscus flower. Verified by plant shown to us by Edward (Snowy) Dimer, Esperance-Norseman road which was flowering in early November; Florabase indicates flowering August–February.	25 , 26
<i>Brachychiton gregorii</i>		Kurrajong	The Kurrajong tree. Helms (1896) recorded the term “darga” at Fraser Range station.	32 , 46
<i>Eucalyptus melanoxydon</i>	pillerli	Black morrel	A species used to make water trees, Dorothy Dimer showed the authors one at Salmon Gums.	33 , 55
<i>Eucalyptus salmonophloia</i>	marrlinja	Salmon gum	Used for water trees, young shoots also used in cooking. Verified in the field — James and Valma Schultz showed the authors a Salmon gum water tree near Tjirntu-Parapara.	33 , 54
<i>Grevillea nematophylla</i>	kunhapiti	Christmas tree; water tree	An indicator tree for Ngadju people that the hot season has started. Verified from specimen sent by Betty Logan from Kalgoorlie area. Florabase verifies flowering time November–December. Note the alternative spellings in the Ngadju wordlist.	30 , 32 , 53
<i>Olearia muelleri</i>	jutumul	Goldfields daisy	An important indicator plant. Dorothy Dimer verified from plants growing around Norseman, FloraBase notes August–January flowering (in Norseman it had finished by early November).	39 , 40 , 53

Latin name	Ngadju name	English common name	Notes	Page List
<i>Santalum acuminatum</i>	tumpari	Quandong tree	Helms (1896) recorded “Dumbai” at Fraser Range. The term for the female fruit of this plant is ‘yagubiddy’, which Ngadju informants stated is a term that derives from their word for female.	27 , 30 , 55 , 56
<i>Santalum spicatum</i>		Sandalwood	The fruit is considered edible.	30
<i>Xanthorrhoea</i> spp.		Grasstree	Referred to as the ‘blackboy’ by some Ngadju participants.	30

Appendix D

Animal species

The following section is a list of animal species that are mentioned throughout the report. Species names and other details were checked using Australian Biological Resources Survey ([Australian Biological Resources Survey 2010](#)).

Latin name	Ngadju name	English common name	Notes	Page List
Birds→				
possibly <i>Cacomantis pallidus</i>		Pallid cuckoo	Ngadju people refer to the 'Mocking bird'; Species identification tentative; John Graham inferred from picture, colour, and description of migratory habit in Simpson and Day (1999)	27
possibly <i>Cracticus nigrogularis</i>	walatuttut	Pied butcher bird	Its call signals that Karrlkunja season is finishing. At Fraser Range in 1891 kurrpartu* was recorded as the name for “small magpie (<i>Cracticus nigrogularis</i>)” (Helms 1896).	41 , 55
<i>Ardeotis australis</i>	kipara	Bush turkey; Australian bustard	parrul* in Helms (1896) .	30 , 41 , 53
<i>Cracticus torquatus</i>	kalykurti	Grey butcher bird	A harbinger (bringer) of bad news.	22 , 53
<i>Cygnus atratus</i>		Black swan		22

Latin name	Ngadju name	English common name	Notes	Page List
<i>Dromaius novaehollandiae</i>	jula*	Emu	Mating occurs in the cooler months of May and June. During the breeding season, males experience hormonal changes, losing their appetite and constructing a rough nest (Malecki et al. 1998). The pair mates every day or two, and every second or third day the female lays one of an average of 11 (and as many as 20) very large, thick-shelled, dark-green eggs. The number of eggs varies with rainfall (Davies 2003).	37, 52
<i>Egretta novaehollandiae</i>	warntu*	White-faced heron		22
<i>Leipoa ocellata</i>		Mallee fowl	The mallee fowl or hen. A source of eggs for food; indicator of Karrlkunya season.	40, 55
<i>Pelecanus conspicillatus</i>		Australian pelican		22
<i>Petrochelidon nigricans</i>		Tree martin		27
<i>Rhipidura leucophrys</i>	jirti-jirti	Willie Wag-tail	A flycatcher bird that can be a harbinger of bad news.	22, 52
<i>Strepera versicolor</i>	jimparlu	Grey currawong, Rain bird, Squeaker bird	Dorothy Dimer identified in Simpson and Day (1999).	22
<i>Vanellus miles</i>		Plover (Masked lapwing)		27
Mammals and monotremes→				
<i>Canis lupus dingo</i>	ngurpany	Dingo	Female dingoes have only one well-defined breeding season each year; they come on heat between March and May and whelp between June and August. Litters are rarely born at other times.(Department of Agriculture and Food WA 2008)	37, 55
<i>Lasiornhinus latifrons</i>		Southern hairy-nosed wombat		27

Latin name	Ngadju name	English common name	Notes	Page List
<i>Macropus fuliginosus</i>	kulpirr	Western grey kangaroo	In a Victorian study, only 46% of females bred during drought, compared with 100% two seasons later (Norbury et al. 1988).	37 , 53
<i>Macropus robustus</i>	pikurta	Euro' kangaroo		30 , 55
<i>Macropus rufus</i>	marlu	Red kangaroo		30 , 54
<i>Tachyglossus aculeatus acanthion</i>		Porcupine; Short-beaked echidna	Breed in about June. young leaves pouch by about November (Abensperg-Traun 1989).	30

Marine Animals→

<i>Arripis georgianus</i>		Australian herring	Annual summer westward migration along the southern coast followed by a summer–autumn spawning in Western Australia: (Ayvazian et al. 2004)	30
<i>Arripis truttaceus</i>		Western Australian salmon	Salmon form very large schools in southern Australian waters and head westwards in mid to late summer, continuing up the west coast as far as Perth. (Nowara and Lenanton 2003)	30

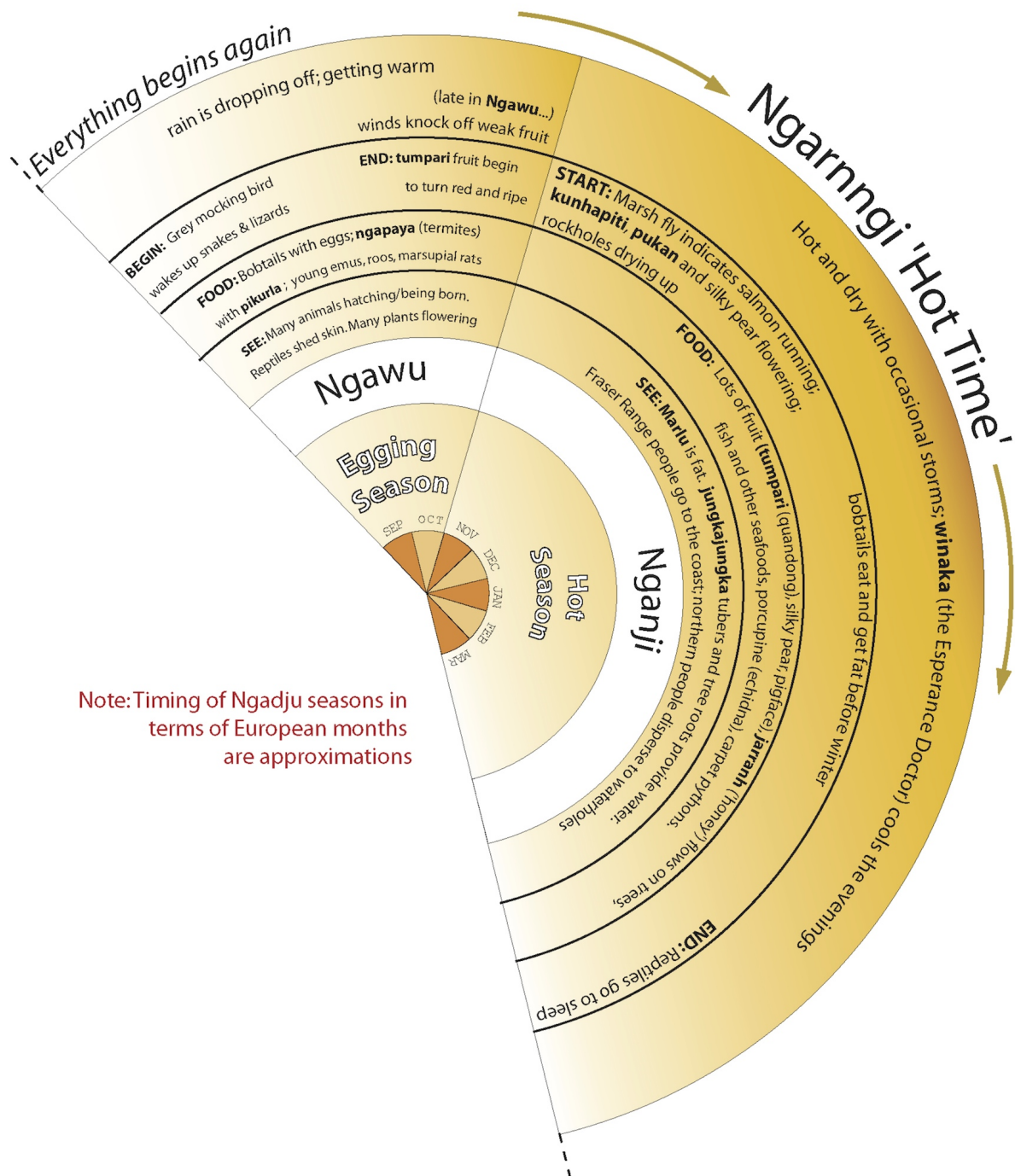
Reptiles→

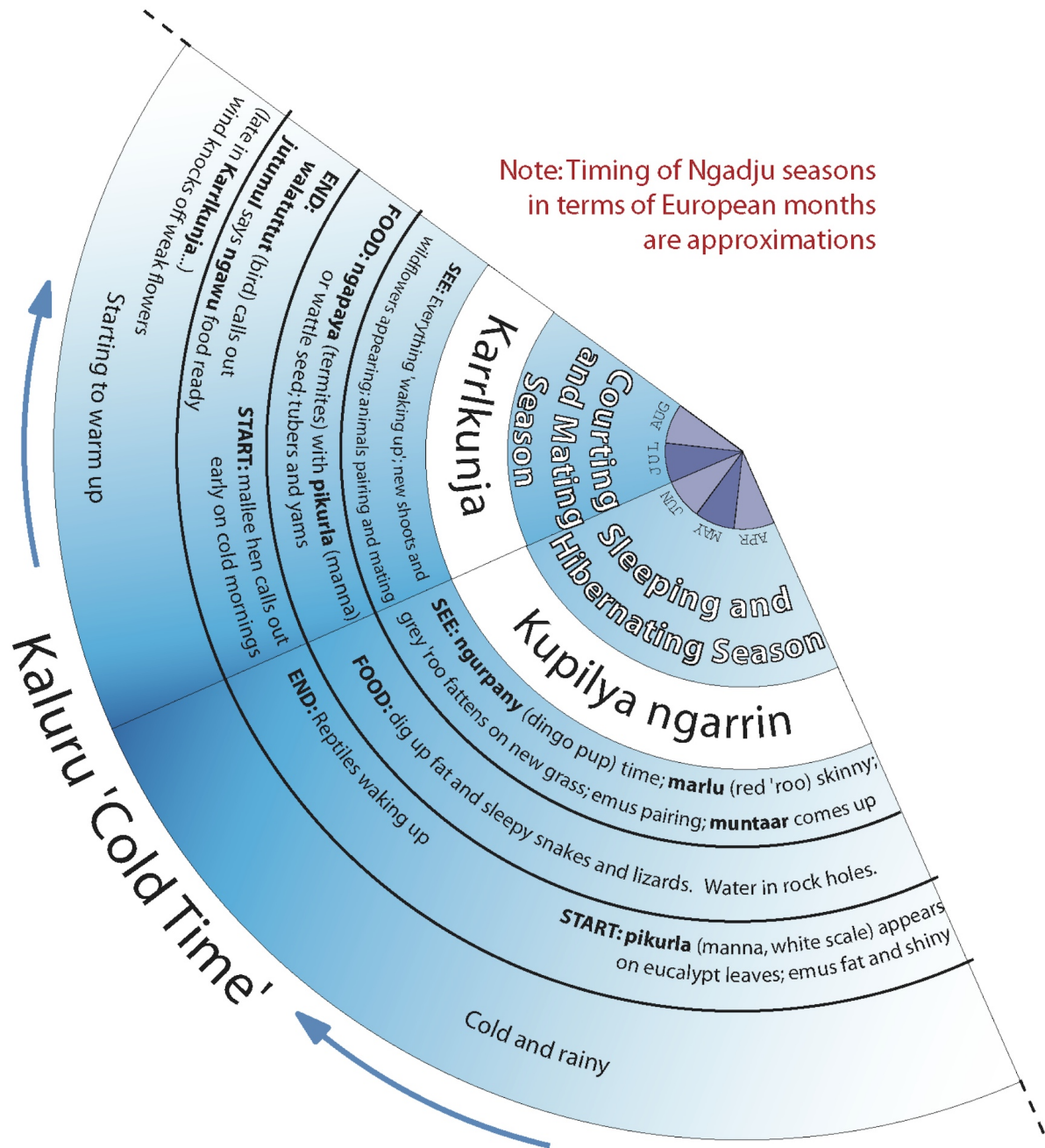
<i>Morelia spilota</i>	pula	Carpet snake; carpet python	Occurs in the south-east half of the Great Western Woodlands	37 , 55
<i>Tiliqua rugosa</i>	yurna (Bal-ladonia)	Western bob-tail	Helms (1896) recorded the term “bigurru” for this species at Fraser Range.	27 , 56
<i>Varanus gouldii</i>	kaalhuny	Big goanna; termite nest-ing goanna (Gould's Goanna); sand goanna	Helms (1896) recorded the term “galga” for this species at Fraser Range in 1891. This animal breeds (September–)November–December, and eggs hatch c. 38 weeks later, i.e. (June–)August–September. Lays eggs in termite mounds which keep eggs at uniform temperature (King and Green 1993)(Thompson 1994).	31 , 53

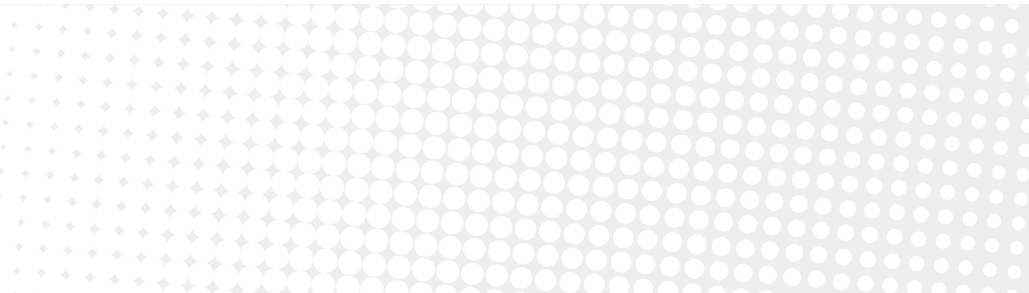
Appendix E

Calendar Circle in close-up

This chapter displays the two parts of the circular calendar shown in Chapter 5 in close-up, so that readers can more easily see the detail. The same detail is also described in the corresponding chapter for each season.







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