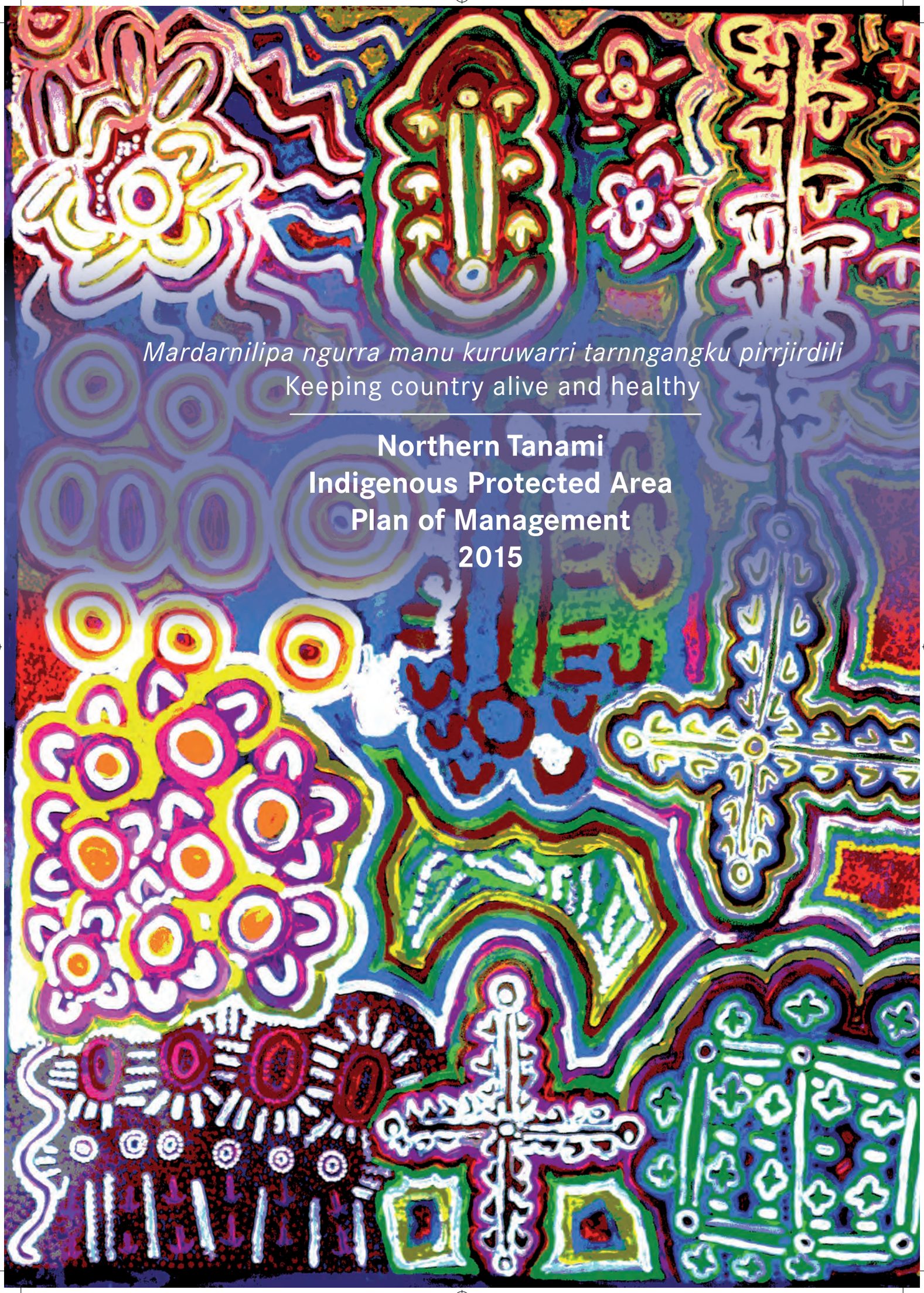


Mardarnilipa ngurra manu kuruwarri tarnngangku pirrjirdili

Keeping country alive and healthy

Northern Tanami Indigenous Protected Area Plan of Management 2015

Mardarnilipa ngurra manu kuruwarri tarnngangku pirrjirdili

Keeping country alive and healthy

Northern Tanami Indigenous Protected Area Plan of Management 2015

CENTRAL LAND COUNCIL

Northern Tanami IPA
INDIGENOUS PROTECTED AREAS

This initiative is funded by the Australian Government

National Library of Australia Cataloguing-in-Publication entry
Central Land Council (Australia)
Mardarnilipa ngurra manu kuruwarri tarnngangku pirrjirdili – Keeping country alive and healthy: Northern Tanami Indigenous Protected Area Plan of Management 2015

ISBN 978 0 99228 500 5

1. Aboriginal Australians–Land tenure–Northern Territory. 2. Protected areas–Northern Territory–Management. 3. Natural resources conservation areas–Northern Territory–Management. 4. Environmental management–Northern Territory–Tanami Desert (N.T.)

333.720994291

Front and Rear Cover Artwork:
In 2005, a group of *wurkumanu* (senior women) from Lajamanu produced two paintings illustrating aspects of the complex pattern of traditional landownership and cultural responsibility in the northern Tanami. IPA Management Committee member Margaret Nungarrayi Martin once pointed to the paintings and stated, '*This is country*'. Such a statement is possible because each *Jukurrpa* track is linked to a *kuruwarri* (sacred design/law), which is in turn associated with a particular tract of country.

Kuruwarri are not static or fixed. Senior knowledge holders such as these women combine primary and secondary *kuruwarri* in diverse ways to invoke or recall a place, which is also its *Jukurrpa*. Just like an effective plan of management, the *kuruwarri* can be encountered from different angles and can provide guidance in a variety of ways depending on the context. As such, these IPA paintings depict much more than a narrow conception of geographical places; they contain some guiding principles for looking after country and culture and are, therefore, part of the essential foundation of the Northern Tanami IPA Plan of Management.

The following artists were involved in producing these paintings:

- Kumanjayi Napangardi Granites
- Lily Nungarrayi Hargraves
- Myra Nungarrayi Herbert
- Biddy Nungarrayi Jurrah
- Biddy Nungarrayi Long
- Judy Napangardi Martin
- Margaret Nungarrayi Martin
- Kumanjayi Napangardi Robertson
- Gladys Napangardi Tasman
- Molly Napurrurla Tasman
- Rosie Napurrurla Tasman

Sites and tracks associated with *Jukurrpa* for *ngatijirri* (budgerigar – *Melopsittacus undulatus*), *mala* (rufous hare-wallaby – *Lagorchestes hirsutus*), *ngurlu* (native seeds), *wardilyka* (bush turkey – *Ardeotis australis*), *wilyari* (native truffle) and *yarla* (bush potato – *Ipomoea costata*) are some of the *kuruwarri* represented in the two paintings.

Contents

Figures

Tables

Text Boxes

Acknowledgements

The following people are acknowledged for their contributions to the development of this plan:

- Members of the IPA Management Committee and other senior traditional owners, in particular:

  Kumanjayi Jampijinpa Bunter, Henry Jakamarra Cook, Paddy Jungarrayi Doolak, Lily Nungarrayi Hargraves, Myra Nungarrayi Herbert, Biddy Nungarrayi Jurrah, Margaret Nungarrayi Martin, Teddy Jupurrurla Morrison, Jerry Jangala Patrick, Wanta (Steven) Jampijinpa Patrick, Biddy Napangardi Raymond, Molly Napurrurla Tasman and Rosie Napurrurla Tasman
- The North Tanami Rangers (formerly Wulaign Rangers) present and past, including:

  Silas Allen, Lazarus Hargraves, Dione Kelly, Edmond Kelly, Jefferson Lewis, Ryan Miller, Anthony (Nebo) Rex, Steven Robertson, Quincy Samuels and Lynette Tasman
- CLC Staff (present and past), including:

  Jenny Atkins, Tina Bain, Hugh Bland, Kate Crossing, Nic Gambold, Andy Harrison, Jamie Moore, Colleen O'Malley, Julia Perdevich, Sam Rando, Richard Tuckwell and Jane Walker.
- *Kardiya* experts:
  Dave Albrecht, Steve Eldridge, Miles Holmes and Rachel Paltridge

Throughout this document, the Warlpiri term '*Yapa*' is used to denote all Aboriginal people with traditional affiliations to country within the IPA; the intent is to convey equal importance to all Aboriginal people. Similarly, while only Warlpiri language words are used, the intent is to convey equal importance to other Aboriginal languages spoken within the IPA, including Gurindji, Nyininy and Pilingarna. These decisions reflect practical editing concerns and are in no way intended to suggest greater importance of one language group over another.

Ngurra-kurlangu – Our Vision

Statements from Traditional Owners

Ngurra nyampuju pirrjirdi manu kapu tarnngajuku nguna pirrjirdijiki nganimpakuju. Pirlirrpa wankaru. Ngurungku kanganpa yajarni manu kagalpa yuka puntu warlalja. Ngula kapu-narlu mardarni kirdana manu ngati nyanu kulangu nguru kuruwarrikirli. Kuruwarri nganimpa nyangu ngurlaju tarnngajuku nyurru-warnu.

Nguru ngalaju palka ka karrimi/ngunami ngalipakuju, palka karliparla nyina nguru nyampukuju. Pirrjirdirli yijardurlu kajilipa nguru warra-warra-kanyi, kajirlipa ngurungka wapa manu kajirlipa milya-pinyi tarnngajuku. Yurlka karliparla nguruku.

Palka jarrijarlipa manurlupa wiri-jarrija nguru nyampurla, pina-jarrijarlipa manu. Kajirlipa-jana Jalangu-warnu pinarri-mani yijala, kajilipa walku-jarri kapurlu kurdu-kurdulu ngalipa-nyangurlu nguru mardarni pirrjirdi nagalipa-piyarlu.

Nyampu IPA ngulaju ngalipaku, IPA-rli ngulaju ngurrjungku kangalpa milki-yirrarni yapaku nyarrpa ngurungka nyinanjaku jintangkaku nyurru-wiyi parlipa wapaja ngurungkaju, IPA-rlilki kangalpa kulpari kanyi ngurarra-kurraju milya-pinjaku manu kajirlipa-jana kurdu-kurdulku pinarrimani nyanungulku. Ranger patu kalu pinarrijarri yapa-kurlangurla manu kardiya-kurlangurla nyarrparlu nguru mardarnijaku. Ngurrju-nyayirni kurdu-warnu-patuku nguruju mardarnijaku, nyanungu paturlanguku.

This country is strong and will remain strong for us. It is alive in spirit. Country always welcomes us and reminds us that we are family. We have the responsibility to look after our father's and mother's country by following the Law. We don't make the Law; our Law is handed down from generation to generation.

Country is there for us to live on and use and we are there for it. It's a strong belief that we should hunt and look around country, walk on the same ground and remember it. This country is us … we love this country.

We were born and grew up in this country. We were taught on country and we want to teach our young ones too. When we pass on, our children can hold country strong, like we do now.

This IPA is for us. It gives us a better chance to look after country and people, and pass our connection on. It's been a long time since we've walked the country. This IPA gives us the opportunity to go back, remember, and use it. It also helps our young people become more knowledgeable. We have rangers learning both *Yapa* and *Kardiya* ways of managing country. It's good for our young people to look after country; it's their country too.

Translated by Valerie Napanangka Patterson and Annette Nampijinpa Patrick

"The IPA has taken a first step. It's not a government thing, it's for Aboriginal people. We have a better chance to tell the story; this is giving us a better chance than before to look after country and people, and pass our connection on."
Wanta (Steven) Jampijinpa Patrick

"Sometimes we didn't get a chance to do this work in the past. The IPA, yes we've got the feeling it's off the ground. The rangers are doing it; we want to do more."
Kumanjayi Jampijinpa Bunter

"This IPA, it's the best medicine … it's going back to country. Country can't do it by itself, it needs Yapa*."*
Margaret Nungarrayi Martin

"It is land management, the rangers, they are really important for us. Through the rangers they will get the power to work in a Yapa *way."*
Kumanjayi Jampijinpa Bunter

"Rangers are coming up with a thousand different things; they are spreading out now."
Kumanjayi Jampijinpa Bunter

"Once old people get out of cars they have tears in their eyes. They have so much love for that place. You show yourself; you have that country's spirit."
Kumanjayi Jampijinpa Bunter

Rosie Napurrurla Tasman, ranger Jonathan Dixon, and Teddy Jupurrurla Morrison at Kungkala rockhole

"This IPA can celebrate life, country and people … We are proud. We can't be Warlpiri without our country."
Kumanjayi Jampijinpa Bunter, Wanta (Steven) Jampijinpa Patrick and Steven Japanangka Dixon

"We want to use rangers like Kurdungurlu *– caretaker – looking after country … just like the old people used to do when they were* Kurdungurlu*."*
Kumanjayi Jangala Martin and Kumanjayi Jampijinpa Bunter

How to Use this Plan

PART A BACKGROUND (Chapters 1–4)

Chapter 1 Introduction

Contains introductory information that provides a regional context with regards to *Yapa* culture, demographics, the ecology, land tenure, land use and infrastructure in the IPA.

Chapter 2 Significance

Documents the significance of country in the IPA through both *Yapa* and *Kardiya* perspectives.

Chapter 3 Management Framework

Provides details on the purpose, scope, cultural foundation, planning processes, governance and management partners of *Mardarnilipa ngurra manu kuruwarri tarnngangku pirrjirdili*.

Chapter 4 Overarching Management

Provides detailed management information with regards to the IPA management structure and decision-making processes, together with cultural protocols, key management principles, concepts and themes.

PART B MANAGEMENT STRATEGIES (Chapters 5–9)

Chapter 5 *Kuruwarri Yapa-kurlangu-kurlu* – Looking after Culture

Provides detailed background information; describes related issues and opportunities and corresponding management objectives and strategies regarding *Yapa* cultural values, knowledge and customary practices.

Chapter 6 *Warrawarra kanyi ngurra* – Looking after Country

Contains detailed background information; sets out key issues and opportunities and associated management objectives and strategies pertaining to soils, water places, plants, animals and fire management in the IPA.

Chapter 7 *Pina jarrijaku jirramala juku* – Two-Way Education and Training

Comprises background information, descriptions of key issues and opportunities and management objectives and strategies regarding *Yapa* and *Kardiya* learning opportunities and education and training in relation to the IPA.

Chapter 8 *Ngurra ngampulaju warrki panujarlu* – Jobs and Economic Development

Contains background information, discussions on related issues and opportunities and associated management objectives and strategies concerning the creation of sustainable on-country livelihoods for *Yapa* in the IPA.

Chapter 9 Monitoring, Evaluation and Review

Describes management requirements for monitoring, evaluation and reporting against the four key management themes of *Mardarnilipa ngurra manu kuruwarri tarnngangku pirrjirdili*

Chapter 10 Plan Implementation

Establishes a prioritisation hierarchy that will be applied to all management strategies contained in this plan.

PART C APPENDICES

Contains appendices that provide detailed information related to certain matters addressed in Parts A and B of the plan.

Summary of the Plan

"This is a strong plan. People can feel the right story for how we want to manage country."

Rosie Napurrurla Tasman

This document, '*Mardarnilipa ngurra manu kuruwarri tarnngangku pirrjirdili* – Keeping Country Alive and Healthy' is the Plan of Management for the Northern Tanami Indigenous Protected Area (IPA).

Warlpiri and Gurindji traditional owners have worked alongside Central Land Council (CLC) staff over 15 years to plan and implement management of the Northern Tanami IPA, which was declared at a ceremony in Lajamanu in April 2007.

The IPA program, an initiative of the Australian Government, aims to support indigenous people to manage their country for the enhancement of biodiversity and cultural values. Implicit in the protection of these values is recognition of social benefits for participating indigenous people and communities, including improved health and education outcomes through involvement in land management activities.

IPA declarations are based on traditional owners entering into voluntary agreements to add their lands to the National Reserve System (NRS) (Australia's system of protected areas). IPAs are classified according to International Union for Conservation of Nature (IUCN) protected area categories.

The Northern Tanami IPA meets the IUCN definition of a protected area with sustainable use of natural resources and is declared as a Category VI reserve to help 'conserve ecosystems and habitats, together with associated cultural values and traditional natural resource management systems' (Dudley 2008, p. 22).

This plan follows on from the original draft Plan of Management developed in 2006 as part of feasibility planning for the IPA and has undergone significant changes as a result of on-country planning activities and a series of planning workshops attended by IPA Management Committee members and other traditional owners in 2009.

The plan outlines a suite of strategies directed at improving management of cultural and natural resources in the IPA. Each of these strategies is based on an appreciation of the central role of Warlpiri and Gurindji culture and of *Yapa* customary knowledge and practices in maintaining a healthy environment. The strategies are also informed by the need to combine traditional ways of managing country with new approaches to address new threats.

The management objectives and strategies for *Mardarnilipa ngurra manu kuruwarri tarnngangku pirrjirdili* are grouped thematically, reflecting the primary goals of traditional owners in managing their country. A summary of values, issues and opportunities, and associated management objectives and strategies is presented for each of the following four themes:

- *Kuruwarri Yapa-kurlangu-kurlu* – Looking after Culture

This theme includes strategies that sustain and strengthen customary and cultural management practices and support indigenous knowledge retention and transfer. These are central to maintaining the natural and cultural resources of the region and the social and spiritual wellbeing of the region's landowners.

- *Warrawarra kanyi ngurra* – Looking after Country

This theme includes strategies that marry *Yapa* and *Kardiya* management knowledge and skills aimed at enhancing the condition of cultural and biodiversity values in the region and mitigating key threatening processes.

- *Pina jarrijaku jirramala juku* – Two-Way Education and Training

This theme covers processes and approaches to strengthen and improve *Yapa* and *Kardiya* education and training outcomes, raise community awareness about threats to country and educate land managers in both traditional and Western approaches to caring for country.

- *Ngurra ngampulaju warrki panujarlu* – Jobs and Economic Development

This theme summarises existing on-country employment opportunities and includes strategies to help build sustainable *Yapa* livelihoods that deliver employment and economic development outcomes for traditional owners in the IPA.

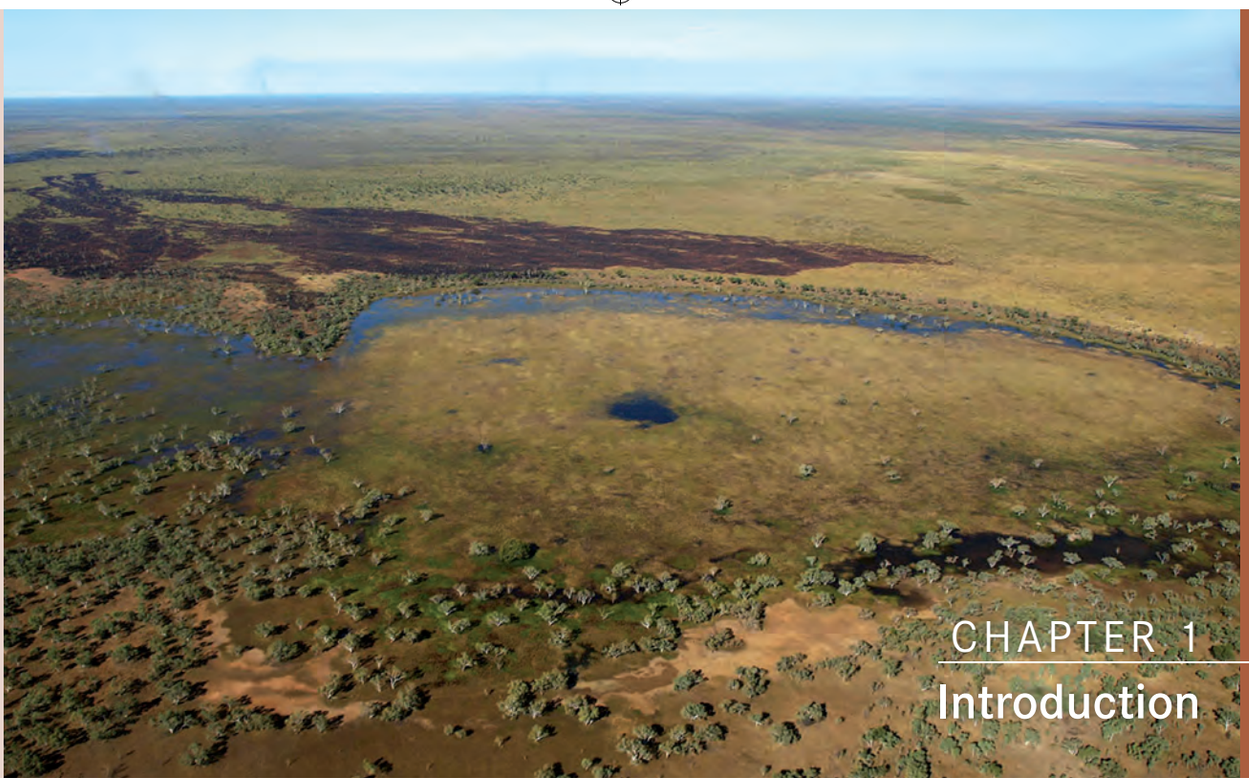
Underpinning all of the management strategies identified in this plan is a set of *Guiding Principles and Cultural Protocols* developed by IPA Management Committee members (refer Section 4.2). These principles and protocols inform how all work is to be done in the IPA so that customs, practices and sites are protected and respected, and so staff from partner organisations are aware of, and observe, appropriate cultural protocols and behaviours.

The Northern Tanami IPA is managed in accordance with traditional governance arrangements through an IPA Management Committee comprising representatives from the two main language groups in the region: Gurindji (northern) and Warlpiri (southern, eastern and western). An IPA Advisory Committee of scientific specialists and government agency representatives provides technical advice to the Management Committee. The management strategies contained in this plan are addressed to and will be implemented primarily by members of the North Tanami (formerly Wulaign) Rangers, a federally funded team of six to ten indigenous rangers based in Lajamanu.

To monitor the effectiveness of the strategies presented here, a five-year monitoring, evaluation, reporting and improvement (MERI) plan for the Northern Tanami IPA project will be prepared within 12 months of approval of this Plan of Management. The MERI plan will define what will be observed and measured in order to evaluate the success of the strategies contained in this plan in achieving management goals. Periodic reviews of the MERI plan will underpin an adaptive approach to management and guide any necessary changes to the provisions of this plan.

PART A

BACKGROUND



CHAPTER 1
Introduction

Aerial view of Winnecke Creek Floodout showing recent fire scars

1.1 Location and Regional Setting

The Northern Tanami Indigenous Protected Area (IPA) is located in the northern portion of the Tanami Desert in the Northern Territory between latitudes 20º 01' and 18º 10' South and longitudes 129º 26' and 132º 01' East (Figure 1).

Declared in 2007, the IPA incorporates an area of approximately 40,050 km² (4,005,000 ha) of inalienable Aboriginal freehold land, including significant portions of the Central Desert and Hooker Creek Aboriginal Land Trusts (ALTs). The IPA abuts four other ALTs (Yingualyalya, Purta, Mount Frederick and Karlantijpa North) on its western and eastern boundaries, and to the

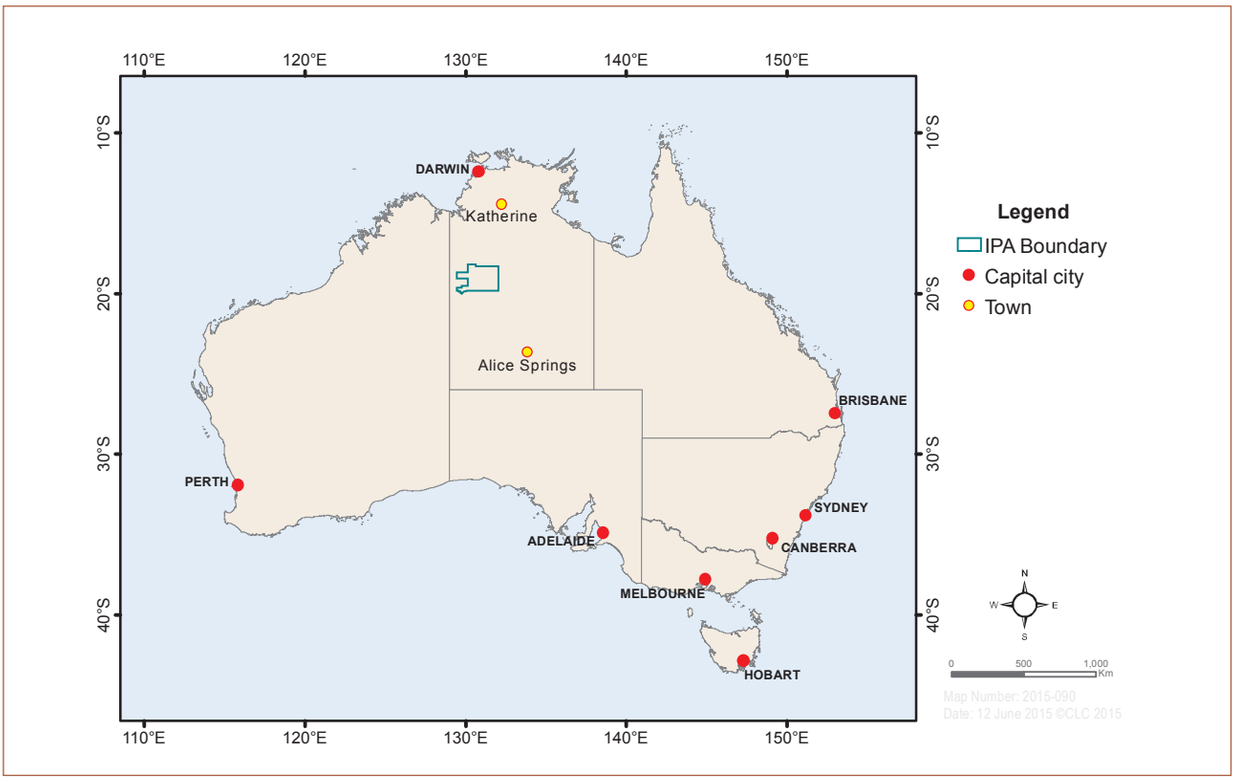
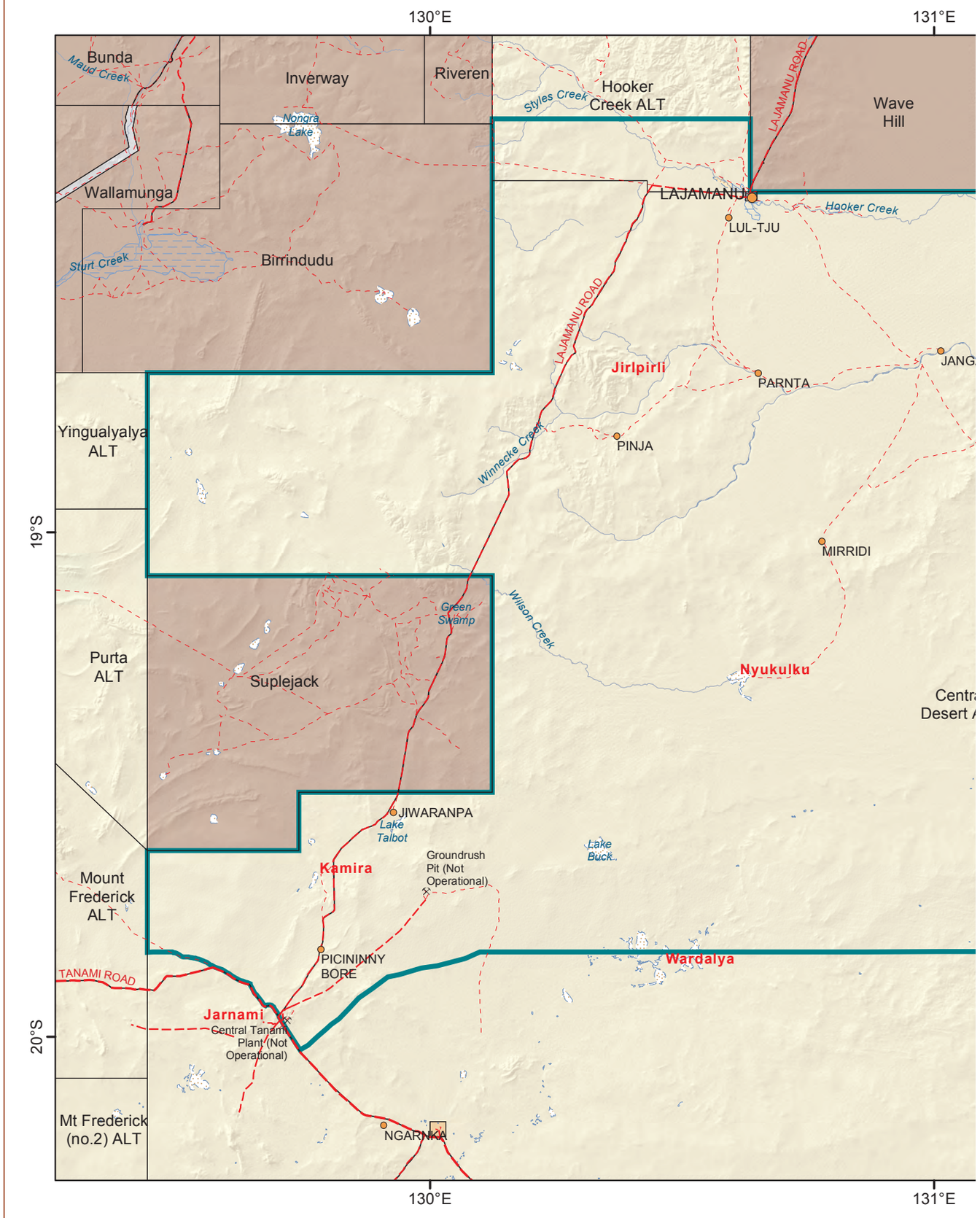


Figure 1 Location of the Northern Tanami IPA



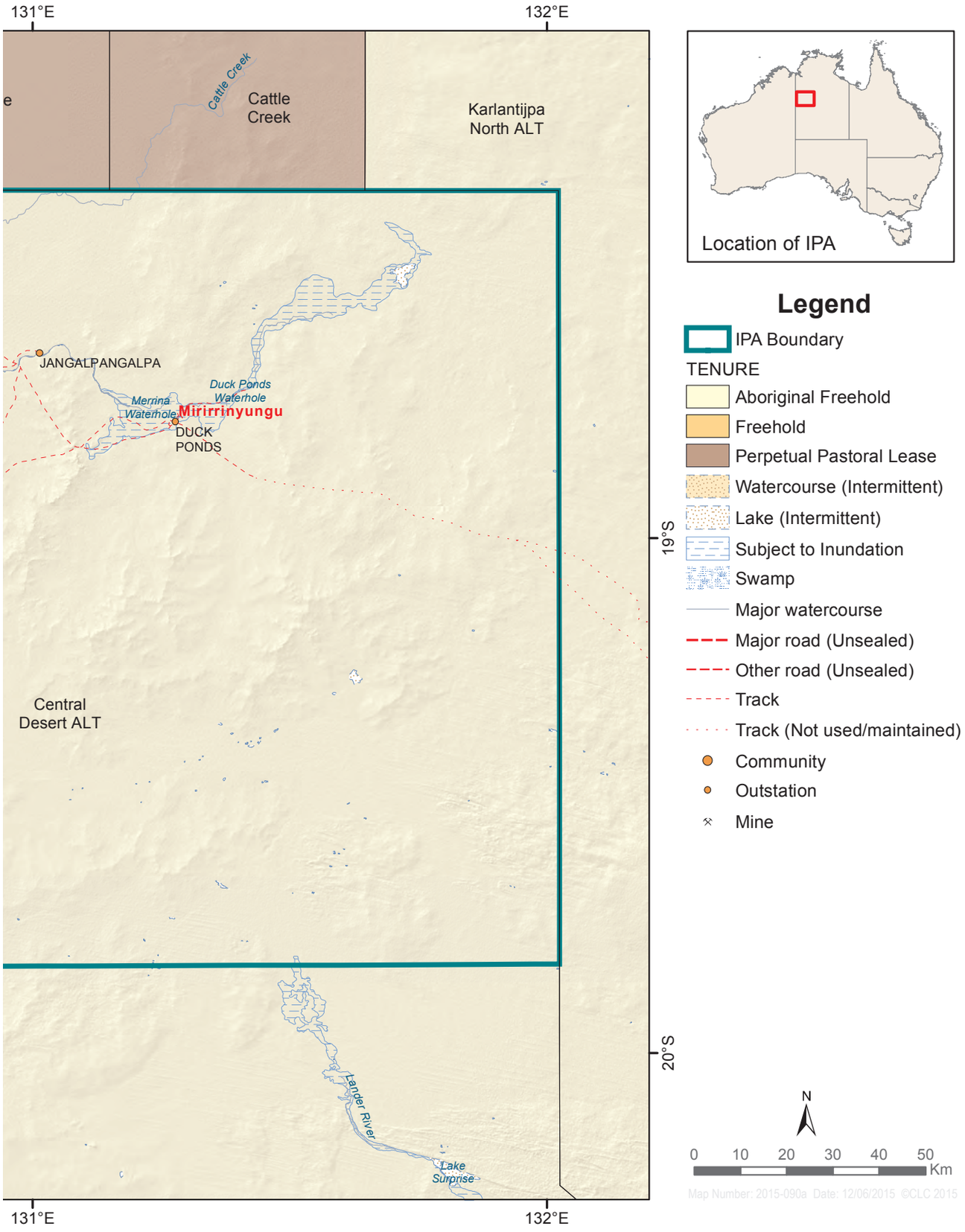


Figure 2 Northern Tanami IPA

north and north-west, the IPA borders three pastoral stations: Birrindudu, Wave Hill and Cattle Creek Perpetual Pastoral Leases (PPL). A fourth pastoral lease, Suplejack PPL located to the south-west of the IPA, shares its boundary with the IPA on three sides (Figure 2).

There are numerous mineral exploration licences covering parts of the IPA, though there is currently no mining activity. The (former) Groundrush gold mine ceased operation in 2005, as did the processing plant for this mine, situated 43 km away on the southern border of the IPA. Both the mine and plant are located in the IPA (Figure 2).

A portion of the 285 km southern boundary of the Northern Tanami IPA is shared with the Southern Tanami IPA. Together these IPAs encompass a total area of 141,535 km^2 of Aboriginal freehold land, equating to 54% of the Tanami Bioregion and 12% of the entire National Reserve System (NRS) in Australia.

The Aboriginal community of Lajamanu is situated inside the northern boundary of the IPA and is the only permanent settlement in the IPA region. Established in 1948 with the forcible resettlement of Warlpiri people from Yuendumu onto what were traditionally Gurindji lands, Lajamanu is the second largest Warlpiri settlement in Australia, with approximately 660 residents.

There are eight outstations in the IPA: Pinja, Parnta, Lul-tju, Mirridi, Jiwaranpa (Talbot Well), Jangalpangalpa, Picininny Bore and Mirirrinyungu (Duck Ponds, also known as Winnecke Creek Floodout). Although most of these are occupied seasonally rather than permanently, they are critical hubs for cultural ceremonies, customary hunting and harvesting and traditional burning.

Vehicular access to the IPA is limited to a single formed road, the so-called Lajamanu Road, which links the Buchanan Highway to the north with the Tanami Road skirting the south-western corner of the IPA. A very limited network of minor roads and basic tracks exists in the IPA; they provide access to outstations and hunting areas during the dry season. Vehicular access to country east of Lajamanu is problematic, with the Yapa-kurlangu, or Warrego Track, which once provided through-access to Tennant Creek some 400 km distant, now largely unnavigable. Only the section of track from Lajamanu to Mirirrinyungu (Duck Ponds) is maintained intermittently.

1.2 *Ngurra* – Country

The Northern Tanami IPA exists at the far northern limit of Australia's semi-arid rangelands. A strong south–north rainfall gradient is reflected in an environmental continuum ranging from semi-arid desert in the south to subtropical savanna in the northern reaches of the IPA. This south–north pattern across country also applies to dominant landscape features, which generally grade from alluvial sandplains with broad playa in the south and east, to sandstone outcrops and laterite plateaus, which, in turn, are replaced by undulating ranges, escarpments and black soil plains of the upper Victoria River catchment in the far north-west of the IPA.

The northern Tanami region has a subtropical climate with distinct wet and dry seasons. Rainfall is almost entirely confined to the summer months (November to March), with average annual rainfall of 427 mm in the south (Rabbit Flat) and 575 mm in the north (Lajamanu). Moderate to high temperatures prevail throughout the year, with an annual mean maximum of 33.5°C. The hottest months, November and December, have a long-term average maximum temperature of 38.1°C.

Yapa (Aboriginal people) recognise four main seasons:

- *Kawalya* and *Yulyurrpu* – cold weather (dry season); wind predominantly south-easterly
- *Kara-purda* – windy weather in October and November; warm westerly wind that signals the end of the cold season
- *Wanta* – hot weather from November to March
- *Ngapa-yiri-yiri* and *Wajirrkinyi* – rainy season when country becomes green (mainly December and January).

A significant feature of the Northern Tanami IPA is its wetlands. To the north these comprise semipermanent water bodies influenced by monsoonal rainfall patterns, while to the south they comprise ephemeral *karru* (creeks), *warrarnpa* (swamps and lakes), *mangkuru* (floodouts) and *warnirri* (rockholes) that only fill after big rains. All of these features are culturally significant for *Yapa* and were critical sources of water, game and food plants when people travelled through country prior to European settlement. Some of the more significant wetlands in the IPA include Nyukulku (Wilson Creek Floodout), Mirirrinyungu (Duck Ponds), Lakes Talbot and Kamira, and the ephemeral creeks, swamps and

paleodrainage channels associated with the northern portion of the Lander River and Lake Surprise system, which is a site of national conservation significance.

The vegetation of the IPA is dominated by *marna* (spinifex – *Triodia* species) hummock grasslands across the *manangkarra* (sandplain country) where a sparse overstorey of mixed acacia and grevillea shrubs is common, with occasional stands of *manja* (mulga – *Acacia aneura*) in more fire-protected areas. Low open woodlands of *wapilingki* (black box – *Eucalyptus microtheca* and *E. victrix*) with open tussock grass understorey occur along watercourses and paleodrainage corridors (in the south and east of the IPA), while communities dominated by *mungilypa* (samphire – *Tecticornia* species) fringe *muluwurru* (saline pans or playas). In the valleys and lower slopes of *pamarrpa* (hilly country) in the north-west, *nurlku* (snappy gum – *Eucalyptus brevifolia*) low open woodland with *kalajirdi* (soft spinifex – *Triodia pungens*) hummock grassland understorey dominates. Another less common community on heavier loams in the southern part of the IPA is open tussock grassland (various *Eragrostis* species, or occasionally *Astrebla pectinata*), which occurs alongside areas of snappy gum low woodland and *pakarli* (inland tea tree – *Melaleuca glomerata*) open shrubland.

The native fauna assemblages present in the IPA, while fairly typical of spinifex plant communities, also reflect the overriding south–north environmental cline, with an overlap of Eyrean (drier inland region) and Torresian (wetter northern region) species present. Desert species found in the IPA such as the central netted dragon (*Ctenophorus nuchalis*), the grey-crowned babbler (*Pomatostomus temporalis*) and the desert spadefoot toad (*Notaden nichollsi*) are close to the northern extent of their range, while a number of animals more typical of the northern savannas are at their southernmost distribution in the IPA. These latter species include *kururrungku* (northern nailtail wallaby – *Onychogalea unguifera*), *kalawurru* (the floodplain monitor – *Varanus panoptes*) and the pictorella mannikin (*Heteromunia pectoralis*). Unlike the Southern Tanami IPA wetlands (e.g. Lake Surprise and Lake Mackay), wetlands in the Northern Tanami IPA do not tend to support large flocks of waterbirds for long periods of time, but there are records of significant numbers of some of the more common waterbird species from Northern Tanami IPA wetlands after big rainfall events.

1.3 *Yapa* – People

The majority of the country included in the IPA is traditionally that of the *Warnayaka*, or Northern Warlpiri. However, land on which Lajamanu township is located, and the country to the west and north-west of it (including the portion of Hooker Creek ALT included in the IPA), is the traditional country of the Gurindji, Kartangarurru[1] and Pilingarna language groups. The western portion of the IPA borders on Jaru/Nyininy land. To the east, the IPA adjoins Warlmanpa land. Prior to European contact, these essentially nomadic people maintained strong ceremonial and trading links with neighbouring tribes.

Yapa and *Ngumbin* are the Warlpiri- and Gurindji-speaking traditional owners of the northern Tanami region. Archaeological evidence suggests that Aboriginal people were present on the northern fringes of Australia's arid interior 45,000 years ago, gradually inhabiting the harshest desert environments over the ensuing 10,000 years. *Yapa* beliefs about their origin are detailed and culturally profound, stretching back to *Jukurrpa*, 'the dreamtime'. *Jukurrpa* is the period of creation when ancestral beings journeyed through country creating landscape features, plants and animals – and *Yapa* themselves.

Jukurrpa is also an anthology, a complex body of knowledge pertaining to virtually all aspects of traditional life. Encoded in ritual songs and ceremonies passed down from generation to generation, this knowledge provides order and meaning for Warlpiri and Gurindji people in their interactions with their environment. With the guidance of *Jukurrpa*, *Yapa* successfully occupied large areas in Central Australia.

Traditionally, the people of these semi-arid deserts lived nomadic lives, travelling as small family groups within vast homelands to take advantage of resource availability across large spatial and temporal scales. During prolonged dry periods, families retreated to the most reliable water places on their country, surviving on the more resilient bush food and wildlife species that persisted around these refuge areas. Wet conditions allowed *Yapa* to spread out across the greater landscape utilising temporary waters and the rain-induced flush of plant and animal life. These good seasons also allowed for gatherings of hundreds of people to conduct ceremonies and maintain political, trade and social

[1] Kartangarurru is no longer spoken: descendants of this group speak Gurindji or Nyininy, Nyininy being a dialect of the south-eastern Kimberley language Jaru.

links. Traditional *Yapa* life reflected the boom and bust cycles that apply to all life in the desert.

From Warlpiri and Gurindji perspectives, an individual acquires trusteeship for a land estate from their father and grandfather; this status is known as *Kirda* and is often referred to as 'boss' in Aboriginal English. The counterpart of *Kirda* is the *Kurdungurlu*, a person whose relationship to that same country is through their mother and mother's father. In Aboriginal English this relationship is referred to as the 'policeman' or 'manager' of that country. A person feels most comfortable in visiting or making decisions about country for which they are *Kirda*. They also have a greater responsibility to look after that country than any other place. However, they must undertake these actions with the permission and guidance of their *Kurdungurlu* (Figure 4).

These complex systems of land stewardship and management were disrupted with the arrival of European settlers, who brought with them very different perspectives on land tenure and resource use. The first records of European exploration of the area are of Augustus Charles Gregory, who passed through present-day Lajamanu between 1854 and 1856, followed by Alexander Forrest, who journeyed through the region in 1879 en route from the Western Australian coast. Further south, Colonel Peter Warburton made explorative forays into the Tanami in the 1870s. In 1890, Allan Davidson prospected for gold at a number of sites in the present-day IPA, including along Wilson and Winnecke Creeks and in the Ware Range.

Pastoralism began in the region in 1883 with the establishment of Wave Hill station, which abuts the northern boundary of the IPA. One of its earliest owners, Nathaniel Buchanan, pioneered overlanding routes from the Tanami to Queensland and Western Australia in the late 1880s. Pastoral settlement in the more arid areas to the south and west of the present-day IPA was slower, largely because of the low productivity and scarce permanent water resources of the Tanami. Suplejack Station, on the western boundary of the IPA, was established as a grazing licence in 1961, converting to a pastoral lease in 1978.

But it was the discovery of traces of gold at Yartulu-yartulu (The Granites) and Jarnami (Tanami) in 1900 by Allan Davidson that would lead to radical changes in traditional life for *Yapa*. By 1909 some 500 miners could be found on the Tanami goldfields, and although that initial rush was short-lived, discoveries of new deposits at The Granites in the 1920s and 1930s led to the next major rush and the establishment of a significant European presence in the region. Many of the early interactions between settlers and *Yapa* were hostile, and reprisals against Warlpiri for stealing and other alleged misdemeanours were often violent. *Yapa* were also exposed to new diseases through contact with Europeans, and there were many deaths due to influenza epidemics and other contagions that passed through Aboriginal camps set up on the edges of mining operations.

The passing of the *Aborigines Protection Act 1909* effectively gave the Australian Government 'legal control' of Aboriginal people on stations and reserves. Policies subsequently pursued by the government, combined with a severe drought between 1895 and 1903 and other droughts in the 1920s and late 1930s, resulted in many *Yapa* moving from traditional lands into settlements around ration depots, mining camps and station homesteads.

In some cases *Yapa* were forcibly removed from their land and resettled into government reserves, such as the Tanami Native Settlement established in the Tanami goldfields in 1945, the Yuendumu Aboriginal Reserve created at Rock Hill Bore (1946) and Hooker Creek Reserve (present-day Lajamanu) established in 1948. Many of these resettlements overturned traditional ownership rules; this is particularly the case at Lajamanu, where Warlpiri people were forcibly resettled onto Gurindji land on several occasions – the last as recently as 1965.

The ensuing depopulation of country was never entirely complete though, and *Yapa* continued to return to their country during good seasons, with some people working in the mining and pastoral industries in order to retain connections to country. It was Gurindji stockmen working at Wave Hill Station who made history in 1966 by going on strike to demand award wages and the return of some of their traditional lands. The Wave Hill 'walk-off' by Gurindji people triggered the start of the land rights movement that resulted in the passing of the Australian Government's *Aboriginal Land Rights (Northern Territory) Act 1976*.

Under this new legislation, the majority of the area within the IPA was granted to its traditional owners through the Warlpiri and Kartangarurru-Kurintji land claim that was lodged by the Central Land Council (CLC) in August 1977. The claim area covered some 94,695 km^2 of country, and the hearing took into consideration submissions from the pastoral, mining

and petroleum industries and the Northern Territory Parks and Wildlife Commission before recommending an unconditional grant of land to the traditional owners.

At the same time as land rights gains were being made in Central Australia, the homelands, or outstation, movement began under the encouragement of the federal government, which provided funding for infrastructure to allow people to move back onto traditional lands. Outstation Resource Centres (including what is now Wulaign Homelands Council Aboriginal Corporation [WHCAC] at Lajamanu) were set up to administer federal funding for the building and maintenance of housing and associated infrastructure and services. Using these funds, eight outstations were built in the IPA area in the mid-1970s to early 1980s.

Changes in government policy led to the federal government handing back responsibility for indigenous housing, including outstation infrastructure, to the Northern Territory Government in 2007. In 2009, triggered by concerns about poor education outcomes in remote indigenous communities, the Northern Territory Government announced its *Working Future* – Territory Growth Towns policy, which expressly shifted the focus away from outstations, placing emphasis on investment in 20 indigenous townships, including Lajamanu.

Currently, outstation support remains minimal and is only available to those which are permanently occupied.

Today, the majority of the traditional owners of the IPA reside in the communities of Lajamanu, Kalkarindji, Daguragu and Yuendumu, but others live as far afield as Katherine and Darwin.

1.4 Land Management Programs

Yapa have undertaken land management activities across the region now included in the IPA for tens of thousands of years. These activities traditionally revolved around sustaining essential food and resource production to ensure people's survival. Activities ranged from burning country and cleaning waterholes to conducting animal and plant increase ceremonies; all of these were governed by *Jukurrpa*.

The movement of *Yapa* off country and the cessation of traditional life during the first half of the twentieth century greatly reduced the extent and regularity with which traditional land management practices were applied. Activities such as burning, which were once systematic and intensively undertaken across large tracts of country, became localised and sporadic, being associated with the forays made by *Yapa* back to country, usually for cultural purposes.

The granting of land rights and the gradual movement of *Yapa* back to their country from the 1970s onwards has been accompanied by a degree of revitalisation of traditional land management activities. Most of this is carried out by people as they traverse the lands at ceremonial times; as they travel for work, recreation or funerals; or during periods of time spent hunting and camping at outstations or other bush camps.

In recent years, *Kardiya* (non-Aboriginal people) have recognised the importance of traditional land management practices and realised the need for pro-active management of country, so they have actively supported *Yapa* participation in traditional and contemporary land management activities.

In 2001, Lajamanu was the first Aboriginal community to establish an indigenous ranger group in the Central Australian region, with the Lajamanu Rangers starting as a two-person team employed by the Wulaign Outstation Resource Centre (now WHCAC) using Community Development Employment Projects funding. The CLC subsequently partnered with WHCAC to expand the program and develop a more strategic work schedule for the rebadged Wulaign Rangers.

The CLC took on administration and employment of the Wulaign Rangers in 2007 and established a full-time Ranger Coordinator position based at Lajamanu in 2009. The Wulaign Rangers underwent a second name change in 2015 to become the North Tanami Rangers, a name the rangers felt more connection to and which reflects their identification with the broader region. The group currently comprises six to ten part-time rangers and a full-time coordinator employed by the CLC and funded through the Australian Government's Working on Country and IPA Program initiatives.

North Tanami Rangers are the primary land management workforce in the Lajamanu region and have played an integral role in managing the IPA since its declaration. The group's annual workplan is developed in collaboration with members of the IPA Management Committee, the IPA Coordinator and Ranger Coordinator and with technical input from scientists and staff from natural resource management organisations.

Workplans contain a mix of cultural and natural resource management activities, with a primary focus on fire management. Other significant tasks include weed control work, cultural knowledge projects, threatened species survey and monitoring work, cultural site

Members of the North Tanami ranger group on a fire management trip 2015

protection, waterhole maintenance and feral animal management. Opportunities for rangers to learn traditional skills from elders are facilitated regularly, and intensive training is provided in contemporary land management techniques.

North Tanami Rangers have also had a long-running involvement in fee-for-service environmental work with Newmont Mining Corporation, participating in a long-term monitoring program – the Tanami Biodiversity Monitoring Program – which began in 2005 on mining tenements in the IPA and the neighbouring Southern Tanami IPA.

The Northern Tanami IPA development project, which began in 2002 under the auspices of the CLC, provided much-needed opportunities for a broader group of traditional owners to re-engage in land management activities. Field trips, which enabled traditional owners to visit country – often for the first time in many years – were a key component of the IPA development program. These trips, which typically included CLC staff and a variety of specialist personnel, provided opportunities for *Yapa* to see first-hand the changes in the condition of their country, discuss management threats and strategies and undertake remedial actions. The trips also created valuable opportunities for elders to pass on traditional knowledge to younger people and record this knowledge on site for safekeeping.

Findings from these early field trips formed the basis of the initial draft Plan of Management for the IPA (produced in 2006) and helped identify areas where ranger workplans could focus to best improve management outcomes across the IPA. The initial planning work also identified areas in the IPA where there was little scientific knowledge to guide management decisions, and some of these places became the focus for further survey work. This included bilby surveys during 2008–09 at 94 sites across the IPA, biological and cultural survey work at Nyukulku (Wilson Creek Floodout) in 2009 and a flora and fauna survey at Mirirrinyungu (Duck Ponds) in 2010.

1.5 Indigenous Protected Area Program

The IPA program, an initiative of the Australian Government, has been established to support Aboriginal people in the management of their country for the enhancement of biodiversity and cultural values. Implicit in the protection of these values is recognition of the need to achieve social benefits for participating Aboriginal people, including improvements in employment, health and educational outcomes.

The program has no legislative foundation. Instead, it is based on traditional owners entering into voluntary agreements to add their lands to the NRS – Australia's system of protected areas. As with all reserves recognised as part of the NRS, IPAs are classified according to the International Union for Conservation of Nature (IUCN) protected area categories. The management of individual IPAs aims to achieve the overarching objectives defined for the protected area category chosen by traditional owners for their country (refer Section 4.1).

The Australian Government assesses the merits of IPA proposals received from traditional owners according to:

- the proportion of the Australian biogeographic region within which the proposed IPA is located which is already included in the NRS
- the level of interest among traditional owners of the proposed IPA for managing their land for conservation purposes
- the capacity of traditional owners to manage the proposed IPA and to administer funds according to Australian Government funding requirements
- the level of demonstrated support from the relevant State/Territory nature conservation agency for declaration of the proposed IPA.

Successful applications are funded for a development phase lasting several years, during which time traditional owners confirm or reject declaration of all or part(s) of their country as an IPA. IPA declaration is dependent on completion of a satisfactory draft Plan of Management for the area and the outcome of funding negotiations. Funding for the ongoing management of IPAs is primarily sourced from the Australian Government through the Department of the Environment.

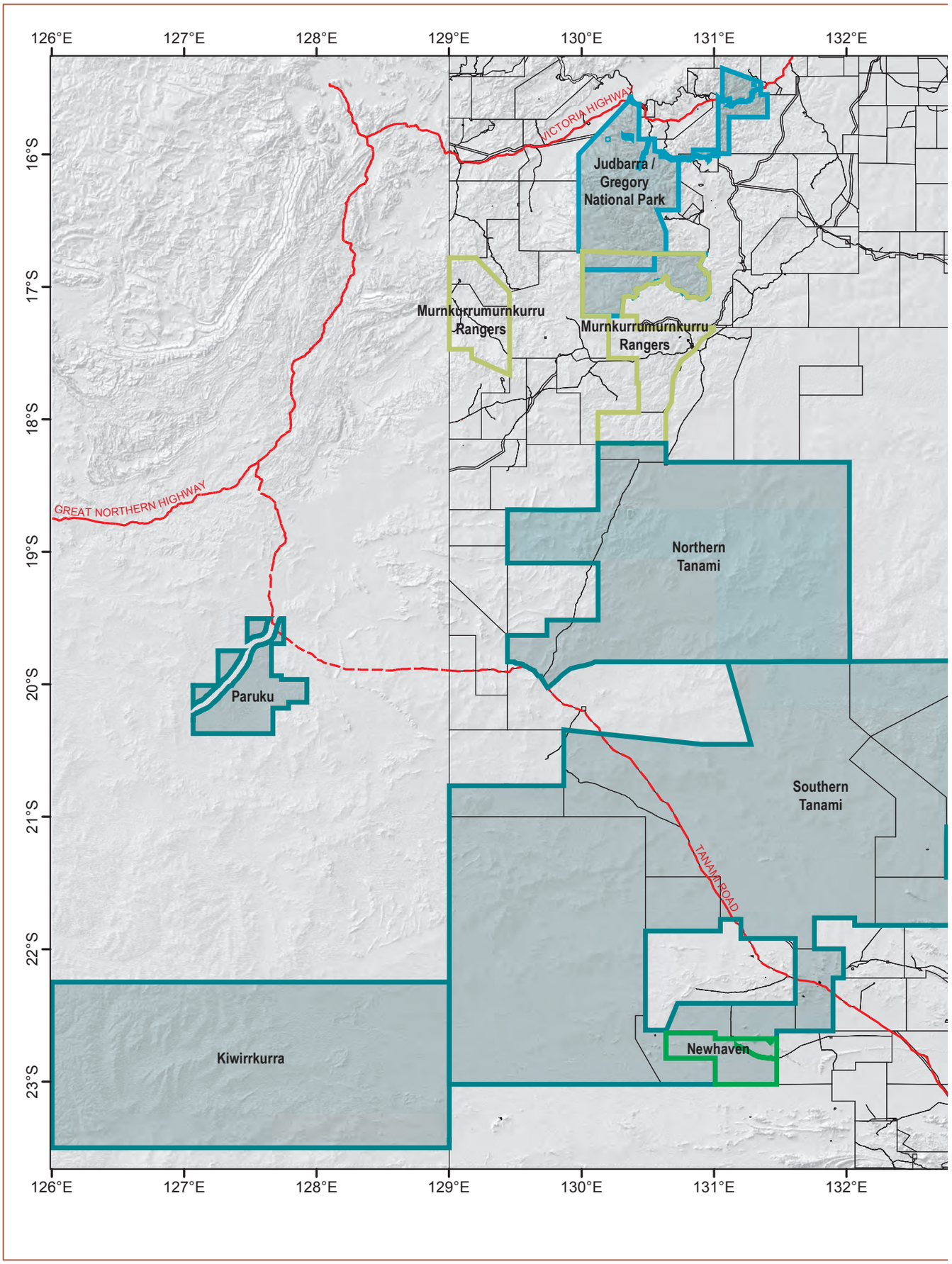
1.6 Linked Protected Areas

The Northern Tanami IPA shares part of its southern border with the Southern Tanami IPA, which was declared in 2012 (Figure 3). Together, these reserves protect more than 14 million hectares of desert country in the centre of the Australian continent, representing the largest contiguous protected terrestrial area in the whole of Australia.

Approximately 130 km to the north of Lajamanu is the 1.3 million hectare Judbarra / Gregory National Park, the largest national park in the Northern Territory Government's park estate. The park was returned to traditional owners in 2009 and is jointly managed by traditional owners and the Northern Territory Parks and Wildlife Commission.

All three of these protected areas lie within, or adjacent to, the broad sweep of country included in the former Trans-Australia Eco-Link Project. This initiative of the Northern Territory and South Australian governments aimed to establish a continental-scale conservation corridor of linked protected areas stretching 3500 km from Arnhem Land to Port Augusta.

Maintenance of conservation values in corridors such as Eco-Link may become increasingly important as predicted changes in regional climates start to affect the distribution of plants and animals. Linked protected areas may allow mobile species to move into areas where they are more likely to survive predicted temperature increases and probable increased wildfire frequency.



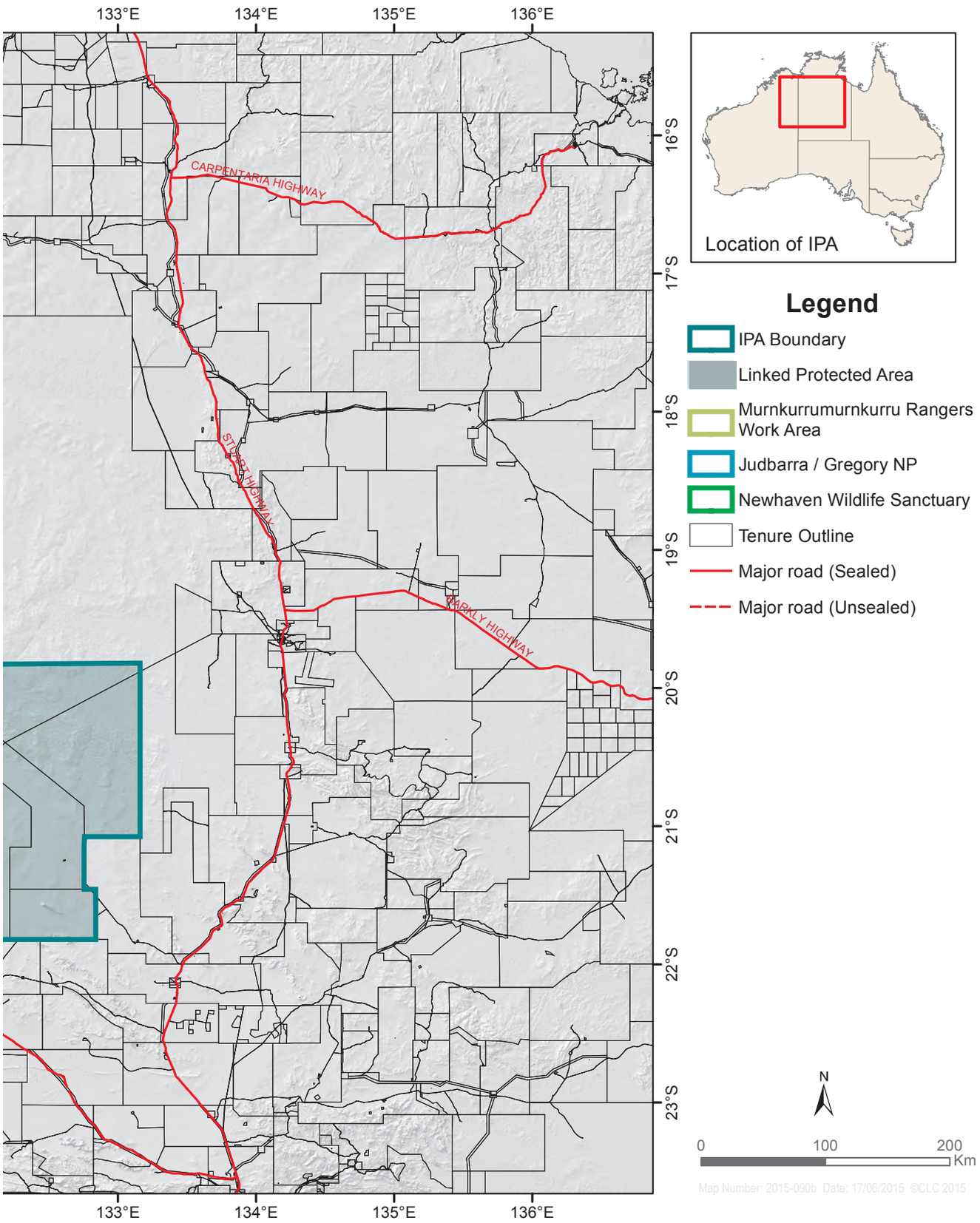


Figure 3 Linked Protected Areas

CHAPTER 2
Significance

Henry Jakamarra Cook, *Kirda* for country near Duck Ponds

2.1 *Yapa* and *Ngumbin* Significance

"Our songs are the land; they are attached to the land. We don't make the Law. Our Law is passed down from generation to generation – we hold that law to pass on the knowledge."

Kumanjayi Jampijinpa Bunter

Country encompassed by the IPA, while being a physical landscape, is also a cultural landscape or a network of meaning. It is through interaction with this cultural landscape that *Yapa* find sustenance: spiritual, cultural and physical.

To *Yapa*, their country is the physical result of *Jukurrpa*, the creative period when ancestral beings rose up from the earth or travelled from distant places, forming or modifying geographical features and placing different plants and animals in the landscape. Eventually, most of these beings were transformed into certain plants or animals themselves, or celestial bodies or elemental forces such as wind, rain or fire. Where they changed into particular entities, such as rocks or trees or watercourses, their powers became localised at these places.

Some 20–30 dreaming tracks or storylines travel through the Northern Tanami IPA, including the extensive dreaming tracks for *ngapa* (rain), *wirntiki* (bush stone-curlew – *Burhinus grallarius*) and *wampana* (spectacled hare-wallaby – *Lagorchestes conspicillatus*). Associated with these dreaming tracks are hundreds of cultural places that are highly significant to *Yapa* as they are the physical evidence of the *Jukurrpa* ancestors, which in turn are the basis for the Law: the social, mythical and religious basis of Aboriginal life. These places are also regarded as sacred sites, as they are believed to be repositories of the essence and consciousness of these ancestor beings. This power, which is still considered to be active, is deemed to be necessary to maintain the life forms related to each being.

Warlpiri and Gurindji people also believe that a person's spirit returns to country after death, and that it is important for people to be buried on their country. Within the IPA there are several cemeteries or isolated grave sites that are of high cultural significance.

In addition to these culturally significant sites, the IPA is also dotted with evidence of people's more recent ancestors, including knapping sites and innumerable campsites. For contemporary *Yapa*, these tangible signs provide people with a direct connection across thousands of years to their forebears. They are highly regarded and a source of pride.

The significance of the IPA to *Yapa* is also linked with the ongoing maintenance of traditional activities such

as gathering of bush resources, burning and hunting. Hunting and gathering activities remain commonplace in Warlpiri and Gurindji society, with bush foods being a popular, healthy, cost-effective substitute for shop-bought foods. Bush medicines are also still widely used to treat a range of ailments. Perpetuating these practices and passing on knowledge about *Jukurrpa*, sites and *ngurra* (country) to young people also provide people with a bridge across hundreds of generations while strengthening the bonds between people and country.

2.2 *Kardiya* Significance

Underpinning the significance of the Northern Tanami IPA to *Kardiya* are its remoteness and the vast scale of the area's relatively intact landscapes in which desert and tropical ecosystems are juxtaposed.

The IPA is a refuge for desert species at the northern extent of their range, such as the nationally iconic *walpajirri* (bilby – *Macrotis lagotis*) and other nationally threatened species such *jajina* (brush-tailed mulgara – *Dasycercus blythi*) and *pujarr-pujarrpa* (southern marsupial mole – *Notoryctes typhlops*). The IPA also includes the southern limit of the distribution of the nationally endangered Gouldian finch (*Erythrura gouldiae*), a strikingly beautiful bird that once foraged across northern Australia in flocks of many hundreds, but is now reduced to scattered remnant populations at favoured waterholes in savanna grasslands mainly in Western Australia and the Top End of the Northern Territory. The occurrence of other near-threatened species such as *wampana* (spectacled hare-wallaby – *Lagorchestes conspicillatus*) and western chestnut mouse (*Pseudomys nanus*) within the IPA represent the southern extent of these species' ranges in the Northern Territory.

The wetlands of the Northern Tanami IPA are significant to *Kardiya* for their ecological and aesthetic values. The conservation value of Wilson Creek Floodout, Kamira and the Lake Buck – Spider Lake complex has been recognised at a bioregional level, while the Lake Surprise and Lander River floodout system that extends into the IPA from the adjoining Southern Tanami IPA is listed as a conservation site of national significance.

The region remains relatively poorly surveyed in terms of its ecological wealth. However, a snapshot of the ecological importance of the IPA is available due to survey work undertaken by Parks and Wildlife Commission staff across the former Tanami Wildlife Sanctuary (which encompassed large parts of both the current Southern and Northern Tanami IPAs) in the 1970s and 1980s, combined with a small number of more recent surveys undertaken by scientists and consultant biologists working alongside traditional owners. The IPA is known to support:

- five nationally threatened animal species
- 12 animals listed as near-threatened in the Northern Territory
- nine species of plants listed as near-threatened in the Northern Territory
- part of one site of international conservation significance (South-west Tanami) and part of one site of national conservation significance (Lake Surprise and Lander River Floodout swamps)
- one site of national botanical significance and four sites of bioregional botanical significance.

Despite being an important ecological refuge for many plants and animals, the Tanami region as a whole is also significant for being a hotspot for mammal species declines since European settlement, contributing to the world record that Australia holds for mammal extinctions (29 species).

The gold mining history of the region is also of significance to *Kardiya*. Some 114 years after the original discovery of gold at Jarnami (Tanami) on the southern boundary of the current day IPA, new areas are still being explored for their potential mineral resources. Since the 1980s, gold mining across the Tanami has also provided some economic benefit back to Warlpiri traditional owners through royalty payments by mining companies and through the creation of limited local employment opportunities at mine sites.

CHAPTER 3
Management Framework

IPA Management Committee meeting at Lul-tju to discuss strategies and actions for this plan

3.1 Purpose and Scope of the Plan of Management

A Plan of Management is a document that outlines how an area will be managed in the years ahead. This document represents the finalisation of the plan for the Northern Tanami IPA, with the original draft Plan of Management being produced in 2006. This version draws on a substantial amount of two-way planning and work on country that *Yapa* have participated in since declaration of the IPA in 2007.

This plan is intended to express the management aspirations and priorities of the traditional owners of the region and contains strategies to achieve a management regime consistent with the IUCN reserve category that traditional owners have chosen for the IPA (refer Section 4.1).

Importantly, the provisions of the plan underpin the work program and priorities of the North Tanami Rangers, who have been entrusted with turning the land management aspirations of traditional owners into reality. Beyond the ranger workforce, the plan is also intended to guide the development and implementation of other community-based and CLC-assisted projects and programs in the IPA.

The scope of this Plan of Management is consistent with that described in the *Guidelines for Australian Indigenous Protected Area Management Plans*. These guidelines dictate that such plans should contain the following components:

- Vision: The vision of traditional owners for the management of their country. This should include a statement of intent to manage their country in accordance with the designated IUCN reserve category for the IPA
- Story: Information about the traditional owners of the IPA and about the IPA itself. This should include a description of the process by which traditional owners decided to create an IPA over their country
- Governance Foundations: Details about the governance structures and processes that are in place to guide the ongoing decision-making and management of the IPA
- Focus for Action: Descriptions of the cultural, natural, social, educational, economic and other values of the IPA; associated threats and opportunities; and management objectives and allied strategies to manage identified threats and realise opportunities
- Feedback Cycle: Concerns an adaptive approach to management in which research and monitoring results are used to evaluate the effectiveness of management policies and actions and adjust them as required.

The scope and contents of the plan are also shaped by the guiding principles, cultural protocols and key management themes provided in Sections 4.2 and 4.5 respectively.

Wherever possible, the provisions of this plan are consistent with those contained in the management

plan and operational plans that have been prepared for the adjoining Southern Tanami IPA. Through Law, many Warlpiri currently living at Lajamanu have management responsibilities or interests (through *Kirda* and *Kurdungurlu* relationships) over land in the Southern Tanami IPA. Conversely, certain Warlpiri people residing in Yuendumu, Wirliyajarrayi (Willowra) and Nyirripi have cultural connections to country in the Northern Tanami IPA. The foundations and intent of this cross-border management approach are detailed in Section 4.4.

A limited review of this plan will begin five years after it has been formally adopted, in accordance with the provisions of Chapter 9. This review will principally be confined to possible changes associated with:

- the emergence of previously unforeseen management issues and opportunities
- the identification of significant new values or emerging opportunities
- the results of monitoring and evaluation processes or of research programs, where they demonstrate that existing strategies are not achieving stated management objectives
- possible adjustments of governance arrangements.

A full review of this Plan of Management will begin approximately 10 years after it has been formally adopted.

3.2 Cultural Foundation

"IPA has a boundary but I have my own boundary that I am responsible for, my own Jukurrpa*; I have all the soakages there and I have the song. I don't step around another place, another father's country."*

Henry Jakamarra Cook

The contents of this plan reflect decisions taken by traditional owner representatives for the entire IPA and guidance provided by smaller numbers of *Yapa* and *Ngumbin* concerning particular estate areas for which they have specific cultural obligations.

Decision-making responsibilities among *Yapa* have historically been undertaken by traditional owners according to their relationship to their land. Traditional land ownership is predicated on Warlpiri and Gurindji kinship systems, which strictly define inheritance responsibilities. Obligations on individuals or families as trustees for discrete estates related to one or more sections of a *Jukurrpa* storyline and associated sites are acquired through people's paternal and maternal grandparents. Rights and responsibilities accompanying trusteeship may vary, but they generally include protecting the area from trespass and malicious use, maintenance of *Jukurrpa* sites, maintaining rockholes and soakages and burning country.

A person's kinship relations and 'skin', mediates many aspects of life beyond landownership. In a contemporary sense, kinship underscores the IPA's governance structure which, being based on equitable clan representation, is a function of culturally prescribed lines of descent. Skin relationships also have special relevance to contemporary indigenous land management because they influence how IPA staff and traditional owners interact and who can access country (Figure 4).

Figure 4 Warlpiri kinship relationships showing *Kirda* and *Kurdungurlu* responsibilities. The four colours, which denote the father–son family line, are adopted widely in Lajamanu to identify membership within kinship groupings.
Source: Kurdiji (2014).

Decision-making about issues affecting country is reserved for the 'right' senior people with high levels of cultural knowledge. *Yapa* will not make decisions for country they have no cultural responsibility for. If a major decision needs to be made, not only must the right traditional owners be involved, but it may also be necessary to hold meetings on the country in question. This can make decision-making, be it for the entire IPA or a particular place within it, extremely challenging, as the people who need to be consulted may reside in towns, communities or outstations that are great distances apart. Other issues confronting *Yapa* making management decisions relating to land in the IPA include the loss of cultural knowledge about particular places and the small number of senior people alive who can speak for certain country.

While the planning process adopted by *Yapa* for making decisions about the IPA declaration and the contents of this plan is soundly based on traditional cultural foundations, it – out of necessity – has incorporated new ways of working.

3.3 Planning Process

The decision by *Yapa* to formalise declaration of their country as an IPA in 2007 and the development of this management plan are part of an ongoing collaborative process that started more than 15 years ago.

The CLC began general land use planning work with *Yapa* living at Lajamanu in 1999, but it was not until late 2002 that IPA feasibility planning work started with Warlpiri and Gurindji traditional owners. With funding obtained by the CLC through the former Commonwealth Government Department of Environment and Heritage, an IPA development officer was appointed. Between 2003 and 2005, this officer organised numerous formal consultations, planning meetings and structured country visits.

Although the majority of traditional owners with cultural responsibility for the northern Tanami region live in the communities of Lajamanu, Kalkarindji, Daguragu and Yuendumu, some senior traditional owners for the area live as far afield as Katherine and Darwin. Given this, ensuring that rightful people were effectively consulted on IPA development matters relevant to them often required extensive travel.

Regular country visits were also an integral part of the IPA planning process. Such family-based trips allowed people to visit their country, often for the first time in many years. A key motivation for many traditional owners was the opportunities such trips presented to undertake cultural responsibilities and to pass on traditional knowledge to younger members of their family. These trips also allowed people to see the changes in the condition of their country and to discuss management issues and strategies with CLC staff. More often than not, country visits were combined with work on a variety of projects, including cultural heritage management, flora and fauna surveys, traditional knowledge documentation, burning programs, waterhole cleaning and weed control.

In 2002 the CLC received funding from the Australian Heritage Commission for traditional owners to undertake cultural heritage documentation work in the Lake Talbot, Spider Lake, Coomarie and Nyukulku (Wilson Creek Floodout) areas. An extensive biological survey was subsequently undertaken in collaboration with Parks and Wildlife Commission scientists and staff from the Northern Territory Herbarium in 2003. Data from these surveys helped build up a picture of the cultural and conservation significance of the area and contributed to the subsequent delineation of management zones within the proposed IPA.

Working alongside project partners such as Northern Territory Government staff and scientific consultants enabled *Yapa* to develop a greater understanding of issues and develop skills in contemporary land management techniques. These collaborations also highlighted the importance of traditional knowledge in contributing towards shared management goals.

The North Tanami Rangers were involved in many of the planning meetings and on-country consultations that occurred over the course of the IPA feasibility process. The rangers' role in implementing some of the early management directions given by traditional owners reinforced their importance within the emerging management model.

Once it became clear that the IPA model suited traditional owners' aspirations for country, statutory consultations were held in 2005 and 2006 with traditional owners for the proposed IPA. At these meetings (held in Lajamanu, Daguragu and Kalkarindji) decisions were made about the boundaries of the proposed IPA; the structure, composition and roles of the proposed IPA Management Committee; the role of the ranger group; and the intent and content of a draft Plan of Management for the proposed IPA.

3.4 Governance

The Northern Tanami IPA Management Committee, which was established in 2006, oversees planning and decision-making for all aspects of managing the IPA. Committee membership closely reflects traditional landownership, with representatives from sectors broadly corresponding to the northern, southern, eastern and western regions of the IPA and with representatives from the two main language groups: Gurindji and Warlpiri.

The Committee meets twice annually for intensive planning and review sessions but can be convened at any time as required.

The key roles and responsibilities of the Management Committee are to:

- represent the aspirations of the traditional owners of the IPA with respect to managing the declared area
- agree on priority management strategies across the IPA, as detailed in this plan, to inform IPA and ranger group resourcing and work programming
- provide direction to the functioning of the ranger group(s) working across the IPA
- review and respond to monitoring and research results, expert advice and progress on plan implementation from a whole-of-IPA perspective
- act as an information exchange forum between traditional owner groups across the greater region
- through the IPA Coordinator, represent IPA interests at CLC mining meetings, including promoting environmental considerations and negotiating moratorium zones or other conditions to protect sites of biological and cultural significance from impacts associated with mineral exploration
- represent the IPA at regional and national forums.

Figure 5 shows the relationships between the IPA Management Committee and the other elements of the IPA management structure.

The IPA Management Committee receives technical advice from the **Northern Tanami IPA Advisory Committee**, which meets annually. The scope of the Advisory Committee's functions includes:

- providing expert advice on all aspects of cultural and natural resource management
- reviewing progress on implementing the IPA management plan

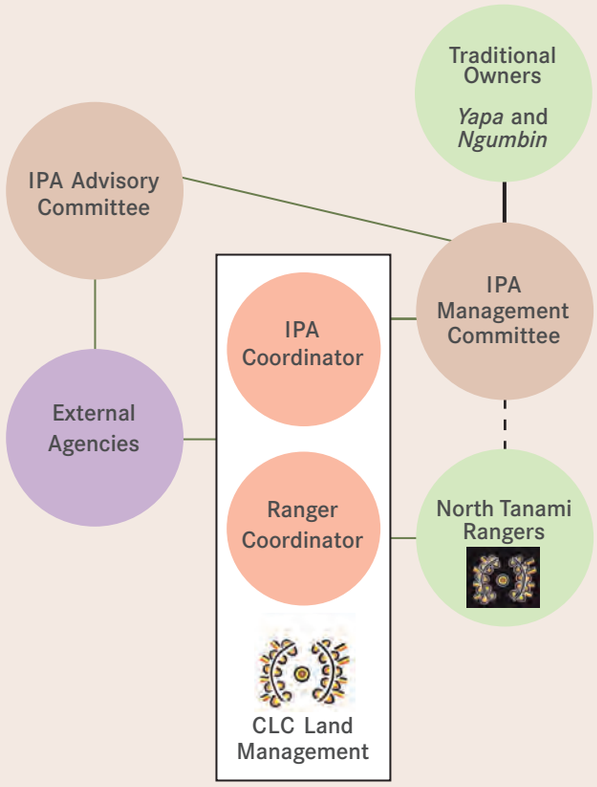


Figure 5 IPA Management Structure

- providing advice on the results of monitoring and research programs
- reviewing funding and partnership arrangements
- acting as an advocate for the IPA in relation to resourcing.

The Advisory Committee is composed of:

- IPA Coordinator
- representative of the Australian Government's IPA program
- representatives from various divisions of the Northern Territory Government Department of Land Resource Management, including Bushfires NT
- representative of the Victoria River District Conservation Association (VRDCA)
- IPA Management Committee representatives.

The **IPA Coordinator**, a CLC employee, is responsible to the Manager, Land Management Section, but is also accountable to the IPA Management Committee in performing the primary duties of coordinating IPA governance arrangements and supervising the implementation of the IPA management plan, in particular:

- overseeing the conversion of priority actions, as identified by the IPA Management Committee, into annual work activity schedules
- ensuring guiding principles and cultural protocols outlined in the Plan of Management are clearly understood and observed
- coordinating IPA work schedules, including those of the ranger group(s), with relevant partner organisations and neighbouring landholders or managers
- providing a range of briefing reports to IPA Management Committee members, the CLC and appropriate stakeholders.

The **North Tanami Rangers**, administered by the CLC, are directly responsible to the CLC Ranger Program Coordinator (North) and are managed on a day-to-day basis by the North Tanami Ranger Coordinator, who ensures that the annual work program is carried out in a safe, culturally responsible and efficient manner. They are also accountable to the IPA Management Committee in performing their primary role, which is to progress the aspirations of the traditional owners of the IPA through implementing the provisions of the Plan of Management on the ground.

The Northern Tanami IPA program, including the work of the rangers, is administered by the **CLC Land Management Section**, which is able to call upon the resources and expertise available in other sections of the organisation as required.

Tied to the IPA management structure is a three-tiered **Decision-Making Model** which is designed to ensure appropriate, adequate and efficient consultation is conducted with all traditional owners regarding IPA management activities. It provides a transparent and consistent means to tailor the scope of consultations to suit individual proposals and ensure that activities conducted under this plan conform to the statutory requirements *of the Aboriginal Land Rights (Northern Territory) Act 1976*.

Level 1 Activities requiring consultations with broader traditional owner groups facilitated through the CLC

- Cultural site protection or maintenance – any activities that may interfere with a sacred site
- Decisions relating to commercial ventures (where profits, dividends or royalties will be generated)
- Broadscale feral animal control, principally aerial operations involving a government agency or neighbouring landholder
- Activities that may adversely affect land or landowners outside the IPA
- Decisions to change the area of the IPA, land uses within the IPA or the role(s) or composition of the IPA Management Committee.

Level 2 Activities requiring Northern Tanami IPA Management Committee input

- Decisions regarding the funding/resourcing of management projects across the IPA
- Major one-off capital works, infrastructure provision, plant or operational purchases
- Establishment of formal collaborations and partnerships with non-government and government organisations
- Strategic decision-making related to the implementation of landscape-scale management actions across the IPA, such as fire management programs
- Decisions about projects on country involving other community stakeholders or visiting parties
- Training and capacity-building decisions regarding IPA Management Committee members and other IPA personnel
- Recruitment advice for IPA and ranger staff
- Annual IPA budgeting and financial decision-making
- Development and oversight of annual IPA and ranger work programs.

Level 3 Activities requiring consent of individual traditional owner(s)

- **All IPA and ranger work activities carried out on specific traditional owner estates, including country visits and burning that is mainly restricted to one family's country**
- **All work on or at outstations**
- **Work and/or visits to particular sacred sites and other culturally sensitive places**
- **Site-specific feral animal control work.**

Outside of this framework, any proposed work in Lajamanu township needs to be endorsed by the Central Desert Regional Council, and outstation work needs to be discussed with staff at the WHCAC.

3.5 Management Partners

The degree to which traditional owner aspirations can be met in relation to the IPA can be greatly enhanced by strong partnerships with organisations that share similar objectives. A number of partnerships with local community organisations, government agencies and research organisations have already added value to the work done in the IPA by traditional owners and indigenous rangers.

Since the establishment of the IPA, there has been a strong partnership forged with the local school (Lajamanu Community Education Centre), and rangers regularly give presentations to classes about the work they do. They also provide the logistical support for an annual school country camp. This event is well supported in the Lajamanu community and relies on the IPA program, the school, the Warlpiri Education and Training Trust (WETT) and the Mt Theo Program (Warlpiri Youth Development Aboriginal Corporation). All of these organisations contribute funds, staff or resources so that 20–30 students can participate in the camp and learn about culture and country from senior traditional owners. IPA Management Committee members place a high value on this collaborative event, as it plays a critical role in fostering the next generation of potential rangers, and aligns well with traditional owners' interest in promoting learning on country.

Discussing joint aerial burning work at Papinya (Southern Tanami IPA). Left to right: Dione Kelly, Jerry Jangala Patrick, Thomas Jangala Rice and Francis Jupurrurla Kelly

Another important locally based partner organisation is the WHCAC. This organisation directly hosted the North Tanami Rangers from their inception in 2001 up until 2007. More recently, WHCAC has provided resources and equipment to support the outstation management work that rangers do, and it has also hosted fire management training sessions for rangers.

The VRDCA is a regional pastoral landcare organisation that has recently partnered with IPA and ranger staff on catchment-scale weed management projects. Funding sourced by VRDCA was used to contract the North Tanami Rangers to control dense Parkinsonia infestations around Nongra Lake on Inverway Station to the north of the IPA in 2010–11, and more recently IPA staff and rangers have been working with VRDCA and other regional stakeholders to develop a more strategic approach to weed and feral herbivore management across the region.

Other organisations with locally based staff that have existing partnerships or the potential to engage as partners in various IPA programs include the Warnayaka Art and Cultural Centre, the Lajamanu Learning Centre (supported by Batchelor Institute of Indigenous Tertiary Education and WETT), Central Desert Regional Council and Victoria Daly Regional Council.

Staff from the Northern Territory Government Department of Land Resource Management actively support *Yapa* land management aspirations in the region. Collaborative projects have included weed surveys and control work, feral animal culls, fire management planning and flora and fauna surveys.

Partnerships with nearby Warlpiri and Murnkurrumurnkurru Ranger groups, traditional owners in the adjoining Southern Tanami IPA and pastoral neighbours with shared boundaries have the potential to significantly benefit *Yapa* and the management of the Northern Tanami IPA (refer Sections 1.6 and 4.4 respectively).

CHAPTER 4
Overarching Management

IPA Management Committee members and rangers mapping *Kirda* and *Kurdungurlu* areas in the IPA

4.1 Protected Area Category

Yapa have determined that the most appropriate IUCN reserve category for the Northern Tanami IPA is Category VI – Protected area with sustainable use of natural resources. This designation allows for a management regime that aims to protect biodiversity and cultural resources, while permitting the sustainable harvesting of traditional resources, including *kuyu* (bush meat); *ngurlu* (seeds and fruits from various food plants); and natural resources required for medicinal, ceremonial, art and craft or other utilitarian purposes.

In accordance with the IUCN *Guidelines for Applying Protected Area Management Categories*, the primary management objective for the Northern Tanami IPA as a Category VI reserve is:

- to protect natural ecosystems and use natural resources sustainably, when conservation and sustainable use can be mutually beneficial.

Management of the IPA will also be consistent with the other objectives listed in the guidelines for Category VI protected areas, namely:

- to promote sustainable use of natural resources, considering ecological, economic and social dimensions
- to promote social and economic benefits to local communities where relevant
- to facilitate intergenerational security for local communities' livelihoods – therefore ensuring that such livelihoods are sustainable
- to integrate other cultural approaches, belief systems and world-views within a range of social and economic approaches to nature conservation
- to contribute to developing and/or maintaining a more balanced relationship between humans and the rest of nature
- to contribute to sustainable development at national, regional and local level (in the last case mainly to local communities and/or indigenous peoples depending on the protected natural resources)
- to facilitate scientific research and environmental monitoring, mainly related to the conservation and sustainable use of natural resources
- to collaborate in the delivery of benefits to people, mostly local communities, living in or near to the designated protected area
- to facilitate recreation and appropriate small-scale tourism.

4.2 Guiding Principles and Cultural Protocols

In addition to the overarching management objectives associated with a Category VI protected area as listed in the previous section, the management strategies contained in this plan are also underpinned by the following fundamental principles. These principles are intended to ensure IPA management proceeds in the spirit of *Ngurra-kurlu*[2] (Pawu-Kurlpurlurnu *et al.* 2008), in accordance with the Warlpiri and Gurindji values of cultural tradition, identity, wellbeing and spiritual connection.

- ***Jukurrpa* underpins all activities on country**

"It's the Jukurrpa. *It tells us what country we belong to, what country we need to look after."* IPA Management Committee members

Jukurrpa and associated cultural protocols determine how country is owned, used and managed by Warlpiri and Gurindji people. It underpins all IPA decision-making and activities.

- **People need to be on country to look after country**

"Without people it's dry that country, that's true. The country is no good when there's no people living there." Kumanjayi Jangala Martin

Yapa believe that country is healthy when it is utilised and occupied by people. They believe that country that is not visited, or for which ceremony has not been performed, becomes unhealthy or even dangerous. To pass on the knowledge and skills to manage and monitor the health of country, people therefore need to be 'on country'. The IPA management strategies presented in this plan are premised on traditional owners playing a key role working alongside the North Tanami Rangers in all management activities on country.

- **The right people speak for country**

"We've got that responsibility through skin, Law. You can't take the wrong people in [to country]. You can get hurt." Kumanjayi Jampijinpa Bunter

Individual *Yapa* have obligations to look after their country. These obligations are passed down through *Jukurrpa* and family kinship systems. Decision-making and activities concerning particular estates within the IPA are undertaken by those people with responsibilities to speak for that country. *Kurdungurlu* and *Kirda* for particular country need to be present during IPA work to ensure the right rituals are performed to keep visitors safe and to ensure there is no inadvertent damage to important sites.

Senior women and girls on a women's cultural trip with IPA, CLC and WYDAC staff

[2] *Ngurra-kurlu* describes the principle cultural elements of *ngurra* (land), *kuruwarri* (Law), *jaru* (language), *juju* (ceremony) and skin and their interrelations. Inherent in this concept is the belief that the proper alignment of these elements can result in healthier people and healthier country (refer Figure 6).

- **Elders and young people, men and women work together**

In Warlpiri and Gurindji culture, both men and women are required to make decisions about country. Each gender is responsible for different kinds of knowledge and has different responsibilities under the Law. Neither group can operate alone. IPA decision-making and management activities need to involve elders, young people, men and women.

- **Opportunities are created for cultural knowledge transfer between elders and young people**

"Once we hand over by teaching the young ones they will realise that country is being given to them and they will have to look after it … country, the songs, the animals, the waterholes. It will be up to them. They have the responsibility."

Rosie Napurrurla Tasman

Elders and young people have cultural responsibilities for the ongoing intergenerational transfer and custodianship of knowledge. Facilitating the transfer of this knowledge to appropriate people is a key component of IPA activities.

- **Different knowledge systems are central to managing country**

"Mother earth and father sky come together and give birth to knowledge."

Wanta (Steven) Jampijinpa Patrick

The skills and advice of senior ***Yapa*** knowledge holders and ***Kardiya*** scientists and land managers are required to ensure that fully informed decisions are made concerning the management of country. Wherever possible, both customary and Western knowledge and skills are to be sought and applied in land management planning and implementation.

- ***Yapa* are kept informed**

As the owners of the IPA, ***Yapa*** are to be kept informed of all activities undertaken on their country. Adoption of a transparent system for reporting back to traditional owners is imperative to maintaining good working relationships between ***Yapa***, IPA staff and external agency personnel.

Jerry Jangala Patrick demonstrating traditional fire making. PAW Media staff are recording this for IEK documentation

4.3 Two-Way Land Management

Yapa have gained an intimate and intricate understanding of the ecology of country in the IPA through thousands of years of observation and practice. Up until the depopulation of their country in the early to mid-twentieth century, the transfer of this accumulated knowledge between generations of *Yapa* was essential to their ongoing survival. By contrast, *Kardiya* interest in and understanding of the ecology of the region is a relatively recent phenomenon and has largely been acquired through comparatively short forays into country and scientific studies of specific places, species or landscape elements.

The northern Tanami region has experienced profound changes since *Yapa* stopped walking their country. The introduction and proliferation of feral animal and weed species, altered fire regimes and changes in water quality at important wetlands due to feral animal impacts are but a few of these modifications. The wealth of traditional knowledge and practice still retained and practised by *Yapa* is not always adequate to address these recent changes. By contrast, managing these threats to biodiversity has become a focus of contemporary *Kardiya* land management research and expertise.

The traditional owners of the IPA acknowledge the critical need to record, share, integrate and apply both *Yapa* and *Kardiya* knowledge and understanding to best look after country. This fundamental requirement for the future wellbeing of the IPA underpins many of the key management strategies contained in this plan.

4.4 Cross-Border Collaboration

The Northern and Southern Tanami IPAs are separated by a linear boundary that bears little relationship to patterns of traditional landownership, with many of the traditional owners for both IPAs living together in the four main Tanami communities of Lajamanu, Yuendumu, Nyirripi and Wirliyajarrayi (Willowra).

For Warlpiri traditional owners, increased collaboration between people associated with the two IPAs is likely to enhance opportunities for families living in different communities to work together and for customary management responsibilities for country and cultural places to be realised. A more collaborative approach will also allow the North Tanami and Warlpiri Rangers to share resources, learning and experience.

Over the last decade, several projects have been undertaken jointly by personnel from the two IPAs; the most noteworthy of these is the involvement of North Tanami Rangers and Warlpiri Rangers in the Tanami Biodiversity Monitoring Program funded by Newmont Mining Corporation and other companies with mining tenements in the region. Staff and traditional owners associated with both IPAs have also worked together through the *Warlu* (Fire Management) Committee to plan and implement strategic fire management programs across the greater Tanami region. Other recent examples of cross-border collaboration include women members of the North Tanami Rangers and Warlpiri Rangers co-facilitating cultural project work near the boundary of the two IPAs, collaborative country visits and ranger groups working together on weed control activities at Lake Ruth on neighbouring Tanami Downs Station (Mangkururrpa ALT).

Similarly, because of shared cultural responsibility for Gurindji country in the northern part of the IPA, North Tanami Rangers have worked collaboratively with the more recently established Murnkurrumurnkurru Ranger group based in Daguragu. Shared project work has included managing Parkinsonia weed infestations in the Hooker Creek catchment, bilby monitoring work around Mirirrinyungu (Duck Ponds), pastoral monitoring on grazing licence areas on Hooker Creek ALT and fire management activities around outstations. These two ranger groups also share training opportunities to make it more viable for trainers to deliver courses on site rather than in Katherine or Alice Springs.

Over the years there has been increased support for collaborative projects with pastoral neighbours. Suplejack Station staff and North Tanami Rangers collaborate annually on constructing firebreaks along their shared boundary, and in 2013 rangers and CLC staff worked with pastoral neighbours and VRDCA staff to reduce feral horse and donkey numbers in the Hooker Creek catchment.

These collaborations would benefit from more formalised arrangements; strategies to address this are presented in Sections 5–8.

4.5 Management Themes

Over the course of the IPA development process and the subsequent management phase, four management themes have been identified that define the broad aspirations of traditional owners in managing the IPA. In Part B of this plan, discussion about the values of the IPA, together with related issues, opportunities, management objectives and strategies, are grouped under these themes:

- *Kuruwarri Yapa-kurlangu-kurlu* – Looking after Culture

Continuing customary practices on country and passing down cultural knowledge between generations are critical to managing the natural and cultural values of the region and to the spiritual and social wellbeing of *Yapa*.

- *Warrawarra kanyi ngurra* – Looking after Country

Managing threatening processes, such as altered fire regimes and introduced plants and animals, is essential to maintain or enhance the condition of the cultural and biodiversity values of the region. Managing these threats requires addressing data gaps and marrying traditional and Western land management knowledge and techniques.

- *Pina jarrijaku jirramala juku* – Two-Way Education and Training

Programs are required to educate *Yapa* and *Kardiya* in both traditional and Western approaches to caring for country.

- *Ngurra ngampulaju warrki panujarlu* – Jobs and Economic Development

Employment opportunities linked to the IPA are essential for the economic development of communities in the region and for retaining traditional owner commitment to IPA designation over their country. Apart from land management programs, other economic development opportunities in the IPA include fee-for-service environmental management work, and jobs in the pastoral and mining sectors. Emerging potential economic opportunities include cultural tourism, carbon farming, and the harvest and processing of bush resources.

These management themes, and the strategies identified to address issues and realise opportunities, are often interrelated. From the perspective of *Yapa*, all aspects of culture, kinship, land, language and Law are intertwined and necessarily linked together. As a consequence, implementing most of the management strategies contained in this plan requires a multi-themed, integrated approach.

PART B

MANAGEMENT STRATEGIES

CHAPTER 5

Kuruwarri Yapa-kurlangu-kurlu Looking after Culture

Teddy Jupurrurla Morrison teaching young boys a dance as part of the IPA declaration ceremony in 2007

5.1 Introduction

For *Yapa*, 'looking after culture' and 'looking after country' are inextricably linked. Embedded in Warlpiri and Gurindji cultures is a strong land management ethic, articulated as "*people being there for country, and country being there for them*" (Wanta [Steven] Jampijinpa Patrick). This reciprocal relationship with country extends to virtually all aspects of Warlpiri and Gurindji culture, customary practices and knowledge and is governed by customary rules passed down from generation to generation and originating from the *Jukurrpa*.

Yapa remain proud of the integrity of their culture, and senior Warlpiri and Gurindji traditional owners strive to keep language, knowledge systems, ceremonies and other cultural practices strong. For *Yapa*, the passing on of this knowledge to younger people is essential and has remained an important aspect of all activity on country. Supporting the maintenance of cultural practices and the transfer of knowledge underpinning these practices will ensure that culture and country remain vibrant and healthy into the future.

5.2 Cultural Beliefs and Knowledge

5.2.1 Background

"Ceremony makes you feel part of it. It makes your heart pump more, gives yourself life, makes you proud; and that way it makes you realise that you have this kurrwa *(responsibility)."*

Wanta (Steven) Jampijinpa Patrick

Traditional *Yapa* beliefs and knowledge systems, in all their layered complexity, are defined in the *Jukurrpa*. Consisting of countless songs, stories, practices and *parnpa/juju* (ceremonies), the *Jukurrpa* describes the origins, attributes, management and uses of every element of the land. It also prescribes who is responsible for certain places, how people interact with each other and who can go where and with whom. The all-encompassing *Jukurrpa* is the very core of *Yapa* culture, connecting and sustaining both people and country.

The *Jukurrpa* ancestors were people, but they also represented species of plants and animals, celestial bodies, wind, rain and fire. Their travails and invocations established the purpose and roles of all

living things and created phenomena such as fire and weather, language, songs, rules and ethics; in short, all of *Yapa* culture was established by the *Jukurrpa* ancestors.

Yapa believe *Jukurrpa* ancestors continue to reside in country, in their original forms as well as in the rocks, the trees and other elements of the landscape. The *Jukurrpa* beings are also believed to have imparted a power or consciousness within the country that is necessary to maintain life forms associated with each of them. In most cases, this power is now localised at certain sites where *Yapa* believe that through ceremony, song and certain ritual actions it may be called up to revitalise country.

In addition to the sites marking places where *Jukurrpa* ancestors ended their journeys, performed actions or left items of importance (Figure 7), the land is crisscrossed with their tracks. These *Jukurrpa* tracks (storylines) link sacred sites and, in turn, their custodians. In its entirety, each track represents the compound story of one or more *Jukurrpa* ancestors. These stories are documented in complex song cycles that describe the actions of these beings, the routes they took and the names of sites along the way. Such songs are memorised by people and continue to be sung during country visits and ceremonies. These songs are believed to be physically present in the ground, water or sky.

Yapa also continue to believe strongly in the presence of the spirits of their relatives within the landscape. Known as *Milarlpa*, these spirits represent a powerful and pervasive force ensuring that country is managed in accordance with the laws of *Jukurrpa*. For *Yapa*, any activity related to land must take *Milarlpa* into account.

"The Law is something to follow like a road guide. The law is a serious thing and it needs to be followed. Marlu *(red kangaroo) is a symbol of the Law. Men cooking a kangaroo is a serious thing … even the dance and ceremony for that one is serious."*

Wanta (Steven) Jampijinpa Patrick

For *Yapa*, *Ngurra-kurlu* is one way of describing the principal elements of culture: *ngurra* (home, the land), *kuruwarri* (Law), *jaru* (language), *parnpa/juju* (ceremony) and skin, and their interrelations. Understanding *Ngurra-kurlu* has many benefits for Warlpiri and also for those who work with them. It can be thought of as:

- a template for the whole of Warlpiri culture
- an efficient pedagogy (way of teaching)
- a process for building identity and self-esteem
- a way of looking after the health of people and the health of country
- a framework to create successful projects that are relevant to Warlpiri people.

(Pawu-Kurlpurlurnu *et al*. 2008)

In essence, in order to manage country properly, a person must follow the rules and instructions that lie within Warlpiri Law. To achieve this, they must visit the right *country*, with people of the right *skin* groups, speaking strong Warlpiri *language* while undertaking activities based on traditional knowledge handed down and celebrated through *ceremony* and song. The IPA is built on this cultural framework that determines how, when, where and by whom activities are undertaken as prescribed by traditional Aboriginal owners and their established cultural protocols.

Figure 6 Sand drawing representing the five elements of *Ngurra-kurlu* (from Pawu-Kurlpurlurnu *et al*. 2008)

Yapa are required to perform particular ceremonies, songs and other rituals to ensure the ongoing wellbeing of species and the continuing viability of individual *Jukurrpa* stories and associated places. Specific individuals or families are responsible for certain storylines and sites as determined by a variety of relationships, including a person's descent, place of birth, spiritual affiliation, ceremonial knowledge and place of residence. *Yapa* believe that country that is neglected, or has not been visited, or for which ceremony has not been performed becomes unhealthy or even dangerous.

Historically, a wide variety of ceremonies existed in Warlpiri and Gurindji culture, each with a specific social or spiritual purpose. While some of these ceremonies have been lost, many are still practised in various

"Ceremony is to do with country. Ceremony goes with country because ceremony is about country all the time. Different families and skin groups are connected to different areas of country. Even on country visits when singing and dancing, this is ceremony. When paint is on the body, it is the ceremony."

Judy Napangardi Martin and Margaret Nungarrayi Martin

Jerry Jangala Patrick teaching songs to school children on a country visit, 2012

forms. There are men's and women's open ceremonies (*purlapa* and *yawulyu*) and restricted ceremonies where ceremonial dialects may be spoken. Many ceremonies include the performance of songs and dance confirming and reinforcing traditional associations with country as well as rituals to generate abundance and ensure the health of specific *mayi* (plants) and *kuyu* (animals).

Ceremonies are key times at which traditional knowledge is recalled, revitalised and taught. Warlpiri equate ceremonies with 'school' in the sense that they represent an iterative education in all elements of traditional culture. In this way, ceremony plays a major role in developing Warlpiri identity, testing knowledge, instilling a sense of pride and responsibility and building leadership and resilience. However, much of the teaching and learning that occurs during ceremony happens in the preparatory stages rather than during the dance or performance itself, which is often fleeting. While painting *kuruwarri* onto the body, traditional owners spend time recounting stories, recalling *jaru* (language) and elaborating *Jukurrpa*. In this sense, ceremony refers not only to the dance and the song, but to the entire process that makes them possible. Traditional owners believe greater recognition and support for ceremony is a key pathway to improved community engagement in the IPA, stronger governance and a more culturally integrated land management program.

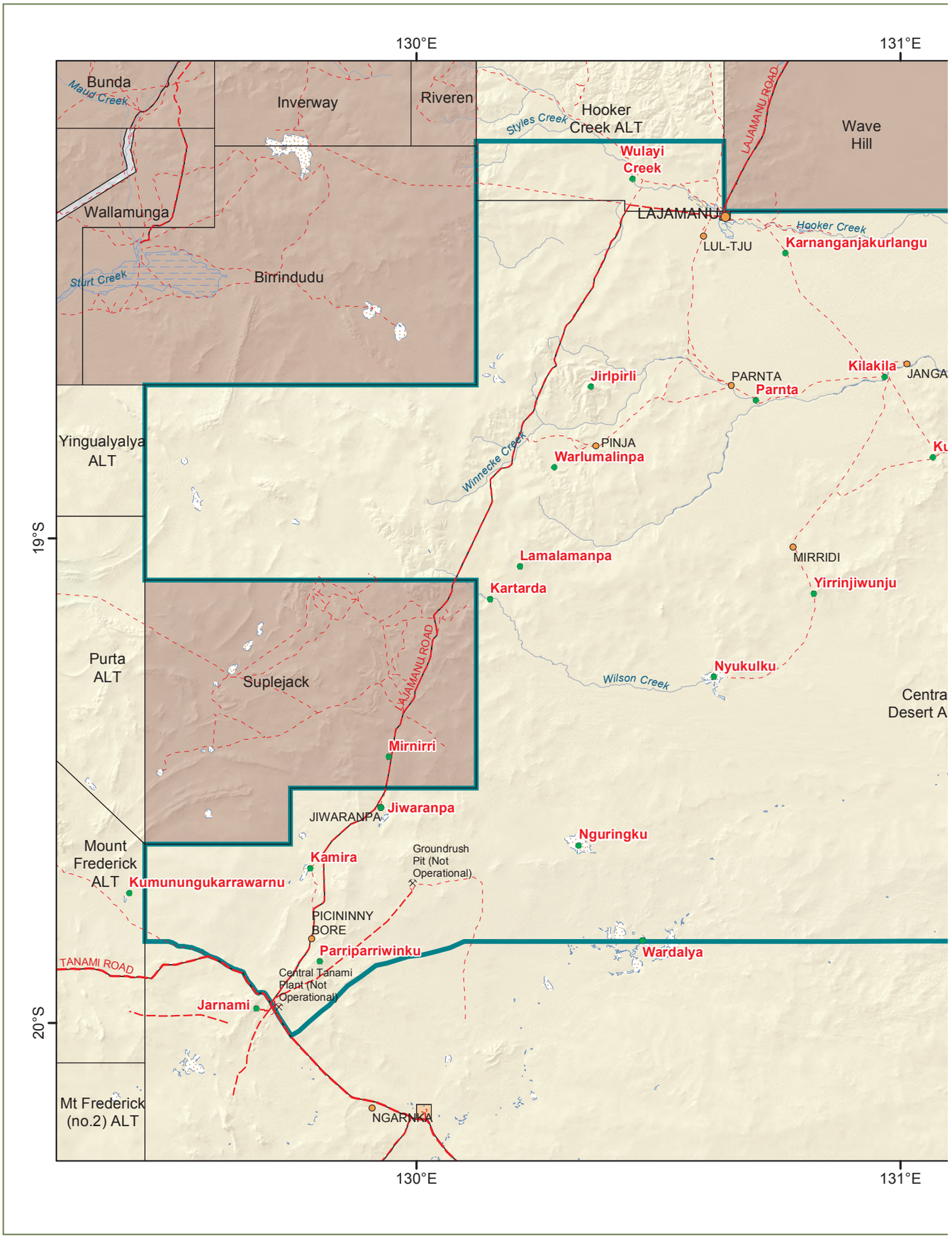
The body of traditional knowledge that informs Warlpiri and Gurindji culture is extensive and complex. The different roles and responsibilities assigned through *Jukurrpa* to men and women are reflected in the existence of gender-specific knowledge and access restrictions to certain knowledge and associated sites. Customarily much of this knowledge was relayed in metaphor and, due to its sacred nature, only became available to initiates through a life-long process of ceremony and inculcation. As a result, traditional culture generally remains obscure to *Kardiya* and younger traditional owners alike.

One aspect of traditional knowledge that is of particular significance to IPA management is the retention and transfer of traditional knowledge relating to country, plants and animals and the way *Yapa* traditionally managed country. Collectively referred to as Indigenous Ecological Knowledge (IEK), this body of knowledge is being drawn on more and more by *Kardiya* scientists and natural resource management agencies to protect ecological systems and processes.

In Warlpiri and Gurindji culture, irrespective of who 'holds' the knowledge, possession carries with it the responsibility for protecting that knowledge. This means ensuring that any restrictions are enforced and that the transfer of knowledge to the next generation of custodians occurs. This oral transfer of *Jukurrpa* and associated knowledge is a significant aspect of *Yapa* culture and is critical in educating young people about their roles and responsibilities in looking after their country.

5.2.2 Issues and Opportunities

Previously, *Jukurrpa* featured in the day-to-day lives of *Yapa* through storytelling, singing and the maintenance of sites. Dances and ceremonies associated with particular animals, plants or places were performed regularly. In the daily search with family members to find food or other resources, children learnt about the ecology, traits and uses of individual species, where to find them and, in the case of animals, how to track and hunt them.



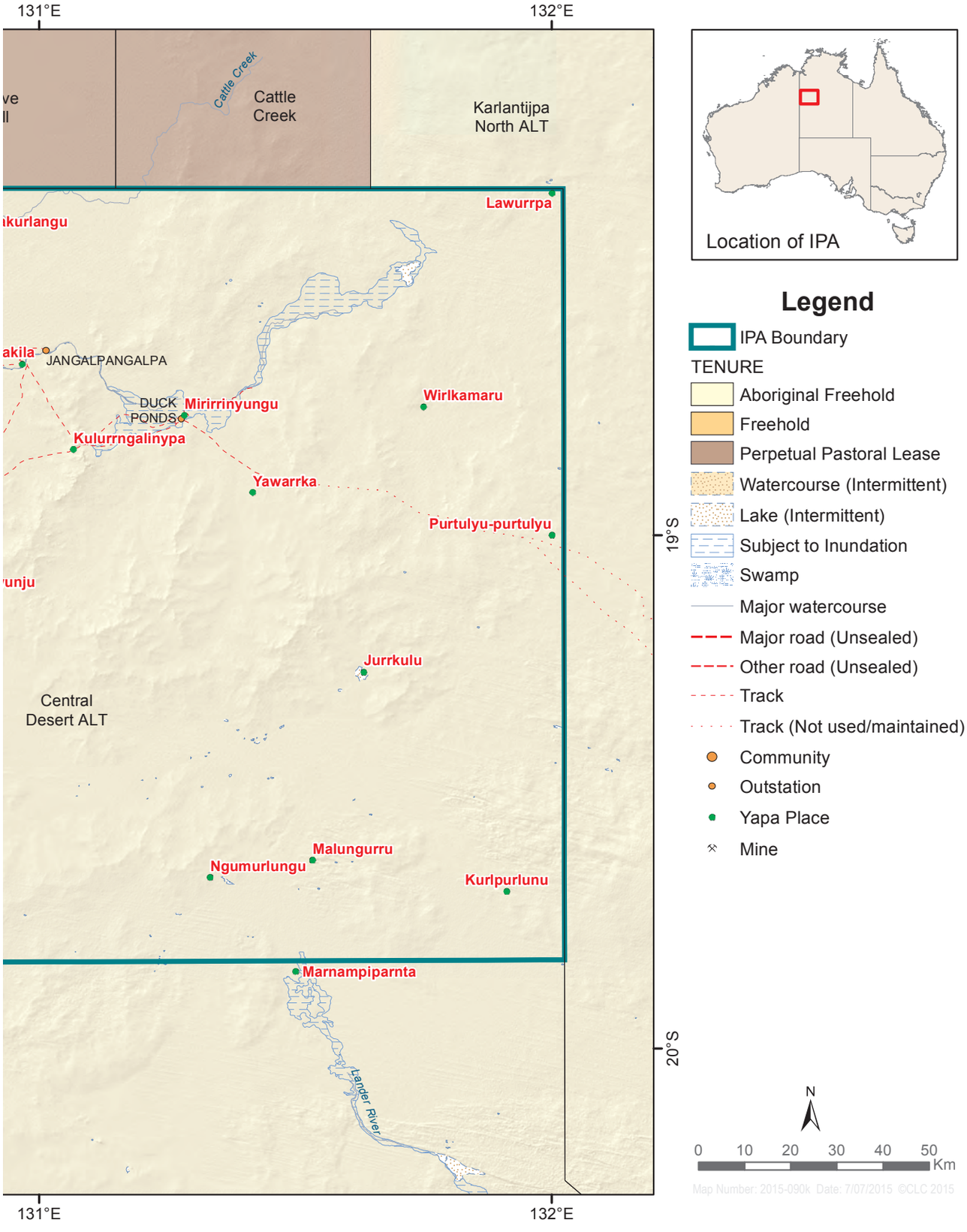


Figure 7 *Yapa* Place Names

With the onset of European settlement in the region, *Yapa* began moving off their country in the early 1900s because of prolonged droughts and the allure of food at ration depots around newly established settlements. Combined with government policies of forced resettlement away from traditional lands and the active discouragement of the use of traditional languages and cultural practices, this contributed to a dramatic loss of cultural knowledge. The loss continues with the passing of senior knowledge holders and the many health and social issues associated with living sedentary lifestyles in centralised communities.

Loss of Cultural Knowledge

Today only a small number of *Yapa* who grew up living a traditional life on country are still alive. Soon this cohort of elders will be gone, marking a definitive point in the region's indigenous history. The passing down of songs, stories and acquired knowledge of country to the next generation is seen as a key responsibility for senior and middle-aged Warlpiri and Gurindji. Elders use the term *pina-maninjaku* in this regard, which translates as 'we want to teach'.

Fragmentation of the traditional knowledge base underpinning Warlpiri and Gurindji culture is now a critical and accelerating issue. This loss of *Yapa* cultural knowledge encompasses:

- loss of *Jukurrpa* stories, songs, ceremonies and practices
- loss of knowledge about culturally significant sites. For various parts of the IPA, knowledge of the locations or the very existence of some sites has been lost forever. Sometimes there is no one alive who has personally visited such places, or the remaining knowledge holders live in distant towns or communities and rarely, if ever, visit their country
- loss of ecological knowledge concerning individual species, particularly those that are rare or now regionally extinct
- loss of knowledge of traditional land management regimes, including burning and sustainable hunting and harvesting practices (refer Section 5.3.2).

These issues are sometimes exacerbated by the reluctance of senior *Yapa* to pass on knowledge to young people if they believe they are not sufficiently mature, respectful or interested. Most elders view the re-engagement of young people with the spiritual, cultural and ecological knowledge embedded in the *Jukurrpa* as being of the highest priority. For them, the revaluing of traditional beliefs and knowledge offers young people a renewed sense of identity and empowerment and the chance to keep *Yapa* culture alive.

Myra Nungarrayi Herbert and Margaret Nungarrayi Martin looking for sugarbag

Children performing a dance as part of 2014 Milpirri Festival, Lajamanu. Tracks Dance Company. Photographer Peter Eve.

Recording a *Jukurrpa* story at Wardalya (Spider Lake)

Events such as the annual IPA-supported school country camp and the biennial Milpirri festival held in Lajamanu provide important opportunities for senior traditional owners to pass on knowledge to young people. There is strong support from and involvement of *Yapa* in both of these events.

Senior *Yapa* involved in IPA management have expressed an interest in conducting long walks on country as a means for passing on important cultural knowledge to both young and older people. CLC administered ranger groups have participated in similar walks on country in the past.

Mainstream recognition of the importance of the traditional knowledge still retained by senior *Yapa* may help build respect for such knowledge among young people. The elevated status given to knowledge holders may encourage indigenous rangers and others to seek out traditional knowledge, reducing the likelihood of more such information being lost (refer Section 7.2).

Recording and Storage of Cultural Knowledge

Yapa cultural knowledge has always been passed down orally. With the number of senior knowledge holders dwindling with each passing year, there is an identified need to document many aspects of *Jukurrpa*.

The locations of cultural sites, and the stories and ceremonies associated with them, need to be recorded, as do aspects of ecological knowledge held by senior people. Retention of this knowledge is not only critical for current and future generations of *Yapa*, it is also important for the long-term management of the IPA.

Several recent projects, including work done by IPA and ranger staff, have utilised contemporary multimedia technologies to document cultural knowledge. In particular, video recordings work well for documenting knowledge and stories, and this technology has been adopted enthusiastically by *Yapa*, especially by younger people. Involving young people in these projects also helps to foster their interest in *Jukurrpa* and *Yapa* culture more generally. The availability of user-friendly video production software in the last few years has meant that in many cases the whole documentation process can be in the hands of *Yapa* themselves without the need to rely on the technical expertise of other people.

Lajamanu community is serviced by Yuendumu-based staff from PAW Media – an Aboriginal media organisation based in the Tanami. PAW has been involved in many knowledge documentation projects over the past 30 years and worked with the North Tanami Rangers in 2009 to video-document cultural and natural resource survey work at Nyukulku (Wilson Creek Floodout). PAW is interested in extending its outreach program and providing media and documentation training to rangers based at Lajamanu.

Recording and securing cultural knowledge is a common objective across several community-based

projects operating in Lajamanu. Over many decades, cultural knowledge has been collected and collated in association with various anthropological, linguistic, educational, historical, media, environmental and art-based endeavours. However, much of this information, held in a variety of media at scattered locations, remains largely unavailable to traditional owners. A notable exception is an interactive database existing in the Lajamanu Learning Centre.

The systems adopted in which to store and retrieve documented cultural information require careful consideration and design. While the system chosen for the storage of this knowledge needs to be accessible to *Yapa*, it must incorporate *Jukurrpa* rules on information access. Use of traditional knowledge by *Kardiya* needs to be covered by protocols to protect indigenous culture and intellectual property rights.

Repatriation of Cultural Material

Ever since the first contact between Europeans and Aboriginal people in Central Australia, the way of life and cultural beliefs of *Yapa* have been studied and documented in a variety of forms. Objects were collected and catalogued, while practices, ceremonies and knowledge were chronicled in words, films and sound recordings. In many cases, this material was deposited in public or private museums, libraries and educational institutions within Australia and abroad.

The information stored in these collections may include *Jukurrpa* knowledge that is no longer held by contemporary *Yapa*. The repatriation of this knowledge and the sharing of it with those people identified as its custodians offer opportunities for cultural revitalisation and enrichment and improved management of the IPA.

Appropriate storage of these artefacts (including modern media to store secret or sacred information) is a high priority for traditional owners. Currently in Lajamanu, very inadequate facilities are being used for separate storage of men's and women's cultural objects, and there are no protocols or practices in place to conserve these materials.

CLC Cultural Heritage Management Program

In 2012, the CLC began developing an organisation-wide Cultural Heritage Management Program to address the coordination, integration, development and prioritisation of cultural heritage management support and activities. The program encompasses a broad range of cultural heritage matters, including:

- the transmission and recording of cultural knowledge
- customary management activities
- the physical maintenance of culturally significant sites
- training and capacity building
- the development of cultural heritage management plans or related documents (refer Section 5.2.2).

The operational guidelines produced as part of the program, *CLC Cultural Heritage Management Program: Guidelines for Anthropology and Land Management Sections,* provide a strategic framework for managing cultural heritage values across the IPA.

Women's Country Mapping Project

At the 2014 *Warlu* Committee meeting, senior women identified a limitation in the planning process. The use of satellite maps without appropriate cultural place overlays prevented women from engaging effectively in decision-making. In response to this challenge, women came up with the idea of creating their own map of country to use for planning project work and for teaching young people about important cultural sites.

Working with the IPA Coordinator and the CLC Fire Officer in early 2015, women involved with the IPA workshopped ideas about what the map would be used for, what information would be included on it and how to develop it so that it could be a dynamic tool for a range of future planning needs. Senior women decided the map would depict country based on skin group connections, as well as showing places of significance in the IPA, including prominent landforms, tracks, water places and cultural sites.

The group then visited country around Parnta outstation and explored a seldom-used track to Pinja to look at and discuss the types of features they would include on their map. Back in the IPA office in Lajamanu, Google Earth software was used to produce a digital image of the IPA, which was projected onto a large canvas. Women then marked places of significance onto the map in geographically accurate locations. This was done so that the map would be spatially accurate and enable effective two-way communication between *Kardiya* and *Yapa* during planning exercises.

The IPA boundary, main tracks, watercourses and other prominent features were then painted onto the canvas. Subsequent country visits will be used to collect additional location-specific information to fill in the map. These trips will also be used to teach younger people the stories associated with specific sites and about customary management responsibilities for these sites.

5.2.3 Management Strategies

Management Objective 5.2.3(a)

Support traditional owners in preventing the ongoing loss of cultural knowledge

Management Strategies

1 In conjunction with senior *Yapa*, the IPA Management Committee and CLC Anthropology Section staff, review the cultural knowledge records held by the CLC for the IPA and identify key knowledge gaps.

2 Based on the advice of *Yapa*, identify the best means of addressing key knowledge gaps, including:

- conducting country visits
- holding one-on-one or group interviews and cultural mapping exercises and documenting specific cultural knowledge of senior traditional owners using multimedia technologies (refer also Management Objective 5.2.3[c])
- sourcing and reviewing archived information (refer also 5.2.3[d]).

3 Develop and implement a country visit program as the principal means of supporting the retention and recording of *Yapa* cultural knowledge.

The program will aim to preserve cultural knowledge associated with:

- *Jukurrpa* stories, songs, ceremonies and practices as they relate to particular places or regions
- culturally significant sites (including relocating 'lost' or rarely visited sites and knowledge concerning their management)
- ecological attributes (including those relating to rare or regionally extinct species) (refer also Management Objective 5.2.3[b])
- customary land management practices (refer also Management Objective 5.3.3[a]).

The program will also include support for an annual school country visit, which will meet the aspirations of traditional owners for passing on cultural knowledge to successive generations.

In keeping with the *CLC Cultural Heritage Management Program: Guidelines for Anthropology and Land Management Sections*, the program will prioritise country visits based on the following considerations:

- the results of the review of the cultural knowledge already recorded for the IPA (refer Strategy 1)
- the risk of irretrievable knowledge loss due to only a small number of senior *Yapa* knowledge holders remaining alive
- areas of outstanding cultural significance
- areas considered to be vulnerable because of proposals for future mining exploration or extraction
- estates for which a low level of cultural knowledge has been recorded
- equity among family groups and different parts of the IPA
- a demonstrated interest shown by traditional owners in retaining their cultural knowledge
- a demonstrated interest shown by potential recipients in receiving cultural knowledge
- areas that are difficult for traditional owners to access without logistical support and which therefore have had low levels of visitation in recent years
- opportunities to mitigate risks to cultural values or sites through undertaking country visits.

Each country visit will aim to contribute to the retention of cultural knowledge through providing opportunities:

- for senior knowledge holders to teach younger people on site through showing and telling
- for *Yapa* to record cultural knowledge for their family or for community use in the form of photographs and sound or video recordings, with copies of material to be retained in the IPA database (or another community-based database) as appropriate (refer Management Objective 5.2.3[c])
- for *Yapa* to undertake ceremonies that may not have been practised for many years because sites are not easily accessed or senior knowledge holders have dispersed
- for CLC staff to record appropriate information for inclusion in the IPA management and/or CLC Anthropology databases (refer Management Objective 5.2.3[c]).

The planning and conduct of individual country visits will require:

- coordinating the involvement of the right senior traditional owners, key knowledge holders, family members and young people for the country involved
- utilising the trip to undertake other IPA land management work priorities
- where appropriate, involvement of other CLC staff, including rangers, regional anthropologists and IPA partners (including cross-border IPAs and ranger groups).

4 Conduct one-on-one or group interviews and cultural mapping exercises with key cultural knowledge holders as directed by *Yapa*. As appropriate, provide opportunities for *Yapa* to record this knowledge for their own use and for suitable material to be recorded and stored in the IPA management and/or CLC Anthropology databases and/or other appropriate community-accessible databases (refer Management Objective 5.2.3[c]).

5 Support the involvement of North Tanami Rangers and IPA Management Committee members in important cultural events such as the CLC's Women's Law and Culture meeting and the biennial Milpirri festival at Lajamanu.

6 Develop language-based community resources documenting the outcomes of cultural heritage maintenance projects to encourage broader involvement of traditional owners.

7 In accordance with protocols governing the appropriate use and management of cultural information (refer Management Objective 5.2.3[c]), produce maps, printed photographs, video and sound recordings and other relevant products to assist traditional owners in maintaining and transferring cultural knowledge.

8 Wherever possible, include country visit objectives into permit approvals for external parties' research or exploratory trips in the IPA.

All work directed at documenting sacred sites or developing archival systems for sacred or secret cultural information recorded as part of IPA work is to be progressed in communication with CLC Anthropology Section staff.

Management Objective 5.2.3(b)

Support the retention, intergenerational transfer and application of Indigenous Ecological Knowledge

Management Strategies

1 Develop and implement an Indigenous Ecological Knowledge (IEK) program designed to:

- provide opportunities for the systematic intergenerational transfer of this knowledge to young *Yapa*
- teach this knowledge to both North Tanami Rangers, other *Yapa* and IPA staff through both formal and informal means (refer also Management Objective 7.2.3[a])
- facilitate the application of this knowledge in planning and day-to-day management of the IPA.

The structure and content of the IEK program will be based on assessments of:

- the extent and type of existing IEK documentation
- the information still held by individual *Yapa* knowledge holders
- IPA management needs for particular IEK.

The program will utilise a variety of means to promote the transfer of IEK, including:

- country visits and IPA and ranger program field trips
- IEK-specific country trips
- school programs (including junior rangers and school country visits)
- formal IEK training workshops and trips for IPA and ranger staff.

As with the country visits, the IEK program will include opportunities to record IEK by both *Yapa* and *Kardiya* and to store appropriate IEK information in the IPA management database for ongoing educational purposes (refer also Management Objective 5.2.3[c]).

Management Objective 5.2.3(c)

Assist traditional owners to manage cultural information

Management Strategies

1 The collection and recording of all cultural knowledge will utilise the standardised methods and tools developed through the *CLC Cultural Heritage Management Program: Guidelines for Anthropology and Land Management Sections*. (This applies to all information collected through the country visit program, knowledge-holder interviews, literature reviews and the IEK program.)

2 Identify options for the safe electronic storage, access, use and distribution of cultural information. Investigate and pursue creation of an interactive community-based IPA management database or other means of serving this purpose.

3 Ensure that all information relating to sacred sites is forwarded to CLC Anthropology Section staff for secure storage.

4 Investigate and pursue options for the secure storage and appropriate management of physical objects associated with the IPA.

5 In conjunction with senior *Yapa*, the IPA Management Committee and CLC Anthropology Section staff, develop and enforce protocols governing the appropriate use and management of all IPA cultural information and items.

6 Ensure that protocols developed in 5 (above) are disseminated and understood by all IPA partners and by any third parties that may engage in projects in the IPA.

Management Objective 5.2.3(d)

Support the repatriation of cultural material associated with the traditional owners of the IPA

Management Strategies

1 Conduct a review of all relevant available publications, including historical records, to locate cultural information related to the IPA which may not be known to contemporary *Yapa*. Make this information accessible to *Yapa* and utilise it, as appropriate, in managing the IPA.

2 In conjunction with CLC Anthropology Section staff, identify relevant organisations, institutions and individuals holding cultural material relevant to the management of the IPA, including but not limited to:

- ceremonial documentation pertinent to increase ceremony or other relevant *parnpa/juju*
- historical documentation related to the location of sacred sites and water places
- documentation of traditional land uses and management practices.

3 In conjunction with *Yapa*, determine which externally held cultural material is relevant to the management of the IPA and seek its repatriation.

School country camps – the next generation in training

Discussions between *Yapa* and staff from the IPA and Lajamanu School about developing an IPA school country camp program began in 2008. These camps were envisaged as an ideal means of teaching children *Jukurrpa* stories and ceremonies linked to selected themes in the current school curriculum. For *Yapa*, learning on country from senior people is the preferred learning model. As such, the involvement of senior *Yapa* is essential to the success of such camps, which also involve IPA staff, rangers, teachers and staff from partner organisations.

"He went that way....." Tracking training on a school country camp

The first of these school country camps was held in September 2009 at a site north-east of Mirirrinyungu. It involved 31 school children, 8 teachers, 27 elders and parents, the (then) Wulaign Rangers and IPA staff. The theme for the four-day camp was *kuyu* (animals): children learned traditional tracking skills from elders and how to make *kularda* (spears) and *kurlangu* (digging sticks) out of *manja* (mulga). They also learned about contemporary fauna survey techniques (pitfall trapping) from rangers. Each night, ceremony was performed and children were taught dances and songs related to country.

Almost every year since then, IPA staff have coordinated an annual school country camp, in partnership with staff from the Lajamanu School and Warlpiri Youth Development Aboriginal Corporation. Mirridi, Nyukulku, Kamira, Jurrulukurlangu and Jiwaranpa are some of the locations of past camps, and the themes have ranged from bush medicines and water places to *jurnarrpa* (*Yapa*-made objects).

In the lead-up to each camp, rangers visit the school to talk to the students about past camps and the IPA work they have recently completed. The IPA Management Committee chooses the location of each camp, then *Yapa* and *Kardiya* staff develop the program of activities and timing of the camps. The Warlpiri Education and Training Trust provides funds to Lajamanu School for additional costs not covered by the IPA program.

Children participating in the camp get to wear Junior Ranger uniforms modelled on those of the North Tanami Rangers. This helps to reinforce the important role that rangers have in managing country in the IPA. After each camp, rangers return to the school with photographs and video footage recorded during the camp and work with the children to develop a storybook about the camp and the things they learned. Copies of this book are then distributed throughout the community.

The school country camp program is a very valuable way of ensuring important traditional knowledge and skills are passed on to younger *Yapa*. The range of activities school children participate in during these trips also reinforces two-way learning outcomes.

5.3 Customary Practices

5.3.1 Background

"When we live in the bush we are strong. In the bush we live a healthy life. We still use bush medicines … we know the plants to fix ourselves up … plants that belong to our country."

Margaret Nungarrayi Martin

The Warlpiri phrase '*yapa-kurlu*' encapsulates the idea of country needing people and people needing country. Warlpiri and Gurindji people believe that their presence on country, actively undertaking traditional burning, hunting and gathering practices, is necessary for the land to be revitalised.

For *Yapa*, the simple act of 'being on country' is the overarching customary practice that overshadows all others. The desire to be on their land, so as to renew their relationships with it and to fulfil their cultural responsibilities for it, is still deeply embedded within *Yapa*.

In historical times, 'being on country' was a constant feature of *Yapa* lives. So, too, were the highly prescribed practices that were required to maximise the productivity of the land and the likelihood of *Yapa* survival. These included:

- protecting and maintaining cultural sites (many of which coincided with resource-rich areas such as water places)
- sustainable resource management (including burning practices and a raft of hunting and harvesting protocols).

In addition to these practices, performance of *parnpa/juju* (ceremonies) – many of which included songs and dances confirming and reinforcing traditional associations with country as well as rituals to generate abundance – ensured the health of specific plants and animals and the country overall. *Yapa* view the continued performance of such ceremonies as an essential component of IPA management.

As well as performing *parnpa/juju*, *Yapa* use various practical measures to protect and maintain cultural sites. These include fine-scale burning work to reduce fuel loads in areas adjoining sacred sites or other culturally significant features and removing debris and silt from waterholes. This work can only be undertaken by *Yapa* with the appropriate connection to specific sites as determined through *Jukurrpa*.

Jukurrpa-prescribed restrictions also applied to access to sacred sites. For especially sensitive places, knowledge of their very existence was highly restricted, with visitation only permitted by, or in the company of, senior custodians. Sanctions for violating knowledge and access restrictions for such places could be severe. Access to other sites was, and remains, gender specific or limited to initiates. Customary practices associated with approaching and visiting most sacred sites, irrespective of their degree of sensitivity, usually demanded specific codes of behaviour. Similarly strict protocols also covered the viewing, handling and possession of sacred objects, many of which were stored at sacred sites.

As mentioned earlier, Warlpiri and Gurindji people believe that a person's spirit returns to country after death, and that it is important for people to be buried on their land. As a result, some sites are of particular significance to people whose ancestors may have died and/or been buried there. Within the IPA, there are a number of historic or contemporary grave sites that are of major cultural significance to the community and which require ongoing management.

In arid landscapes, water is the defining resource for wildlife and human inhabitants alike. As *Yapa* were ultimately dependent on the quality and quantity of this very limited resource, places such as rockholes and springs were actively managed. On each visit, plant debris and animal remains were removed from the water to make sure it remained uncontaminated, then barriers – such as branches or rocks – were placed over soakages and small rockholes to reduce evaporation. These cleaning and preserving practices, regularly performed at the many water places dotted across the greater landscape, also optimised food production by sustaining local populations of game species reliant on water supplies (refer Section 6.3.1).

Regular burning continues to be the primary instrument of customary land management for contemporary Warlpiri and Gurindji people. Prior to European settlement, fire was used routinely to manage desert country, with each burn carried out with intimate attention to seasonal conditions and in strict accordance with long-standing tradition. Fire was used to clear country, rejuvenate resources, cook, gain warmth or light or to signal to countrymen over large distances. Burning has a counterpart in *Jukurrpa*, and it is often felt that

country that has not been burnt for some time is likely to be 'wild' and possibly dangerous to people.

Travelling out on country to collect bush resources has a deep cultural basis; traditional owners identify it as a foundational activity from which many social and environmental benefits derive. Two Warlpiri words are used to describe different types of country visits. *Manjiki* means 'camping out' for three days or longer with time to "sing the songs and go over them slowly and to learn all the rocks and trees and to understand the significance of an area" (IPA workshop participant). The other type of country visit is known as *wirlinyi*, which means 'moving away from one's fixed camp for the day and returning'.

Wirlinyi is about harvesting and use of resources, but it also encompasses many other activities associated with hunting and gathering. These include tracking, teaching, burning, monitoring and appreciating country. *Wirlinyi* is an inherent part of the relationship Warlpiri and Gurindji people have with their land. Within this relationship there is an expectation of reciprocity: when one looks after the land, the land will in turn look after you, providing physical and spiritual sustenance. In this sense, *wirlinyi* can be viewed as the foundation of indigenous land management.

Traditional hunting and harvesting provide opportunities to transfer cultural knowledge between the generations and perpetuate valuable customary practices. In promoting and supporting *wirlinyi* through the IPA, traditional owners hope to positively influence the hunting practices of younger people. They hope to regain a proper balance in the management of popular game species.

While the continuation of customary practices is no longer critical to *Yapa* survival, the partial or total cessation of such activities across all or parts of the region has had profound impacts upon *Yapa* and biodiversity.

5.3.2 Issues and Opportunities

With most *Yapa* now living in settlements, sometimes far removed from their traditional estates, opportunities for them to spend time on their country and undertake customary practices are often severely limited. Although eight outstations were constructed across the region to facilitate traditional owners' aspirations to return to live on their country, only one of these, Lul-tju, has operational bores or generators and is recognised as being permanently occupied under the Northern Territory Government's 2009 Territory Growth Towns

Girls with *laju* found during the school country camp, 2014

Lily Nungarrayi Hargraves showing *yarla* she has dug up

Teddy Jupurrurla Morrison teaching a dance to boys on a school country visit, 2012

policy. There is no funding for ongoing maintenance work at the other seven outstations in the IPA; however, the North Tanami Rangers do undertake annual fuel reduction and weed management work at several of these outstations to support traditional owners' aspirations.

The ability of *Yapa* to be on country is also hampered by access difficulties. Most of the IPA is roadless, and those tracks that do exist are usually of a rudimentary nature and only negotiable by four-wheel drive vehicles. Very few *Yapa* own such vehicles. To adequately extend management across the IPA, it will be necessary to develop new access tracks. Such tracks invariably also serve as fire breaks and tend to help disperse hunting pressure across a broader area. Conversely, they can also facilitate the spread of weeds and feral animals and result in soil disturbance, which may lead to impeded sheet flow during rain events and accelerated erosion.

In addition to infrastructure constraints, the diminishing number of surviving senior knowledge holders means that with each passing year more and more knowledge is lost concerning the locations of sacred sites, burial places and water sources. In some cases, loss of more intricate knowledge associated with some customary management practices at these sites – such as fire management – is also impacting on the health of country in the IPA. Compounding this issue is disinterest among some young people to take on the roles and responsibilities of custodians of their country and to learn and apply customary land management practices. This includes an appreciation of access restrictions and an understanding of the protocols governing resource harvesting.

As *Yapa* are no longer reliant on locally available natural resources for their survival, adherence to the traditional rules aimed at preventing overharvesting has faltered. Traditional Law relating to resource species is no longer common knowledge among younger *Yapa*. Critically, without the benefit of customary restrictions on consumption, nor the advantage of an ecological perspective, many favoured hunting species are suffering declines, partially as a result of overhunting facilitated by modern hunting methods and the concentration of hunting around communities and outstations. Emus and bustards are particularly vulnerable to overhunting, as they are easily approached and tend to feed in more open, recently burnt areas.

Both the North Tanami Rangers and the IPA initiative have included country visit programs in which senior

traditional owners and their families have been provided with the means of visiting and spending time on their country. The availability of reliable four-wheel drive vehicles and helicopter transport through these programs has enabled people to visit remote country, often for the first time in many decades.

Such country trips have been, and continue to be, used by *Yapa* to visit sacred sites and water places, undertake customary activities and teach young people about places and practices. Including young people on these trips is critical not only to the long-term retention of knowledge about customary land management practices and the building of confidence to apply them, but also as an invaluable way to reinforce the importance of the custodial roles and responsibilities young people have inherited.

In addition to country visits, the ranger and IPA programs have conducted innumerable field trips throughout the region in recent years, primarily focused on contemporary land management activities such as fire, weed and feral animal management and flora and fauna surveys. Senior traditional owners and members of their families are invited on all such field trips, which provide additional opportunities for people to conduct customary activities. Such trips also allow *Kardiya* staff to learn from traditional owners and expose *Yapa* to Western land management approaches and concerns. This has resulted in better understanding among *Yapa* participants of impacts associated with feral animals and weeds.

The reinvigoration of customary land management practices across the IPA is viewed as essential to the health of both *Yapa* and country. The IPA program has the potential to strengthen traditional owner ties with their country and increase the application of customary practices. It also has a central role in facilitating intergenerational transfer of customary land management knowledge and encouraging young *Yapa* to revalue such knowledge.

Line-up of troopies on a joint Southern and Northern Tanami IPA trip

5.3.3 Management Strategies

Management Objective 5.3.3(a)

Support traditional owners to fulfil cultural obligations to care for country through customary management activities, including:

- **looking after cultural sites**
- **hunting and harvesting of bush resources**
- **burning country**

Management Strategies

1 Provide coordinated and equitable opportunities for individuals and families to access their country in order to undertake customary practices through:

- the country visit program (refer Management Objective 5.2.3[a])
- annual field work programs of rangers and IPA staff
- annual burning schedules (refer Section 6.6.1).

2 Develop and implement a cultural site management schedule for physical sites with priorities determined by considering the following criteria:

- the results of the review of cultural knowledge already recorded (refer Management Objective 5.2.3[a])
- the risk of irretrievable loss of the knowledge of the location, significance and management of individual sites
- sites of outstanding cultural significance (including grave sites)
- estates for which a low level of cultural site information has been recorded
- a demonstrated interest by traditional owners in managing their sites
- the risk of irreversible damage occurring at a site if management action is not taken
- sites with the potential for tourist visitation or those at which *Yapa* are considering commencing tourism activities.

(For the management of culturally significant water places, refer also Management Objective 6.3.3[a,b]).

3 For each cultural site included on the management schedule, determine:

- the recording, survey and threat-assessment requirements
- the need for management intervention and follow-up maintenance and condition-monitoring schedules
- whether or not a Cultural Heritage Management Plan or similar planning document is required.

4 Create a comprehensive record of *Yapa* customary land management practices using a variety of appropriate media, including video and sound recordings. Distribute copies of this material to *Yapa* as teaching tools. Store this information in the IPA database for use by *Yapa* and ranger and IPA staff.

Management Objective 5.3.3(b)

Encourage the broad adoption of traditional hunting and harvesting protocols designed to manage resources in sustainable ways

Management Strategies

1. Together with IPA Management Committee members:
   - document the protocols that *Yapa* want observed in the IPA with regard to traditional hunting and harvesting concerning particular species and places
   - discuss the possible development of sustainable hunting and harvesting plans for popular resource use areas in the IPA, including those in the vicinity of Lajamanu community and the eight outstations in the IPA. If agreed to by the IPA Management Committee, develop and implement hunting and harvesting plans.
2. If agreed to by the IPA Management Committee, produce and distribute educational material (e.g. posters, booklets, videos) concerning sustainable hunting and harvesting protocols and plans.
3. Develop and implement monitoring programs to measure changes in availability of game species and bush resources in high use areas, including the country around Lajamanu. Use monitoring results to alter protocols, plans and educational materials as necessary.

Joint trip to Mina Mina with *Yapa* from both Northern and Southern Tanami IPAs

Management Objective 5.3.3(c)

Develop, maintain and protect infrastructure that supports traditional owners in visiting their country

Management Strategies

1 Working with partner organisations, prepare and implement a program for developing, maintaining and protecting infrastructure across the IPA that supports traditional owners in accessing and spending time on their country. Such infrastructure may include, but is not limited to:

- roads and tracks
- bores
- hand pumps
- *yama* (shade shelters)
- water storage facilities
- outstation buildings
- campsites
- fences.

In determining priorities for infrastructure work, consideration will be given to:

- the potential use of the infrastructure by traditional owners, rangers and IPA staff in implementing land management programs
- the number of *Yapa* likely to benefit from the proposed works
- the potential for co-investment from other organisations

  the capacity and interest of estate group members in funding and maintaining infrastructure into the future
- the importance of infrastructure in supporting sustainable economic development (e.g. future tourism enterprises)
- the probability of increased visitation enabled by new or existing infrastructure introducing new, or exacerbating existing, risks to environmentally sensitive areas
- the history of previous management concerning particular infrastructure
- the immediate and long-term availability of resources to effect infrastructure projects
- the need for certain infrastructure to meet legislated safety standards
- preservation of human life.

2 As part of the infrastructure program:

- negotiate agreements with relevant partner organisations to co-fund priority infrastructure projects
- work with partner organisations to assess all existing infrastructure to determine items that are redundant or unsafe and require replacement, removal and/or rehabilitation. Undertake removal and rehabilitation works as required
- work with partner organisations to prepare condition reports and associated maintenance schedules for all infrastructure to be retained.

3 Undertake all infrastructure projects in accordance with legislated infrastructure regulations, the *IPA Road and Track Construction and Rehabilitation Guidelines* (refer Appendix 7) and the *Environmental Conditions of CLC Grazing Licences* (refer Appendix 8).

CHAPTER 6

Warrawarra kanyi ngurra Looking after Country

Aerial view of a campsite for a joint-IPA trip. Note burning work in the background.

6.1 Introduction

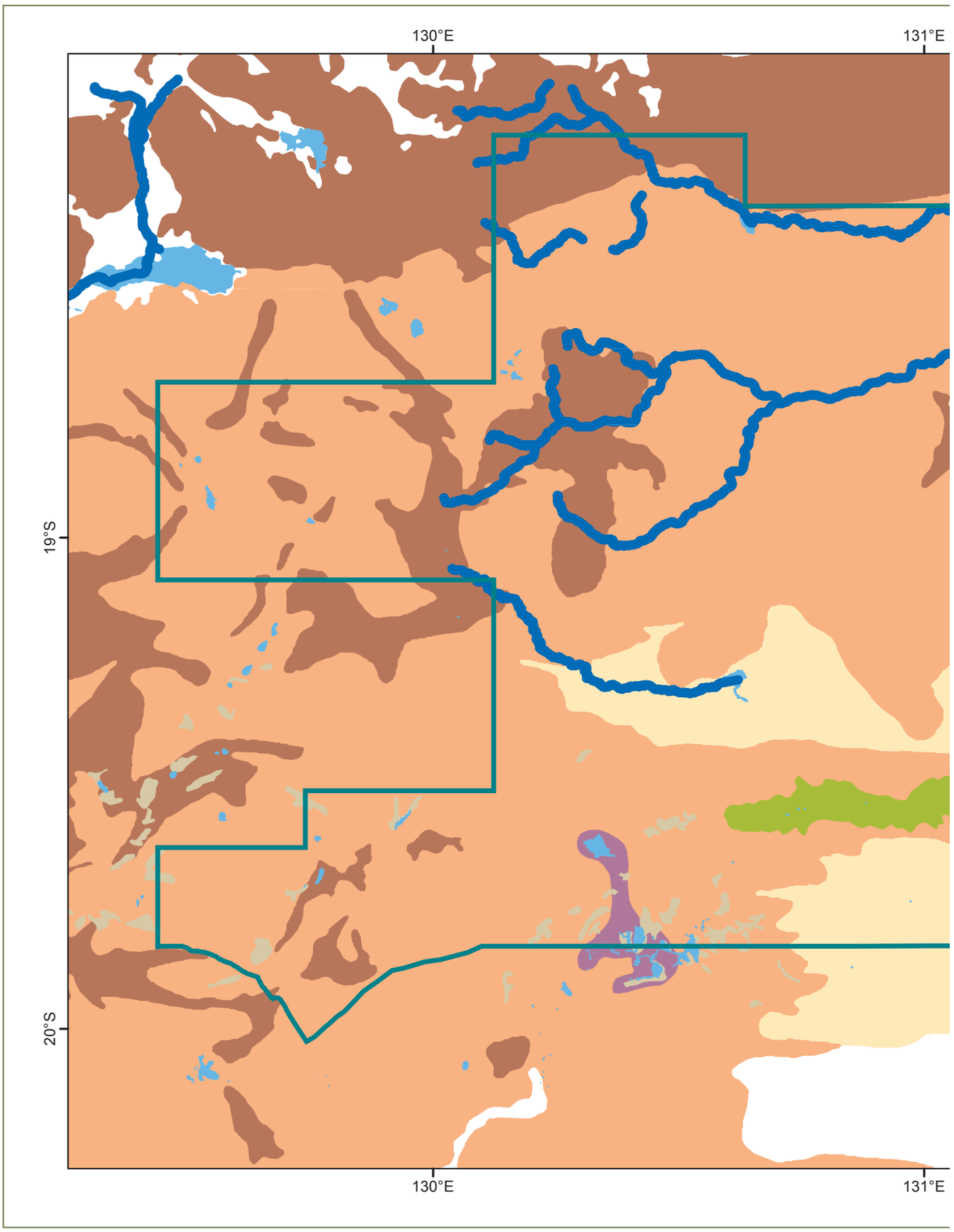
"It's good for rangers to look after country. We rely on these rangers to look after country the proper way, burning right, looking after soakages, plants yijardu-nyayirnirli *(the right way), country and the Law that goes with that country. You are taught the proper way to look after country."*

Kumanjayi Jampijinpa Bunter

For *Yapa*, caring for country and use of the land and its resources are one and the same, bound together by customs, conventions and obligations deriving from *Jukurrpa*. *Yapa* believe that during *Jukurrpa* all elements of country, including people, gained purpose and order. From a Warlpiri and Gurindji perspective, looking after country equates with maintaining these arrangements, upholding traditional Law and perpetuating people's longstanding ritualised relationships with the environment. This ethos is summed up in phrases such as '*yirdaju nyayinarli*', which can be translated as "true living, no change, we have to live that way to keep country strong by doing things on country" (Kumanjayi Jampijinpa Bunter).

By contrast, contemporary Western land management tends to be science-based and concentrated on either deriving an income from natural resources or on conserving the biodiversity or heritage values of an area.

While the underlying values or motivations behind *Yapa* and *Kardiya* management of country differ, the outcomes sought are generally aligned – particularly with respect to protecting places and species of cultural or conservation significance. Working towards restoring certain traditional land management regimes is viewed as highly desirable by both *Yapa* and *Kardiya*. The cumulative effects of detrimental environmental and social changes since *Yapa* stopped walking the land mean that traditional ways of managing country, alone, are no longer effective. New approaches that include a mix of old and new ways are necessary to ensure country is managed well and remains healthy for successive generations of *Yapa* and *Kardiya*.



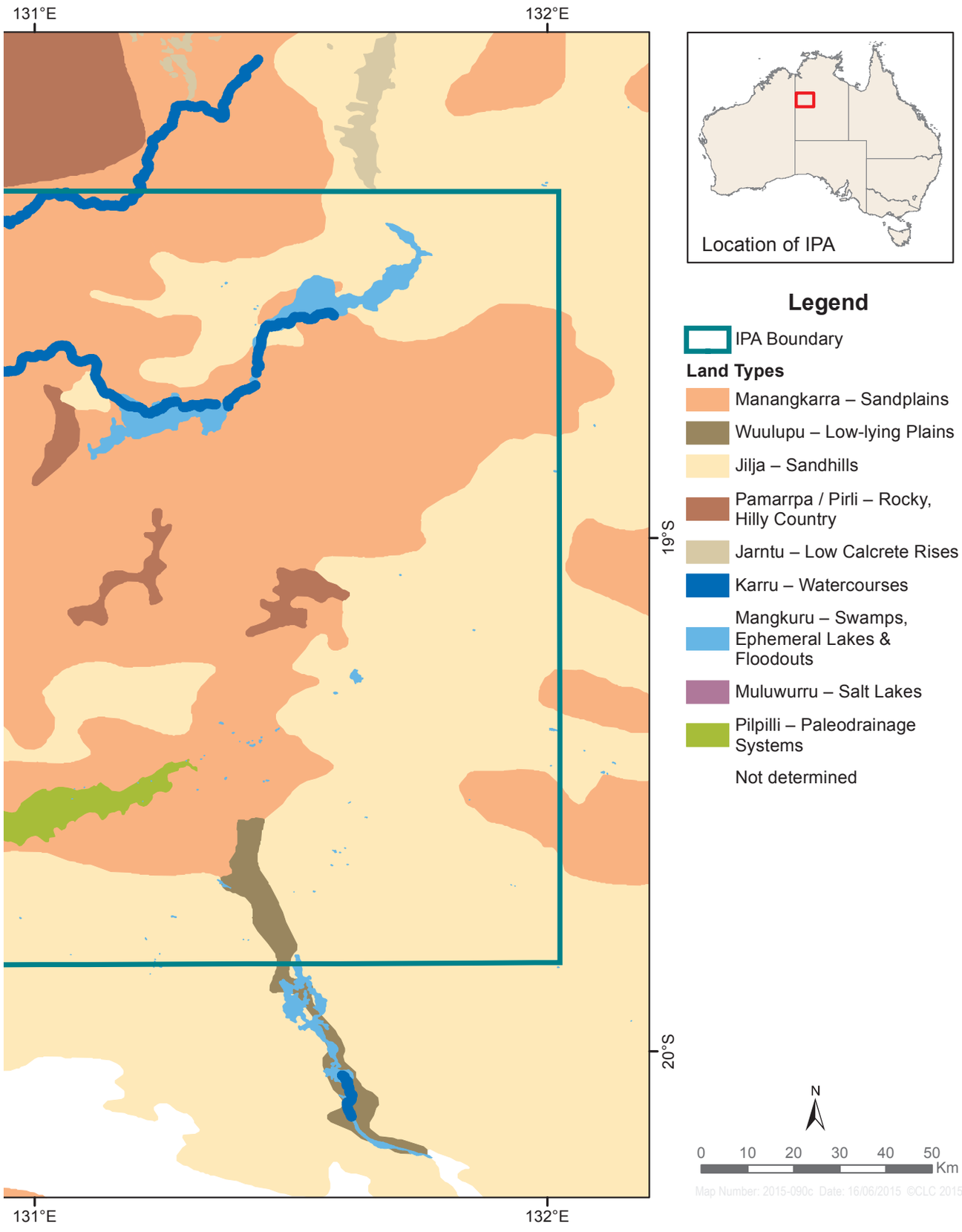


Figure 8 Land types within the IPA

Land Types of the IPA

Gently undulating and sparsely vegetated over the most part, the Northern Tanami IPA is largely characterised by extensive areas of sandplain and dunefields in the southern and eastern portions and sandplain with low rocky hills or minor ranges in the west. These predominant land types are interspersed with a variety of ephemeral wetland-based land types, including creeks and rivers, swamps, saline lakes and floodout areas. Across the IPA there is a gradual decline from desert uplands in the north-west to the alluvial plains of the south-east, with all major watercourses conforming to this generalised gradient. Virtually all of the sandplain areas and ancient drainage systems in the south are mantled in fine wind-blown sands.

The country of the IPA is categorised by *Kardiya* into the following nine broad land types that *Yapa* also recognise (Figure 8):

Manangkarra – Alluvial Sandplains

Very gently undulating, *manangkarra* (sandplains) are the prevailing landform across the IPA. These broad alluvial plains are subjected to sheet flow following heavy rain events. They include ephemeral wetlands such as creeks and rivers, playa and floodout areas. *Manangkarra* often overlie calcrete or laterite deposits which, in turn, are commonly covered by younger aeolian (wind-borne) sediments.

The intrinsically flammable nature of the vegetation of this land type underpins the ecology of the region. Fire regimes are a key determinant of vegetation structure and composition and of faunal assemblages at both the local and regional scales. Traditionally, *manangkarra* country was burnt by *Yapa* in a deliberate patchwork manner, a regime designed to maintain the productivity of this habitat. In more recent time, in areas where there have been less frequent or less intense fire patterns, patches of *manja* (mulga) open woodland have persisted on *manangkarra*.

Typical vegetation

Marna (spinifex) hummock grass species (*Triodia pungens* and *T. schinzii*) dominate, and the overlying sparse shrub layer comprises a mix of *Acacia*, *Grevillea* and *Hakea* species with occasional *walanja* (silver leaf box – *Eucalyptus pruinosa*) or *wirrkali* (bloodwood – *Corymbia terminalis*) low trees

Important *Mangarri* (bush foods)

Marrkirdi (plumbush – *Santalum lanceolatum*), *yarla* (bush potato – *Ipomoea costata*), *wakirlpirri* (dogwood – *Acacia sericophora*) and *wanakiji* (bush tomato – *Solanum chippendalei*)

Important *Kuyu* (animals)

Walpajirri (bilby – *Macrotis lagotis*), *wardapi* (sand goanna – *Varanus gouldii*), *wardilyka* (bush turkey – *Ardeotis australis*), *laju* (witchetty grub – *Xyleutes biarpiti*)

Manangkarra land type

Wuulupu – Low-lying Alluvial Plains

This land type is a subset of ***manangkarra*** and occurs on lower lying areas scattered across the IPA. It is most extensive in the south associated with the Lander River system. The more fertile soils hold moisture longer than the surrounding sandplains and hence support a greater abundance and diversity of plant species compared to other land types. These meandering depressions often correspond with traditional travelling routes and song-lines linking ancestral water places. ***Mulju*** (soakages) are usually situated in ***wuulupu***, due to groundwater lying relatively close to the surface in these areas.

Typical vegetation
Vegetation is typically open, low woodlands of *wapilingki* (smooth-barked coolabah – *Eucalyptus victrix*), occasionally with scattered *ngapiri* (river red gum – *E. camaldulensis*) trees and various bloodwoods (*Corymbia species*) over tussock grasses (including silky browntop – *Eulalia aurea* and golden beard grass – *Chrysopogon fallax*) and various sedges (mainly *Cyperus species*)
Important *Mangarri* (bush foods)
As for *manangkarra* land type
Important *Kuyu* (animals)
As for *manangkarra* land type, plus various frogs

Jilja – Sandhills

Jilja are a common feature in the northern Tanami region but only form parallel-trending red sand dunefields in the southern and eastern portions of the IPA, with these dunes rarely reaching more than 5 m in height. Scattered low sandhills occur through ***manangkarra*** areas in the western half of the IPA. As is the case elsewhere in Central Australia, ***jilja*** are composed of fine wind-blown sands which have low fertility and, as a consequence, support sparse shrubby vegetative cover.

Typical vegetation
Kalajirdi (soft spinifex – *Triodia pungens*) sparse hummock grasses predominate, overlain by occasional bloodwood trees (*Corymbia species*), shrubby wattles (*Acacia* species) or mixed low shrubs or perennial forbs
Important *Mangarri* (bush foods)
Yarla (bush potato – *Ipomoea costata*), *kampurarrpa* (desert raisin – *Solanum centrale*), *yarunpa* (inferior native tobacco – *Nicotiana velutina*) and, in fire-protected areas, *marrawaji* (desert walnut – *Owenia reticulata*)
Important *Kuyu* (animals)
Rdajalpa (woma python – *Aspidites ramsayi*), canegrass dragon (*Diporiphora winneckei*), *wardapi* (sand goanna – *Varanus gouldii*) and *milyirtiri* (night skink – *Liopholis striata*)

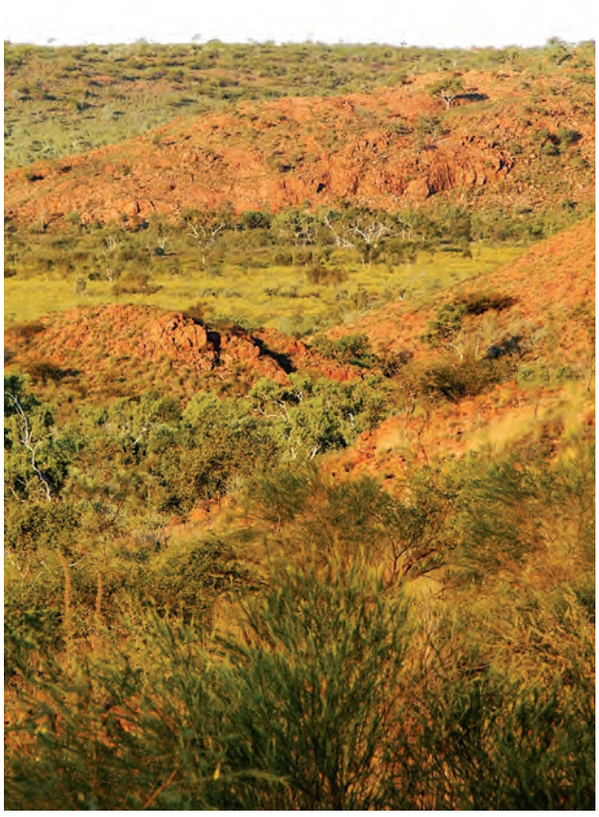
Jilja land type

Pamarrpa and Pirli – Rocky, Hill Country

Pamarrpa and *pirli* are associated with the Ware and Coomarie Ranges, the Winnecke Hills and various lesser hills, outcrops, small escarpments and low rises. They are most common in the western and north-western portions of the IPA. The highest relief in the IPA occurs within the Ware Range (rising to 521 m), with the baseline height of the surrounding sandplains averaging around 230 m. *Pamarrpa* and *pirli* in the IPA may comprise a variety of rock types, including sandstone, laterite, granite and conglomerate.

Pamarrpa country tends to impede the progress of fire fronts, thereby providing refugia in gullies, gorges and south-facing escarpments where fire-sensitive species or communities can persist. Water places such as springs, rockholes and run-off areas are also associated with elevated *pamarrpa* and *pirli* country. Rocky habitats were highly significant to traditional economies for the variety and specificity of the plants and animals they harbour. These areas are often of ongoing cultural importance for *Yapa* because of their links to ancestral beings associated with *Jukurrpa*.

Typical vegetation
Marna (spinifex – *Triodia species*) hummock grasses dominate with an overstorey of sparse, low *nurlku* (snappy gum – *Eucalyptus brevifolia*)
Important *Mangarri* (bush foods)
Wijirrki (rock fig – *Ficus brachypoda*), *karrinyarra* (silkyheads – *Cymbopogon obtectus*), *jurnpurnpa* (wild tobacco – *Nicotiana benthamiana*), *marrkirdi* (plumbush – *Santalum lanceolatum*), *yarrarntinyi* (native currant – *Psydrax latifolia*) and *yarraji* (edible grass seeds)
Important *Kuyu* (animals)
Kanyarla (euro – *Macropus robustus*), *yinarlingi* (echidna – *Tachyglossus aculeatus*), *jurlarda* (native honey bee – *Tetragonula* or *Austroplebeia* species)



Pamarrpa land type

Jurntu – Low Calcrete Rises

Low, weathered, rubbly calcrete rises are generally confined to areas bordering swamps or low-lying alluvial plains scattered across the IPA. Percolating carbonate-rich groundwater formed these deposits long ago, and their exposed and crumbling surfaces support a distinctive flora and are favoured by some game species, including echidna, blackhead python and, more recently, the European rabbit.

Typical vegetation
Open *marna* hummock grasslands (*Triodia pungens*), with scattered bloodwood (*Corymbia species*) and *wanurkurdu* (whitewood – *Atalaya hemiglauca*) low trees and mixed shrubs
Important *Mangarri* (bush foods)
Wild melon (*Cucumis* species), *marnakiji* (conkerberry – *Carissa lanceolata*)
Important *Kuyu* (animals)
Yinarlingi (echidna – *Tachyglossus aculeatus*), *mujunyku* (rabbit – *Oryctolagus cuniculus*) and, in the north, *wampana* (spectacled hare-wallaby – *Lagorchestes conspicillatus*)

Karru – Watercourses

A number of significant *karru* traverse the IPA. Foremost of these are Winnecke, Wilson and Hooker creeks. In the south, the terminal reaches of the Lander River form the only substantial watercourse. Most *karru* emanate from hills and plateaus in the elevated west and north-west sectors of the IPA. Though generally considered ephemeral, semipermanent waterholes are not uncommon along their courses.

Karru provide crucial habitat for waterbirds and many game species, including emu and nailtail wallaby, during prolonged periods of drought, and as such were important hunting areas for *Yapa*.

Typical vegetation

Ngapiri (river red gum – *Eucalyptus camaldulensis*), *wapilingki* (smooth-barked *coolabah* – *E. victrix*) and various bloodwood (*Corymbia species*) fringing woodlands are the dominant vegetation. In some areas *pakarli* (inland tea tree – *Melaleuca glomerata* or *M. lasiandra*) and scattered *yinirnti* (bean tree – *Erythrina vespertilio*) also occur. Understorey species include a mix of non-spinifex grasses and mixed low shrubs

Important *Mangarri* (bush foods)

Janmarda (bush onion – *Cyperus bulbosus*), *marrkirdi* (plumbush – *Santalum lanceolatum*), *ngarlajiyi* (pencil yam – *Vigna lanceolata*), *marnakiji* (conkerberry – *Carissa lanceolata*)

Important *Kuyu* (animals)

kururrungku (northern nailtail wallaby – *Onychogalea unguifera*), *yankirri* (emu – *Dromaius novaehollandiae*), *ngarlu* (sugarbag, produced by native bees – *Tetragonula* or *Austroplebeia species*), *jipilyaku* (ducks), *ngartarta* (*Austrothelphusa transversa* – freshwater crab), *yipilanji* (redgum witchetty grub – *Endoxyla* species), *yapuralyi* (sugar-leaf/lerp – *Glycaspis brimblecombei*)

Karru land type

Mangkuru – Swamps. Ephemeral Lakes and Floodouts

Seasonally inundated *mangkuru* are a feature of the IPA, with the most significant of these being Jiwaranpa (Lake Talbot and Kamira Lake), Nyukulku (Wilson Creek Floodout), and Mirirrinyungu (Duck Ponds). The availability of water and the relatively fertile soils surrounding these features contribute to higher species richness but also mean these sites are hotspots for feral animals and weed infestations. This land type is particularly favoured by *Yapa* for hunting and resource gathering.

Typical vegetation

Open woodlands of *wapilingki* (black box – *Eucalyptus microtheca* or smooth-barked coolabah – *E. victrix*) over soft grasses and sedges dominate this land type. Various bloodwoods (*Corymbia species*) and hakeas (*H. arborescens* and *H. macrocarpa*) are also relatively common in the shrub layer

Important *Mangarri* (bush foods)

Janmarda (bush onion – *Cyperus bulbosus*), *yakirra* (desert Flinders grass – *Yakirra australiensis*), *marrkirdi* (plumbush – *Santalum lanceolatum*)

Important *Kuyu* (animals)

yankirri (emu – *Dromaius novaehollandiae*), *ngarlu* (sugarbag produced by native bees – *Tetragonula* or *Austroplebeia* species), *jipilyaku* (ducks), *ngartarta* (*Austrothelphusa transversa* – freshwater crab), *jipilyaku* (ducks)

Mangkuru land type

Muluwurru – Salt Lakes

True, hyper-saline saltpans are uncommon in the semi-arid landscape of the northern Tanami, but pans of varying salinity occur throughout the IPA. These range from small playa to large ephemeral lakes such as Nguringku (Lake Buck) and Wardalya (Spider Lake). These closed drainage systems fill from a combination of surface flow (run-on) and groundwater recharge; following peak rainfall events, they may hold water for several months. Episodic wetlands of this kind provide important inland habitat for waterbirds and migratory species. The sandplains surrounding ***muluwurru*** are often key habitat for species such as bilby, mulgara and macropods. ***Muluwurru*** are important areas for ***Yapa*** for hunting and bush food collection.

Typical vegetation
Bare pans are fringed by low *mungilypa* (samphire shrubland – *Tecticornia indica*, *T. pergranulata*, *T. verrucosa*) and in some cases are surrounded by salt mulga (*Acacia maconochieana*) or other saline-tolerant shrubs such as *pakarli* (inland tea tree – *Melaleuca glomerata*)
Important *Mangarri* (bush foods)
Janmarda (bush onion – Cyperus bulbosus) and *manyani* (pink plains bush – *Pluchea tetranthera*) for its edible grubs
Important *Kuyu* (animals)
Waterbirds (in season), *kalawurru* (floodplain monitor – *Varanus panoptes*), *marlu* (red kangaroo – *Macropus rufus*) and *mirnirri* (thorny devil – *Moloch horridus*)

Muluwurru land type near Duck Ponds with *pakarli* vegetation

Pilpilli – Paleodrainage Systems

Broad areas of low relief occur in the south of the IPA where subsurface ancient river channels exist. These subtle surface depressions lack defined drainage and may periodically flood, but in most cases their soils allow floodwaters to percolate down and recharge aquifers. *Pilpilli* are characterised by large, distinctively shaped termite mounds that occur almost exclusively in this land type. The range of game species and bush foods typical of this specialised land type mean that *pilpilli* were traditionally important hunting and resource areas for *Yapa*. *Pilpilli* are also ecologically significant as key habitat for a range of threatened fauna including *jajina* (mulgara), *walpajirri* (bilby) and, in the South Tanami IPA, *warrana* (great desert skink).

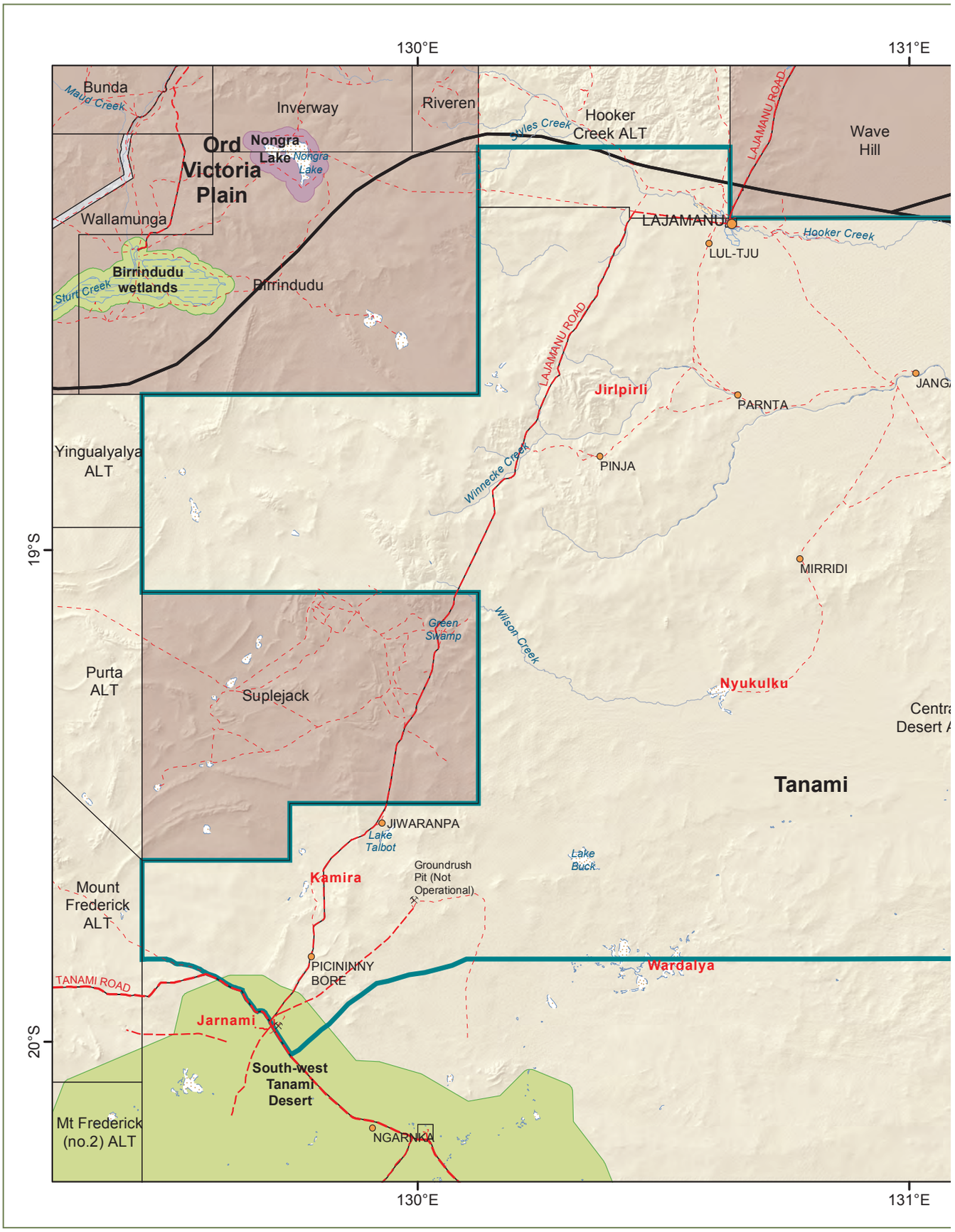
Typical vegetation
Pakarli (inland tea tree – *Melaleuca glomerata*) open shrubland or chenopod low open shrubland interspersed with *marna* (spinifex – *Triodia species*) hummock grasslands
Important *Mangarri* (bush foods)
Janmarda (bush onion – *Cyperus bulbosus*), *jukurru* (northern orange – *Capparis umbonata*), *yakirra* (desert Flinders grass – *Yakirra australiensis*)
Important *Kuyu* (animals)
Wardilyka (bush turkey – *Ardeotis australis*), *walpajirri* (bilby – *Macrotis lagotis*), *yuturnrpa* (termites), *milwarna* (Stimson's python – *Antaresia stimsoni*)

Kardiya have divided the region included in the IPA into three bioregions (Figure 9). These relatively large areas, with landscape-scale similarities in natural features and environmental processes affecting the function of entire ecosystems, are:

- Tanami Desert Bioregion (> 98% of the IPA): This bioregion is characterised by gently undulating sandplains with areas of sand dunes rarely exceeding 5 m in height, interspersed with hills, ranges, wetlands and drainage systems. Sandplain vegetation is dominated by hummock grasslands associated with acacia, bloodwood, grevillea and hakea mixed shrub steppes. All but the northern portion of the IPA is contained within this bioregion.
- Sturt Plateau Bioregion (< 2% of the IPA): Gently undulating plains on lateritised Cretaceous sandstones and neutral sandy red and yellow earths characterise this bioregion. The vegetation is predominantly small-fruited bloodwood (*Corymbia dichromophloia*) woodland with spinifex understorey. A very small part of this bioregion is represented in the north-west corner of the IPA.
- Ord Victoria Plains Bioregion (< 0.5% of the IPA): The characteristic features of this bioregion are level to gently undulating plains with scattered hills or rocky rises on Cambrian volcanics and Proterozoic sedimentary rocks. Typical vegetation is mixed grassland (spinifex and annual grasses) with scattered bloodwood and snappy gum low trees. A very small portion of this bioregion intrudes into the north-east corner of the IPA.

Kardiya have also identified the following two Sites of Conservation Significance (SOCS) that are partially contained in the IPA (Figure 9):

- South-west Tanami SOCS: Of international significance, this SOCS covers 19,433 km^2 of country, most of which is located in the adjoining Southern Tanami IPA. Only a very small area extends into the south-west corner of the Northern Tanami IPA. Of the 11 threatened species documented in the entire SOCS, six vertebrate species have been recorded in the Northern Tanami IPA. Two plant species endemic to the Tanami bioregion and occurring in this SOCS have been recorded in the Northern Tanami IPA (refer also Sections 6.4.1 and 6.5.1).
- Lake Surprise and Lander River Floodout Swamps SOCS: Of national significance the majority of this 3681 km^2 SOCS occurs in the Southern Tanami IPA, with only the northern portion extending into the south-east corner of the Northern Tanami IPA. It contains six threatened species (five vertebrates and one plant: *Eleocharis papillosa*, but the latter has not been recorded in the Northern Tanami IPA). Six of the significant plant species (either at the bioregion or Northern Territory level) documented for this SOCS have also been recorded in the Northern Tanami IPA portion, as has the one endemic frog species (refer also Sections 6.4.1 and 6.5.1).



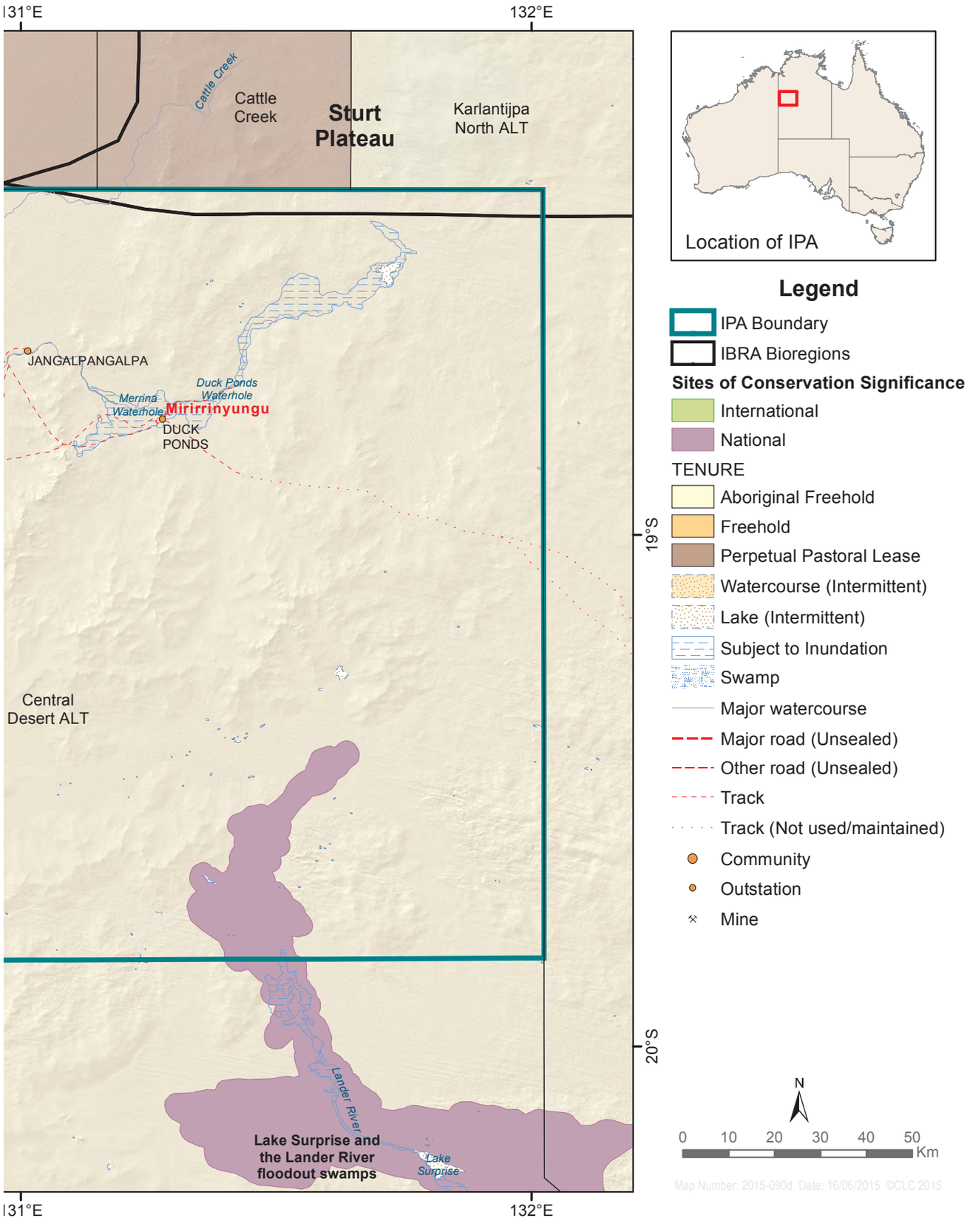


Figure 9 Bioregions and Sites of Conervation Significance within the IPA

6.2 *Walya* – Rocks, Landforms and Soils

6.2.1 Background

The underlying geology of the IPA is largely hidden from view beneath extensive sandplains created by sedimentation from colluvial sheet flow processes or, as with the interspersing sand dune systems, by wind-blown deposition.

While isolated outcrops of rock, in the form of low rises, hills and ridges, are scattered across the landscape, there are no major range systems, and the predominant geological process across the Tanami region has been one of weathering and erosion (with deposition of sediments) with very few periods of uplift.

The IPA sits within three major Precambrian tectonic units: the Granites–Tanami Block to the south, the Birrindudu Basin to the north and the Wiso Basin to the east. The basement rocks are quartzites and granites of the Winnecke Formation and Winnecke Granophyre formed during the Paleoproterozoic period (approximately 1825–1810 million years ago).

The major formative geological events in the region have been:

- a period of strong tectonic movement during which the basement sediments were folded, uplifted and eroded. These were then overlain by undifferentiated Carpentarian and Adelaidean sediments towards the end of the Proterozoic Eon (~ 570 million years ago)
- the eruption of the Antrim Plateau Volcanics in the mid to late Cambrian (~ 450 million years ago) with resultant flow of basalts along the well-developed drainage system that extended across the region in that period
- the Alice Springs Orogeny (400–300 million years ago) which resulted in minor local uplift and the formation of the low range systems in the IPA
- the Permian (~ 299–285 million years ago) glaciation event and deposition of marine sediments as a result of the retreat of the Cretaceous sea (~ 95 million years ago)
- major sedimentation events associated with aridification of the area from the mid-Miocene onwards (~ 16–11.6 million years ago), which resulted in progressive infilling of paleodrainage channels to form the present-day sandplains, formation of playas in some of the larger channels and the formation of the dunefields.

The dominant landforms of the IPA, the *manangkarra/wuulupu* (sandplains) and *jilja* (sandhills), covering more than 92% of the IPA, are a direct legacy of this geological history of erosion and deposition. Composed of quaternary quartz sands, most of the dunes are aligned in the direction of the prevailing winds such that the more significant dunes in the south and east of the IPA are typically oriented north-west to south-east.

The *manangkarra* of the western half of the IPA are interrupted by another important IPA landform: *pamarrpa/pirli* (hilly, rocky country). While the low ranges and rocky hills in the IPA never exceed 550 m in height, they do support distinctive plant communities generally dominated by low open *nurlku* (snappy gum – *Eucalyptus brevifolia*) woodlands. Sandstone, granite, siltstone, conglomerate, ironstone, amphibolite and basalt are the dominant rock types of these landforms, which are sometimes capped with lateritic gravel or silcrete.

In the south of the IPA are the remnants of the extensive ancient river system that once covered much of the Tanami region. This paleodrainage system is now largely infilled with millions of years of sediment deposition, and the visible remains are the network of drainage depressions and playas. Their relatively nutrient-rich and water-retentive soils contribute to the richness of flora and fauna communities associated with this landform. The Tanami paleodrainage system supports some of the healthiest wild populations of bilbies remaining in Australia, along with several other nationally threatened plants and animals. Other notable water-based landforms to be found in the IPA include watercourse channels, ephemeral swamps, lakes and floodouts (refer Section 6.3.1).

In general, the soils of the IPA are relatively infertile, containing very low levels of phosphorus, nitrogen and organic carbon. The *manangkarra/wuulupu* and *jilja* are typically overlain by heavily leached wind-blown sand. Other more restricted soil types present include thin, infertile soils derived from local weathering of rocky outcrops, colluvial soils derived from sheet flow near low ranges and alluvial sand and gravel associated with watercourses. Saline clays and calcrete deposits are found near Nguringku (Lake Buck) and Wardalya (Spider Lake), and exposed, rubbly calcrete can also be associated with the edges of drainage channels or swamps.

Whereas *Kardiya* view the rocks, landforms and soils of the IPA as the products of eons of geological processes, to *Yapa* they are associated with ancestral beings that

travelled throughout the land at the time of creation. Many landscape features – be they individual rocks, hills or ranges – are regarded as sacred sites that are imbued with deep cultural significance. Traditionally, various rocks also had crucial day-to-day uses. Grinding stones were essential for preparing seeds, a mainstay of traditional *Yapa* diet. Specific rock types were also utilised in certain tools, such as spear tips and axes or as flints for starting fires. Ochre was, and still is, used for ceremonial decoration.

Kardiya primarily value the rocks and landforms of the region for their mining potential. The region has been subjected to mineral exploration since the early 1900s. Most of the early activity was focused on the discovery of gold at Jarnami (Tanami), and current gold extraction operations focus on The Granites, south of the Northern Tanami IPA in the Southern Tanami IPA (refer Section 8.3.1).

6.2.2 Issues and Opportunities

While the rocks and landforms of the IPA are generally robust and impervious to human-related impacts, gold mining activity (open cut and underground) has localised direct impact on landforms and soils and current practices are managed through strict environmental guidelines and compliance monitoring.

Haul roads created to move extracted ore from mine sites to processing mills, along with mine access roads, are potentially disruptive to surface sheet flow processes during high rainfall events and can contribute to localised erosion if not well placed or maintained.

Erosion damage is a significant issue on low-lying sections of the Lajamanu Road in the vicinity of Jiwaranpa and also in sections around Jirlpirli (Winnecke Hills). Although the Northern Territory Government funds the Wulaign Homelands Council Aboriginal Corporation (WHCAC) to maintain this road, because of its poor alignment and ongoing issues with drainage in many places, the budget is inadequate to effectively maintain it, let alone complete much-needed erosion mitigation measures. North Tanami Rangers have been called out on many occasions to rescue community members whose cars have become bogged in badly eroded places on the Lajamanu Road.

Elsewhere in the IPA, apart from the short section of track into Lul-tju outstation maintained by the Central Desert Regional Council as part of Territory Growth Towns funding, no organisation has responsibility for maintaining access tracks. Accelerated soil erosion associated with tracks is a common issue in the IPA. The conversion of sections of vehicular tracks into deep gullies can occur wherever vehicular activity results in a lowering, however minor, of the natural surface level of the landscape. The section of the Warrego Track where it passes through Mirirrinyungu (Duck Ponds) is a good example of this erosion damage.

Yapa from Lajamanu have a longstanding interest in seeing the Yapa-kurlangu (Warrego Track) reopened to link the IPA through Mirirrinyungu (Duck Ponds) to Tennant Creek. Although site clearance work has been completed for a realigned route for the entire track, traditional owners from Mangalawurru are opposed to the reopening of the southern section, and so a compromise solution was recently reached to allow grading of the northern section of the track through to Emu Bore (to the east of the IPA boundary).

Localised erosion problems can also be caused by the pads of feral camels and horses and the burrowing activity of rabbits. Soil crusts (formed by algae, lichens and mosses), which are important in holding desert soils together, are particularly vulnerable to disturbance, as are soft substrates such as calcrete. Soil crust is absent from areas where high concentrations of feral herbivores gather, such as around the Hooker Creek Floodout, or where vehicle traffic is heavy.

Erosion damage on track through Duck Ponds area

Unmaintained track used for hauling fuel for IPA aerial burning work

6.2.3 Management Strategies

Management Objective 6.2.3(a)

Protect soil values by minimising the creation of new sites of human-related soil erosion and mitigating existing soil erosion problems

Management Strategies

1. Establish and maintain an inventory of sites of human-related soil erosion.
2. Prepare and implement a prioritised program of soil rehabilitation works based on the above-mentioned inventory and the following considerations:
   - associated risks to cultural and/or biological values
   - the level of significance of the value(s) threatened
   - the level of concern among traditional owners
   - the likelihood of severe and irreversible damage to values if the problem is left untreated
   - the rate of erosion activity
   - the availability of resources to treat erosion problems, including the need to monitor treated sites and undertake follow-up works as required.
3. Working with staff of the Central Desert Regional Council and WHCAC, undertake an inventory and condition assessment of all vehicular tracks in the IPA and determine which of these require:
   - closure and rehabilitation
   - re-routing
   - upgrading (including erosion control works).

   Matters to be considered when making decisions concerning the future of individual vehicular tracks will include:
   - the consent of all traditional owners with an interest in country along the entire length of the track for any works
   - the importance of the track in providing traditional owners with access to their estates, including sacred sites
   - the importance of the track in providing access to hunting and bush resource harvesting areas
   - the strategic value of the track for land management purposes.

   As funding permits, manage each assessed track or section of track according to the above assessments as part of the prioritised program of soil rehabilitation works.
4. If traditional owners identify the need for new tracks, and the proper TOID-based consultations are completed for the full length of the proposed track, engage personnel with soil conservation expertise to undertake a site assessment and provide advice on alignment and erosion mitigation measures required before costing and budgeting these works. Utilise the same criteria as those listed in Management Objective 6.2.3(a) Strategy 3 to determine track construction priorities.
5. Work with the CLC Ranger Trainer to determine the need for heavy machinery operation and soil conservation training for North Tanami Rangers or IPA staff.

6 Develop a monitoring schedule for treated sites as a means of measuring treatment success and the need for additional remediation work. Undertake follow-up soil erosion mitigation work as required.

7 Prepare and distribute soil erosion educational material for *Yapa*.

8 Liaise with representatives of the Central Desert Regional Council, WHCAC, mineral exploration companies and other relevant organisations to ensure that all roads and tracks constructed, maintained or upgraded in the IPA conform to the IPA Road and Track Construction and Rehabilitation Guidelines as detailed in Appendix 7.

9 Minimise the creation of new sites of soil disturbance by locating new infrastructure (where feasible) on previously disturbed sites if there is no risk of further erosion damage.

10 Rapidly stabilise any newly disturbed sites and incorporate erosion mitigation measures into all site preparation.

Wulaign grader repairing erosion damage on Duck Ponds track in 2015

6.3 *Ngapa* – Water

6.3.1 Background

Within the IPA, water is a much-valued and culturally significant resource. Highly variable rainfall and high evaporation rates, combined with the landforms and geology of the region, have resulted in few, if any, permanent surface waters.

Surface waters include waterholes situated in ephemeral creek and river systems, isolated soakages, springs and rockholes, freshwater and saline swamps, playas and lakes. For *Yapa*, water places are categorised as:

- *karru* – creeks, watercourses
- *mangkuru* – semipermanent waterholes or floodouts associated with more significant *karru*
- *muluwurru* – salt lakes or claypans, generally associated with lower lying sandplains
- *jila* – springs, generally associated with rocky hills
- *mulju* – soakages, created by digging into creek lines where there is an underground supply of water. These were referred to as 'native wells' by early explorers
- *warnirri* – rockholes. These are depressions found in rocky substrates which, depending on their size, can hold water for long periods.

The Ware Range and the Winnecke Hills in the western half of the IPA are the sources of the only significant *karru* that emanate from within the IPA: Wilson and Winnecke creeks. Both of these ephemeral systems flow eastwards after heavy rain events and terminate in semipermanent waterholes in expansive floodout areas that can remain inundated for very long periods. Nyukulku (Wilson Creek Floodout) and Mirirrinyungu (Duck Ponds) and their associated *karru* support distinctive riverine habitat, with *ngapiri* (river red gums) or *wapilingki* (smooth-barked coolabah) forming open woodlands along the banks or around the floodout areas themselves. These wetlands provide habitat for a number of rare and threatened species and also support concentrations of waterbirds after flood events.

Two other significant river systems, Hooker Creek and the Lander River, terminate close to the northern and southern borders (respectively) of the IPA. The Lander River system has been listed as a SOCS by the Northern Territory Government (refer Section 6.1) because of its ecological importance and undisturbed nature. Hooker Creek and its floodout area have been assessed as a Site of Botanical Significance (SOBS) at the bioregional scale because of the rarity of some of plants that occur in wetland communities there (refer Section 6.4.1).

Waterhole in the Ware Range

Nyukulku (Wilson Creek Floodout)

Across the IPA there are also a number of minor, usually dry, watercourses associated with low rocky hills. Heavy rains result in all of these watercourses carrying significant amounts of water and nutrients from the ranges onto the desert plains, and their dissipation into the ground helps recharge local water tables.

Of the other short-lived surface waters replenished after rain, claypans and *muluwurru* (salt lakes) are the first to evaporate. Nguringku (Lake Buck) and Wardalya (Spider Lake) are typical examples of these ephemeral wetlands. Their soils tend to be clay-based, with relatively high salinity levels as a result of mobilisation of salts from underlying shallow aquifers. In the summer of 2005–06, record rains filled numerous *muluwurru* throughout the IPA, and aerial waterbird surveys conducted in April 2006 at 12 wetlands in the IPA (and at an additional seven wetlands in the Southern Tanami IPA) counted some 15,000 waterbirds of more than 40 species (refer Section 6.5.1).

Small, isolated *warnirri* (rockholes) occur in the ranges and isolated hills in the western half of the IPA. At these places, water collects in hollows formed over long periods through gradual weathering of an initial depression. Traditional management of these water sources included chipping grooves into the rock surface to direct flow into them. *Mulju* (native wells or soaks), which were traditionally more reliable water sources for *Yapa*, were formed when water seeped into hollows dug in freely permeable sediments. They were usually dug in swales between sand ridges or where a sloping surface of hard rock disappeared beneath a plain.

Groundwater represents the only reliable permanent source of water in the IPA. It has built up over millions of years from rain and floodwater seeping into porous rock or sand and is present throughout the arid zone in aquifers of varying depth. Water quality and recharge rates are highly variable, as is accessibility of these water resources. The IPA straddles two major groundwater bodies: the Birrindudu Basin to the north and the Wiso Basin to the east. Water from aquifers in these basins can be discharged naturally at low points in the landscape through *jila* (springs), as is the case at Milwayi (Coomarie Spring), one of the few semipermanent wetlands in the IPA.

Groundwater close to the surface (such as at the base of ranges and in dry river beds) was traditionally reached by *Yapa* digging large holes into which groundwater would slowly seep. These days bores are required to access groundwater in aquifers where most of the water is several hundred years old, with local recharge (from river flow and sheet flow across the landscape) being minimal and water movement being very slow (thousands of years to move several hundred kilometres). All water supplies for communities and outstations in the IPA depend on groundwater sourced from wells or bores. The main borefield for Lajamanu is to the north of the community, where water is pumped from aquifers at a depth of around 50 m. The quality of

this water is somewhat compromised by the relatively high levels of dissolved salts, including calcium carbonate, and in some cases working bores have had to be abandoned because of salt levels in the water.

The groundwater resources of the IPA include paleodrainage systems where groundwater may be only 10–20 m below the surface. The Central Tanami Paleodrainage Depression, covering 514 km^2, is the largest such system in the IPA.

Central to *Yapa* survival in the region was their accumulated knowledge about the location of water places and their judicious use of these scarce resources. For *Yapa*, death by dehydration was a real possibility, so this knowledge was shared by everyone; *Yapa* travelling through country often used fire and smoke signals to communicate to others where water could be found.

Visits to water places often included maintenance activities directed at optimising the quantity and quality of water supplies. These included cleaning out debris, mud and sand in the water to avoid siltation and covering over water or seepages with branches or rocks to minimise evaporation.

In traditional times, on the rare occasions when prolonged heavy rain fell, bush foods could be abundant; large floodout areas or semipermanent waterholes enabled people to stay in one area for extended periods. At such times, over a hundred people might be camped at the one water source for ceremonies and hunting of waterbirds and other game animals drawn to the water. In contrast, during severe droughts people would be forced to move off their estates to use water on country belonging to others. This often required gift-giving and other forms of exchange to guarantee access. When most known sources were depleted, rain-making ceremonies were performed, and this still occurs today in some parts of Central Australia. There are also ceremonies to stop rain falling.

Given the necessity of water for life, it is hardly surprising that water places feature strongly in the *Jukurrpa*. An ancestral being called *warnayarra* (water snake, rainbow serpent) is said to have formed each water place, and one remains at each site as a guardian. To avoid upsetting these guardians, an appropriate traditional owner must be present whenever people visit. Strict rules govern behaviour at waterholes and dictate who can and cannot visit different sites.

In addition to cultural significance, certain water places also have considerable recreational value for *Yapa* today. Jirlpirli waterhole (near Ware Range), Wiyala waterhole and other waterholes on Hooker Creek close to Lajamanu and the turkey nest dam (north-west of Lajamanu) are popular summer swimming holes for residents of Lajamanu community.

In historic times, natural waters were also critical to the survival of *Kardiya* explorers and early settlers, who frequently relied on *Yapa* to identify the locations of usable supplies. Sometimes *Yapa* were forced to show water places to explorers, who fed them salty food and then withheld water from them. As the *Kardiya* population in the region grew in the early 1900s, depletion of waters by pack animals and the violation of cultural protocols associated with water places sometimes resulted in conflict between *Kardiya* and *Yapa*.

In recent years, *Kardiya* have focused on documenting the physical characteristics of the region's water resources (salinity, recharge, discharge and the links between groundwater aquifers), their extraction for mining or domestic purposes and their biological attributes, such as dependent flora and fauna.

Certain water places of the IPA support highly distinctive habitats, characterised by fire-sensitive or relictual plant species. Water places are also refuges for highly restricted animal species, some of which were formerly widespread across the region. There is only one fish species known to occur in the IPA: the spangled perch (*Leiopotherapon unicolor*), which has been recorded rarely from ephemeral waterbodies associated with Hooker Creek in the north of the IPA.

While there are no wetlands of national significance in the IPA (listed in the *Directory of Important Wetlands in Australia*), *Kardiya* have formally recognised the paleodrainage system of the south-west Tanami and the floodouts associated with the Lander River and Lake Surprise as important SOCS (refer Section 6.1). Six other water places in the IPA (Hooker Creek and Floodout, Winnecke Floodout, Coomarie, Lake Buck, Central Tanami Paleodrainage Depression and Wilson Creek and Floodout) are recognised as SOBS (refer Section 6.4.1).

6.3.2 Issues and Opportunities

Loss of Cultural Knowledge

"We got to remember all these waterholes, all the dreamings taught through the song. Children will feel these stories; when they are older they feel related. When they visit there, places when they are older, they feel jintangka *(all with one) – part of it."*

Kumanjayi Jampijinpa Bunter

A key concern for *Yapa* is the ongoing loss of knowledge about water places across the IPA – their names, locations and associated *Jukurrpa* stories and ceremonies. The region now included in the IPA was once dotted with a large number of named water places, many of which were significant cultural sites. With the movement of people off country and the lack of vehicular access to many parts of the IPA, some of the more remote water places are now rarely, if ever, visited. The locations of soaks or smaller rockholes may have already been permanently lost from personal and collective memories. This loss has been rapid and is continuing, with knowledge of some water places often held by only a small number of senior people who may have visited them as children. As these people pass away, so too does an important part of *Yapa* culture as water places are lost from the landscape (refer also Section 5.2.2).

The loss of knowledge about the existence or location of many water places, combined with the difficulties associated with visiting many known water places, means that most such places have not been maintained for many decades. In the absence of regular digging out and cleaning, many of these places have been infilled and no longer provide water for dependent wildlife species. This is likely to have resulted in significant biodiversity changes across parts of the landscape.

Feral Animals

Large feral herbivores – such as horses, donkeys, cattle, swamp buffalo and camels – use and damage many important water places across the IPA (refer also Section 6.5.2). These feral animals drain waterholes much more quickly than native species, contaminate waters with fecal waste, cause erosion around waterholes leading to sedimentation and sometimes die at or in waterholes, leaving a rotting carcass that can pollute the water for many months or years. Feral animal impacts radiate out from water sources to create a halo of degradation. This includes damage or complete destruction of soil crusts, erosion of low banks and lake edges and the local loss or depletion of palatable plant species.

Horses, swamp buffalo and donkeys are a problem primarily in the Hooker Creek catchment, while damage from cattle is concentrated around Nyukulku and throughout the Milwayi Spring/Kamira Lake/Lake Talbot wetland complex. Although fewer in number across the IPA, camels can cause considerable impacts around small waterholes because of their capacity to drink

Horse carcasses removed from Emu Rockhole

close to 90 litres of water at a time and their tendency, along with horses, to create pads where they regularly walk. These worn paths can impede and re-direct sheet flows, resulting in local changes in water availability for vegetation. Such changes can damage habitats such as the relatively restricted plant communities that grow in floodout areas (refer Section 6.4.1).

Between 2009 and 2010, North Tanami Rangers worked with IPA staff to fence Emu Waterhole on Hooker Creek. Although this fencing project served an important role in engaging *Yapa* with issues associated with feral horses and camels, the fence itself has not been effective in excluding feral animals, and there are ongoing issues with its maintenance. In a general sense the benefits of exclusion fences are highly localised, and their installation in CLC-supported projects has been largely discontinued because of high maintenance costs and questionable effectiveness. Issues associated with exclusion fencing on IPAs in the CLC region include:

- the potential for exclusion fences to permanently alter or damage sacred sites
- fence construction being relatively expensive compared to other feral animal management options and being an ineffective long-term solution if not done in conjunction with feral animal reduction programs
- the requirement for well-designed and well-placed fences and their intensive and ongoing maintenance often being outside the technical and financial resources of IPAs
- animal welfare considerations related to the exclusion of animals from water, the entanglement of animals in fences or their entrapment within fenced exclusion zones
- the choking of water places by vegetation when herbivores are excluded and the resultant impacts on fauna (including aquatic animals).

Introduced cane toads were first recorded near Lajamanu in 2011, and there are now established populations of this pest animal in several waterholes along Hooker Creek. Traditional owners and rangers are very concerned about the impacts of this new animal on goanna and frog populations in the vicinity of affected waterholes. To date there have been no effective methods developed for preventing the southward and westward spread of cane toads from established populations in the Top End.

Preventing the establishment of cane toads at IPA wetlands away from Hooker Creek may only be possible if there is early detection of adult toads and removal of eggs and tadpoles using recently developed chemical lure traps (refer Section 6.5.2).

Introduced Plants

Introduced plants also present a significant threat to water places in the IPA. Along the banks of creeks and in floodout areas, higher nutrient and moisture levels, combined with concentrations of feral animals, enable rapid weed establishment. The cycle is perpetuated as seeds are washed downstream in subsequent floods,

Rangers treating Parkinsonia infestations along Hooker Creek, 2013

enabling these plants to spread further across the landscape. More isolated water places, such as rockholes and springs in rocky gorges, can also be points for weed introduction and subsequent dispersal, being carried on clothing, shoes, swags, vehicles, animal fur and feathers and in bird droppings.

Weeds can lead to changes in water levels in waterholes or floodout areas heavily infested by perennial weed species, and dense infestations can also restrict access for native animals to surface waters.

Parkinsonia, present throughout much of the Hooker Creek upper catchment, has formed dense infestations around semipermanent waterholes in the river bed. Since 2011, North Tanami Rangers and IPA staff have worked with Northern Territory Government Weed Branch staff to map current infestations of this Weed of National Significance (WONS) and to commence chemical treatment of downstream infestations (refer Section 6.4.2).

Buffel grass (*Cenchrus ciliaris*) and couch grass (*Cynodon dactylon*), both present in the IPA, also pose significant current threats to water place values, as potentially do another 19 weed species recorded in the IPA (refer also Section 6.4.2).

Groundwater Issues

Maintenance of bores or hand pumps at outstations is not the responsibility of either of the two main service organisations in Lajamanu (Central Desert Regional Council and WHCAC) and, as a consequence, this infrastructure is generally not functional or is in very poor condition. In the recent past, the Centre for Appropriate Technology (CAT) has worked with traditional owners and North Tanami Rangers to fit new hand pumps at several outstations on the IPA and train community members to maintain them. Traditional owners are concerned about the poor quality of bore water at some outstations and the lack of maintenance of bore infrastructure at these places.

A better understanding of aquifers across the IPA is required so that *Yapa* can make informed decisions about future mining and infrastructure development proposals, or about the feasibility of potential new community-generated enterprises.

Beyond knowledge gaps concerning the physical attributes of aquifers, little is also known about groundwater-dependent plants and animals and their management requirements. While considerably more is known about the biodiversity values of surface waters, here, too, knowledge and understanding are limited and fragmented. There is also currently very limited understanding about the potential impact of climate change on water resources, flood events, culturally important water places or the plant and animal communities dependent on these habitats.

6.3.3 Management Strategies

Management Objective 6.3.3(a)

Support traditional owners in preventing the ongoing loss of cultural knowledge associated with water places

Management Strategies

1. In conjunction with senior *Yapa*, the IPA Management Committee and CLC Anthropology Section staff, review the cultural knowledge records held by the organisation for water places in the IPA.
2. Develop and implement a program to fill in knowledge gaps about water places, including their:
   - names
   - locations
   - associated *Jukurrpa* stories and history of use by *Yapa*
   - threats and management actions required.

   Research priorities and the means by which knowledge gaps are to be filled will be guided by the same criteria as those listed in Strategy 2, Management Objective 5.3.3(a).

Management Objective 6.3.3(b)

Manage important water places in order to maintain or enhance their cultural and ecological values

1. Develop a water place management schedule based on traditional management practices and contemporary management needs. The schedule will include details concerning the management regimes to be applied to particular places, such as:
   - types of activities (e.g. protective burning, cleaning out of debris, weed management)
   - the regularity of maintenance visits
   - type(s) of surveys and monitoring (if any) to be conducted.

   Priority water places will be determined using the same criteria as those listed in Strategy 2, Management Objective 5.3.3(a), together with consideration of:
   - the significance of the biodiversity values present
   - the need to undertake works in order to maintain benefits from previous management efforts
   - the presence/absence of other high-priority management actions at or near the water place, such as those related to:
     - soil conservation (Section 6.2.3)
     - weed control (Section 6.4.3)
     - protection of significant plants (Section 6.4.3)
     - feral animal control (Section 6.5.2)
     - threatened species programs (Section 6.5.2)
     - fire management (Section 6.6.3).
2. Implement the water place management schedule through field trips specifically undertaken for this purpose or through the incorporation of water place activities into:
   - the IPA country visit program
   - appropriate ranger and IPA program land management trips.
3. Ensure quarantine protocols are in place for all water place maintenance and monitoring activities to prevent the spread of potential waterborne pathogens and invasive plants.
4. Develop and implement a water place monitoring program as a means of measuring the success or otherwise of key management strategies.
5. Work collaboratively with researchers to improve knowledge about potential impacts of climate change on wetland communities in the IPA and about future management actions that might be required.

(For management objectives and strategies concerning weed and feral animal–related impacts on water places, refer Sections 6.4.3 and 6.5.3 respectively.)

Management Objective 6.3.3(c)

Manage groundwater resources in sustainable ways

1. Support research by tertiary institutions and relevant government agencies into the sustainable use of the groundwater resources of the IPA.
2. Disseminate relevant materials about groundwater resources and their threats among IPA Management Committee members to increase traditional owners' understanding of potential impacts of any new mining proposals or other developments.
3. Advocate for funding for regular maintenance of bores, hand pumps and infrastructure associated with outstations in the IPA.

6.4 *Mayi* – Plants

6.4.1 Background

The vegetation of the IPA is dominated by *marna* (spinifex – *Triodia* species) grasslands that thrive on the infertile sandy soils which characterise the region. The ubiquitous hummocks of spinifex cover sandplains and dunefields and extend from the verges of salt lakes to the tops of the rocky ranges. Within and adjoining these hummock grasslands are a variety of other vegetation types, including low open woodlands, open shrublands and tussock grass communities (Figure 10). While this vegetation pattern reflects the broader composition of rocks, soils, landforms and climatic patterns in the IPA, it is largely a product of fire regimes (refer Section 6.6.2). Highly restricted plant communities can be found along sheltered creek lines, in fire-protected gullies and around the edges of salt lakes and floodout areas.

Across the IPA, certain vegetation communities characterise specific land types, whereas others may be found across a variety of landscapes (Figure 9). Key vegetation types that are readily distinguishable by both *Yapa* and *Kardiya* are:

- spinifex hummock grasslands
- mixed eucalypt open woodlands
- mulga open woodlands
- samphire low shrublands
- tea tree shrublands
- tussock grasslands.

Spinifex community

Spinifex Hummock Grasslands

Land types: alluvial sandplains, low-lying alluvial plains, sandhills, rocky hill country, low calcrete rises

Low open spinifex hummock grasslands with an overstorey dominated by sparse tall acacia shrubs account for just over 90% of the vegetation of the IPA. Eight different spinifex species have been recorded in the IPA, with the dominant species throughout the different land types being soft spinifex (*Triodia pungens*). Feathertop spinifex (*Triodia schinzii*) is the next most common of the spinifex species. It tends to be more common on deep sands.

The composition of the shrub layer in this community varies depending on a number of factors, including soil fertility, soil moisture availability, aspect and fire history. On sandplains where there are no sandhills present, the dominant acacias in the shrub overstorey are dogwood (*Acacia sericophora*) and *A. adsurgens*, with flat-leaved hakea (*H. macrocarpa*) often present. On sandplains between dunes, *Acacia torulosa* and *A. stipuligera* scattered shrubs dominate the overstorey along with occasional scattered trees such as bloodwoods (*Corymbia terminalis* and *C. deserticola* subsp. *mesogeotica*). Spinifex grasslands in lower lying areas tend to be dominated by soft spinifex, and the overstorey in these places comprises an open shrubland of turpentine (*Acacia lysiphloia*), *A. adsurgens* and holly grevillea (*G. wickhamii*). In long-unburnt areas, mulga (*Acacia aneura*) is commonly found in the swales between dunes, while on hill slopes, overstorey species typically include snappy gum (*Eucalyptus brevifolia*) and bloodwoods (*Corymbia species*).

The high resin content of spinifex means that this plant community provides most of the fuel for wildfires in the region. Because of its capacity to resprout after burning, these hummock grasslands can regrow sufficiently after three to five years to provide fuel for another hot wildfire. Patches of spinifex that have remained unburnt for more than 10 years are rare in the IPA. *Yapa* consider this type of spinifex community to be 'rubbish' country and in need of cool-season burning.

Mixed Eucalypt Open Woodlands

Land types: rocky hill country, swamps or floodouts, watercourses, low-lying alluvial plains

Woodland communities make up just under 9% of the vegetation of the IPA. The most well-represented of these are the snappy gum (*Eucalyptus brevifolia)* low open woodlands (7.45% of the IPA) that dominate the rocky hill county in the western half of the IPA. Various bloodwoods (*Corymbia* species) can also be present in the overstorey layer, while a mixed shrub layer of *Acacia* (e.g. *A. lysiphloia*, A. *monticola*) and *Hakea* species overlies the soft spinifex (*Triodia pungens*) understorey. This community favours the sandstone or granitic soils found on ranges and isolated hills.

Silver leaf box (*Eucalyptus pruinosa*) and bloodwood (*Corymbia terminalis*) open woodlands, occurring on less than 1% of the IPA, can be found on lower lying sandplain areas, including around Wilson Creek. The shrub layer in this plant community includes conkerberry (*Carissa lanceolata*), an important bush food for *Yapa*, and tea trees (*Melaleuca* species). The ground layer is dominated by non-spinifex grasses such as golden beard grass (*Chrysopogon fallax*) and oat grass (*Themeda avenacea*).

Open woodlands of black box (*Eucalyptus microtheca*) or smooth-barked coolabah (*E. victrix*) with occasional bloodwoods (*Corymbia opaca* or *C. flavescens*) or river red gum (*Eucalyptus camaldulensis* subsp. *obtusa*) form the fringing vegetation community along river systems and floodout areas such as around Nyukulku (Wilson Creek Floodout) and Mirirrinyungu (Duck Ponds). They are also associated with drainage depressions or paleodrainage systems in the south of the IPA. Tussock grasses (*Eulalia aurea* and *Chrysopogon fallax*) and sedges (*Fimbristylis* species) are the dominant ground cover here, though soft spinifex (*Triodia pungens*) may also be present. The shrub layer in this community generally comprises mixed Hakea species (e.g. *H. aborescens*, *H. macrocarpa*) and dogwood (*Acacia sericophora*).

Most of the woodland trees in the IPA grow to less than 15 m in height. As trees age, they provide important habitat for a range of tree hollow–dependent birds, bats and reptiles (refer Section 6.5.1).

Eucalypt woodland of *wapilingki* (*Eucalyptus victrix*) on a floodout

Mulga Open Woodlands

Land types: rocky hill country, alluvial sandplains, paleodrainage systems

Woodlands of fire-sensitive mulga (*Acacia aneura*) cover less than 0.5% of the IPA. They primarily occur on run-on areas, sometimes in association with paleodrainage channels on sandplains in the south of the IPA. They can also be found on alluvial sandplains adjacent to hills and ranges or fringing floodout areas. Mulga communities in the IPA typically have an understorey of woollybutt (*Eragrostis eriopoda*) or kerosene grasses (*Aristida* species) and often have various bloodwoods (*Corymbia* species) in the overstorey. The mulga stands fringing Mirirrinyungu (Duck Ponds) are believed to be among the most northerly stands of this species across the continent, while around Lake Buck, mulga is replaced by groves of salt mulga (*Acacia maconochieana*).

Mulga is particularly vulnerable to hot wildfires that can occur following high rainfall seasons. Individual mulga trees can be killed by fire, and entire mulga woodlands can be eradicated and replaced by spinifex-dominated communities over time if the interval between hot fires is too brief for plants to produce sufficient seed reserves.

Aerial view of unburnt mulga (*Acacia aneura*) stands in sandplain country

Aerial view of salt mulga (*Acacia maconochieana*) near Lake Talbot

Samphire Low Shrublands

Land type: saltpans, paleodrainage systems

Although only accounting for 0.33% of the total vegetative cover of the IPA, low open samphire shrublands are a very distinctive vegetation type fringing bare pans in the south of the IPA. The dominant low shrub in this community is *mungilypa* (samphire or glasswort – *Tecticornia indica* subsp. *leiostachya* and *T. verrucosa*), the seeds of which were an important food source for *Yapa* in earlier times. Other co-occurring saltbush species include buckbush (*Salsola tragus*) and swamp bluebush (*Chenopodium auricomum*). Inland tea tree (*Melaleuca glomerata*) shrubs or black box (*Eucalyptus microtheca*) trees are scattered throughout this plant community in the overstorey layer. This plant community is also vulnerable to wildfire.

Tea Tree Shrublands

Land type: swamps and floodouts, saltpans, paleodrainage systems

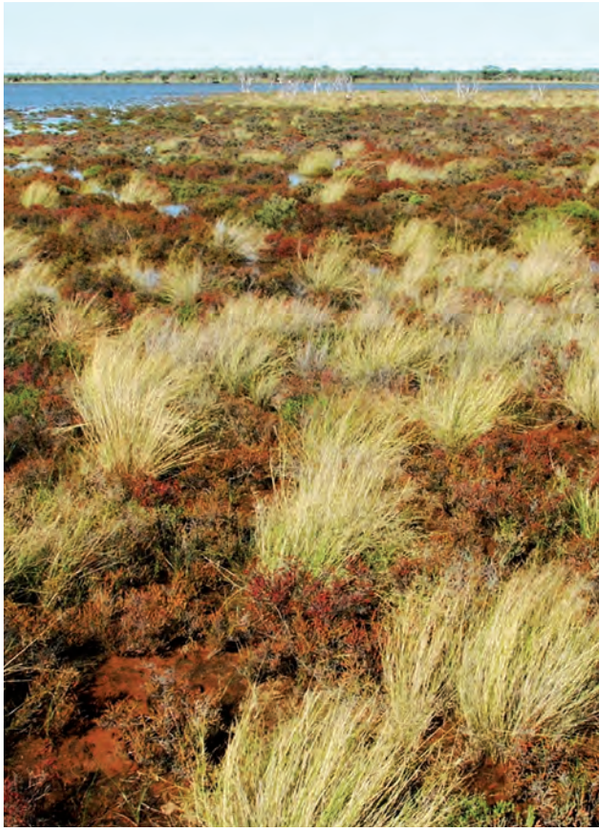
Fringing several of the swamps, saltpans and ephemeral lakes in the south of the IPA, tea tree shrublands dominated by *pakarli* (inland tea tree – *Melaleuca glomerata*) and sandhill tea tree (*M. lasiandra*) make up around 0.02% of the total vegetative cover across the IPA. Other shrub species found in this community include desert grevillea (*G. juncifolia*) and witchetty bush (*Acacia kempeana*). The understorey typically consists of spinifex or low tussock grasses.

Tussock Grasslands

Land type: swamps or floodouts, saltpans

Non-spinifex tussock grasslands cover only about 0.01% of the IPA. In general, these grasslands are found on lake beds or fringing pans in the south of the IPA. Dominant species include woollybutts and lovegrasses (*Eragrostis eriopoda*, *E. falcata* and *E. speciosa*). Overstorey species scattered throughout this community include bramble wattle (*Acacia victoriae*), *marnakiji* (conkerberry – *Carissa lanceolata*) and, less commonly, isolated black box trees (*Eucalyptus microtheca*). Lake Buck supports a distinctive grassland community comprising barley Mitchell grass (*Astrebla pectinata*), feathertop wiregrass (*Aristida latifolia*) and curly bluegrass (*Dichanthium fecundum*).

Successive hot wildfires have the potential to alter the composition of tussock grassland communities, with spinifex species tending to replace more fire-sensitive tussock grasses under this regime.



Samphire and tussock grass vegetation surrounding Lake Talbot

Pakarli (tea tree) vegetation

Table 1. Threatened and data-deficient plant species in the IPA

Species	Conservation Status	Northern Territory Endemic
Acacia abbreviata	NT	yes
Acacia doreta (syn. *A. grasbyi*)	NT	no
Acacia stipulosa	NT	no
Brachyachne prostrata	NT	no
Elatine macrocalyx	NT	no
Eucalyptus cupularis	NT	no
Logania centralis	NT	no
Mitrasacme lutea	NT	no
Trianthema oxycalyptra var. *oxycalyptra*	NT	no
Acacia maconochieana	DD	no
Acacia pachycarpa	DD	no
Acacia stellaticeps	DD	no
Acacia synchronicia	DD	no
Acrachne racemosa	DD	no
Amaranthus induratus	DD	no
Corymbia pachycarpa subsp. *glabrescens*	DD	no
Crotalaria montana var. *angustifolia*	DD	no
Cullen corallum	DD	no
Dodonaea hispidula var. *arida*	DD	no
Ectrosia schultzii var. *schultzii*	DD	no
Fimbristylis corynocarya	DD	no
Fimbristylis velata	DD	no
Heliotropium ballii	DD	no
Heliotropium fasciculatum	DD	no
Heliotropium parviantrum	DD	no
Heliotropium pulvinum	DD	yes
Heliotropium sphaericum	DD	no
Heliotropium subreniforme	DD	yes
Indigofera ammobia	DD	no
Jacksonia aculeata	DD	no
Nesaea repens	DD	no
Olax spartea	DD	no
Peplidium sp. Tanami	DD	no
Polymeria sp. Western Tanami	DD	no
Senna artemisioides subsp. *symonii*	DD	no
Synaptantha tillaeacea var. Western Tanami	DD	no
Tecticornia halocnemoides subsp. *tenuis*	DD	no
Tephrosia rosea var. *rosea*	DD	no
Tephrosia sp. Mistake Creek	DD	no
Trachymene villosa	DD	no
Tribulus sp. long-styled eichlerianus	DD	no
Zornia muelleriana subsp. *muelleriana*	DD	no

Conservation status codes *Territory Parks and Wildlife Conservation Act 2000*: **NT**: near threatened, **DD**: data deficient. **Northern Territory Endemic**: not known to occur outside the Northern Territory.

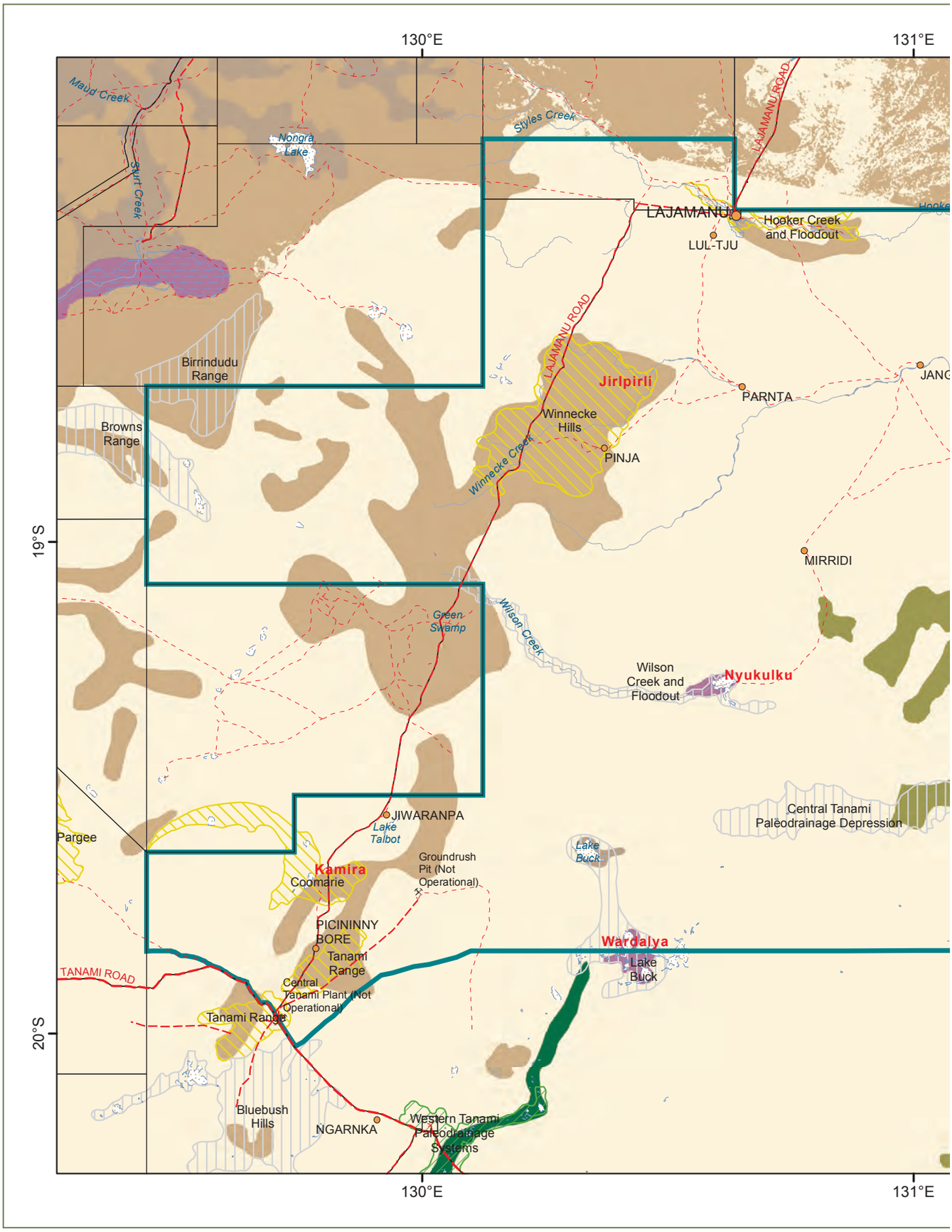
To date, over 790 plant taxa have been recorded from the IPA, marking it as a region of relatively high species diversity in Central Australia. The most species-rich families include:

- Fabaceae (peas and wattles: 114 taxa)
- Poaceae (grasses: 110 taxa)
- Cyperaceae (sedges: 49 taxa)
- Amaranthaceae (mulla mullas, saltbushes and allies: 51 taxa)
- Malvaceae (mallows: hibiscus and allies: 49 taxa)
- Goodeniaceae (hand-flowers and allies: 29 taxa)
- Myrtaceae (eucalypts, paperbarks and allies: 29 taxa)
- Asteraceae (daisies: 25 taxa).

Another indicator of the plant diversity in the IPA is the tally of 22 gum tree species (*Eucalyptus* and *Corymbia*) and over 51 different types of wattle. As with the fauna, floristic diversity here is largely attributable to the IPA's biogeographic setting, being an area where savanna and desert communities intersect.

Traditionally, *Yapa* held an intimate knowledge of very many plant species based on their utilitarian values. Plant parts such as tubers, fruits and seeds were important food items. *Mangarri* (dampers) made from seeds of different grasses, shrubs and trees were a staple part of people's diets. Many plants were also valued for their medicinal properties or mild narcotic effects, and others were used for ornamental or ceremonial purposes. Certain plants were valued for their resins or gums, which were used in binding tool handles, while others were valued for the water-holding properties of their roots. Plant material was also essential to create tools required for everyday survival, especially *karlangu* (digging sticks) and *kurlinjirri* (scooped dishes) for women and *kurlarda* (spears) and *pikirri* (spear-throwers) for men. Plants were also utilised for *yama* (shelters) and as tinder for starting fire or for *warlu* (firewood) itself.

Plants remain an important part of *Jukurrpa*, and ceremonies exist for many different species, including all of the main food plants. Individual trees or patches of vegetation may be sacred themselves, or they may act as important markers to nearby sacred sites. Many plants continue to be harvested for food or medicinal purposes, while *watiya* (wood) of certain trees is collected to create contemporary and traditional artefacts to sell through the Warnayaka Art and Cultural Centre in Lajamanu.



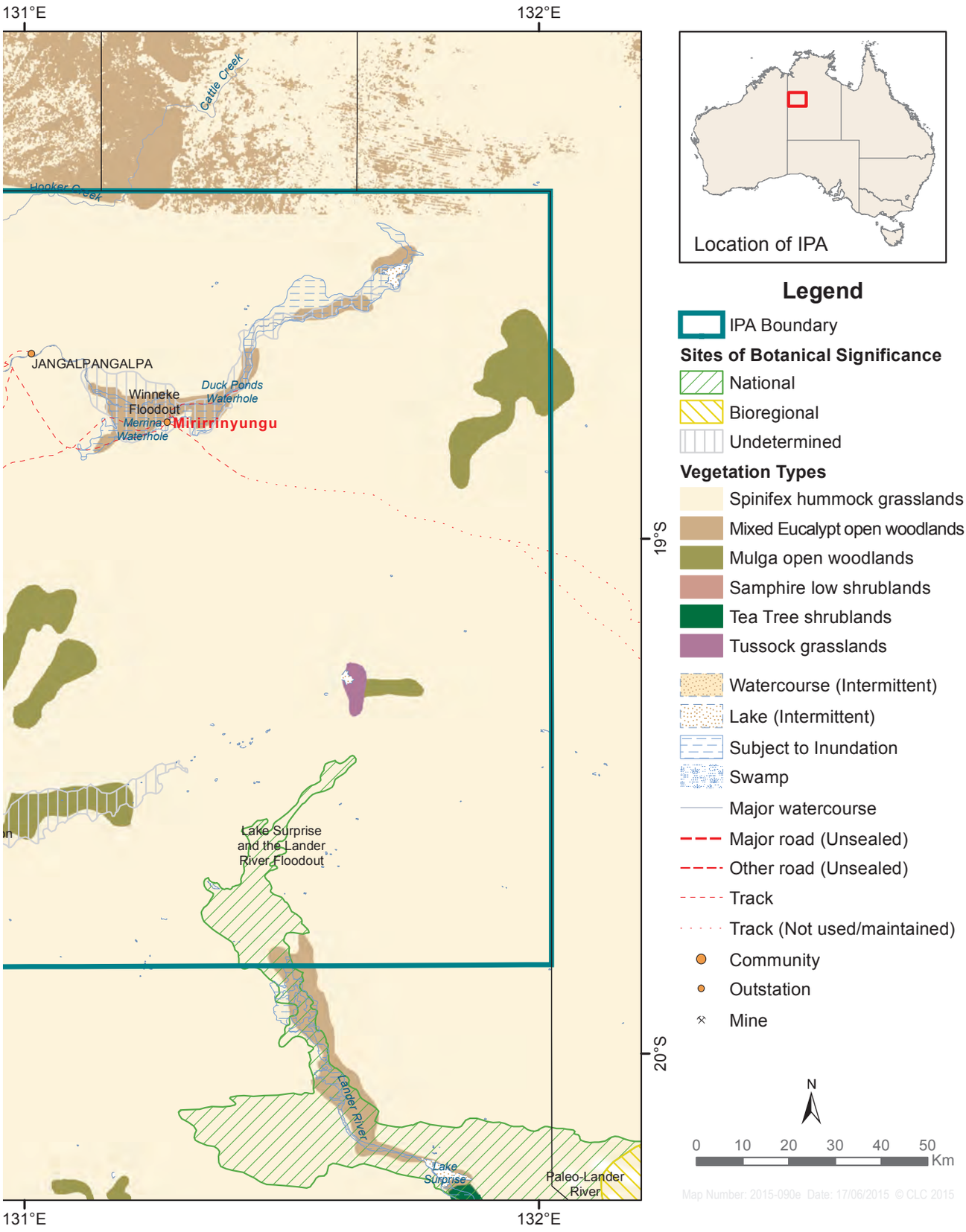
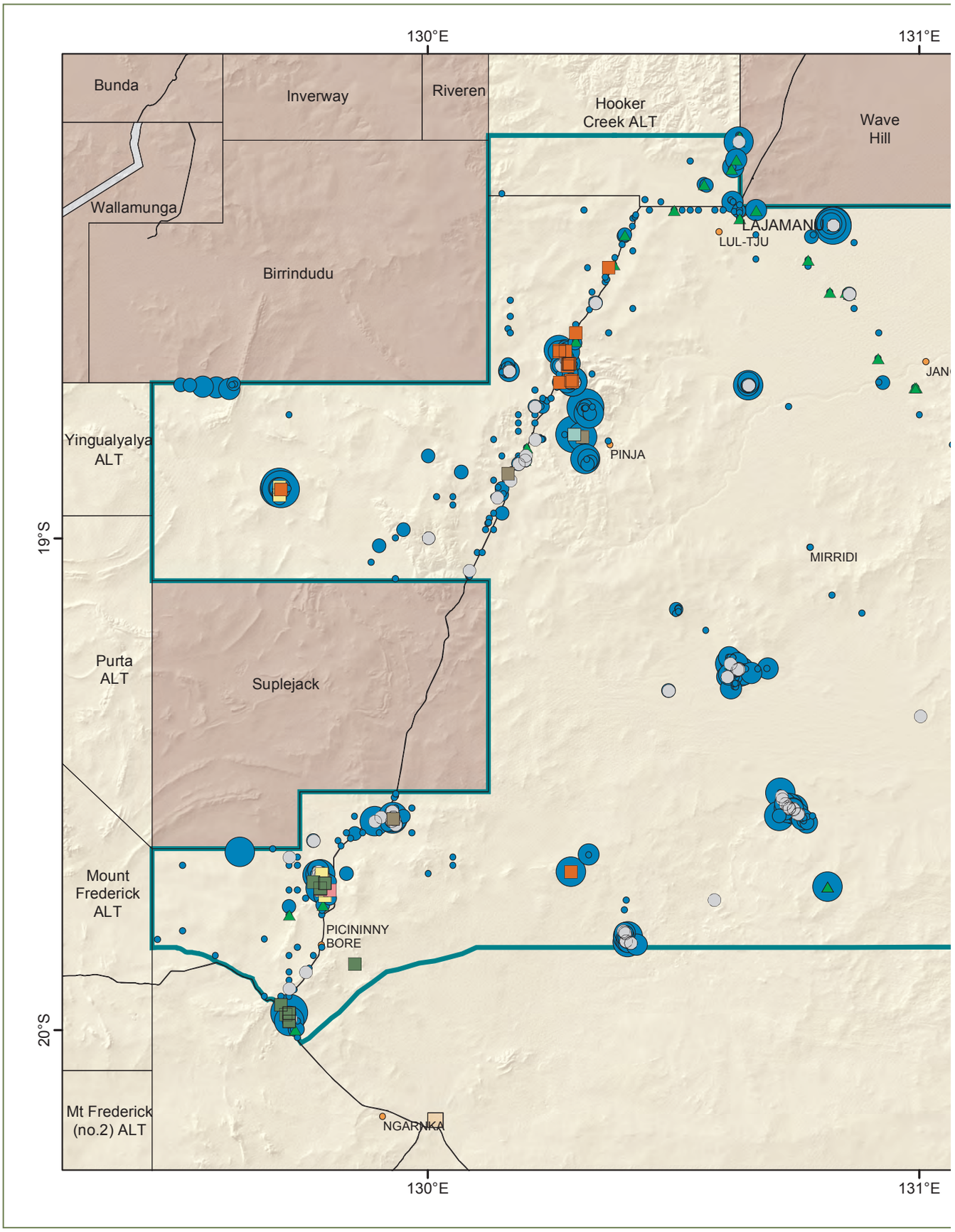


Figure 10 Vegetation and Sites of Botanical Significance



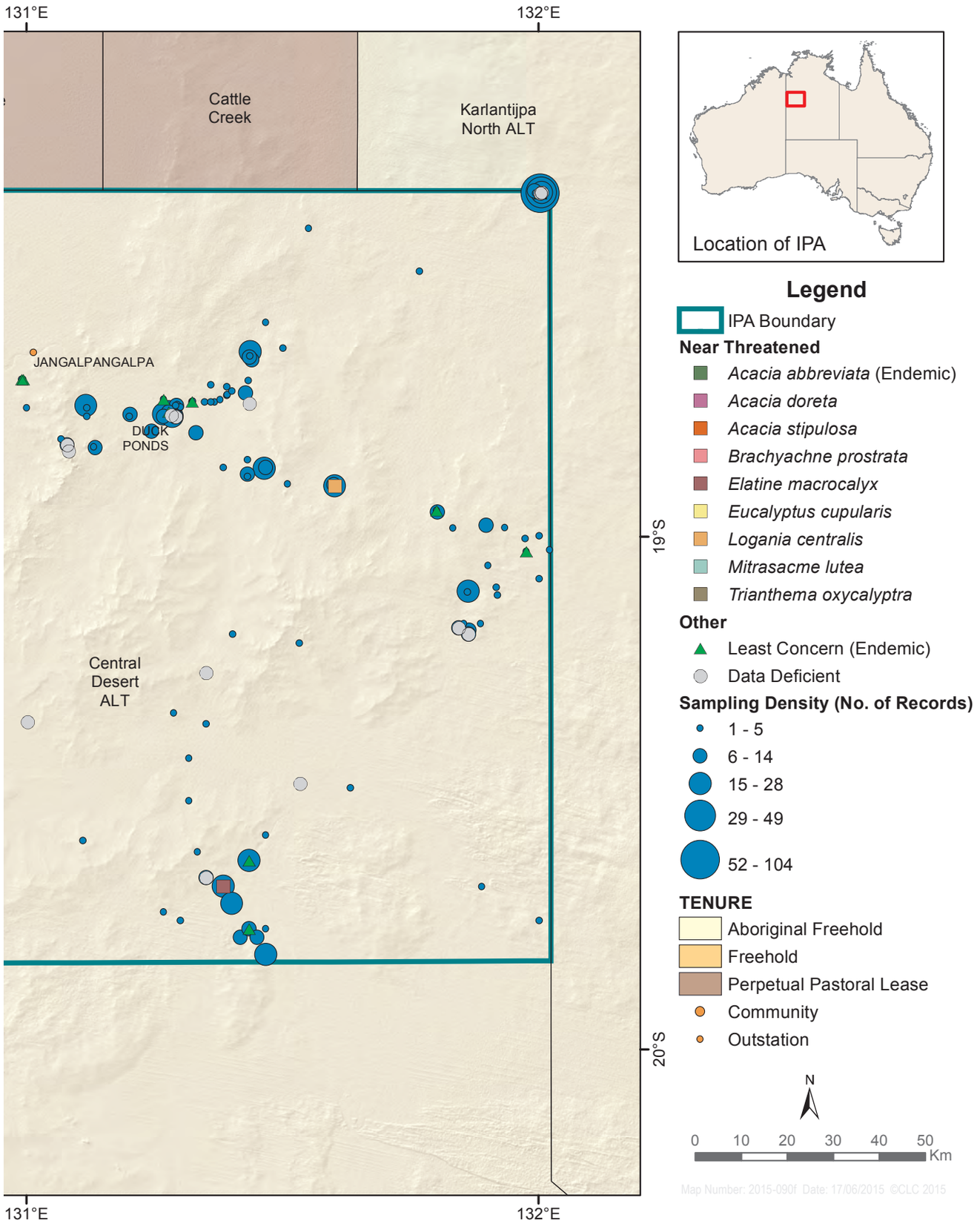


Figure 11 Threatened and Significant Flora and Botanical Sampling Effort

For *Kardiya*, the plants of the IPA hold little, if any, utilitarian or economic value. Instead, *Kardiya* values are associated with aesthetic and scientific appreciation of the composition and distribution of the plant communities present, describing and mapping vegetation types and protecting plant diversity, including rare or threatened species and communities.

The plants of the IPA perform critical ecological functions, including soil formation and stabilisation, nutrient storage and cycling, and the provision of wildlife habitats, refugia, roosts, nests and food sources.

Although there are no nationally listed threatened plants known from the IPA, the region contains several species of conservation significance (refer Table 1 and Figure 11). No plant species are listed as threatened at the national level, though nine taxa recorded in the IPA are listed as near threatened under Northern Territory legislation, with a further 33 plant taxa found in the IPA described as data deficient, meaning that insufficient information is known about them to determine their conservation status. A total of 13 of the plant species found in the IPA are endemic to the Northern Territory (refer Appendix 4 for a complete list of plants in the IPA).

The IPA contains all or part of 11 designated SOBS (Table 2 and Figure 10). Of these, one site is considered to be of national significance, and four are of bioregional importance. The significance of a further six sites is yet to be determined, and additional survey work is required at all these sites.

Table 2. Sites of Botanical Significance in the Northern Tanami IPA

SOBS name	Significance	Bioregion + nearest *Yapa* place name	Portion contained in the IPA	Values summary*	Corresponding site of Conservation Significance
Lake Surprise and Lander River Floodout	National	Tanami Marnam-piparnta	Small part	15 plant taxa of national or Northern Territory significance. Six endemic plant species (either at the bioregion or Northern Territory level) and one endemic frog species	Lake Surprise and Lander River Floodout
Coomarie	Bioregional	Tanami Kamira	Majority	7 taxa of national, Northern Territory or bioregional significance, including the only known population of *Acacia stenophylla* in the Tanami bioregion	N/A
Hooker Creek and Floodout	Bioregional	Tanami Wulayi	All	7 taxa of national, Northern Territory or bioregional significance	N/A
Tanami Range	Bioregional	Tanami Jarnami	Part	14 taxa of national, Northern Territory or bioregional significance, including being the type locality for the near-threatened *Acacia abbreviata*	N/A
Winnecke Hills	Bioregional	Tanami Jirlpirli	All	9 taxa of national, Northern Territory or bioregional significance. Represents area of overlap between flora of Victoria River region and the Tanami	N/A
Lake Buck and Spider Lake	Undetermined	Tanami Nguringku	Part	Unconfirmed botanical values	N/A
Wilson Creek and Floodout	Undetermined	Tanami Nyukulku	Majority	Unconfirmed botanical values	N/A
Birrindudu	Undetermined	Tanami	Part	Unconfirmed botanical values	N/A
Browns Range	Undetermined	Tanami	Part	Unconfirmed botanical values	N/A
Central Tanami Drainage Depression	Undetermined	Tanami	All	Unconfirmed botanical values	N/A
Winnecke Floodout	Undetermined	Tanami Mirirrinyungu	All	Unconfirmed botanical values; known to contain one of the most northerly populations of mulga in Australia	N/A

* note the significance categories assigned as part of the SOBS classification in 2000 are now usurped by reclassification done in 2010-2011 under the *Territory Parks and Conservation Act 2000*

6.4.2 Issues and Opportunities

The key issues associated with vegetation across the IPA are:

- loss of cultural knowledge
- incomplete scientific knowledge
- changed fire regimes
- introduced plants
- feral animals
- changes to surface water flows.

Loss of Cultural Knowledge

With the majority of *Yapa* residing in communities, their diets are now focused on store-bought food, and illnesses once commonly treated with plant-derived medicines are now treated with synthetic drugs provided by the local clinic. The end of people's reliance on bush foods and medicines has resulted in a decline in customary practices and an associated demise of intergenerational transfer of traditional knowledge associated with plants. This loss has extended to knowledge about plants traditionally used for many other purposes.

Beyond the diminution of culture that this trend represents, this loss of knowledge has health and wellbeing consequences for *Yapa*. It also has plant conservation implications, as embedded within traditional plant knowledge are ecological insights and understanding based on thousands of years of observation and practice. From a land management perspective, the loss of such knowledge is especially regrettable, given the relatively poor scientific understanding of the plants of the IPA and of the interaction between native animals and particular plant species or vegetation communities.

A number of older people who hold traditional knowledge about plants are still alive today, and with increased opportunities to visit country as part of IPA work, this knowledge can be revived and passed on to others, especially to young people.

Incomplete Scientific Knowledge

Although *Kardiya* have collected plant specimens from the region that is now included in the IPA for well over a century, this collecting has largely been sporadic and opportunistic and tends to be focused around roads and access tracks (Figure 11). It has only been in the last couple of decades that work has begun to fill in the many botanical knowledge gaps in any systematic way. This activity gained momentum in 2002 with the commencement of the IPA development project, which incorporated several biological surveys involving government and consultant botanists. Most of this survey effort focused on fauna rather than flora, so there still remains a lot of work to do to comprehensively survey plant communities across the IPA and determine their management requirements. Further survey work is likely to generate a number of new records of rare or endemic plants in the IPA.

Kardiya understanding of Central Australian plant ecology is also far from complete. Considerable potential still remains to combine *Kardiya* and *Yapa* plant knowledge to better manage the vegetation of the IPA.

Women and girls collecting *janmarda* (bush onion) on IPA trip

Changed Fire Regimes

Prior to the depopulation of country during the first half of the twentieth century, vegetation across the Tanami Desert consisted of patches in different stages of recovery after fire, the result of traditional *Yapa* burning practices. With the movement of people off country, this traditional regime of a patchwork of relatively small, low-intensity fires has been replaced by a pattern of larger and more intense wildfires that periodically burn tens or hundreds of thousands of hectares (refer also Section 6.6.2).The implications of this change on the vegetation of the IPA have been profound and include:

- replacement of the fine-scale mosaic pattern of vegetation types and age classes with large expanses of even-aged vegetation communities
- contraction in the distribution of fire-sensitive communities – such as mulga woodlands, samphire or tussock grass communities – and their replacement by fire-tolerant or fire-dependent vegetation types, such as spinifex grasslands
- ongoing loss of already localised relictual fire-sensitive plant species
- loss of old-growth vegetation, including hollow-bearing mature trees, with attendant impacts on hollow-dependent animal species (refer also Section 6.5.2)
- promotion of the spread of more fire-tolerant weed species, such as buffel grass, which thrive on being burnt regularly and readily colonise burnt areas
- increased soil erosion as a result of fire killing soil-crusting plants (algae, liverworts, lichens and mosses), which normally protect desert soils
- destruction of sacred trees and other culturally significant vegetation, which can result in *Jukurrpa* sites being lost through the disappearance of key vegetation markers along songlines
- reductions in the distribution and availability of important *Yapa* bush foods and medicine plants.

The widespread nature of these impacts highlights the importance of fire management in the IPA (refer Section 6.6).

Introduced Plants

The majority of the IPA is free of weeds, especially sandhill and rocky hill country, much of which has infertile soils or is distant from surface waters and access tracks that allow for easier dispersal of weed seeds. Relatively fertile parts of the IPA – such as floodout areas, swamps and riparian areas, places near tracks and built infrastructure, and areas where feral animals congregate – are far more vulnerable to weed infestation.

Twenty-two introduced plant species have been recorded from the IPA, with the majority of these being found close to Lajamanu community or in the vicinity of outstations (Table 3).

The impacts of weeds on the native vegetation of the IPA can include:

- declines in the diversity of native plant species
- reduced regeneration success of native plant species
- loss of deep-rooted perennials (which affects recharge rates, soil salinity and erosion)
- increased frequency and intensity of fires, resulting in changes to vegetation composition and structure.

Water places, in particular, are vulnerable to weed infestations because of the concentration of nutrients in these sites, the ready availability of soil moisture and the tendency of feral horses and stray cattle to gather at these places. Excessive weed growth can affect aquatic ecosystem processes by altering evaporation rates, water table levels and soil nutrient levels. In addition, watercourses infested with weeds can enhance the spread of fire rather than acting as natural firebreaks, and larger native animals such as macropods can be impeded from accessing surface waters in heavily infested areas. Fires in buffel or couch grass growing along watercourses tend to burn fiercely, often killing old hollow-bearing eucalypts that provide nest, roost and den sites for native animals.

Yapa once considered weeds to be of no consequence; they were just another *watiya* (tree or bush) or grass. Now, the removal of weed infestations around sacred sites and water places to protect them from fire damage is viewed as an important part of maintaining these places. *Yapa* also recognise that weeds such as buffel grass (*Cenchrus ciliaris*) and Parkinsonia (*Parkinsonia aculeata*) can displace culturally important plants such as *jurnpurnpa* (bush tobacco – *Nicotiana benthamiana*) and prized bush food species such as *kampurarrpa* (desert raisin – *Solanum centrale*).

The following weed species recorded in the IPA have the potential to cause serious environmental degradation:

- Buffel grass (*Cenchrus ciliaris*) out-competes native plant species and markedly increases fuel loads, resulting in severe fire behaviour. Several infestations occur across the IPA, often associated with infrastructure such as outstations and tracks.

Buffel grass has now spread into important wetland areas such as Mirirrinyungu (Duck Ponds), Milwayi (Coomarie Spring) and Lake Talbot. To date, this weed has not been recorded from Nyukulku (Wilson Creek Floodout).

- Caltrop (*Tribulus terrestris*) is listed as a Class B weed under the Northern Territory *Weeds Management Act 2001*. It has been recorded around Lajamanu township and at Spider Lake. Caltrop can form a dense mat in heavily infested sites, and its sharp-spined fruits are a nuisance to stock and to people.
- Couch grass (*Cynodon dactylon*) poses a significant threat to the integrity of riparian corridors, paleodrainage systems and saline and freshwater lakes where it has the ability to smother and suppress native vegetation. There is currently only one Northern Territory Herbarium record of couch grass from within the IPA, from the Mirirrinyungu (Duck Ponds) area where there is a relatively small, localised infestation.
- Parkinsonia (*Parkinsonia aculeata*) is a WONS and is listed as a Class B weed under the Northern Territory *Weeds Management Act 2001*. This invasive species forms dense infestations along riparian zones and around waterholes and floodout areas in the Hooker Creek catchment to the north of Lajamanu community.

Ranger controlling rubber bush, 2010

- Rubber bush (*Calotropis procera*) is listed as a Class B weed under the Northern Territory *Weeds Management Act 2001*. Fewer than five plants have been recorded in the IPA, from the Hooker Creek catchment, downstream of Lajamanu. Elsewhere in the Tanami, this weed is well established in the vicinity of communities, bores and outstations.

Other significant environmental weeds that are present in the Southern Tanami IPA but are yet to be recorded in the Northern Tanami IPA are athel pine (*Tamarix aphylla*: WONS; Class B weed) and Mexican poppy (*Argemone ochroleuca*: Class B weed). To the north and east of the IPA, a number of serious environmental weeds occur, including:

- bellyache bush (*Jatropha gossypiifolia*) WONS; Class A weed
- devil's claw (*Martynia annua*) WONS; Classes A and C weed
- hyptis (*Hyptis suaveolens*) Class B weed
- lion's tail (*Leonotis nepetifolia*) Classes A and C weed
- mesquite (*Prosopis* species) WONS; Classes A and C weed
- prickly acacia (*Acacia nilotica* subsp. *indica*) WONS; Classes A and C weed
- rubber vine (*Cryptostegia* species) WONS; Classes A and C weed.

All of these weeds have the potential to spread into the IPA through flood events or by vehicle-based transmission of seed.

The most effective ways to limit the spread and proliferation of weeds in the IPA are by rapidly identifying and swiftly treating new species and infestations and minimising soil disturbance by feral animals and human activity.

North Tanami and Murnkurrumurnkurru Rangers have been actively involved in Parkinsonia management in the IPA in collaboration with Northern Territory Government Weeds Branch staff. North Tanami Rangers have also controlled buffel grass infestations around infrastructure and at some high conservation value sites. Despite this, there remains a lot more to be done to effectively curb the spread of existing infestations, to stop the incursion of weeds into new areas and to prevent the establishment of new weed species in the IPA.

Managing Parkinsonia – cross-catchment collaborations

Parkinsonia (*Parkinsonia aculeata*) is considered to be one of the worst weeds in Australia because of its invasiveness and its potential to spread into new areas and deleteriously affect the economic potential and the cultural and environmental values of these places. Parkinsonia is one of 32 Weeds of National Significance (WONS), whose management requires coordination among all levels of government, landholders and other organisations and individuals with weed management responsibilities.

Parkinsonia is now widespread in catchments across northern Australia, and in the Northern Territory it has also spread south into arid and semi-arid regions. Growing up to 8 m in height, each of these dense, prickly shrubs can produce more than 5000 seeds every year, and these seeds can survive in the soil for many years. Parkinsonia can form such dense infestations around watercourses and wetlands that livestock and native animals can be prevented from accessing water.

Parkinsonia was first recorded in the Hooker Creek catchment more than 20 years ago. In 2011, IPA staff and rangers worked with Northern Territory Government weed management staff to conduct an aerial survey of the sections of the watercourse in the Central Desert and Hooker Creek Aboriginal Land Trusts (ALTs) to better understand the current distribution of Parkinsonia. During this survey, dense infestations were mapped within a 5 km radius of Lajamanu and near the boundary between Birrindudu Perpetual Pastoral Lease and Hooker Creek ALT.

Trials of various chemical and manual control methods were undertaken by rangers and Northern Territory Government staff to determine which were best for treating these dense infestations. Since then, the North Tanami Rangers have collaborated with the Murnkurrumurnkurru Rangers to treat Parkinsonia infestations at key sites along Hooker Creek. Further collaborative weed management work is factored into each group's annual workplan.

Because of the need to treat upstream (source) infestations located beyond the IPA boundary, IPA staff have held discussions with personnel from the Northern Territory Government, Victoria River District Conservation Association and neighbouring pastoral properties to develop a strategic catchment-scale approach to Parkinsonia control.

Parkinsonia aculeata in flower

Rangers undertaking Parkinsonia control contract-work on Inverway Station in 2011

Table 3. Weed species recorded in the Northern Tanami IPA

Common name	Scientific name	Northern Territory *Weeds Management Act 2001* status	Australian status	Distribution and management in the IPA
	Portulaca pilosa			Weedy annual mat-forming plant. Recorded at a few disturbed sites, including Coomarie Spring. Seed likely to be spread by stray cattle
African mahogany	*Khaya senegalensis*			Recorded at Mirirrinyungu (Duck Ponds) outstation in 2010. This weedy tree species has a slight potential to spread by seed
Asthma plant	*Euphorbia hirta*			Annual herb that can spread widely. Single record from Spider Lake
Awnless barnyard grass	*Echinochloa colona*			Annual grass recorded from a number of sites in the IPA, often associated with disturbed water places. Recorded from Lake Talbot, Wilson Creek and Hooker Creek Floodout areas
Barnyard grass	*Echinochloa crus-galli*			Annual grass recorded from the Mirirrinyungu (Duck Ponds) area. Seeds dispersed in water
Black pigweed	*Trianthema portulacastrum*			Annual mat-forming herb that occurs in disturbed areas, often associated with moist soils. One record from the IPA in Lajamanu township
Buffel grass	*Cenchrus ciliaris*			Widespread, with dense infestations around outstations, Lajamanu community and some access tracks. Fuels very hot and more frequent wildfires
Caltrop	*Tribulus terrestris*	Class B		Mat-forming weed that invades disturbed areas. Recorded from a few sites in the IPA, including Lajamanu township and Spider Lake. Spiky seeds spread by animals and vehicles
Carribean stylo	*Stylosanthes hamata*			Short-lived perennial herb that is a pasture species in northern areas. Recorded at a few disturbed sites in the IPA, including Mirridi outstation
Couch grass	*Cynodon dactylon*			Only recorded from Mirirrinyungu (Duck Ponds) to date. Because of its competitive nature and risk of spread, this species is a high priority for eradication
Crowsfoot grass	*Eleusine indica*			Annual tufted grass, recorded only from Lajamanu township. Considered a serious weed in productive landscapes overseas
Finger grass	*Chloris barbata*			Annual or short-lived grass. Only recorded from bore overflow at Mirirrinyungu (Duck Ponds) outstation. Although it does not tend to form dense infestations, it should be prevented from spreading into the wetland area
Green amaranth	*Amaranthus viridis*			Annual forb found in disturbed areas. Single record from Lajamanu horse yards. Does not tend to form dense infestations
Parkinsonia	*Parkinsonia aculeata*	Class B	WONS	Localised dense infestations in Hooker Creek catchment and isolated plants associated with outstations. Ongoing strategic control of key infestations and survey work required to identify any new incursions for immediate eradication
Phasey bean	*Macroptilium lathyroides*			Perennial scrambling herb grown intentionally as forage species. Seeds spread by water or vehicles. Single record from the Lajamanu horse yards

Common name	Scientific name	Northern Territory *Weeds Management Act 2001* status	Australian status	Distribution and management in the IPA
Rubber bush	*Calotropis procera*	Class B		Only recorded from Hooker Creek downstream of Lajamanu. Additional surveys and control work within catchment recommended
Sabi grass	*Urochloa mosambicensis*			Sprawling perennial grass that invades water places. Easy to confuse with native species. Single record from Lake Talbot, where it is likely spread by cattle that stray into this wetland area
Small stinkgrass	*Eragrostis minor*			Annual weedy grass that can form dense infestations in disturbed areas. Unpleasant smell when crushed. Single record from Lajamanu horse yards
Spiked malvastrum	*Malvastrum americanum*			Short-lived forb that thrives in disturbed areas. Recorded at a number of IPA sites, including around Wilson Creek Floodout, Spider Lake and Lake Talbot
Townsville stylo	*Stylosanthes humilis*			Annual or short-lived pasture herb. Single record from the roadside near Lajamanu township
Tridax daisy	*Tridax procumbens*			Low, creeping perennial daisy that invades disturbed areas around outstations and tracks. Single record from the Lajamanu horse yards
Whorled pigeon grass	*Setaria verticillata*			Annual grass that can invade disturbed areas. Does not tend to form dense infestations. Single record from Coomarie Spring area, likely spread by cattle that regularly stray into this wetland area

Feral Animals

Six feral herbivore species are present in the IPA: camels, rabbits, cattle, swamp buffaloes, donkeys and horses (refer also Section 6.5.2). The most significant threat to IPA values comes from feral horses and the high numbers of cattle that stray into wetland areas from Suplejack Station.

Unmanaged horse, swamp buffalo and cattle populations cause localised impacts on vegetation through overgrazing and trampling, spread of weed seeds, and soil disturbance. Horses and cattle can also compete with key game species for palatable forbs and grasses. Horse impacts tend to be localised around waterholes on Hooker Creek near Lajamanu, whereas significant numbers of cattle regularly stray into wetland areas in the Milwayi Spring/Kamira Lake/Lake Talbot complex and into Nyukulku (Wilson Creek Floodout). Although swamp buffalo are only occasionally seen in the north of the IPA, their impacts can be very similar to cattle if populations are left unchecked.

Donkeys also impact on vegetation through direct grazing pressure and as a result of trampling, dispersal of weed seeds in dung and through disturbance to soils. Donkeys are present on the IPA in comparatively low numbers, and their populations are concentrated near Lajamanu and the northern part of the Winnecke Hills.

Camels, which are found at relatively low densities throughout the region, significantly impact on native vegetation through heavy browsing, breaking branches (sometimes to the point of killing individual trees and shrubs) and eating seedlings. Even less severe browsing, if repeated, can stunt tree and shrub growth.

Although rabbits can potentially denude the country of vegetation, their presence in the IPA is extremely limited. There are only a handful of historical records for this species from the southern portion of the IPA, namely the Picininny Bore vicinity (1990) and Lake Buck surrounds (1982).

Changes to Surface Water Flows

Ground disturbance that alters natural surface contours and water flows can result in impacts on native vegetation. Potholes, runnels and drains associated with formed roads, trenched tracks and even vehicle wheel marks can redirect surface flows away from some areas of vegetation and concentrate water at others. Obvious impacts include increased vegetative growth along road and track verges and the presence of weeds such as buffel grass along road and track corridors.

During high rainfall events, the funneling of surface flows along unformed vehicular tracks can scour out soil and undermine vegetation, resulting in the development of ever-widening corridors of disturbance.

Although such vegetation disturbance and loss is highly localised, parts of the IPA are crisscrossed with vehicular tracks, especially near Lajamanu community, meaning that the cumulative impact on vegetation associated with changed surface water flows is likely to be considerable.

Flood waters over Lajamanu Road

6.4.3. Management Strategies

Management Objective 6.4.3(a)

Support traditional owners in preventing the ongoing loss of cultural knowledge about plants

1. In conjunction with senior *Yapa*, the IPA Management Committee, CLC Anthropology Section staff and managers of adjoining protected areas, review the cultural knowledge information held for plants of the region.
2. Develop and implement a schedule of activities directed at preserving traditional plant knowledge, with priority setting guided by the following criteria:
   - the results of the review of plant knowledge already recorded
   - the risk of irretrievable loss of plant knowledge
   - information related to plants of outstanding cultural significance
   - information related to rare or threatened plant species or information that is considered to be important for the management of vegetation in the IPA
   - immediate management needs where there may be an impending threat to particular plant communities
   - a demonstrated interest by traditional owners to pass on particular plant knowledge
   - a demonstrated interest shown by potential recipients in receiving cultural knowledge.

This schedule should be directed at, but not limited to, the preservation of cultural information relating to the management of key areas and plant species utilised for:

- bush foods
- *parnpa*/*juju* (ceremony)
- the production of traditional and contemporary artefacts
- firewood
- medicines.

Based on the advice of *Yapa*, identify the best means of preventing knowledge loss, including:

- conducting country visits
- holding one-on-one and group interviews
- engaging young people in multimedia projects to document plant knowledge
- undertaking literature reviews.

3 Create a comprehensive record of *Yapa* plant knowledge using a variety of appropriate media, including video and sound recordings. Distribute copies of this material to *Yapa* as teaching tools. Store this information in the IPA database for use by *Yapa* and *Kardiya* ranger and IPA staff.

Management Objective 6.4.3(b)

Address *Kardiya* knowledge gaps related to the vegetation of the IPA

Management Strategies

1 Identify and prioritise gaps in *Kardiya* knowledge and understanding of the vegetation of the IPA. Known deficiencies include:

- inventory and survey work in the six undetermined SOBS in the IPA (refer Figure 10)
- survey work and information concerning rare, restricted and data-deficient plants in wetland areas apart from Mirirrinyungu (Duck Ponds) and Nyukulku (Wilson Creek Floodout)
- information on the composition and fire age of vegetation communities that may contain suitable bilby habitat
- the distribution and ecological health of significant remnant stands of mulga (*Acacia aneura*) communities.

2 Conduct flora surveys to address data gaps in relation to the vegetation of the IPA, especially the location, range, status and health of culturally and ecologically significant species and communities.

3 Create improved vegetation maps of the IPA at scale(s) that are useful for management purposes.

Management Objective 6.4.3(c)

Manage the IPA to ensure that the full suite of plant species and communities is conserved

1. Combine *Yapa* and *Kardiya* plant knowledge in the management of the vegetation of the IPA.
2. Develop and implement management regimes designed to optimise the health of:
   - each individual vegetation type (refer also Section 6.4.1)
   - culturally significant plants and vegetation communities, including key harvest areas (refer also Section 6.4.3)
   - ecologically significant plant communities, such as those supporting bilby populations
   - rare, localised or threatened species and communities.
3. Where warranted, develop and implement site-specific action schedules to protect culturally and/or ecologically significant plants or communities with restricted distributions that are known to be at risk.
4. Support research directed at improving the management of the vegetation of the IPA.
5. Where appropriate, liaise with staff of adjoining protected areas to facilitate complementary management of native vegetation values and associated research.

(For management objectives and strategies related to sustainable harvesting, changes to surface water flows, feral animal control and fire management, refer Sections 5.3.3, 6.3.3, 6.5.3 and 6.6.3 respectively.)

Management Objective 6.4.3(d)

Reduce the introduction, spread and proliferation of weed species across the IPA

Management Strategies

1. Map all known weed species and populations and collate information on abundance, distribution and past treatment histories.
2. Develop a weed management plan for the IPA to guide weed control activities. In determining priorities, consideration will be given to:
   - weed species that threaten customary or biodiversity values
   - the level of significance of the value(s) threatened
   - legislative requirements related to the control of the species
   - targeting weed populations with currently restricted distributions but known potential to become a significant problem
   - species that require ongoing management to maintain benefits from previous control activities
   - species that must be controlled to allow another higher priority action to take place
   - the location of an infestation in an area of exceptional customary or biological value
   - the location of an infestation with regard to its likelihood to be spread by human or other means (i.e. at the headwaters of a catchment or along roadsides)
   - the existence of effective and suitable means of controlling the species
   - the immediate and long-term availability of resources to effect control or eradication.

Key management priorities already identified include:

- eradication of isolated couch grass infestations at Mirirrinyungu (Duck Ponds)
- in collaboration with Murnkurrumurnkurru Rangers, ongoing strategic control of Parkinsonia infestations along Hooker Creek, and identification and eradication of new satellite populations
- collaborative work with Birrindudu PPL personnel to manage source populations of Parkinsonia in the upper reaches of Hooker Creek catchment
- treatment of isolated buffel grass infestations that threaten to invade ecologically significant areas at Nyukulku (Wilson Creek Floodout) and Mirirrinyungu (Duck Ponds)
- survey of the Hooker Creek catchment to detect and eradicate rubber bush and other weedy shrub species
- survey of upper Wilson Creek catchment to detect and eradicate weed infestations
- targeted weed survey work at Mirirrinyungu (Duck Ponds), Spider Lake and Lake Buck to prevent the incursion or establishment of new WONS or Classes A and B weed species
- the treatment, removal and replacement of shade plantings of weedy ornamental trees (e.g. African mahogany, athel pine) around outstations or in Lajamanu township.

3 Conduct regular surveys of disturbed areas, including outstations and tracks, to detect and control:

- new outbreaks of known weed species and expansion of known infestations
- the introduction of new weed species.

Priority will be given to areas of high cultural or ecological significance that are known to be highly susceptible to weed invasions.

4 Establish, equip and promote vehicle clean-down stations at key sites en route to environmentally sensitive areas, especially weed-free areas and those deemed to be at high risk of weed introductions.

5 Consider establishing permanent weed quarantine stations at Lajamanu community to reduce the rate of introduction and spread of weed species into weed-free areas.

6 Implement weed hygiene standards for the use of all IPA and ranger program vehicles when operating off-track in the IPA (as per Appendix 6).

7 Liaise with staff of Central Desert and Victoria River District Councils and the Northern Territory Department of Transport regarding the application of weed hygiene standards for all road maintenance and earthmoving equipment (refer Appendix 6).

8 Minimise new soil disturbance with the aim of limiting opportunities for the introduction of new weed species and expansion of existing weed infestations.

9 Prepare and implement a systematic long-term monitoring program to measure trends in weed distributions, abundance, introductions and impacts.

10 Support weed identification training and chemical handling training for all ranger and IPA staff.

11 Produce language-based graphical materials about key weeds in the IPA and distribute these widely to help community members understand the importance of weed management actions.

12 Develop and apply an evaluation regime to measure the effectiveness of weed control efforts. All control programs will be described and critically reviewed to determine the reasons for success or failure so that future programs can be adapted accordingly to ensure better results.

13 As appropriate, liaise with staff of adjoining protected areas to facilitate complementary management of weed species.

6.5 *Kuyu* – Animals

"It's good country that belongs to us … it's filled with lots of animals … we've got animals, we go out hunting."

IPA Management Committee members

6.5.1 Background

In an overarching sense, the fauna of the IPA is typical of that found across large expanses of desert country in Central Australia. It includes a suite of invertebrates, reptiles, amphibians, birds and mammals, all of which are adapted to the relatively harsh environment of the region. While the species present, together with their distributions and abundances, largely reflect the natural conditions and constraints of desert landscapes, they are also a product of the profound influences exerted by humans – both *Yapa* and *Kardiya*.

Since the onset of European settlement in the early twentieth century, arid Australia has undergone a wave of extinctions, with medium-sized mammals suffering the greatest declines. Of the original mammal fauna inhabiting Australia's interior deserts, at least 22 species have become extinct either regionally or at a global level – with five of these having been recorded in the past from the area now included in the IPA. *Yapa* oral histories still retain references to hunting animals like *pakaru* (golden bandicoot – *Isoodon auratus*), *mala* (rufous hare-wallaby – *Lagorchestes hirsutus*) and *wurlna* (burrowing bettong – *Bettongia lesueur*) in the Tanami desert up until at least the 1950s.

A total of 304 extant vertebrate species have been recorded in the IPA (the threatened and significant fauna and fauna sampling density is shown in Figure 12). Given the limited fauna survey effort in the more remote parts, it is quite likely that at least another 15 animal species exist in the IPA, and *Yapa* have reported species such as common brushtail possums (*Trichosurus vulpecula*), black-footed rock-wallabies (*Petrogale lateralis*) and princess parrots (*Polytelis alexandrae*) as still occurring. Eleven introduced animals have been recorded in the IPA: nine mammals, one bird species and one amphibian (Table 6).

As with the vegetation of the IPA, the fauna communities present reflect the generalised rainfall gradient that exists – with savanna species in the north, grading into more Eyrean (desert) species in the south. The

Ranger, Anthony (Nebo) Rex with *wardapi*

region's arid-adapted fauna is typified in the distinctive assemblage that inhabits paleodrainage lines which are dominated by the giant termite mounds of *Nasutitermes* species in the south of the IPA. Species characterising this land type include white-winged fairy-wren (*Malurus leucopterus*), pied honeyeater (*Certhionyx variegatus*), striated grasswren (*Amytornis striatus*), woma python (*Aspidites ramsayi*), pygmy desert monitor (*Varanus eremius*), Stimson's python (*Antaresia stimsoni*), long-nosed water dragon (*Lophognathus longirostris*) and the centralian dtella (*Gehyra montium*).

Conversely, an assemblage inhabiting wooded watercourses and floodouts in the northern sector of the IPA typifies savanna fauna. This community includes species such as the spectacled hare-wallaby (*Lagorchestes conspicillatus*), pheasant coucal (*Centropus phasianinus*), red-backed fairy-wren (*Malurus melanocephalus*), pictorella mannikin (*Heteromunia pectoralis*), floodplain monitor (*Varanus panoptes*), northern water dragon (*Lophognathus gilberti*) and the northern dtella (*Gehyra australis*).

As is the case globally, invertebrate species dominate the IPA numerically. Despite being poorly surveyed and researched by *Kardiya* scientists, they are believed to account for more species, numbers of individuals and biomass than all of the other groups of animals combined. They are essential for soil turnover, nutrient cycling, pollination and decomposition and are important food sources for many birds, reptiles and mammals.

Yapa have extensive knowledge of invertebrates, from ants, spiders and beetles to water insects and plant parasites. *Yapa* recognise country-specific termite mounds and have working knowledge of ant species and their role in storing and aiding germination of various *ngurlu* (bush seeds). Several different types of insects or their larvae, as well as the products they produce (galls, honey dew, sugar-leaf) were nutritionally critical in traditional times, and *Yapa* still supplement their diets with such foods. Invertebrates are also important *Jukurrpa* species, and dreaming tracks for *yunkuranyi* (honey ants) and *yuturnrpa* (termites) pass through many parts of Central Australian desert country.

Reptiles and Amphibians

Australian deserts are renowned for their reptile diversity, and the northern Tanami region is no exception, with reptiles being the second most diverse vertebrate group present. Eighty-six reptile species (11 snakes, 74 lizards and one turtle) have been recorded in the IPA (refer Appendix 5 for a complete list). Of these, skinks are the most diverse group, represented by 33 species. The next most diverse groups are the agamids (dragons: 13 species) and geckonids (geckos: 14 species), followed by varanids (monitors and goannas: 9 species), elapids (venomous snakes: 7 species), pygopids (legless lizards: 6 species) and biods (pythons: 3 species). A single typhlopid species (blind snake) and one turtle have also been recorded.

The 11 species of snakes that occur in the IPA include three types of python: *rdajalpa* (woma python – *Aspidites ramsayi*), *yurnturrkunyu* (black-headed python –*Aspidites melanocephalus*) and Stimson's python (*Antaresia stimsoni*) and seven venomous species, including the king brown snake (*Pseudechis australis*), western brown snake (*Pseudonaja nuchalis*) and little spotted snake (*Suta punctata*).

Reptiles feature prominently in *Jukurrpa* stories of the Tanami region, which include sites and storylines associated with *lungkarda* (blue-tongue lizard), *lingka* (venomous snakes), *rdajalpa* (woma python) and *warnayarra* (water serpent). Reptiles traditionally formed a major component of people's diet, with species such as sand goanna and perentie still highly sought after.

To *Kardiya*, three reptile species present are especially noteworthy. The floodplain monitor (*Varanus panoptes*) is listed as Vulnerable under Northern Territory legislation, while the woma python (*Aspidites ramsayi*) and king brown snake (*Pseudechis australis*) are both listed as Near Threatened. In addition to these species, the great

Ridge-tailed goanna (*Varanus acanthurus*)

desert skink (*Liopholis kintorei*), which is listed as Vulnerable under Australian Government legislation, occurs just to the south of the IPA and may occur in suitable habitat in the Lake Buck / Spider Lake area.

Of the 13 amphibian species (including one introduced species) recorded in the IPA, nine are burrowing frogs. These include toadlets (*Uperoleia*), water-holding frogs (*Neobatrachus* and *Notaden*), ground-dwelling tree-frogs (in the *Litoria* genus) and marsh frogs (*Limnodynastes*). The remaining species are all tree-frogs, and only one of these – the red tree-frog (*Litoria rubella*) – is truly desert-adapted.

Most of the IPA's native amphibian species are relatively common in suitable habitats, and all breed opportunistically in temporary pools of water after rain. *Yapa* still collect several of these frog species for eating. The only introduced amphibian recorded is the cane toad (*Rhinella marina*), which is rapidly moving into new wetland areas in the IPA (refer Appendix 5 for a complete list of amphibian species).

Jurlpu – Birds

The IPA is home to a typical desert bird fauna, with 171 bird species having been recorded to date (refer Appendix 5 for a complete list.) Mobility is a common characteristic of the IPA's avian fauna, with many species undertaking seasonal movements in response to resource availability. Honeyeaters as a group epitomise this nomadism, moving en masse across Australia's interior in synchrony with the progressive flowering of acacias and grevilleas.

Waterbirds and shorebirds likewise show large seasonal variation in their diversity and numbers, being most common during the warmer, wetter summer months. Forty-three waterbird and shorebird species have been recorded from the IPA, and 18 of these species are known to breed there in years when episodic flooding has recharged wetlands and triggered booms of aquatic resources, particularly in beetle (*Coleoptera*) and fly (*Diptera*) larvae. Breeding waterbirds include black swans (*Cygnus atratus*), red-necked avocets (*Recurvirostris novaehollandiae*), black-winged stilts (*Himantopus himantopus*), Eurasian coots (*Fulica atra*), gull-billed terns (*Gelochelidon nilotica*), hoary-headed grebes (*Poliocephalus poliocephalus*) and a variety of ducks.

The IPA lies within the East Asian – Australasian flyway. Eleven migratory species of shorebirds or waterbirds that periodically use wetlands in the IPA are listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as species protected under international bilateral agreements for the conservation of migratory birds. A further four (non-waterbird) species recorded in the IPA are also listed under the EPBC Act migratory bird schedules: fork-tailed swift (*Apus pacificus*), white-bellied sea-eagle (*Haliaeetus leucogaster*), barn swallow (*Hirundo rustica*), Caspian tern (*Hydroprogne caspia*) and rainbow bee-eater (*Merops ornatus*) (see Table 4 for full listing).

Species present year-round in the IPA can be placed into several groups according to their habitat preference. Of these, ground-nesting and grassland birds are notable for their vulnerability to fire, introduced predators and, in some cases, over-hunting. Within the IPA, this last group includes the emu (*Dromaius novaehollandiae*), bush turkey (*Ardeotis australis*), bush stone-curlew (*Burhinus grallarius*) and striated grasswren (*Amytornis striatus*). All of these species are listed as Near Threatened under Northern Territory legislation.

Ubiquitous species such as budgerigars (*Melopsittacus undulatus*) and masked woodswallows (*Artamus personatus*) are found across all habitat types of the IPA. Budgerigars breed up in boom years after rains to exploit an abundance of available seed, before contracting to reliable waters in dry periods. By contrast, woodswallows are nomadic habitat generalists that exploit a broad range of insects.

A wide variety of raptors, both nocturnal and diurnal, inhabit the open landscapes of the IPA. These include three species of eagle, four species of kite, six species of falcon, one harrier, a goshawk, a sparrowhawk, a buzzard and five species of owl. Two of these species are considered threatened in the Northern Territory: the grey falcon (*Falco hypoleucos*), listed as Vulnerable, is encountered occasionally and is known to breed in the IPA; while the square-tailed kite (*Lophoictinia isura*) is listed as Near Threatened in the Northern Territory and is rarely recorded in the region (refer Appendix 5 for a complete list of bird species).

Kardiya recognise 25 bird species found in the IPA as having conservation significance (Table 4 and Figure 13). Of these, two species are listed as threatened species under the EPBC Act. The Australian painted snipe (*Rostratula australis*) has been recorded on a number of occasions in the vicinity of water places in the IPA. By contrast, there are only two records of Gouldian finch (*Erythrura gouldiae*) from within the IPA. This species has declined in abundance significantly across northern Australia, mainly due to increased frequency of wildfires affecting seed production in critical grass species that the finches rely on.

Glossy ibis flying over Wilson Creek Floodout

The only introduced bird recorded in the region is the house sparrow (*Passer domesticus*), which has occasionally been observed in very low numbers near billabongs to the west of Lajamanu township.

For *Yapa*, *Jukurrpa* stories of the IPA feature birds such as *ngatijirri* (budgerigar – *Melopsittacus undulatus*), *wirntiki* (bush stone-curlew), *wardilyka* (bush turkey – *Ardeotis australis*) and *yankirri* (emu – *Dromaius novaehollandiae*). The latter two species remain especially prized food, though traditionally a range of other birds – including budgerigars, galahs and crested pigeons – were also eaten. Birds such as *jinjimari* (zebra finches – *Taeniopygia guttata*) and *ngarlamarurru* (crested pigeons – *Ocyphaps lophotes*) were especially significant to *Yapa*, as they acted as marker species that indicated the presence of water.

Table 4. Birds of Conservation Significance in the IPA

Common Name	*Yapa* Name	Scientific Name	AUS Status EPBC Act	Northern Territory Status TPWC Act*	EPBC Act–listed Migratory Species			
					Bonn	JAMBA†	CAMBA‡	ROKAMBA§
Australian painted snipe		*Rostratula australis*	VU	VU	✓	✗	✗	✗
Barn swallow		*Hirundo rustica*	–	–	✗	✓	✓	✓
Bush stone-curlew	*Wirntiki*	*Burhinus grallarius*	–	NT				
Bush turkey, Australian bustard	*Wardilyka*	*Ardeotis australis*	–	NT				
Caspian tern		*Hydroprogne caspia*	–	–	✗	✓	✓	✓
Common greenshank		*Tringa nebularia*	–	–	A2H	✓	✓	✓
Common sandpiper		*Actitis hypoleucos*	–	–	A2H	✓	✓	✓
Eastern great egret		*Ardea modesta*	–	–	✗	✓	✓	✗
Emu	*Yankirri*	*Dromaius novaehollandiae*	–	NT				
Flock bronzewing	*Wawukurl-pari*	*Phaps histrionica*	–	NT				
Fork-tailed swift		*Apus pacificus*	–	–	✗	✓	✓	✓
Glossy ibis	*Wintiki*	*Plegadis falcinellus*	–	–	A2S	✓	✗	✗
Gouldian finch		*Erythrura gouldiae*	EN	VU				
Grey falcon	*Winyi-winyipa*	*Falco hypoleucos*	–	VU				
Grey honeyeater		*Conopophila whitei*		DD				
Marsh sandpiper		*Tringa stagnatilis*	–	–	A2H	✓	✓	✓
Oriental plover		*Charadrius veredus*	–	–	A2H	✗	✓	✓
Oriental pratincol		*Glareola maldivarum*	–	–	✗	✓	✓	✓
Pictorella mannikin		*Heteromunia pectoralis*	–	NT				
Rainbow bee-eater	*Lirnpa-pirda-pirda*	*Merops ornatus*	–	–	✗	✗	✓	✗
Red-necked stint		*Calidris ruficollis*	–	–	A2H	✓	✓	✓
Sharp-tailed sandpiper		*Calidris acuminata*	–	–	A2H	✓	✓	✓
Square-tailed kite		*Lophoictinia isura*	–	NT				
Striated grasswren		*Amytornis striatus*	–	NT				
White-bellied sea-eagle		*Haliaeetus leucogaster*			✗	✓	✗	✗

EN=Endangered; VU=Vulnerable; NT=Near Threatened; DD= Data Deficient; A2S=species listed explicitly in Appendix 2 Bonn Convention; A2H=species is a member of a family listed in Appendix 2 Bonn Convention
*TPWC Act = *Territory Parks and Wildlife Conservation Act* † JAMBA =Japan–Australia Migratory Bird Agreement
‡ CAMBA = China–Australia Migratory Bird Agreement § ROKAMBA = Republic of Korea–Australia Migratory Bird Agreement

Mammals

A century ago, the region now included in the IPA was home to more than 45 native mammal species. Since then, almost half of these species have become extinct, either at a national or regional level. Although many of the 24 native mammal species that survive in the IPA are commonly found elsewhere across Central Australia, some, such as ***walpajirri*** (bilby – *Macrotis lagotis*), ***jajina*** (mulgara – *Dasycercus blythi*) and ***pujarr-pujarrpa*** (southern marsupial mole – *Notoryctes typhlops*), have become more restricted in their distribution (refer Appendix 5 for a complete list of extant mammal species recorded in the IPA).

Six rodent species have been recorded in the IPA, including the ubiquitous spinifex hopping mouse (*Notomys alexis*) and sandy inland mouse (*Pseudomys hermannsburgensis*). Less common are habitat-specific species such as the desert mouse (*P. desertor*), delicate mouse (*P. delicatulus*) and western chestnut mouse (*P. nanus*). Of the rodents, Forrest's mouse (*Leggadinia forresti*) is the main species that undergoes rapid population expansion following good rainfall events.

Five of the original 15 species of dasyurids (marsupial mice) formerly present in Central Australia occur in the IPA. The surviving species tend to be the smaller

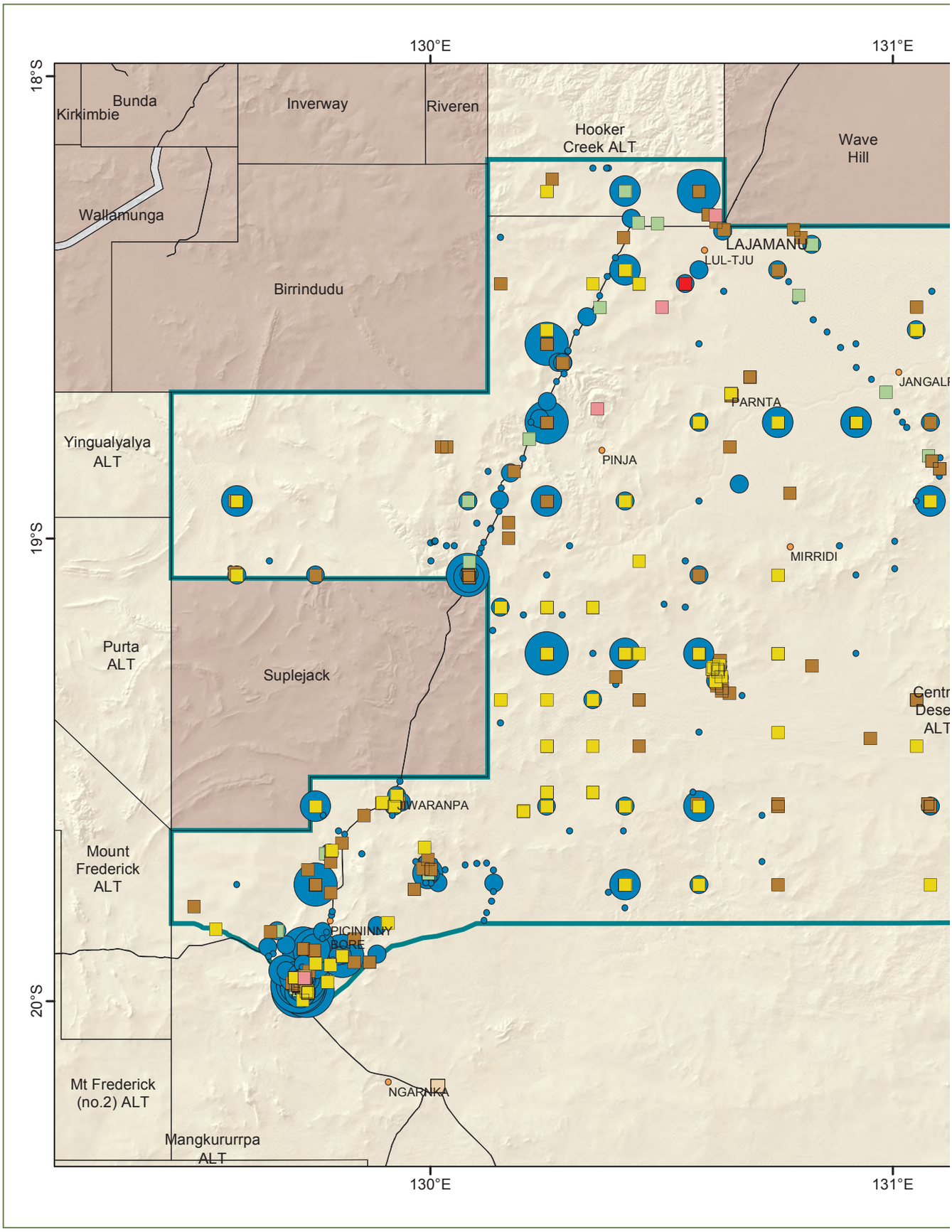
Rangers Dione Kelly and Braedon Hogan with a spinifex hopping mouse (*Notomys alexis*) trapped as part of the TBMP fauna survey 2012

Bilby *kuna*

members of the group and include two species of dunnarts as well as ***jajina*** (brush-tailed mulgara – *Dasycercus blythi*), fat-tailed antechinus (*Pseudantechinus macdonnellensis*) and the claypan specialist the long-tailed planigale (*Planigale ingrami*). ***Jajina*** populations recorded using motion detection cameras at Mirirrinyungu and Parnta in 2012 (refer Figure 13) are significant in that they occur further north than their currently known distribution in the Northern Territory.

Four macropod species are present. ***Marlu*** (red kangaroo – *Macropus rufus*), which inhabits sandplain and mulga country, and ***kanyarla*** (euro – *Macropus robustus*) which occupies the hills and ranges, are the most widespread. By contrast, ***wampana*** (spectacled hare-wallaby – *Lagorchestes conspicillatus*) and ***kururrungku*** (northern nailtail wallaby – *Onychogalea ungulifera*) are generally found in the wetter country in tropical parts of northern Australia, but their range extends south as far as the Southern Tanami IPA, where both species tends to favour riparian or wetland habitats.

Of the original five species of bandicoots and bilbies that formerly occurred in the Tanami region, only the ***walpajirri*** (bilby – *Macrotis lagotis*) survives. Once widespread in the IPA, it is now only found at a dozen or so sites, mainly associated with paleodrainage channels or wetland fringes. Aside from holding important cultural significance to ***Yapa*** through ***Jukurrpa*** connections and as a former game species, the ***walpajirri***



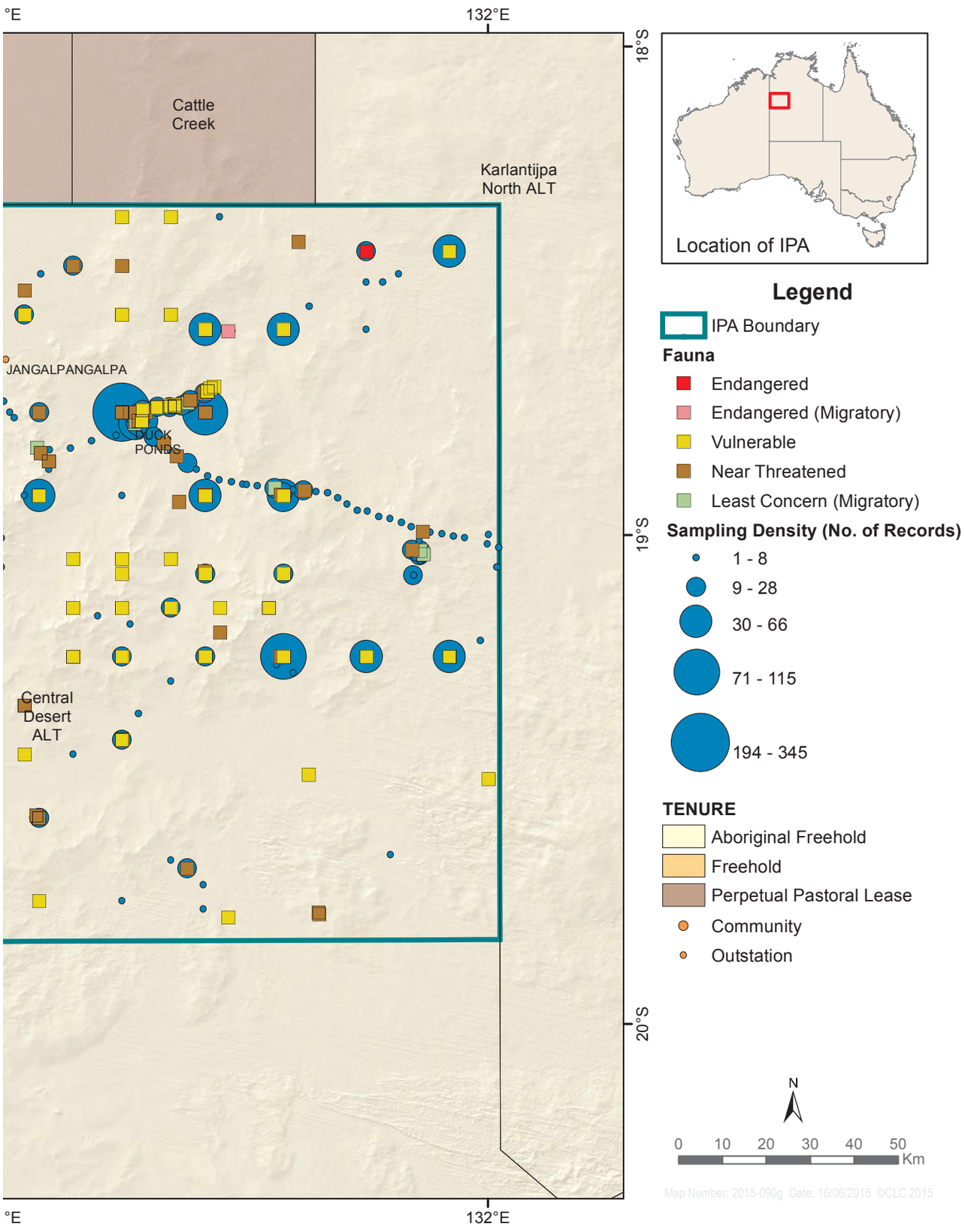


Figure 12 Threatened and Significant Fauna and Fauna Sampling Density

Table 5. Mammals of Conservation Significance in the IPA

Common Name	*Yapa* Name	Scientific Name	AUS Status EPBC Act	Northern Territory Status TPWC Act*	Distribution in the IPA
Brush-tailed mulgara	*Jajina*	*Dasycercus blythi*	VU	VU	Scattered distribution in suitable sandplain and paleodrainage habitat
Spectacled hare-wallaby	*Wampana*	*Lagorchestes conspicillatus*	–	NT	Widespread but uncommon in wetland and sandplain habitat
Bilby	*Walpajirri*	*Macrotis lagotis*	VU	VU	Strongholds around Mirirrinyungu (Duck Ponds), near Parnta and Mirridi and in the south-west of the IPA
Southern marsupial mole	*Pujarr-pujarrpa*	*Notoryctes typhlops*	EN	VU	Despite only two formal records in the IPA, likely to be widespread but uncommon in sandhill country
Northern nailtail wallaby	*Kururrungku*	*Onychogalea unguifera*	–	NT	Widespread throughout wetland and sandplain habitat
Western chestnut mouse	–	*Pseudomys nanus*	–	NT	Favours lateritic sandplains –scattered distribution in the IPA

VU=Vulnerable, EN=Endangered, NT=Near Threatened
*TPWC Act = *Territory Parks and Wildlife Conservation Act*

has also been chosen by traditional owners as the logo for the North Tanami Rangers, in recognition of its national conservation significance.

All five bat species recorded in the IPA are common where suitable habitat is present (woodlands, caves, tree-lined water courses). Most roost in tree hollows, under bark, in caves or in rock crevices, and some will take advantage of human-made structures such as roofs of houses and sheds.

Dingoes (*Canis lupus*) have inhabited Australia for 4000–5000 years, long enough to become an integral part of the ecological system and intimately incorporated into *Yapa* cultures. The dingo's role in Australia's post-colonial ecology remains pivotal. Dingoes are known to prey on introduced predators such as foxes and cats. Their removal from desert landscapes through baiting programs elsewhere in Central Australia has deleteriously impacted on native animals that are the favoured prey of cats and foxes.

Nine introduced mammals have been recorded in the IPA: cats, foxes, cattle, swamp buffaloes, donkeys, horses, camels, rabbits and house mice (refer Section 6.5.2).

Many of the extant and extinct animal species of the region are important *Jukurrpa* animals. Best known of these are probably the *wampana* (spectacled hare-wallaby), *mala* (rufous hare-wallaby – *Lagorchestes hirsutus*) and *janganpa* (common brushtail possum – *Trichosurus vulpecula*), which have important dreaming tracks passing through the Tanami region. Traditionally, *Yapa* would have utilised most of the medium-sized to larger mammal species for food. Today, only *marlu* and *kanyarla* are still commonly hunted, though other species such as *wampana* and *yinarlingi* are also caught as opportunities arise.

Of the surviving native mammal fauna, *Kardiya* consider six species to be of conservation significance (Table 5 and Figure13).

Fish

Spangled perch (*Leiopotherapon unicolor*) have been recorded occasionally from ephemeral waterbodies associated with Hooker Creek in the north of the IPA. Further aquatic survey effort at wetlands in the IPA may result in additional fish species being recorded.

6.5.2 Issues and Opportunities

The spate of mammal extinctions that has occurred throughout Central Australia since the 1920s, including the region now included in the IPA, is not solely a thing of the past. Local mammal declines continue, with bilbies not having been recorded in the Kamira Lake – Lake Talbot area since 2002. Such declines are not restricted to mammals. The avifauna of the region is also known to have been severely depleted, with emu and bush turkey no longer a common sight over much of the IPA. *Yapa* are saddened by the disappearance of these animals, many of which are key *Jukurrpa* species.

The dramatic and rapid impacts on the wildlife of the north Tanami region, as elsewhere, are due to the cumulative effects of a number of human-created or induced changes and processes, the interactions of which are not well understood. Factors implicated in the demise of various native animal species and obstacles to their effective management in the IPA include:

- knowledge gaps
- altered fire regimes
- feral animals
- reduced surface water availability
- introduced plants
- overhunting.

Knowledge gaps

Traditional ecological and ceremonial knowledge about animals that are now regionally extinct is only held by a small and ever-diminishing number of senior people. With *Yapa* no longer reliant on native animals for food, the intergenerational transfer of knowledge about many extant animal species is also in decline. *Yapa* believe that the failure to conduct required increase ceremonies is a key factor in the demise of various animals (refer also Section 5.2.2).

From a *Kardiya* perspective, the IPA remains a poorly surveyed region of the Northern Territory with regards to fauna and flora (Figures 11 and 12). Relatively little information is available concerning the presence or absence of certain species, trends in animal populations, impacts of contemporary fire regimes or predation pressure, or the conditions required to support particular threatened species. This paucity of scientific information, combined with the ongoing loss of traditional ecological knowledge, hampers effective wildlife management across the region.

In recent years, the CLC has worked with biologists to develop a tracking-based fauna survey and monitoring program to utilise the highly developed tracking skills of senior traditional owners. Track plot monitoring methodology has been used by traditional owners and North Tanami Rangers to undertake opportunistic fauna surveys in the IPA and to monitor certain bilby populations. Data are collected by rangers using CyberTracker software on GPS-linked mobile data devices. This software uses icon-based data collection sequences to overcome literacy issues among some Aboriginal users.

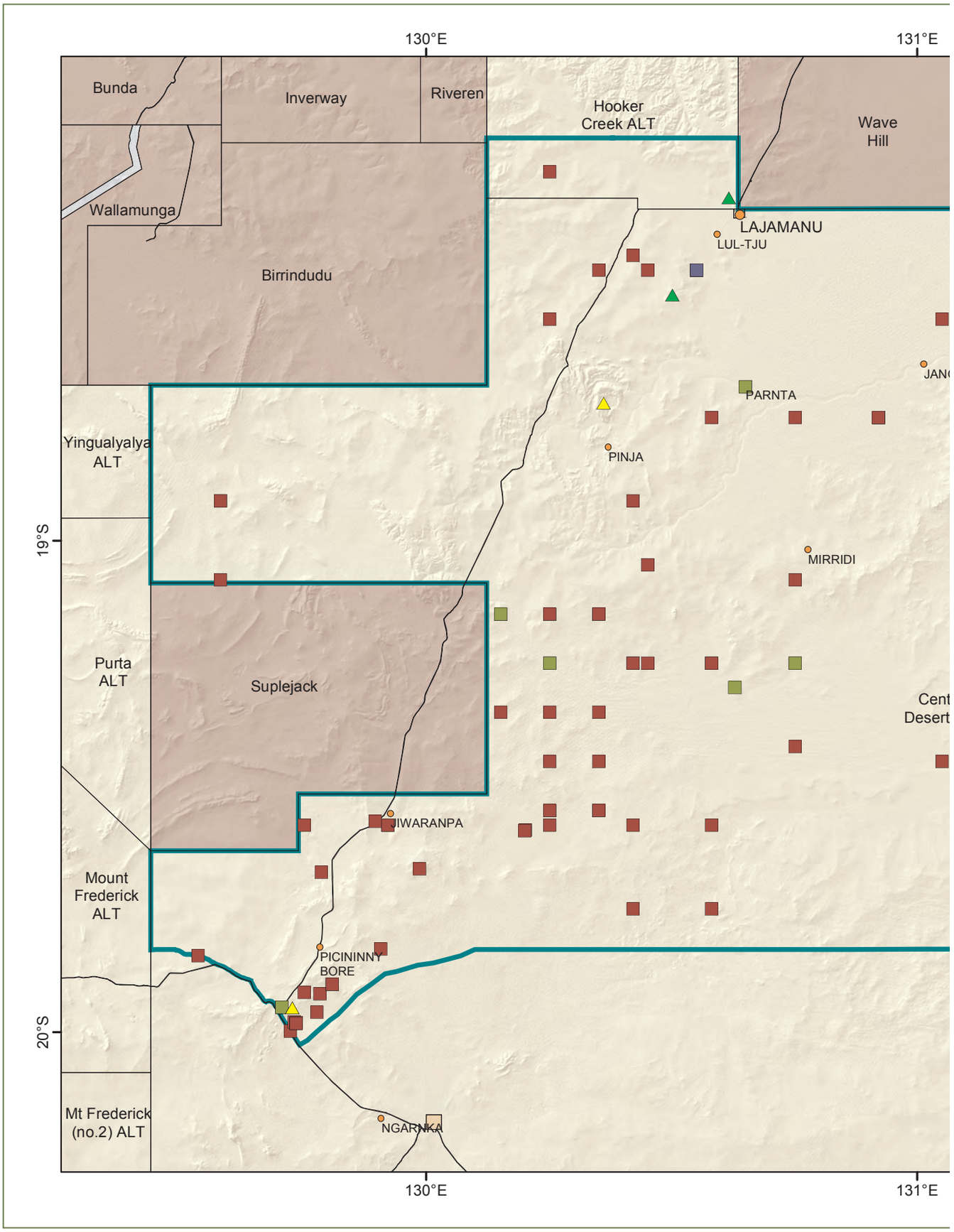
A monitoring program for *walpajirri* populations in the IPA was initiated in 2009, and since then rangers and traditional owners with expert tracking skills have been undertaking regular track plot surveys in likely habitat areas. A review of the IPA *walpajirri* monitoring program undertaken in 2012 made recommendations to refine site selection, and improve data collected about habitat and population structure. These changes will be built into future bilby surveys (refer Section 6.5.3 c).

Altered Fire Regimes

The replacement of the traditional *Yapa* burning regime that was characterised by a mosaic of small, low intensity fires with one defined by larger and more intense wildfires has had severe consequences for native wildlife (refer also Section 6.6.2).

This altered burning pattern has impacted on the habitat requirements of various animals because small-scale patchworks of burnt and unburnt country have been replaced by broadscale expanses of even-aged spinifex grasslands, and the extent of fire-sensitive vegetation and its dependent faunal communities has been reduced.

Although many native animals are habitat generalists, a large number of species have specific fire requirements. Non-burrowing animals rely on spinifex clumps for protection from predators and extreme temperatures. Extensive wildfire events can leave large areas of country with no shelter at all, so that animals are much more susceptible to being easily taken by predators. Spinifex communities in the northern Tanami take at least six to ten years after being burnt to attain old-growth form suitable for species such as the desert mouse (*Pseudomys desertor*), striated grasswren (*Amytornis striatus*), spinifexbird (*Eremiornis carteri*) and rufous-crowned emu-wren (*Stipiturus ruficeps*).



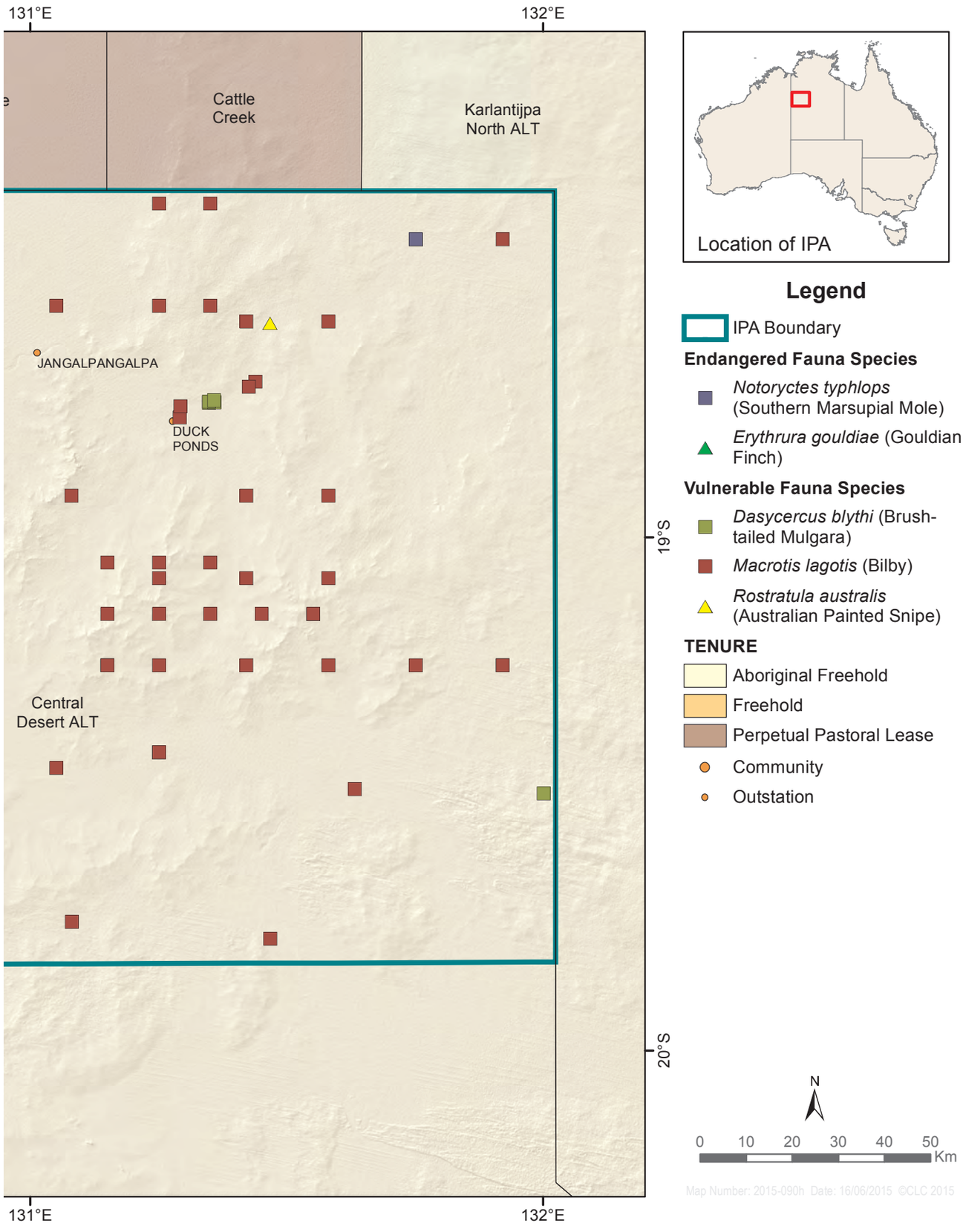


Figure 13 EPBC Act-listed Threatened Birds and Mammals

Looking out for *walpajirri* – the value of traditional tracking skills

Walpajirri (bilby – *Macrotis lagotis*) once ranged over much of mainland Australia. Today, due to the combined impacts of vegetation clearance, predation by cats and foxes and changes in fire regimes, their range has contracted to the arid desert regions of Western Australia and the Northern Territory and to a single national park in Queensland's Channel Country.

Warlpiri country is the stronghold for remnant *walpajirri* populations in the Northern Territory, with the IPA situated close to the current northern extent of the known range of the species. Until recently, the IPA was regarded as lying beyond the range of European foxes; however, recent tracking surveys have detected fox tracks at a few sites, particularly after high rainfall years. Fox presence within the IPA is likely to put additional pressure on *walpajirri* populations.

Between 2008 and 2009, traditional owners with tracking expertise, rangers and consultant ecologists conducted systematic tracking surveys across 94 sites in the IPA, covering most of the areas accessible by roads. The tracks, scats, diggings and burrows of all animals observed by trackers within 2 ha track plots were recorded by rangers using handheld GPS-linked computers uploaded with CyberTracker software. The data collected during these surveys provided a baseline against which trends in native and feral animal species populations, including *walpajirri*, can be gauged into the future.

A monitoring plan developed in 2009 for *walpajirri* in the IPA prescribed that populations should be monitored three times each year at four sites: near Parnta outstation, south of Mirridi outstation, around Miririnyungu, and at the 'Tower' site just north of Lajamanu. Track-based monitoring at several of these sites has been undertaken at least once a year since then, and other methods have also been used to monitor *walpajirri* populations, including the use of motion-detection cameras outside burrows.

A 2012 review of the *walpajirri* monitoring program highlighted the importance of traditional tracking techniques in collecting fine-scale data about the movements of *walpajirri*, their population structure, diet, and the impact of predator numbers on their persistence within an area. The IPA is fortunate to have some of the most highly skilled trackers left in the Northern Territory living at Lajamanu, including Jerry Jangala Patrick, who has worked with the North Tanami Rangers and Junior Rangers over many years to help develop their tracking skills and knowledge of animal behaviour. The IPA is looking at ways to enhance the transfer of detailed tracking knowledge to younger Yapa, as well as investigating ways to accredit and recognise traditional tracking skills levels in a formal training framework.

Jerry Jangala Patrick showing bilby tracks and burrows to rangers who are recording data on CyberTracker

Two bilbies leaving a burrow near Nyulkuku. Image captured using a motion detection camera in 2012

Granivorous birds such as the pictorella mannikin (*Heteromunia pectoralis*) and Gouldian finch (*Erythrura gouldiae*) have a specific diet that makes them reliant on a small range of savanna grasses, including certain spinifex (*Triodia*) species. These grasses only set seed if there is at least two years between fire events. The widespread decline in a number of granivorous bird species in northern Australia is believed to be, in large part, due to the frequency and intensity of wildfires under contemporary fire regimes.

By contrast, many insectivorous and some nomadic granivorous birds favour recently burnt habitats, which produce an abundance of ephemeral plant and insect life after rains. Such species include budgerigars, masked woodswallows and crimson chats (*Ephthianura tricolor*). Raptors also favour recently burnt country, as it provides open hunting terrain. Some species, such as brown falcons and black kites, hunt immediately ahead of a fire front where they can pick off fleeing reptiles and small mammals.

Yet other species, such as ***jajina***, require small adjoining patches of burnt and unburnt country. The complex relationships between individual animal species and fire are illustrated by the staged recolonisation of recently burnt areas by small mammals in which spinifex hopping mice (*Notomys alexis*) are followed by sandy inland mice (*Pseudomys hermannsburgensis*) and then ***jajina*** (mulgara – *Dasycercus blythi*).

The ongoing loss of fire-sensitive plants and communities is known to have impacted on a range of animals that are dependent on such vegetation. This includes the distinct suite of bird species that occupy mature mulga stands and nectivorous birds that supplement their diet with fire-sensitive mistletoe species.

Other wildlife impacts associated with the current fire regime include:

- loss of large hollow-forming trees that provide habitat for various birds, mammals and reptiles
- local loss of reptile species dependent on accumulated plant litter for habitat
- local loss of many animal species, including small mammals and reptiles, that are not able to disperse beyond large burnt areas
- concentration of predators at the edges of burnt habitat to exploit animals that have survived wildfires but have to forage further afield for food resources.

Feral Animals

"We are not happy; those donkeys and horses damage country and make it no good. They are digging the ground, breaking down trees and plants. Only happy to have animals that belong to country."

Molly Napurrurla Tasman and Judy Napangardi Martin

"These animals have no Warlpiri ceremony like marlu *and dingo."*

Judy Napangardi Martin and Molly Napurrurla Tasman

Eleven introduced animal species have been recorded in the IPA (refer Table 6). Of these, cats and foxes have had catastrophic impacts on native wildlife, being implicated in the extinction of many medium-sized mammals. Predation by these two species remains a key threat to numerous native mammals, reptiles and ground-nesting birds. Cats are widespread and abundant across the IPA and able to occupy all habitats and terrains.

By contrast, until the late 1990s foxes were rarely sighted in the northern and north-eastern Tanami desert. They now appear to be well established, though at low densities, as far north as Lajamanu. An observed increase in fox signs by traditional owners is a major conservation concern, particularly for vulnerable medium-sized mammals such as the bilby and brush-tailed mulgara. While localised control of foxes and cats is possible to some extent through targeted hunting or selective baiting programs, broadscale control is not currently feasible.

The domestic dog (*Canis familiaris*) has gradually replaced the dingo (*Canis lupus*) as the ubiquitous companion of ***Yapa***. Yet although domestic dogs are common in Lajamanu and at occupied outstations, they do not occur as wild dogs elsewhere in the IPA. Dogs can prey on a range of native animals within a radius of several kilometres of their home base, but because of their limited range, they have not been included in the count of feral animals for the IPA.

The numbers of house mice present in the IPA fluctuate wildly in keeping with the boom and bust cycles that characterise Central Australia. In good seasons, house mice may be present in plague proportions and present threats to native mice through competition for burrows and food and potentially as vectors for disease. No suitable broadscale control methods exist.

Table 6. Feral Animals Present in the IPA

Common Name	*Yapa* Name	Species Name	Distribution in the IPA
Camel	*Kawartawara*	*Camelus dromedarius*	Single animals to small herds mostly in the southern half of the IPA. The population was estimated to be around 1200 animals in 2009–10
Cane toad	–	*Rhinella marina*	Currently only known from waterholes in Hooker Creek, where it is now common
Cat	*Minija*	*Felis catus*	Widespread and abundant through most land types in the IPA
Cattle	*Puluku*	*Bos taurus*	Predominantly stray cattle from Supplejack Station. Generally confined to floodouts and surrounds near Wilson and Winnecke creeks and Coomarie/Lake Talbot. In 2009–10 surveys numbers were estimated to be around 1500
Donkey	*Tangkiyi*	*Equus asinus*	Mainly found in rocky uplands in the western half of the IPA where the population is estimated to be close to 500 animals
Fox	*Pujuma*	*Vulpes vulpes*	Widespread at low to medium densities in the southern half of the IPA, rare in the north. Generally coincides with the distribution of rabbits
Horse	*Nantuwu*	*Equus caballus*	Mainly found within a 25 km radius of Lajamanu, where numbers were estimated to be over 600 in 2009–10
House mouse	*Minini*	*Mus musculus*	Widespread throughout the IPA; can become abundant in response to rainfall
House sparrow	–	*Passer domesticus*	Occasionally present in low numbers in the vicinity of Lajamanu township
Rabbit	*Mujunyku*	*Oryctolagus cuniculus*	Widespread but patchy; only in southern half of IPA. Very low densities since 2000
Swamp buffalo	*Jurru-pirrjirdi*	*Bubalus bubalis*	Rare. Vagrant animals sighted in north of the IPA

The European rabbit also occurs in the IPA at the northern limit of their Australian distribution. They are generally confined to the southern half of the IPA, where they occur patchily and in low numbers in suitable habitat such as calcrete outcrops and on the periphery of salt lakes. Rabbits have been associated with mammal extinctions in Central Australia through competition for food and burrows.

Of the five large feral herbivores present in the IPA, the most significant impacts are caused by localised concentrations of cattle and horses at wetland areas where the effects of their browsing, trampling, defecating and water use can severely degrade fringing vegetation communities, seriously reduce water quality and quantity and have deleterious impacts on native animal communities that rely on these water places.

Feral horses at Hooker Creek floodout

Horses are largely dependent on semipermanent waterholes along the lower reaches of Hooker Creek near Lajamanu community. In good seasons, significant numbers of horses can also be found along the Lajamanu Road as far south as the Ware Range. Unmanaged horse populations cause localised impacts on vegetation through overgrazing and trampling, spread of weed seeds, soil disturbance and fouling of water places. Horses can also compete with key game species through competition for palatable forbs and grasses.

Horse numbers across the IPA were estimated to be fewer than 1000 in aerial surveys conducted in 2009–10. Since that time traditional owners and the North Tanami Rangers have been working together to find a culturally acceptable solution to manage feral horses. Horses hold important value for *Yapa*, particularly for senior people who have worked in the cattle industry, so *Yapa* are generally opposed to broadscale control measures (such as aerial culls).

In 2013, traditional owners and the CLC collaborated with the Victoria River District Conservation Association and neighbouring pastoralists to reduce the number of horses and donkeys on Hooker Creek ALT, including that portion within the IPA. Some 1100 horses and 1700 donkeys were culled during this operation. Working under the guidance of traditional owners, North Tanami Rangers have collaborated with a pet meat harvester to cull more than 500 horses from the Hooker Creek catchment since operations began in 2013. This small-scale harvest program has the added benefit of building skills among rangers, who work alongside the contractor to butcher the carcasses.

Cattle are generally confined to the wetland areas of Wilson and Winnecke creeks and around Lake Talbot and Kamira Lake. In these ecologically sensitive places cattle have caused significant degradation, and these sites are hotspots for weed infestations – with several weedy grasses and herbs being recorded only in these locations (Table 3). Cattle are considered a valuable resource by traditional owners and are regularly harvested as 'killer' meat. Commercial utilisation through mustering or trapping has so far proved unviable due to difficulties of access, the low numbers of animals and the likelihood that many are branded stock from neighbouring Suplejack Station.

Feral camels are present in low numbers across the IPA in sandplain and wetland habitats, particularly in the south of the IPA. Although numbers fluctuate with migratory movements and responses to seasonal conditions, the feral camel population in the IPA was estimated to be around 1200 in 2009–10. The most obvious impacts of camels on wildlife are the rapid depletion of ephemeral waters at the expense of native species and the fouling of water places. Elsewhere, camels are responsible for widespread overgrazing and trampling of vegetation utilised by a range of native animals, including important game species such as *marlu* and *yankirri*.

Fringing vegetation at Nyukulku is very sensitive to trampling by feral cattle

Feral horse management – trialling a local solution to a broadscale issue

For many senior *Yapa*, horses represent a tangible link back to their former involvement in the pastoral industry; they are therefore generally reluctant to view wild horses in the IPA as an environmental issue that needs management.

But over recent years, rangers have observed declining water quality at various wetlands in the IPA frequented by feral horses and cattle, and they have had to remove horses that have perished in Emu Waterhole. With this firsthand experience, they have been in a strong position to advocate for increased efforts to manage feral horse populations and played a pivotal role in leading consultations about horse management with IPA Management Committee members and the broader community.

The IPA Management Committee considered various control options, including mustering and transporting horses to an abattoir in South Australia, aerial culling and small-scale harvest operations. Factors such as financial viability and animal welfare were considered, and in September 2012 the Committee contracted the operator of a crocodile farm to regularly cull small numbers of horses from the Hooker Creek catchment in the IPA. One of the conditions that the Committee placed on the contract was that the operator also trained rangers in butchery skills.

Between 2013 and 2014, a total of 450 horses were shot and butchered by the contractor, with assistance provided by rangers. The income generated by the sale of the horse meat was put into a trust fund for which the IPA Management Committee oversaw spending decisions. The positive outcomes from this management program led the Committee to renew the contract for a further term, which will see up to 100 horses culled and butchered in the IPA up to seven times a year.

This level of harvest is only likely to temporarily reduce the environmental impacts of feral horses at wetlands in the immediate vicinity of the culls, and strategic broadscale measures such as aerial culling operations will still be required periodically on Aboriginal Land Trusts to the north of the IPA.

Above: Rangers erecting warning signs for feral horse culling work in the IPA

Right: Rangers monitoring water quality in an area where feral cattle stray

Camels are known to preferentially browse a variety of traditionally important plants, for instance *marrkirdi* (plumbush – *Santalum lanceolatum*) and *walakarri* (supplejack – *Ventilago viminalis)*. In large numbers, camels (a well as horses) can also have significant impacts on infrastructure such as fences, buildings and bores. They can also damage important cultural sites, including grave sites.

Donkeys are present in relatively low numbers (the 2009–10 estimate was fewer than 500 animals) in the IPA. They tend to favour rocky country in the western part of the IPA where there are localised concentrations around the Winnecke Hills and Ware Range. Donkey impacts tend to be similar to those of feral horses, but their diet also includes woody vegetation as well as grasses, so a broader range of species are directly affected by their browsing. There have been a number of landscape-scale culls of donkeys on pastoral lands and ALTs to the north of the IPA over the last decade aimed at reducing their impacts across the region.

The cane toad is another feral animal species that is now becoming established in wetland areas in the north of the IPA. First recorded in the IPA in 2011, cane toads are now common in semipermanent waterholes in Hooker Creek near Lajamanu. They are also present in large numbers in Wiyala waterhole on a tributary of Hooker Creek to the west of Lajamanu. In the Northern Territory, the rate of expansion of cane toads has been recorded at around 55 km each year.

Donkeys in the IPA near Jilpilyi on the Lajamanu Road

Cane toads produce toxins that can be lethal to native predators such as goannas and snakes, and elsewhere in northern Australia populations of these native species have plummeted in the years after cane toads become established. Cane toad eggs also contain toxins, so that when they are ingested by native frogs these animals can also die. The tadpoles of cane toads are aggressive predators and can deplete native frog and fish populations by feeding on their eggs and larvae.

Rangers and traditional owners are very concerned that cane toads will move into other culturally and ecologically important wetlands in the IPA. Although there are no effective control methods at a landscape level, there have been some success stories at the local scale with community action to remove cane toad eggs and humanely dispose of adult toads. More recently, there have been promising developments in the field of cane toad attractants (sourced from the toxins of toads themselves), and these have been used in traps to successfully reduce cane toad tadpole populations at newly infested sites elsewhere in the Northern Territory.

Another pest species group that has the potential to spread into the IPA and affect native animals is the so-called tramp ants. These invasive ants were inadvertently transported to Australia in the holds of ships or in planes. Three of them – yellow crazy ant (*Anoplolepis gracilipes*), African big-headed ant (*Pheidole megacephala*) and tropical fire ant (*Solenopsis geminata*) – are already established in savanna habitats in the Top End. The African big-headed ant is also well established in gardens and houses around Alice Springs and could be present in Lajamanu. Tramp ants are very aggressive (some species also have lethal toxins), and they can compete with native insects and with insectivorous reptiles, birds and small mammals for food and habitat resources.

Yapa and *Kardiya* perspectives on feral animal control often differ markedly. For *Yapa*, the distinction between introduced and native animals – with one 'bad' and the other 'good' – is not always clearly recognised. *Yapa* have a cultural aversion to killing any animal unless it is required for food or another purpose, although this attitude is changing as the effects of introduced species become better understood by *Yapa*. *Kardiya* typically have few, if any, qualms about using humane lethal control measures for introduced species.

Cost-effective management of feral pests generally relies on a sustained multifaceted approach. A feral animal strategy for the IPA was developed in 2011, with an overall objective of reducing the impacts of large feral herbivores on the natural, cultural and built assets of the IPA using best practice (safe, legal and humane) and economically viable methods that are culturally appropriate and acceptable to traditional owners (refer Section 6.5.3[d]).

Reduced Surface Water Availability

In addition to water being consumed by large feral herbivores, its availability for native animals has been significantly reduced by the cessation of the customary *Yapa* practice of clearing out water places. Without regular clearing out of soil, dung and debris, many rockholes and other surface waters across the IPA no longer sustain local populations of wildlife species dependent on such places (refer also Section 6.3.2).

Introduced Plants

Weeds can have a considerable impact on native wildlife, especially in areas where they form thick, dense monocultures. Infestations of species such as buffel and (potentially) couch grass compete with, and prevent recruitment of, preferred food plants of certain native animals. Dense infestations of woody weeds like Parkinsonia can also prevent native animals from accessing surface waters or preferred food species.

Buffel grass infestations tend to burn far more intensely than the native plant species that occupy the same ecological niche, often resulting in the loss of mature trees and hollow-dependent animal species. Such infestations can also harbour feral predators such as foxes and cats.

Overhunting

Traditionally, hunting was governed by protocols to maintain populations of game species for ongoing use (refer also Section 5.3.2). To varying degrees, many *Yapa* are now either unaware of these rules or choose to ignore them.

With *Yapa* now leading sedentary and centralised lifestyles, hunting pressure is highly concentrated in vehicle-accessible country surrounding communities. Hunting is regularly undertaken along tracks linking Lajamanu and outstations. Unregulated hunting in these places has contributed to target species such as *marlu* (red kangaroo), *wardilyka* (bush turkey) and *yankirri* (emu) becoming locally uncommon.

Wardilyka - bush turkey

6.5.3 Management Strategies

Management Objective 6.5.3(a)

Support traditional owners in preventing the ongoing loss of cultural knowledge about native animals

Management Strategies

1 In conjunction with senior *Yapa*, the IPA Management Committee, CLC Anthropology Section staff and managers of adjoining protected areas, review the cultural knowledge information held for native animals of the region.

2 Develop and implement a schedule of activities directed at preserving traditional knowledge about native animals, with priority setting guided by the following criteria:

- the results of the review of native animal knowledge already recorded
- the risk of irretrievable loss of knowledge about native animals
- information related to animals of outstanding cultural significance
- information related to rare or threatened animal species or information that is considered to be important to manage wildlife in the IPA
- immediate management needs where there may be an impending threat to particular animal communities
- a demonstrated interest by traditional owners to pass on particular native animal knowledge
- a demonstrated interest shown by potential recipients in receiving cultural knowledge.

Based on the advice of *Yapa*, identify the best means of preventing knowledge loss, including:

- conducting country visits
- holding one-on-one and group interviews
- engaging young people in multimedia projects to document plant knowledge
- undertaking literature reviews.

4 Create a comprehensive record of *Yapa* knowledge about native animals using a variety of appropriate media, including video and sound recordings. Distribute copies of this material to *Yapa* as teaching tools. Store this information in the IPA database for use by *Yapa* and *Kardiya* ranger and IPA staff.

Management Objective 6.5.3(b)

Address *Kardiya* knowledge gaps related to the wildlife of the IPA

Management Strategies

1 Identify and prioritise gaps in *Kardiya* knowledge and understanding of the wildlife of the IPA. Known deficiencies include:

- the number, extent and health of *walpajirri* (bilby) colonies and the relationship of distribution patterns to contemporary fire regimes
- the number, extent and health of *jajina* (mulgara) populations
- distribution and abundance information related to popular game species in key hunting areas
- information on Gouldian finch, Australian painted snipe and *pujarr-pujarrpa* (southern marsupial mole).

2 Conduct fauna surveys to address knowledge gaps in relation to the wildlife of the IPA, especially the location, range, status and health of culturally and ecologically significant species.

3 Develop and maintain baseline data sets for all culturally significant and rare and threatened animal species.

4 Facilitate training for rangers in survey and monitoring techniques (including track plot monitoring methodology) and the use of CyberTracker data collection techniques.

Management Objective 6.5.3(c)

Manage the IPA to ensure the long-term viability of populations of all native animal species

Management Strategies

1 Combine *Yapa* and *Kardiya* knowledge in the management of the wildlife of the IPA.

2 Implement the key actions in threatened species recovery plans and related documents for all listed threatened species.

3 In collaboration with Northern Territory Government Department of Land Resource Management staff, develop and implement broadscale and/or site-specific management regimes designed to optimise the viability of populations of culturally significant and rare or threatened animal species. Where appropriate, liaise with staff of adjoining protected areas to develop complementary programs and priorities.

4 Undertake regular targeted surveys and instigate robust monitoring programs for threatened animal species to evaluate the effectiveness of the conservation regimes being implemented. Alter species management, as necessary, in response to survey results and future research outcomes.

5 Review recommendations made in the 2012 CLC report on the IPA bilby monitoring program, and implement changes to improve the quality and scientific value of the data collected through tracking surveys.

6 Support research directed at improving wildlife management, especially that related to culturally significant and rare or threatened species.

7 Where appropriate, liaise with staff of adjoining protected areas to facilitate complementary management of wildlife and associated research.

8 Facilitate traditional tracking training delivered by senior trackers to North Tanami Rangers to increase their skills in identifying animal species present in the IPA.

(For management objectives and strategies related to sustainable hunting, changes to surface water flows and weeds and fire management, refer Sections 5.3.3, 6.3.3, 6.4.3 and 6.6.3 respectively.)

Management Objective 6.5.3(d)

Reduce the distribution, abundance and associated impacts of livestock and feral animal species

Management Strategies

1. Collate existing data and collect new data in order to map all known feral animal species and populations, including information on abundance, distribution and control histories.
2. Review and prioritise management strategies in the documents *Feral Animal Strategy for the Northern Tanami IPA* and *Monitoring Feral Camels on the Northern Tanami IPA*.

   Prioritisation of management actions will be based on:

   - assessment of the current threat
   - the level of significance of the value(s) threatened
   - the location of feral animal populations in an area of exceptional customary or biological value
   - legislative requirements related to the control of the species
   - targeting feral animal populations with currently restricted distributions but known potential to become a significant problem
   - species that require ongoing management to maintain benefits from previous control activities
   - species that require monitoring to ensure new pests do not become established in the IPA
   - species that must be controlled to allow another higher priority action to take place
   - the existence of effective and suitable means of controlling the species
   - the immediate and long-term availability of resources to effect control or eradication.

   Key management priorities already identified include:

   - working collaboratively with Suplejack Station to muster stray cattle and prevent new incursions into key wetland areas in the IPA
   - managing horse populations in the vicinity of Lajamanu
   - implementation of a camel monitoring program in priority areas identified in the strategy document *Monitoring Feral Camels on the Northern Tanami IPA*.
3. Collaborate with managers of Suplejack Station and Tanami Downs pastoral enterprise to find permanent solutions to prevent cattle straying into the IPA and impacting on wetland areas.
4. Regularly liaise with staff of adjoining areas to encourage the adoption of mutually beneficial cross-border camel, horse and donkey control strategies and work programs.
5. Implement strategic management actions to try to prevent the spread of cane toads into new areas in the IPA. Such measures will include:

   - effective monitoring programs at Mirirrinyungu (Duck Ponds) and Nyukulku (Wilson Creek Floodout) to enable early detection of new incursions
   - rapid implementation of control measures, including removal of eggs and trapping of tadpoles when new infestations are first detected at monitored wetlands
   - quarantine measures to ensure adult toads or eggs are not inadvertently spread into new areas.
6. Together with traditional owners, develop and implement a feral horse and donkey management strategy for the entire IPA.

7 Where deemed appropriate, develop and implement local-scale feral predator hunting, trapping or shooting programs in order to protect highly vulnerable populations of rare or threatened animal species. Liaise with staff of adjoining protected areas to encourage:
   - adoption of complementary control activities
   - shared research projects
   - knowledge transfer.

8 Investigate effective quarantine measures to prevent the incursion of new pest species (such as tramp ants) into the IPA.

9 Develop and apply a monitoring and evaluation regime to measure the effectiveness of all feral animal control efforts. All control programs will be described and critically reviewed to determine the reasons for success or failure so that future programs can be adapted accordingly to ensure better results. Share evaluation results between staff of adjoining protected areas.

10 Initiate a community education program at Lajamanu regarding the importance of ongoing management of feral animals across the IPA.

11 Facilitate training opportunities for rangers to build up skills to effectively participate in feral animal control programs in the IPA. Skills areas to be developed include:
   - feral animal tracking and data collection
   - population survey and monitoring techniques
   - low-stress animal handling
   - firearms training.

6.6 *Warlu* – Fire

6.6.1 Background

"We light 'em bush fire, we happy. The trees, the grass, the country: it grabs our Spirit. When we see the smoke, we wish we were out there and hunting."

Myra Nungarrayi Herbert

The IPA is a highly flammable landscape, one which has been profoundly shaped by the deliberate application of fire. *Warlu* (fire) was an essential component of traditional *Yapa* life, being the key tool available to people to optimise and sustain food production. In hunting, fire was used to herd or flush out wildlife or to lure game species that were attracted by smoke or new plant growth. It was also used to maximise the harvest of bush foods such as grass and acacia seeds, bush tomatoes and plumbushes. Many of the plant species that were staple food items for *Yapa* are promoted by regular burning. Fire was also used for signalling; as a weapon against enemies; to clear campsites and travel routes; for light, warmth and cooking; as a crucial element of *parnpa/juju*; and to protect sacred sites. All of these uses were defined and described within *Jukurrpa*.

Traditionally, *Yapa* burned the country as they travelled, with fire probably applied most intensively in and around high resource use areas such as watercourses and along travel routes between water places. Warlpiri and Gurindji people living in Australia's northern deserts had to be particularly adept in the use of fire. Straddling the ecotone between rangelands and savannas, much of their country rapidly senesced to impenetrable, resource-depauperate shrublands if left unburnt for five years or longer.

To maintain a suitable equilibrium between usable open country and these 'turpentine scrubs', traditional owners were forced to burn late in the year. Broadscale fires were used from October through to the onset of summer rains, a period coinciding with strong winds, low humidity and high temperatures, which were ideal conditions in which to burn tough acacia thickets.

Lynette Napangardi Tasman and Myra Nungarrayi Herbert burning country near Duck Ponds

Traditional burning regimes also included more refined practices. Fire was used discretely to promote resources such as ***kampurarrpa*** (desert raisin – *Solanum centrale*) and ***yarla*** (bush potato – I*pomoea costata*) and to protect other species, including ***jurnpurnpa*** (native tobacco – *Nicotiana benthamiana*) and ***marrawaji*** (desert walnut – *Owenia reticulata*).

This burning regime produced a mosaic of small-scale fires and a correspondingly tight mix of different vegetation patch sizes, types, ages and fuel loads. Most likely, this fire pattern created a network of firebreaks which reduced the likelihood of lightning-ignited fires burning uninterrupted during the most damaging of fire seasons. That said, away from the most intensively managed sites and routes, in seldom-visited country, it is likely that larger fires were common.

The ecology of the IPA reflects this prolonged history of 'firestick farming' (refer also Section 6.5.1). Most plant species in the spinifex communities that dominate the region are highly adapted to being burnt. Almost all plant species in these communities set seeds within 2–3 years of a fire. This is a particularly important response given that although spinifex communities in the northern Tanami will generally carry a fire every 5–7 years, this inter-fire period may be even shorter following successive years of high rainfall. Many overstorey species, including eucalypts, acacias, grevilleas and hakeas, resprout almost immediately after fire. Trees such as corkwoods and bloodwoods have thick bark that provides insulation from the heat of fires, while the pale-coloured bark of smooth-barked coolabah, river red gums and snappy gums reflects heat.

Regenerating acacia shrub following fire management

The hummock grasslands dominating the northern Tanami desert comprise spinifex species capable of rapid regeneration following fire by resprouting from a subterranean base. A range of ephemeral grasses and forbs are also rejuvenated by fire, as are many short-lived shrub species. These include the flying saucer bush (*Acacia hilliana*) and *janmarda* (bush onion – *Cyperus bulbosus*). Both of these species provide key resources for the bilby, which is known to move into areas immediately after fire to forage for invertebrates and small reptiles. The underground corms of *janmarda* provide a second resource windfall, as do the witchetty grubs surviving in the roots of burnt acacia bushes.

Many other species of wildlife similarly rely on habitats created or revived by patchy fires. Reptiles, in particular, are favoured by indigenous burning practices. In the IPA, many species are obligate spinifex inhabitants reliant on mosaic fire patterns that both maintain hummock grasslands and afford refuge. When an area is burnt, most reptile communities are depleted, either through the direct action of fire or the absence of resources following it. Species survival in the landscape therefore relies on recolonisation from islands of unburnt habitat; the patchier the pattern of burning, the more likely recolonisation success.

Not all species in the IPA thrive on fire. Although *manja* (mulga – *Acacia aneura*) may regenerate after fire through resprouting or seed germination, two successive fires within a 10–15 year interval will usually kill entire stands. Extensive groves of dead *manja* trees in some parts of the IPA, now replaced by spinifex communities, attest to the impact of fire on this community. The most fire-sensitive plants present, such as *wijirrki* (desert fig – *Ficus brachypoda*) and *walakarri* (supplejack – *Ventilago viminalis*), are readily killed by even mild cool-season fires. Such species have highly localised distributions, being confined to rocky hill sites that afford natural protection from fires such as in south-facing gorges or on rock outcrops and escarpments.

6.6.2 Issues and Opportunities

Altered Fire Regimes

The movement of Aboriginal people off their traditional lands to pastoral stations and their forced removal into settlements at Lajamanu and Yuendumu in the first half of the twentieth century, combined with active discouragement of traditional burning by *Kardiya*, resulted in dramatic changes in fire regimes across the Tanami region. The mosaic of vegetation patches of differing post-fire ages and burnt-area firebreaks created by traditional burning practices was converted to a landscape dominated by large expanses of vegetation of uniform structure and age. Frequent, small, deliberate burns were replaced by lightning-ignited wildfires which, after high rainfall episodes and the resultant build-up of high fuel loads, periodically became landscape-scale conflagrations. This fire pattern has characterised the Tanami region for almost a century, with extreme fire seasons recorded recently in 1994–95, 2000–02, 2007 and 2011–13.

The scale of such wildfires is illustrated by those of 2007, which burned some 80,000 km^2, or 38% of the Tanami region, over an eight-week period. In extreme rainfall periods, such as those experienced in the Tanami region in 2000–02, the same area of spinifex-dominated country can fuel a second intense wildfire within a two-year period. This short interval between fires is insufficient for many obligate seeding plants (those that only reproduce by seeds) to mature sufficiently to produce seeds to enable regeneration.

Analysis of fire frequency in the northern Tanami based on a recent fourteen-year record (2000–14) shows that, on average, fire occurred in most areas every 3.5 years. However, while no areas were burnt annually, a significant proportion (~ 11%) of the northern Tanami was burnt at least every second year (Figure 14). Fire-intensity figures are less definitive, relying on the prevalence of late-season fire (July–March) as a surrogate for hot wildfire. Roughly half of the IPA has been affected by high-intensity fires at least twice in the past 14 years.

The implications of this altered fire regime for the cultural values of the IPA have been, and continue to be, severe. Uncontrolled wildfires have destroyed or damaged various sacred sites and 'marker' trees traditionally used by *Yapa* for navigation. Changed fire patterns have also contributed to reducing the availability of traditional food and medicinal plants and game species.

The recent establishment of buffel grass at disturbed sites – such as near Lajamanu township, around outstations and on road verges – further exacerbates current fire patterns. Buffel grass fuels more frequent wildfires because of its capacity to rapidly regenerate from rootstock after fire. Its ability to produce large seed banks that can survive underground for several years enables it to rapidly colonise burnt areas.

Aerial view of recent fire scars near a watercourse

The ecological impacts associated with this changed fire regime have been profound (refer Sections 6.4.2 and 6.5.2). Repeated summer wildfires have substantially changed the composition and distribution of vegetation types on a vast scale, promoting the dominance of homogenous even-aged spinifex communities. These changes have included the incremental loss of fire-sensitive plant communities and species. The current fire regime has also contributed to the regional extinction of many native animal species and the decline of others. It may also result in widespread soil erosion, as the summer wildfire season is also the time of year when rain is most likely to occur.

The limited network of maintained access tracks in the IPA is an ongoing impediment to efforts to change this dominant fire pattern. Most small-scale early-season burns (a combination of ground-based and aerial fire management by IPA staff, rangers and community members) are confined to within a 50 km radius of Lajamanu community or are close to Lajamanu Road. By contrast, elsewhere in the IPA, large late-season wildfire events predominate, and the scars from these fire events cover many hundreds of square kilometres of country.

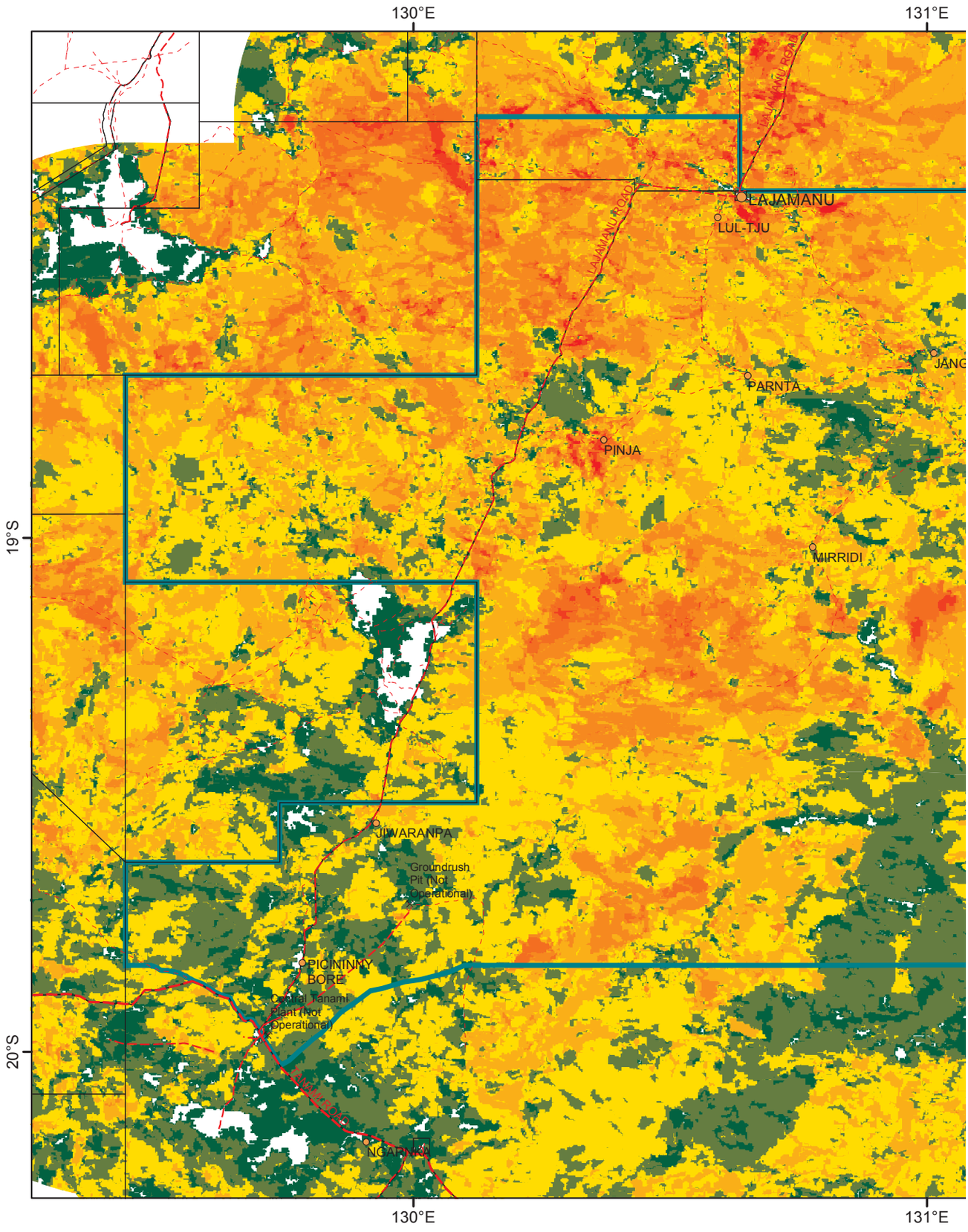
For there to be any hope of returning the country to pre-European fire patterns, fire management programs in the IPA need to combine contemporary and traditional burning knowledge, tools and practices.

Loss of Traditional Fire Knowledge, Practices and Protocols

For many *Yapa*, fire continues to be integral to daily family life. It remains an important source of heating and cooking and is used to clear campsites or to signal for assistance. In vehicle-accessible areas it is still used for hunting. Despite this, only a small number of senior people still retain a detailed understanding and appreciation of traditional fire knowledge, practices and protocols.

The loss of traditional fire knowledge that has occurred among members of the last few generations of *Yapa* has often been accompanied by a corresponding loss of confidence in burning. Many people continue to light fires, sometimes at inappropriate times of year, or in places not approved by the IPA Management Committee. The frequency of these unmanaged fires is causing detrimental outcomes for country and is overriding the strategic fire management efforts by rangers and IPA staff.

For many senior *Yapa*, the intergenerational transfer of traditional knowledge, including that relating to fire, is of the utmost importance. Creating opportunities for traditional owner family groups to access their country and work together is central to achieving this aspiration. The building of knowledge and confidence and the reclaiming of responsibility and control by young people are essential if fire is to once again be used across the landscape in beneficial ways.



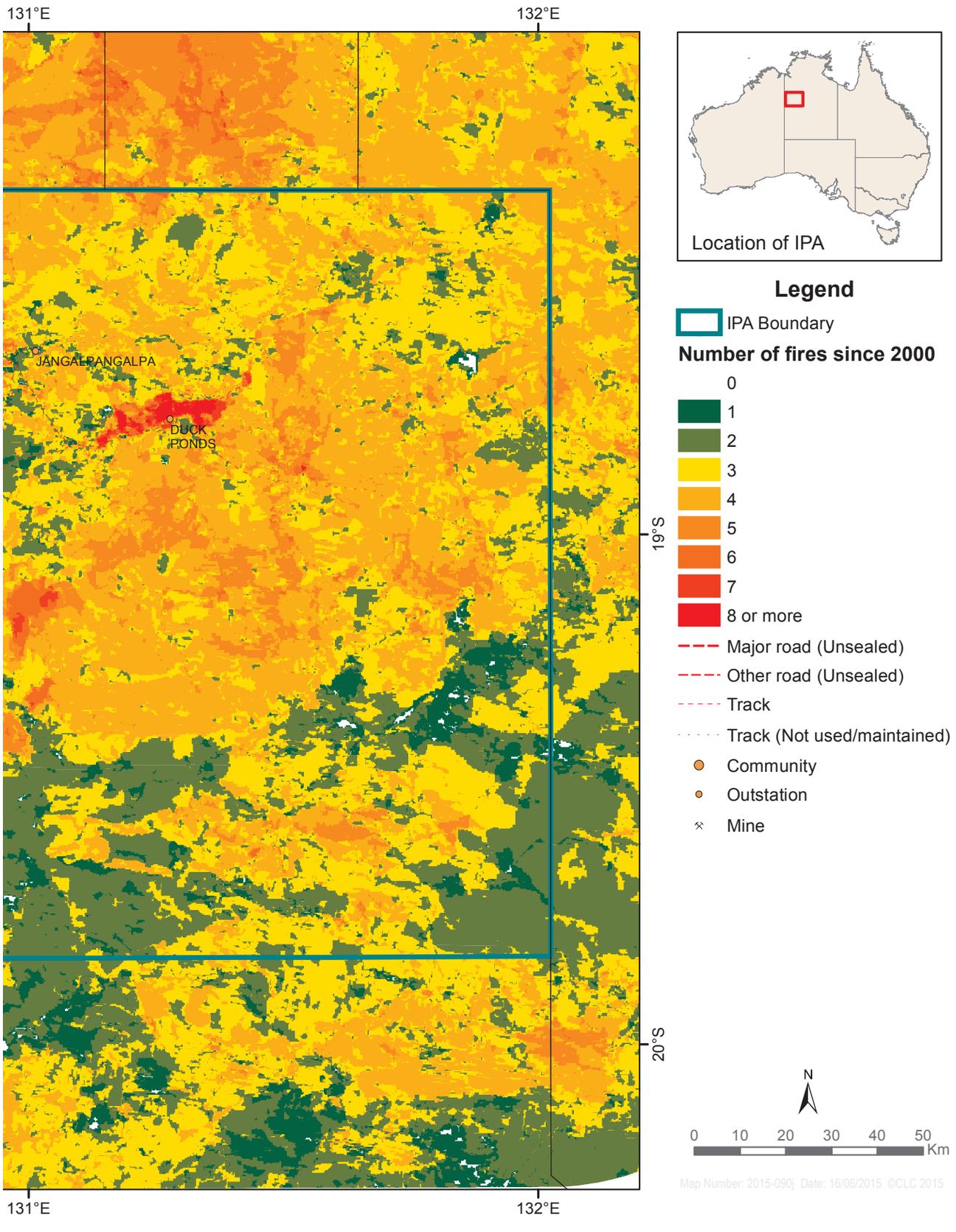


Figure 14 Northern Territory IPA Fire Frequency 2000-14

Passing on traditional burning knowledge. Joe Jangala Bird and ranger, Jeffrey Matthews Jnr

Concerted action has been taken in recent years to address the key fire-related issues in the region, including the loss of traditional fire knowledge. The foundations for effective fire management in the IPA have been established through the:

- formation in 2010 of the *Warlu* Committee, a regional *Yapa* fire management committee representing traditional owners and Aboriginal ranger groups of the greater Tanami region
- facilitation of annual *Warlu* Committee meetings to review outcomes of the burning program and wildfire season and to set regional fire management priorities for the following season
- convening of annual fire planning workshops with members of the Northern Tanami IPA Management Committee, North Tanami Rangers, CLC Fire Program staff and personnel from Bushfires NT
- securing of external grant funding to implement strategic regional burning programs
- training of traditional owners and rangers in aerial and ground-based burning techniques to enable greater control over burning programs
- development of tailored fire management training materials and community education tools to increase awareness about the need for effective fire management across the IPA and greater Tanami region.

Dione Kelly operating the Raindance aerial incendiary machine

A key objective of all burning work facilitated through the IPA is to create opportunities for the intergenerational transfer of traditional fire knowledge and protocols. This is achieved through country trips to remote places that traditional owners have identified as priority areas for burning in the coming season. On these trips cultural management activities, including IEK transfer, are encouraged.

6.6.3 Management Strategies

Management Objective 6.6.3(a)

Manage fire so as to:

- **protect human life and community and outstation infrastructure**
- **protect sites of cultural significance**
- **maintain or enhance the productivity of key hunting and customary resource use areas**
- **maintain or enhance the condition of biodiversity values**
- **protect infrastructure on adjoining properties**

Management Strategies

1 Continue and expand the existing fire management program across the IPA and implement prescribed burns directed at:

- protecting communities and outstations
- protecting cultural sites
- managing the productivity of key hunting and bush food harvesting areas
- maintaining or enhancing the condition of biodiversity values
- creating effective burnt-area firebreaks along or near IPA boundaries.

Update annual fire management plans as required in response to:

- seasonal conditions
- recent wildfires
- completed prescribed burns
- directions from annual community fire planning meetings and the *Warlu* Committee.

Within the context of annual fire management planning:

- prescriptions directed at protecting Lajamanu and outstations will be developed in consultation with community residents, outstation owners and staff of Central Desert Regional Council, WHCAC and Bushfires NT. All such prescriptions will be regarded as high priority actions, though the need for such work will vary according to seasonal conditions
- fire management prescriptions and priorities concerned with protecting cultural sites and managing hunting and harvesting areas will be made by appropriate traditional owners
- prescriptions directed at biodiversity conservation will be based on:
  - the overriding aim of replacing the current fire regime of large, intense wildfires with a fine-scale mosaic of small fires so as to create diverse vegetation patch sizes, types, ages and fuel loads
  - the need to protect fire-sensitive communities and relict species
  - the need to protect remaining old-growth vegetation, including hollow-bearing trees
  - fire management actions identified in recovery plans or related documents for threatened species
  - the known needs of species and communities that require specific fire regimes for their survival
  - managing fire so as not to promote the spread of weed species
  - managing fire so as to minimise the creation or exacerbation of soil erosion problems
- priority setting for biodiversity conservation burns will be guided by:
  - the level of significance of the biodiversity values
  - the likelihood of success for a given fire management activity

- fire management actions which must be implemented to maintain benefits from previous management

- known high priority fire activities related to biodiversity conservation include prescribed burns to protect and maintain habitats for:
  - bilby and mulgara populations across the IPA
  - fire-sensitive salt mulga (*Acacia maconochieana*) communities around Lake Buck and Spider Lake
- prescriptions concerning boundary firebreaks and priorities will be determined in consultation with neighbouring landowners and managers.

2 Fire management activities will be tailored to individual situations, but may include the following ground and aerial components:

- ground burns adjacent to roads and tracks to strengthen their role as firebreaks and reduce the risk of roadside ignitions
- ground burns, including aerially assisted burns, patch burning and strategic and opportunistic burns to protect or enhance the condition of cultural or ecological values
- localised fuel reduction activities, including back-burning and slashing to protect community or outstation infrastructure
- landscape-scale aerial incendiary operations to break up large areas of contiguous and high fuel loads or to create strategic fire breaks.

3 Collaborate with research organisations to improve knowledge about:

- the fire management needs of culturally or ecologically significant places and species
- burning program design to mitigate against the proliferation of extensive wildfires in the season immediately following high rainfall years
- likely impacts on fire regimes (on other ecological processes, species and communities) associated with predicted changes in rainfall and temperature in the northern Tanami as a result of climate change.

4 Facilitate training for *Yapa* and *Kardiya* IPA and ranger staff to improve both contemporary and traditional fire management skills.

5 Review the network of access tracks in the IPA (in line with Section 5.3[a] and 6.2.3[a]) with respect to ground-based burning program needs and determine which tracks need upgrading or realigning or where new tracks are needed to maximise fire management outcomes while minimising erosion impacts.

Management Objective 6.6.3(b)

Support traditional owners in preventing the ongoing loss of cultural knowledge about fire

1 In conjunction with senior *Yapa* and members of the *Warlu* and IPA Management Committees, review the traditional fire knowledge recorded for the region.

2 Develop and implement a schedule of activities directed at preserving traditional fire knowledge with priority setting guided by the following criteria:

- the results of the review of fire knowledge already recorded
- the risk of irretrievable loss of knowledge
- information which is considered to be important for ongoing fire management in the IPA

- a demonstrated interest by traditional owners to pass on particular fire knowledge
- a demonstrated interest shown by potential recipients in receiving cultural knowledge.

Based on the advice of *Yapa*, identify the best means of preventing knowledge loss, including:

- conducting country visits
- holding one-on-one and group interviews
- undertaking literature reviews.

3 Create a comprehensive record of *Yapa* fire knowledge using a variety of appropriate media, including video and sound recordings. Distribute copies of this material to *Yapa* as teaching tools. Store this information in the IPA database for use by *Yapa* and *Kardiya* ranger and IPA staff.

4 Under direction from the *Warlu* Committee, create and distribute additional educational material among community residents concerning traditional fire knowledge, practices and protocols (refer also Section 7.2.3).

Management Objective 6.6.3(c)

Undertake fire planning and management in collaboration with managers and owners of neighbouring land

Management Strategies

1 Support the ongoing operation of the *Warlu* Committee and assist in building the capacity of its members.

2 Collaborate with Warlpiri Rangers and Murnkurrumurnkurru Rangers on priority fire management activities on the southern and northern borders of the IPA.

3 Regularly meet with staff from Suplejack, Birrindudu, Cattle Creek and Wave Hill pastoral leases to plan and review collaborative annual fire management work to establish firebreaks on the shared boundary.

(Refer Appendix 9 for descriptions of annual IPA and regional fire planning cycles and the roles and responsibilities of respective parties.)

Ranger, Jerisha Green, burning country

CHAPTER 7

Pina jarrijaku jirramala juku Two-Way Education and Training

Learning about greenhouse gases from CSIRO scientist Dr Jocelyn Davies, 2009

7.1 Introduction

"What is in Yapa *teaching [and] knowledge from old people? It is guidance. Knowledge to equip [people] for life."*

Kumanjayi Jampijinpa Bunter and Wanta (Steven) Jampijinpa Patrick

"The IPA is for us … It also helps our young people to become more knowledgeable and skilled. We have rangers learning both Yapa *and* Kardiya *ways of managing country."*

IPA Management Committee member

While both *Yapa* and *Kardiya* cultures view education as critically important, there are distinct differences in their underlying approaches to teaching and learning. *Yapa* education has traditionally been about *Jukurrpa* and customary practices, and learning commonly occurs 'on country,' where senior people in family groups pass on knowledge. Learning in this way is interactive, with children watching and participating in activities (e.g. dances, tracking animals or harvesting bush medicines).

Yapa refer to the overall attainment of cultural knowledge and cultural responsibility as *yirdnarni*, or power. They stress that while mainstream education, including appropriate accredited training is important, an individual's resilience, confidence and capacity stem from their cultural and social foundations.

By contrast, the *Kardiya* approach to education is based on the classroom, with formal instruction presented by a trained teacher. It generally involves learning about concepts in a theoretical way, largely through written texts or dialogue in English, according to a prescribed curriculum.

The merits of a combination of both educational styles are increasingly acknowledged by both *Yapa* and *Kardiya*. This acceptance of the benefits of both ways is also reflected in the shared view that 'two-way' land management is necessary to properly look after the IPA (refer Sections 4.2 and 4.3). 'Two-way' land management requires 'two-way' education and training.

7.2 Education and Training

7.2.1 Background

Formal schooling, in particular the acquisition of English literacy and numeracy skills, is an increasingly important requirement for rangers to be able to work effectively in the IPA. In the Northern Territory, school attendance is compulsory for all children from the age of 6 until 17 (or until year 10 is completed). In the Tanami region, the Northern Territory Department of Education operates primary and middle schools at Yuendumu, Wirliyajarrayi (Willowra), Nyirripi, Yuelamu (Mt Allan) and Lajamanu. Secondary education is provided at Yuendumu School and the Kalkarindji School. Further afield, five secondary schools are located in Alice Springs, one of which is dedicated to teaching remote area Aboriginal students. There are also two secondary schools in Katherine, one of which (along with Yirarra College in Alice Springs), hosts a Clontarf[3] training academy for indigenous students.

Three schools in the region (Yuendumu, Lajamanu and Kalkarindji) also participate in the Family as First Teachers Program which is an early childhood learning and family support program for remote indigenous families with children younger than school age (0–4 years). The program aims to engage families and communities as active participants in their children's learning by developing culturally appropriate games and learning resources.

Adult education is also catered for with community learning centres established in Lajamanu, Nyirripi and Wirliyajarrayi (Willowra). These facilities are mainly run by staff from the Batchelor Institute of Indigenous Tertiary Education (BIITE) as hubs for formal and informal learning for all community members.

The Tanami region has a strong and unique history of active involvement of Warlpiri people in education delivery and reform. Spurred on by the Whitlam government's introduction of bilingual programs for remote Northern Territory schools in 1973, there was rapid development of a *Yapa* teaching workforce in the Tanami region. By the early 1990s, 10 Warlpiri staff had qualified as teachers through training programs run by BIITE, and many more *Yapa* had trained as teachers' assistants and literacy workers.

Jerry Jangala Patrick teaching boomerang making on the school country camp, 2012

In 2005, concern about the dramatic scaling back of bilingual programs and the ongoing poor attendance and performance data from remote schools in the region, led to the establishment by *Yapa* of the Warlpiri Education and Training Trust (WETT). WETT uses royalty money from Newmont Asia Pacific mining operations in the region for projects to improve education and training outcomes for *Yapa*. With the support of CLC staff in the Community Development Unit, WETT has invested in many significant education and training projects over the last decade.

In most schools in the Tanami region, learning about country is given dedicated time in the formal curriculum. Annual school country camps involving students from Lajamanu School have been a popular feature of the curriculum in recent years. Facilitated by the IPA Coordinator, these week-long camps enable senior community members and the North Tanami Rangers to develop and implement a program of activities to teach children about culture and country.

Senior secondary school students can also participate in 'work experience' programs, which provide short-term, on-the-job placements designed to introduce young people to jobs that may match their interests and skills. While this has not yet involved the North Tanami Rangers, in other CLC-supported ranger groups work experience placements do occur and have proved a very positive medium for encouraging senior students to stay in school and to aspire to become a ranger.

[3] The Clontarf Foundation supports training programs for young Aboriginal men across 59 schools in Australia. The program uses students' enthusiasm for football to engage them in broader education goals.

Rangers learning to sharpen a chainsaw chain as part of Certificate II in CLM training

Formal education and training is also available beyond the school system for people who may have had limited school-based education. Victoria Daly Regional Council is the regional provider for remote job placements and training programs administered through the Department of the Prime Minster and Cabinet, and it contracts out the delivery of pre-vocational and vocational training opportunities at Lajamanu.

BIITE was specifically established for the tertiary education of indigenous people in the Northern Territory. It provides a range of tertiary qualifications in the fields of education and humanities, health and sciences, business and community studies, and community education and training. Many of the training courses are practically oriented, which fits well with *Yapa* learning styles. BIITE is the main provider of nationally accredited training to the CLC Ranger Program, focusing on units from Certificates III–V in Conservation and Land Management (CLM) training packages. Although BIITE is the main training provider, other organisations also deliver individual components of the training program, which is overseen by the CLC Ranger Trainer.

Members of the North Tanami Ranger group participate in a comprehensive training program that incorporates both Western and traditional land management skills and understanding (Table 7). The emphasis is on providing nationally accredited training, so that rangers acquire formal qualifications that will allow them to move into other jobs should they wish to. Senior *Yapa* knowledge holders also educate rangers in customary land management practices through practical instruction during field work and in formal training sessions pertaining to particular tasks or projects.

Group and personalised support for CLC Rangers is available through the CLC Ranger Mentors, who are guided by principles that aim to empower ranger staff to take active responsibility for their training and ongoing education. Senior Ranger positions have been created in most CLC Ranger Groups to recognise advanced leadership skills and past work experience. The CLC Ranger Trainer works with each Senior Ranger to develop a tailored training plan so they can advance their training beyond Certificate II level. Other CLC rangers have completed Certificate IV in Training and Assessment as part of a long-term aim for qualified rangers to oversee training delivery to other rangers in their group.

In some cases training units in nationally accredited programs are poorly adapted for use by indigenous staff. To address this problem in a unit relating to fire management, the CLC collaborated with fire management experts and Registered Training Organisations (RTOs) to develop fire management training materials tailored to suit the learning needs, cultural aspirations and specialised knowledge of rangers and traditional owners. The Fire Management in Central Australia training resource kit, produced by the CLC in 2012, is now being used by BIITE staff to deliver nationally accredited fire awareness units. This training resource is a good example of the application of two-way learning principles.

Over recent years, CLC Ranger Program staff have also worked closely with training staff from Charles Darwin University to develop learning frameworks that take into account Aboriginal people's preferred learning styles and optimise the students' potential to take responsibility for their own lifelong learning outcomes.

Table 7. Overview of CLC Ranger Training Program

Compulsory Training for all CLC Ranger Groups
CLC Workplace Induction
Baseline Workplace English Language and Literacy (WELL) test
WELL (or equivalent) training (currently unavailable, but funding being sought)
4WD training for licensed drivers
Basic First Aid
Certificate II (or higher) in CLM
Chainsaw operation
Quad bike operation
Safe chemical handling
Advanced Training and Skills Development (optional)
Aerial incendiary operations
Certificate II in Multimedia or non-accredited filming and editing training
Certificates III and IV in CLM
Certificate IV in Training and Assessment
Computer and IT certificate courses
CyberTracker use (CLC in-house training)
Field butchery
Firearms safety and awareness
Firefighting I
Horsemanship
Horticulture and nursery training
Resources and Infrastructure (units from Certificates I–III)
Rural Operations (units from Certificates I–III)
Tourism (Certificates I–III)
Traditional tracking methodology
Water monitoring methodology
Welding and metal fabrication
Occupational Licensing (optional)
'C' Class Northern Territory Drivers Licence
SMARTtrain Chemical Application Accreditation or Chemical User Accreditation
Construction Industry White Card
Firearms licensing (corporate)
Heavy Machinery Operator Licence
Customary Land Management Training
Burning procedures and protocols
Bush foods – names and correct harvesting procedures and preparation techniques
Bush medicines – correct species identification and production methods
Dances and ceremonies associated with particular areas of country
Jukurrpa associated with particular areas of country, sites or species
Seasonal indicators
Tracking skills
Yapa habitat types and ecological associations
Yapa identification skills (names for plants, animals, landforms, etc.)

7.2.2 Issues and Opportunities

Yapa often face insurmountable barriers to participation and achievement in education, be it the acquisition of basic literacy and numeracy skills in schools or the successful completion of post-school training courses. Socio-economic disadvantage, geographic isolation, poor health, substandard housing and historical underinvestment in infrastructure mean that school and adult learning are characteristically attempted in social and physical settings that are less than conducive to positive learning outcomes.

For *Yapa*, creation of the Northern Tanami IPA offers the prospect of increased resources and opportunities to educate people on country about culture and customary land management practices (refer Chapter 5) and contemporary land management issues and solutions (refer Chapter 6). IPA and ranger field work also exposes people to community role models and the potential for future employment in culturally valued roles. Such ongoing opportunities, combined with a formal program of school/IPA country visits and the development of initiatives such as junior ranger programs, ranger cadetships and work experience placements all potentially help to encourage older children to stay on longer in school.

The IPA program also has the potential to help coordinate the delivery of formal education and training courses that *Yapa* need so they can take advantage of existing and future employment in land management and other business opportunities associated with the IPA (refer Chapter 8). School and community-based promotion of education and training pathways to achieve land management employment are likely to contribute to improved education outcomes in the region.

There is the potential to improve the coordination of training delivery between Northern Tanami IPA staff and North Tanami Rangers with neighbouring IPA and ranger groups and with local government and non-government land management organisations operating in the region (refer also Section 3.5). In recent years, the North Tanami Rangers have coordinated their training schedules with the Warlpiri Rangers or Murnkurrumurnkurru Rangers to maximise student numbers for more cost effective on-site training delivery.

There have been some very positive examples emerging of the effectiveness of peer-to-peer skills and knowledge transfer in the CLC Ranger Program. In some cases, Senior Rangers with particular specialist skills (e.g. fencing or water monitoring) and an ability to teach other rangers have travelled to another region and worked alongside those rangers on a specific project to transfer their skills. This informal training delivery has several advantages over more formal models, including being conducted in language and adapted to the conceptual framework of the recipient.

School children on a country visit with elders

Ranger Dione Kelly talking about project work with school children at Lajamanu School, 2014

Ranger exchange programs are another opportunity to enhance peer-to-peer knowledge transfer, and these exchanges are very popular amongst rangers. The North Tanami Rangers recently participated in a reciprocal ranger exchange visit with the Yugul Mangi Rangers based in Ngukurr.

Rangers in other CLC groups have gained confidence and leadership skills by completing certificate courses in Indigenous Leadership offered by the Australian Indigenous Learning Centre in Canberra. The prestige gained by this type of specialised training provides a positive incentive for rangers to complete other mandatory training units for CLM courses.

To date there have been limited opportunities for secondments with organisations such as other Aboriginal Land Councils and the Northern Territory Parks and Wildlife Commission, but these secondments can potentially increase training outcomes and skills enhancement.

Partnership projects with other organisations are another positive way to enhance education outcomes for *Yapa*. In recent years, the North Tanami Rangers have partnered with CSIRO scientists in a fire management project called Tanami Fire and Carbon: Building Science in Place. The project used an adaptive learning model to ensure that the scientific methodology was understood and able to be used effectively by rangers with little formal science background.

The North Tanami Rangers have also benefited from informal skills development through partnership projects with staff from the Centre for Appropriate Technology (CAT), such as their involvement in upgrading outstation infrastructure, including hand pumps. Rangers have enjoyed these opportunities to put their theory-based training into practice.

There is potential in the IPA to develop a formal '*malpa*'[4] program in which senior traditional owners and individual *Kardiya* staff are paired up to encourage two-way learning. Adoption of such a program would permit *Kardiya* staff to gain an accelerated understanding of traditional knowledge, cultural protocols and customary land management skills. It would also enhance the traditional role of senior *Yapa* as respected knowledge holders and teachers by enabling them to transfer information concerning Western land management approaches to other community residents.

Among the CLC membership more broadly, there has been considerable interest in governance training to develop skills to function effectively on the numerous committees and Boards that many more senior *Yapa* are generally involved with. The CLC has developed a tailored governance training program for Council members, and there may be an opportunity to adapt this to suit the needs of the IPA Management Committee.

There is still a long way to go to get the *Yapa* component of the two-way education concept equally valued and incorporated into mainstream learning models. The development of an accredited training program for traditional tracking skills, in which the attainment of prescribed skill levels by rangers is linked to career

[4] *Malpa* is a Pitjantjatjara word meaning 'friend' or 'companion'. In a professional context it means 'mentor'.

progression, is strongly supported by traditional owners of the IPA, and is encouraging the retention and application of these traditional skills.

The IPA program can also play an important role in fostering greater community understanding of contemporary land management issues and solutions. Many community residents do not yet appreciate the links between threats, such as changed fire regimes, feral animals and weeds, and changes to bush resources that they value, be they game species or bush tucker plants. Rangers and IPA staff, together with IPA Management Committee members, can lead efforts in raising community awareness of these and other IPA-related matters and in engendering widespread ownership of issues and support for solutions.

Representatives of other community-based organisations, including schools, community education centres, aged care facilities, councils, job providers and government departments can also help disseminate IPA educational messages. In addition to the spoken word, newsletters and other resources (ideally in local languages) – including story books, posters and DVDs – can also be used in community educational programs.

Yapa involved in IPA management are also interested in exploring digital media avenues to get messages about management issues or recent project work on the IPA out to a wider audience in remote communities. Indigenous Community Television (ICTV) and IndigiTube have screened DVD content made by other ranger groups in the past, and both are popular media sources for community members.

Installing a motion detection camera on a school country camp

Rangers measuring vegetation biomass for the CSIRO Fire and Carbon project in 2009

7.2.3 Management Strategies

Management Objective 7.2.3(a)

Encourage *Yapa* and *Kardiya* ranger and IPA staff to gain the necessary skills and knowledge to manage the IPA using 'two-way' approaches

Management Strategies

1. Investigate and pursue the development of a shared training program for *Yapa* and *Kardiya* ranger and IPA staff with representative staff from adjoining protected areas and ranger groups and relevant education and training providers, namely:
   - Central Land Council (Warlpiri Rangers, Murnkurrumurnkurru Rangers, Southern Tanami IPA)
   - Northern Land Council (Timber Creek Rangers, Yugul Mangi Land and Sea Rangers – Ngukurr)
   - Northern Territory Parks and Wildlife Commission (Judbarra / Gregory National Park Rangers)
   - Batchelor Institute of Indigenous Tertiary Education
   - Charles Darwin University
   - Central Desert Regional Council
   - Northern Territory Department of Education
   - Northern Territory Department of Business.

   The training program should include:
   - identification of common training needs that meet the requirements of the CLC Ranger Training Program and IPA Management Committee members
   - identification of suitable local training venues and of training providers able to deliver training locally
   - development of an annual timetable of shared training opportunities delivered in the region
   - development of course materials or training resources better suited to *Yapa* participants
   - development of a register of training expertise available from partner organisations and among *Yapa*
   - development of a Memorandum of Understanding, with key partners committing to local delivery of a shared training program.
2. Work with the CLC Ranger Trainer to prioritise training units to enable North Tanami Rangers to complete and graduate from Certificate II in CLM and progress to Certificate III courses.
3. In collaboration with the CLC Ranger Trainer, develop a training plan to advance at least one North Tanami Ranger to Senior Ranger level.
4. Investigate and pursue funding opportunities for foundational workplace literacy and numeracy training for rangers and for participation in leadership and governance training opportunities for IPA and ranger staff and IPA Management Committee members.
5. Work collaboratively with remote job providers to identify skills gaps and to provide training opportunities relevant to *Yapa* involved in managing the IPA.
6. Continue to engage senior *Yapa* knowledge holders in formal instruction and on-the-job training of *Yapa* rangers and IPA staff in cultural knowledge and customary land management practices, including the management of cultural sites, water places, plants, animals and fire.
7. Work with IPA Management Committee members to develop and deliver Cultural Awareness training workshops for new *Kardiya* IPA and Ranger Program staff.

8 Investigate and pursue the development of accredited training in customary land management knowledge and skills for uptake by *Yapa* and *Kardiya* ranger and IPA staff. Examine ways of aligning the attainment of certain knowledge levels with financial incentives and career progression.

The development of this training should be undertaken in the context of the entire CLC Aboriginal Ranger Program and should include:

- involvement of senior *Yapa* in advisory and review roles
- supporting key knowledge holders to develop training and assessment methodologies, processes and protocols
- involvement of senior *Yapa* and rangers in training and accreditation trials
- involvement of RTOs in developing training materials and pursuing accreditation status within existing national frameworks.

9 Explore and pursue opportunities for staff exchanges and personnel sharing among adjoining protected areas and nearby ranger groups.

10 Explore and pursue opportunities for short-term secondments for *Yapa* IPA and ranger staff with local industry groups in the mining and service delivery sectors to further advance skills development and work experience.

11 Investigate and progress options to establish a *Malpa* program that pairs individual *Kardiya* ranger and IPA staff with senior *Yapa* knowledge holders.

12 Investigate and progress the creation of a land management skills register of staff of all adjoining protected areas and ranger programs. Use the register to access locally available advice and assistance for IPA projects.

13 Facilitate IPA and ranger staff and IPA Management Committee member involvement in ranger camps, I PA workshops or meetings of other regional groups involved in land management programs to exchange ideas and learnings and to plan joint activities.

14 Explore opportunities for collaborative research projects with partner organisations that meaningfully involve rangers and other *Yapa* to address knowledge gaps of interest to the IPA.

Management Objective 7.2.3(b)

Develop educational opportunities and pathways that link primary, secondary and community education to employment outcomes in CLM

Management Strategies

1 Work with Lajamanu School and relevant partner organisations to expand and improve the annual school country visits program. Such visits will continue to involve senior *Yapa* knowledge holders and ranger staff with the aim of exposing students to both traditional and Western land management practices and understanding.

2 In collaboration with Lajamanu School, implement a program of ranger talks and activities within the school curriculum to enhance understanding about contemporary land management issues and ranger work.

3 Investigate and progress the development of a Junior Ranger program for students of Lajamanu School in conjunction with North Tanami Rangers and IPA staff.

4 Liaise with local and regional education stakeholder groups and relevant community organisations to develop and implement vocational training opportunities in the IPA and the ranger program for interested secondary school students and graduates, including:
   - work experience placements
   - ranger cadetship programs.

Management Objective 7.2.3(c)

Promote increased community awareness and understanding of a range of land management issues and IPA activities

Management Strategies

1 Seek the advice of senior *Yapa*, rangers and members of the IPA Management Committee and Warlu Committee about the need to develop tailored community awareness-raising material about land management issues such as fire, feral animals and weeds. In response to this advice, produce and distribute a range of educational products including, but not limited to:
   - educational picture books, films, posters, signs and maps
   - language-based field guides and sound recordings.

2 Explore opportunities to distribute video-based education materials produced by the IPA and ranger group through the ICTV network and on IndigiTube.

3 Seek out relevant Warlpiri resources from the Bilingual Resource Development Unit at Yuendumu School to use in community education programs. Seek out similar Gurindji resources from relevant language centres and schools.

4 Collaborate with staff of relevant government and non-government agencies, including those of Bushfires NT, Northern Territory Government Department of Land Resource Management and Victoria River District Conservation Association to deliver community information sessions regarding key threats to the biodiversity values of the IPA.

5 Regularly report on IPA and ranger group activities to traditional owners using a variety of media, including newsletters, videos, posters, community meetings and social activities such as film nights.

6 Produce a community-accessible version of this Plan of Management appropriate for speakers of Warlpiri/Gurindji.

7 Investigate and pursue the development of a community-accessible interactive database as a means of keeping community residents informed of IPA and ranger group activities.

8 Produce and distribute educational material to staff of local businesses, government departments and community-based organisations concerning the IPA.

(For management objectives and strategies concerning education relating to sustainable hunting/harvesting and tourism, refer Sections 5.3.3 and 8.4.1 respectively.)

CHAPTER 8

Ngurra ngampulaju warrki panujarlu
Jobs and Economic Development

Rangers involved in the Tanami Biodiversity Monitoring Program at The Granites mine site in 2005

8.1 Introduction

"Jobs for young people, yuwayi *…*
Rangers look after that place, look after country for us."

Margaret Nungarrayi Martin

Economic development in the northern Tanami region, as in much of northern Australia, has typically either bypassed or exploited its indigenous inhabitants. As pastoral enterprises and the mining sector developed in the region, *Yapa* worked as stockmen, labourers, domestic help, cooks and mechanics. Their labours enabled the northern pastoral industry to flourish and Tanami gold mines to prosper. Aboriginal workers in this period were often 'paid' in rations (tobacco, sugar, flour and tea) and clothing or were paid wages well below those of their non-indigenous counterparts.

Increased mechanisation, and the legislated introduction of equal wages across the Northern Territory pastoral industry in 1968, meant less demand for Aboriginal labour and many families were once again forced to move off traditional lands and in to communities.

Today, the main employer of indigenous people in remote regions of the Northern Territory is the health care and social services sector (32.1% of the indigenous labour force) followed by cultural and recreational services (11.7% – this category includes indigenous rangers). The agricultural, forestry and fisheries sector provides just 3.3% of indigenous employment in these remote regions, while the mining sector only accounts for 1.4% .

The paucity of regional employment opportunities has meant that most *Yapa* wishing to remain on their country have needed to rely on welfare payments. Within Lajamanu itself, the Australian Bureau of Statistics 2011 census data show indigenous unemployment levels of between 22% and 29% (the higher figure reported by women). Around 60% of *Yapa* living in Lajamanu at the time of the census reported having a weekly income of $299 or less.

While this welfare dependence has contributed to many of the contemporary social issues faced by community residents, it has also been a factor in people maintaining links with their country and retaining large parts of the traditional skills and knowledge base necessary to manage their land. The absence of many development-related impacts has also resulted in the biodiversity values of the region remaining relatively high. It is these values, together with the preservation of traditional *Yapa* skills, culture and connections to country that may underpin the future economic development of the region.

Some potential exists to create or expand a number of employment or business opportunities that are based on traditional *Yapa* skills, knowledge and interests. These include a range of options focused on land management work, the provision of environmental services to the mining and pastoral sector (particularly weed and fire management), the establishment of small-scale tourism enterprises and the commercial harvest of bush resources.

Although the barriers to *Yapa* realising the benefits associated with these opportunities are many and varied, capacity shortcomings present initial hurdles that must be overcome first. The overriding need to build *Yapa* capacity should drive the pace and ways in which business development is pursued in the IPA to maximise the longevity of any resulting enterprises and the gains they deliver to *Yapa*.

8.2 Land Management

8.2.1 Background

A *Yapa* ranger group has been based at the community of Lajamanu since 2001. Administered by the CLC and currently funded through the Australian Government's *Working on Country* program, the North Tanami Ranger group employs between six and ten individuals typically working four days per week. Female rangers have been included in the group since 2010, but as with the majority of the indigenous ranger workforce nationally, male employees make up the greater proportion of this group.

The North Tanami Rangers and IPA staff are based in the CLC regional office in Lajamanu, and their operational base includes an adjoining workshop and storage shed. The group is one of the better resourced ranger groups in the CLC region, with two vehicles (a troop carrier and a utility), trailers (including a purpose-built fire management trailer) and quad bikes. The group also owns a variety of equipment, including welding gear, hand tools, chainsaws and weed and fire management equipment.

Senior traditional owners have tasked the North Tanami Ranger group with implementing their land management aspirations and priorities. Traditional land management has been coupled with work directed at addressing contemporary land management issues. To date, ranger group activities have included burning, waterhole management, feral animal and weed control, cultural site protection, recording of traditional knowledge, participating in flora and fauna surveys, and maintaining basic infrastructure at outstations in the IPA. The rangers have also been involved in contract-based environmental service delivery, such as weed control and biodiversity survey work, with mining companies and neighbouring pastoralists. To enable the rangers to undertake these and other tasks in a safe and proficient manner, they all participate in a structured training program (refer Section 7.2.1).

In addition to the jobs available in the North Tanami Ranger group, CLC land management programs in the northern Tanami region have generated many casual employment opportunities for *Yapa*. Traditional owners of country upon which land management work is being conducted typically accompany and work alongside rangers and other CLC staff. Every effort is made to include extended family groups in such casual on-country employment. Funding provided for management of the IPA, as well as grants for related projects, has significantly increased the number of casual employment opportunities available to *Yapa* in land management work.

Ranger troopie on country

Rangers receiving welding training as part of repair to horseyards near Lajamanu

8.2.2 Issues and Opportunities

Land management work has strong cultural foundations for *Yapa*, as it is aligned with *Jukurrpa* obligations, utilises traditional ecological knowledge and fosters individual and family connections with place. Such work, which is universally supported by traditional owners, can be extremely beneficial to people's mental and physical wellbeing. Given all of this, land management work is highly appealing to many *Yapa* and is more likely to sustain the interest and commitment of individuals than most other potential employment opportunities available in the region.

Ultimately, *Yapa* aspire to be fully responsible for all aspects of land management associated with the IPA. Central to achieving this goal is the ranger program. While rangers receive considerable training and mentoring to build individual and group capacity, there remains a pervasive need for skills-building in areas such as leadership, management, coordination, governance and logistics. To some extent the CLC is addressing these gaps by providing national leadership training opportunities. Mentoring support is also provided to rangers to help them attain Certificate IV in CLM, which includes units focused on small group management, project development and evaluation. The CLC also fosters the development of these capacities through centralised administrative support and the engagement of two Aboriginal Support Officers who provide peer-to-peer training in a locum capacity across all CLC ranger groups.

Although certain *Yapa* have a broad range of skills and experience in land management work and are encouraged to take on considerable responsibility, various educational, social and cultural factors impact on people's performance. These include:

- Low level literacy and numeracy: This can reduce people's ability to work effectively in certain roles and tasks and result in rangers avoiding training courses in contemporary land management matters or resigning altogether due to feelings of inadequacy or disillusionment.
- Remote location work: The need to be away from families for extended periods when ranger work occurs at remote locations can impact on ranger motivation and work attendance; this is particularly true for female rangers who have considerable family and domestic responsibilities.
- Unfamiliarity with Western work practices: Western-style work ethics, practices and expectations may be foreign to *Yapa* and counter to how they and members of their extended families operate.
- Family and individual money issues: Rangers may experience pressure (humbug) from family members to share out their income greatly reducing the personal financial incentive for them to continue working. Furthermore, the material needs or desires of *Yapa* are usually far less than those of *Kardiya*, meaning that there is often less financial need for people to undertake full-time employment.
- Cultural restrictions: Traditional Owners continually express the need to have the right people for country involved in activities undertaken on the IPA. Consequently, *Yapa* rangers can feel uncomfortable about doing work on country they are not culturally connected to, especially if the right people are not present. Similarly, certain activities (e.g. weeding, seed collection) can be regarded as 'women's work' and men may be reluctant to participate. Although men and women can work together at many of the same sites, and are happy to camp and attend training courses together, cultural issues can arise if women and men are required to travel together.
- High mobility: *Yapa* have many familial and cultural responsibilities (e.g. caring for elders and children, mourning, ceremonial commitments) that often require a high level of mobility within the region. Occasionally individuals are required to relocate to adjacent communities for periods of months or years in order to reduce cultural tensions or fulfil social responsibilities.

Some of these factors also contribute to the relatively high turnover in ranger positions in the North Tanami Ranger group. Measures have been implemented by the CLC to improve retention rates in these jobs, such as providing one-on-one mentoring to resolve issues that may affect rangers' performance and creating career pathways in the Ranger Program. These pathways include creating indigenous-identified Senior Ranger and Ranger Support Officer positions and programs directed at enabling indigenous staff to fill Ranger Coordinator positions.

Although ranger positions and casual land management work opportunities tend to be available to both men and women, women continue to be underrepresented as workers in the IPA. This is probably due to a combination of cultural, family and resourcing issues. Given that looking after country requires the expertise and knowledge of both men and women (e.g. sacred sites are often specific to gender; women have extensive

knowledge about plants and small animals that men are often not familiar with), supporting and expanding the involvement of women in land management work is important for the future of the IPA.

Ranger cadetships and work experience placements for school students aspiring to become rangers have yet to be trialled in the IPA, but are seen as a positive step towards building the next generation of rangers and IPA staff.

The IPA and theme-based CLC land management programs, such as fire or feral animal management projects, offer the prospect of increased and more regular opportunities for *Yapa* to engage in paid land management work. Such opportunities should be managed so as to guarantee equity and alignment with cultural protocols and to build personal and community capacity, ownership and pride in IPA work.

8.2.3 Management Strategies

Management Objective 8.2.3(a)

Support the retention and growth of the *Yapa* ranger workforce

Management Strategies

1. Within the bounds of current enterprise agreements, employment legislation, grant funding conditions and the capacity of CLC management, investigate and pursue *Yapa* ranger work models that are culturally appropriate and may better suit *Yapa* employment aspirations. These may include:
   - job-sharing opportunities that allow more than one person to share a single ranger position to allow greater employment flexibility, particularly for women
   - conversion of some current 'permanent' ranger positions to 'casual' positions
   - scope for rangers to undertake blocks of intensive seasonal work as opposed to continuous employment or to be employed on a week-on/week-off basis.
2. Develop and recruit to at least one Senior Ranger position in the North Tanami Rangers (refer Section 7.2.3[a]).
3. When recruiting for ranger positions, preference ranger cadetship participants or those previously involved in work experience placements if their skills and experience match those of other applicants (refer Section 7.2.3[a]).
4. Explore the adoption of flexible employment arrangements with the Southern Tanami IPA and nearby CLC ranger groups to accommodate the cultural and familial responsibilities of rangers who require mobility and relocation within the region.
5. Work towards an equal representation of women in the ranger workforce by:
   - identifying and mentoring women with an interest in working as rangers
   - working with local job providers to assist women to prepare job applications and attend interviews
   - advertising ranger positions in local stores and community offices frequented by both women and men
   - ensuring the composition of interview panels is gender-balanced
   - developing projects and activities in the ranger workplan suited to the capabilities, interests and cultural responsibilities of female rangers
   - showcasing women's projects and women rangers' work at local career days and school presentations
   - working with female members of the IPA Management Committee to provide support for female rangers.

6 Develop and pursue career and capacity-building pathways for *Yapa* with the long-term aim of *Yapa* occupying all ranger and IPA management positions (refer Section 7.2.3[a]).

7 Contribute to the development of an incentive program for long-term ranger employees (e.g. attendance at national and international conferences or training opportunities, secondment to other regional employers or other ranger groups) (refer Section 7.2.3[a]).

8 Work with CLC staff and regional industry groups and land management organisations to explore and develop secondment opportunities for rangers (refer Section 7.2.3[a]).

Management Objective 8.2.3(b)

Provide casual land management employment opportunities for *Yapa*

Management Strategies

1 Develop and maintain a casual employment register for *Yapa* that includes information on:

- individual work histories, including days of casual employment per year
- levels of interest in different types of land management work
- respective estate areas and particular cultural responsibilities
- existing knowledge, skill levels and any formal training completed.

Use the register to ensure:

- equitable access to casual employment opportunities
- that the right people are engaged for work on particular parts of the IPA
- people's skills and interests are matched with particular tasks
- people's individual training needs are met, where feasible.

2 Develop and implement a casual staff training program for longer term casual employees based on information contained in the casual employment register. Dependent on funding availability, such a program would produce tailored training designed to deliver the skills needed by each individual to proficiently undertake their preferred work activities.

3 Ensure that the right traditional owners are employed to oversee field work and country visits undertaken on their particular estate areas (refer Section 7.2.3[a]).

4 Use local interpreters (employed on a casual basis) for all significant meetings related to the IPA, and encourage their use by industry groups or other organisations in the region.

5 Create a register of key cultural knowledge holders to be employed for formal instruction and on-the-job training of *Yapa* rangers and IPA staff and to teach students during school country visits (refer Section 7.2.3).

6 Work with key CLC staff to formalise and institute a tiered pay structure that recognises cultural skills and experience of *Yapa* involved in casual employment in the IPA (refer Section 7.2.3).

8.3 Mining and Pastoral Jobs

8.3.1 Background

Since the discovery of gold in the Tanami desert in 1900, mining and mineral exploration have remained enduring economic activities in the region. The mining industry has experienced considerable fluctuations in production levels as a result of market conditions, and these consequently have ramifications on work-force size.

Agreements reached with Traditional Owners in 1983 opened the way for large-scale mineral exploration. The 1990s and 2010s saw the discovery of significant gold ore bodies to the south and south-west of the IPA. Presently, The Granites mine, in the Southern Tanami IPA, is the only operational mine and plant in the greater Tanami region. In the near future it is expected that the Twin Bonanza mine and Tanami plant to the west of The Granites will also be operational.

Other mineral resources that have been subject to exploration or mining licences in the region include phosphate, base metals, uranium, wolfram and rare earths. Mineral exploration licences (existing or pending) currently cover more than half of the IPA (Figure 15). That said, the amount of mineral exploration activity within the IPA varies markedly from year to year. Many mining exploration licences are not executed or are on-sold to third parties in response to market conditions.

Provisions under the *Aboriginal Land Rights (Northern Territory) Act 1976* give the CLC a lead role in ensuring traditional owners are adequately compensated for mining activities on their land. The CLC and traditional owners are in a relatively strong position to negotiate suitable quotas and conditions for indigenous employment in new mining agreements made under this legislation. Between 2001 and 2010, more than 50 *Yapa* obtained employment at The Granites mine through the assistance of the CLC and the Indigenous Mentor employed by the mine.

All mineral and hydrocarbon exploration on Aboriginal lands in the Northern Territory is subject to royalty payments by mining companies. Revenue from mining leases for The Granites mine operation is invested back into projects that benefit Aboriginal communities in the region through decisions made by traditional owners on the Kurra Association, Warlpiri Education

Tour of The Granites mine site for traditional owners and rangers

and Training Trust (WETT) or the Granites Mine Affected Area Aboriginal Corporation (GMAAAC). CLC staff have worked with WETT and GMAAAC members on a number of projects funded by mining lease monies or royalty income. These projects include an Early Childhood Care and Development program, a Youth and Media program and a Learning Community Centre program, each of which have direct benefits for Lajamanu residents.

Over the past three decades the cattle industry in northern Australia has undergone a significant transformation. Many smaller family-owned holdings have been consolidated into more profitable corporate-owned and intensive grazing operations. Another change has been the growth in Aboriginal-owned or -operated pastoral enterprises across the Northern Territory.

Aboriginal men who lost their jobs in the Northern Territory pastoral industry when equal pay legislation was introduced often harbour strong aspirations for themselves, or for their children, to work in cattle enterprises. During the 1990s, two pastoral leases in the Tanami region (Mongrel Downs and Mistake Creek) were purchased by the CLC on behalf of traditional owners. Over the next two decades a number of small-scale pastoral enterprises were initiated by traditional owners on Aboriginal freehold land in the southern Tanami region

Although the IPA area itself is largely unsuitable for grazing, just to the north a portion of the Hooker Creek ALT is managed as a grazing licence which is currently held by the owners of Riveren Perpetual Pastoral Lease (PPL). Income from this licence is paid to a Land Use Trust account for Gurindji traditional owners. Conditions associated with this licence include provisions for employment and training opportunities for traditional owners and other *Yapa*. At the time of writing, a proposal for an additional grazing licence area on Hooker Creek ALT adjoining Wave Hill station is being considered by traditional owners.

Yapa involved in the IPA have recently expressed an interest in re-establishing a small-scale cattle operation on part of the Hooker Creek ALT just to the north of the IPA where certain infrastructure remains from an earlier enterprise.

8.3.2 Issues and Opportunities

Although current reserves at The Granites mine are reaching the end of economic extraction, the recent approval of a new gold mine south-west of the IPA may help bolster regional mining employment opportunities for *Yapa*.

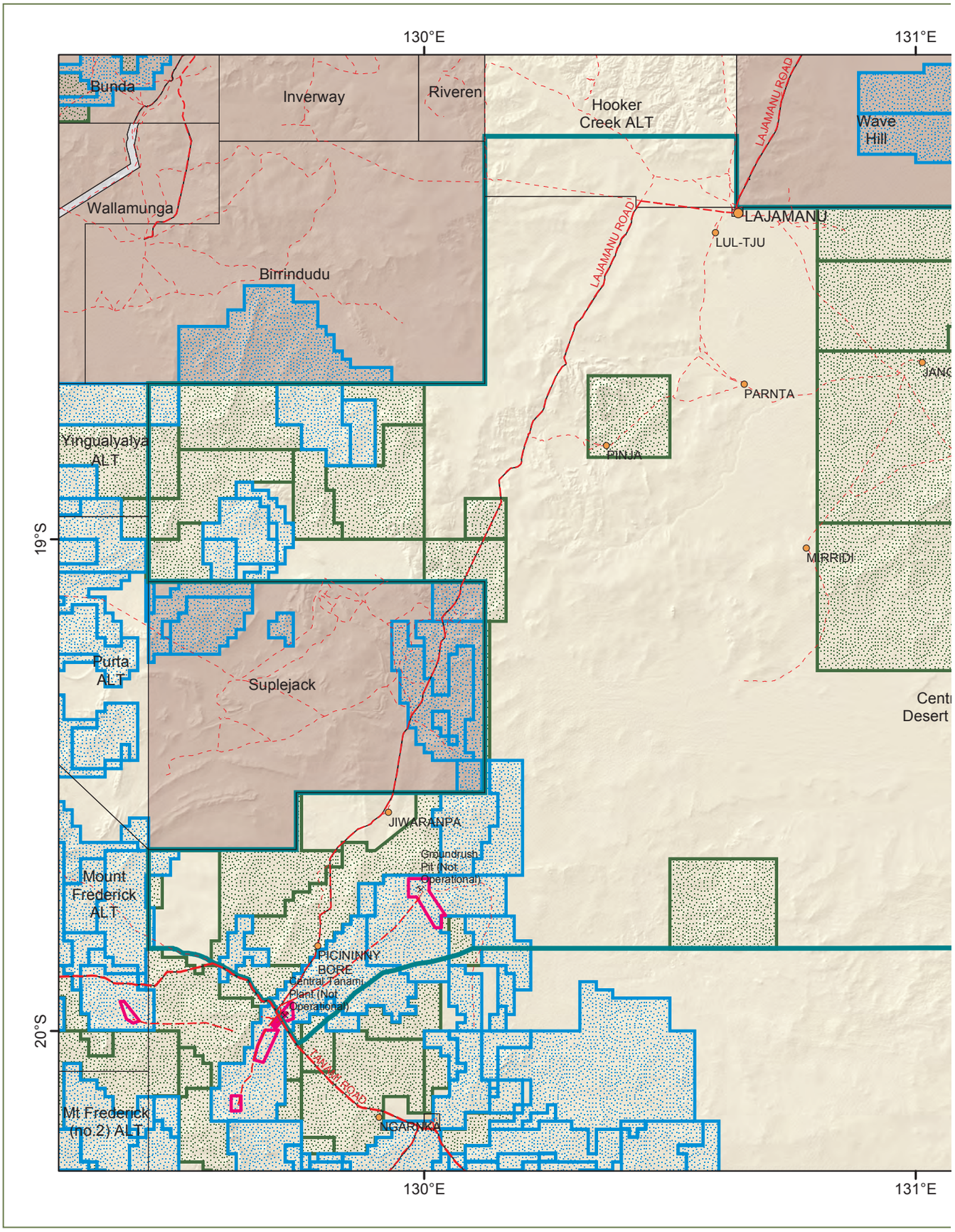
As part of the indigenous employment conditions linked to the mining agreement for its operations at The Granites, Newmont has contracted environmental work to the North Tanami Rangers and Warlpiri Rangers. Over the past two decades this work has included weed management and fauna and flora survey work in the context of the Tanami Biodiversity Monitoring Program – an environmental monitoring partnership between Newmont and the CLC. Although *Yapa* involved in management of the IPA have an interest in expanding these contract opportunities, there is a trade-off between this off-site work and the availability of rangers to undertake priority projects in the IPA.

In a similar way, although mineral exploration and extraction activities provide potential employment, financial and other benefits to traditional owners, they may also result in irreversible impacts on the cultural and natural values of the land. Mining royalties can also contribute to social problems in the community if not managed appropriately.

A regional example of a successful indigenous pastoral employment model is Mistake Creek Station to the north-west of the IPA. This Aboriginal-owned property employs six Aboriginal staff and provides them with ongoing training and mentoring support. The station is also the venue for a successful pastoral training program for indigenous people living in the broader region. Since 2013, more than 60 Aboriginal students have completed a 10-day training course in low-stress stock handling, horse management, stock-water monitoring and personal development. There may be opportunities for *Yapa* involved in the IPA who have an interest in pastoral employment or enterprise development to participate in future training courses at Mistake Creek.

The IPA has a good working relationship with Suplejack Station (which borders the IPA on its western boundary), and rangers work collaboratively with station staff on cross-border fire management matters. The negotiation of similar cross-border management arrangements with the managers of Birrindudu, Cattle Creek and Wave Hill stations may provide limited casual work opportunities for traditional owners in the future.

Elsewhere, the North Tanami Rangers successfully completed a contract for the control of extensive Parkinsonia infestations around Nongra Lake on Inverway PPL between 2010 and 2011. The merits of this type of work need to be weighed up against ranger involvement in IPA projects that the IPA Management Committee consider to be priorities.



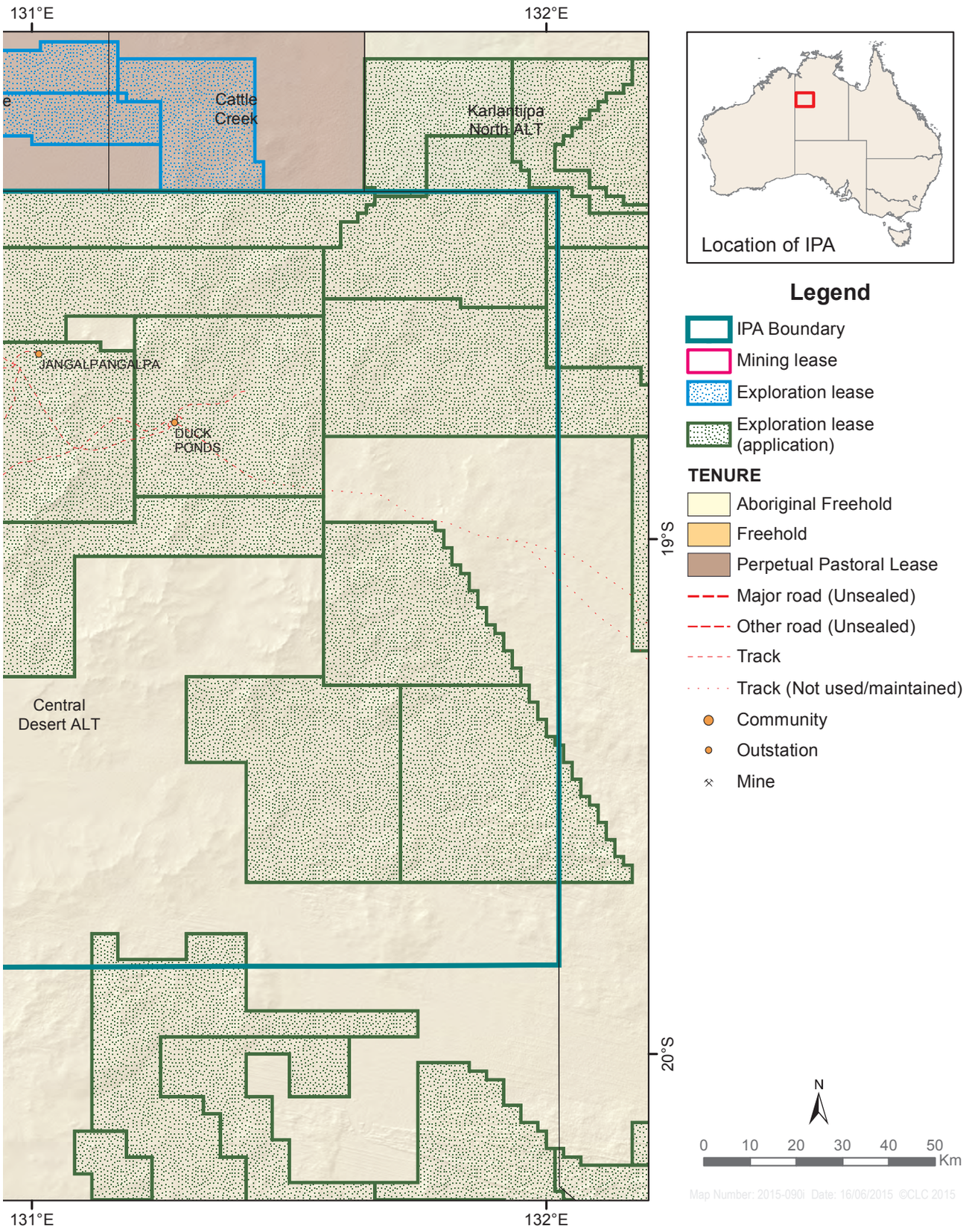


Figure 15 Current Mining Exploration Licences within the IPA

8.3.3 Management Strategies

Management Objective 8.3.3(a)

Support the increased involvement of *Yapa* in regional mining and pastoral employment opportunities

Management Strategies

1. Work collaboratively with relevant CLC staff to develop partnership programs with training providers, mining companies and pastoral stations operating in the Tanami and Victoria River regions aimed at maximising mining or pastoral employment opportunities for traditional owners associated with the IPA. This may include measures such as:
   - industry co-investment in on-site pre-employment training courses tailored for *Yapa*
   - development and investment in mentoring programs to support new *Yapa* employees to succeed in work placements
   - establishment of suitably trained *Yapa* work teams to undertake environmental service delivery contracts (weed and fire management, feral animal control, biodiversity survey and monitoring, ground water monitoring and site rehabilitation) on mining lands or pastoral stations in the region
   - reactivation of investment in, and commitment to, a biennial schedule for the Tanami Biodiversity Monitoring Program by Newmont and other relevant mining companies to provide contract-based employment for rangers and other *Yapa*
   - development of secondment opportunities for rangers or work experience placements for *Yapa* in mining and pastoral organisations in the region.
2. Enhance relevant skills of interested rangers and casual IPA staff to enable them to take up work opportunities in the mining or pastoral sectors through:
   - advocacy with RTOs for the delivery of block-based training programs for *Yapa* to complete core Certificate I and II units specific to mining or pastoral jobs
   - enabling *Yapa* involved in the IPA to complete pastoral training courses at Mistake Creek station.

Management Objective 8.3.3(b)

Minimise impacts associated with mining operations on cultural and natural values

Management Strategies

1. Collate environmental information and define values for areas subject to mineral exploration applications in the IPA.
2. Assess the potential for proposed mineral exploration and subsequent extraction activities to have negative impacts on values in the IPA. In particular, identify:
   - potential impacts on sacred sites or other sites of cultural significance
   - potential for mineral exploration activities to interfere with current land management activities
   - potential for the introduction and spread of weeds
   - potential for soil erosion issues stemming from road and track construction
   - potential disturbance of habitat or destruction of populations of threatened or significant animal species
   - potential disturbance or destruction of significant or threatened plant populations or vegetation communities

- potential for pollution from mineral exploration and mining activities
- the combined impacts of soil erosion, introduced weeds and pollution on areas of outstanding value associated with wetlands and watercourses, SOCS, SOBS and culturally significant sites
- knowledge gaps for biological values
- threats that may impact on matters of national environmental significance and thus trigger the *Environment Protection and Biodiversity Conservation Act 1999*
- potential impacts on groundwater and hydrology
- potential impacts on significant landforms
- potential impacts on sites of historical significance.

3 Through CLC mining meetings and other processes, ensure that traditional owners are fully informed regarding the environmental implications of proposed mineral exploration and mining activities in the IPA. To this end, provide traditional owners with:

- an outline of potential consequences of proposed mineral exploration and subsequent extraction activities and their likely impacts on cultural and environmental values in key areas
- a set of possible operational conditions and criteria for their consideration which may be incorporated into the terms of the exploration agreement, such as:
  - measures to mitigate the impacts of weeds, soil erosion and pollution on known values
  - mineral exploration exclusion zones designed to protect key cultural and environmental values.

4 In collaboration with CLC Mining Section staff, develop a schedule of strategic infrastructure requirements to support ongoing land management activities in the IPA for possible inclusion in negotiations with mineral exploration proponents. Such infrastructure may include:

- roads and tracks
- bores, hand pumps and tanks.

5 Work with CLC Mining Section staff to develop environmental assessment criteria and accompanying policies and protocols to guide consultative processes of all future mining exploration applications in the IPA.

Management Objective 8.3.3(c)

Minimise impacts associated with livestock grazing on cultural and natural values

Management Strategies

1 Work collaboratively with staff of the CLC Rural Enterprise Unit to ensure any additional grazing licences on Hooker Creek ALT will include conditions directed at:

- managing existing weed infestations and minimising the risk of new weed incursions into the IPA
- protecting cultural and natural values of any future grazing licence area
- monitoring changes in the condition of cultural and natural attributes of the licence area (refer Appendix 8).

2 Ensure the conditions contained in any grazing licence(s) issued are complied with by the licensee(s). Report breaches of conditions and the results of monitoring to the IPA Management Committee for consideration.

3 Commence discussions with the owners of Suplejack PPL to develop a permanent solution to prevent cattle straying into the IPA, then work collaboratively to progress agreed solution (refer Section 6.5.3 [d]).

4 Subject any new livestock grazing proposals to rigorous assessments regarding their viability, likely impacts and potential benefits to traditional owners. Report the findings of such assessments to the IPA Management Committee for consideration.

8.4 Other Opportunities

8.4.1 Background

Beyond land management, mining or pastoral-related work, employment and economic development options in the IPA are very limited. The commercial harvest of bush resources, art and artefact production, cultural tourism and carbon farming are a few industries that offer the prospect of additional, albeit limited, business or job opportunities.

While Aboriginal people have been harvesting bush foods for sale in Central Australia for over 30 years, the industry remains small; the most successful operations rely on individuals and families building personal relationships with buyers. Plant species with commercial potential as food items, such as *kampurarrpa* (desert raisin – *Solanum centrale*) and *wakirlpirri* seed (dogwood – *Acacia sericophora*) occur in the region, as do various species favoured for land rehabilitation purposes.

The production of art works and the manufacture of wooden artefacts such as traditional weapons and clapsticks provide some income to *Yapa* associated with the IPA. Artefact production is the main commercial use of bush resources in the IPA.

The rich cultural and natural values of Central Australia are a major drawcard for visitors from around the world. Economically, Central Australia is the most tourism-reliant region in the country. It receives almost half a million visitors each year, 40% of whom are from overseas. Over 90% of the visitors coming to the Northern Territory expect to meet or interact with Aboriginal people during their visit. Although considered by *Yapa* to be an attractive enterprise option, cultural tourism has yet to be developed to any extent in the Tanami region.

'Carbon farming' is an emerging enterprise stream in which land managers can earn carbon credits by reducing greenhouse gas emissions and storing carbon in vegetation and soils through changes to land management practices. With the existence of a market-set price on carbon, these credits can then potentially be sold to individuals and businesses that want or need to offset the greenhouse gas emissions of their business operations. The potential for Central Australian land managers to gain carbon credits has yet to be tested but is likely to be limited. In the IPA, opportunities to accrue credits may eventually be possible in relation to managing fire and feral camels.

8.4.2 Issues and Opportunities

The collection of bush resources in the IPA by *Yapa* represents a continuation of a key aspect of traditional use of country. The harvest of wild produce also fulfils a cultural need to be on country, fosters intergenerational transfer of traditional knowledge, strengthens social and family bonds as people work together, is one of the few economic activities open to women and promotes self-esteem through rewarding the application of *Yapa* knowledge and skills. It also generates an independent source of income for people in a culturally appropriate way, in that individuals can tailor their production to suit their personal financial needs and other priorities in their lives.

Yapa living in the Southern Tanami IPA have periodically been involved in the commercial harvest of acacia seeds for mining rehabilitation work. The potential recommissioning of the former Groundrush gold mine may provide an opportunity for *Yapa* in the Northern Tanami IPA to generate some income through similar bush resource harvesting.

Artists based at Lajamanu can sell their art and artefacts through Warnayaka Art and Cultural Centre established in 2007. The sustainability of the ongoing harvest of *watiya* (wood) in the IPA for artefact production and sale is unknown. It is likely that overharvesting has occurred in localised areas close to communities and outstations and along popular travel routes.

Sustainability issues associated with any future bush food harvest operations also require consideration. The viability of any future bush food harvest proposals on the IPA will also be influenced by the prices offered by buyers, market types and scales and seasonal and spatial variability in the abundance and availability of produce.

The remoteness of the Tanami region, the poor condition of access roads and the paucity of passenger airline services to remote communities present significant

Wanakiji (bush tomato - *Solanum chippendalei*)

Milpirri festival dance performance in 2012

impediments to the growth of cultural tourism enterprises. However, there may be some potential to link small-scale cultural tourism ventures with the biennial Milpirri festival.

Commencing in 2005, the Milpirri festival is a cross-cultural collaboration between Tracks Dance Company and *Yapa* from Lajamanu community. Every second year, staff from Tracks participate in a six-week residency in Lajamanu involving the community and an external production team in the development of the themes and choreography for a one-night performance. The festival involves nearly 200 community members (from primary school age upwards) in dance performances celebrating and reinforcing important aspects of Warlpiri culture. Over the years, the Milpirri festival has attracted a growing number of interstate and international tourists. Festival organisers have recently provided ad hoc opportunities for tourists to go out on country with *Yapa*, and there may be potential to expand this type of cultural tourism within the IPA context.

Carbon farming is yet to be tested in desert systems, and there are no standardised techniques to assess carbon stores in the arid zone. A major problem is the lack of baseline data required to assess changes in carbon

Winnowing edible Acacia seed to clean out chaff

Rangers measuring vegetation biomass with CSIRO scientist, 2009

storage or emission. Baseline levels are difficult and expensive to measure in deserts, where the distribution of nutrients is very patchy and unpredictable in both space and time. North Tanami Rangers partnered with CSIRO scientists on a proof-of-concept project in 2009 aimed at trialling methods for measuring carbon sequestered in plant biomass at sites in the IPA. The project produced some interesting preliminary data and was successful in engaging rangers in technical measurements, but recent changes in government climate change policy have meant there has been no follow-up to this project.

Though specific carbon accounting methodologies have yet to be developed for the arid zone, potential future opportunities to achieve carbon sequestration have been identified through improved fire management and reductions in numbers of feral ruminant herbivores (camels). Both of these areas offer the potential to offset existing IPA management costs.

8.4.3 Management Strategies

Management Objective 8.4.3(a)

Support the sustainable harvest of bush resources

Management Strategies

1. Work with traditional owners and the Warnayaka Art and Cultural Centre to identify key harvest species and areas utilised for the commercial production of art and craft items.
2. Assist *Yapa* to engage with the bush food and bush seed industry by linking buyers to harvesters.
3. Work with traditional owners and rangers to assess the likely impacts of harvest activities on known environmental values, particularly rare or threatened species and areas of conservation significance.
4. As appropriate, develop and distribute species and/or harvest area protocols designed to:
   - ensure harvest activities are consistent with any species or site-specific conservation plans or strategies
   - eliminate or reduce impacts on significant environmental values
   - prevent overharvesting of key commercial resource species
   - reduce the risks associated with harvest activities of introducing and spreading weed species
   - reduce the risk of creating new soil erosion problems associated with harvest-related vehicle use (refer Section 5.3.3[a]).

Management Objective 8.4.3(b)

Explore and progress viable *Yapa*-controlled cultural tourism enterprises

1. Investigate and pursue opportunities to develop cultural tourism in the IPA, including:
   - working collaboratively with CLC Community Development staff and the CLC Aboriginal Tourism Officer to scope *Yapa* interest in and skills related to cultural tourism ventures
   - feasibility studies for cultural tourism ventures linked to the Milpirri festival
   - facilitation of relevant training for *Yapa* interested in developing small-scale cultural tourism enterprises in the IPA.
2. For both internally and externally generated tourism proposals, ensure the advice provided to the IPA Management Committee includes information relating to the following matters:
   - viability of the proposal, track record of proponents and their ability to meet financial commitments
   - delivery of meaningful social and economic benefits to traditional owners, including employment, training and business development
   - the willingness and ability of proponents to develop a sustainable working relationship with traditional landowners
   - the protection of sites of significance and amelioration of impacts on local culture, community, environment and other stakeholders.

Management Objective 8.4.3(c)

Explore and progress viable carbon abatement opportunities

1. Investigate and support opportunities for the development of carbon abatement initiatives in the IPA, including:
   - research and feasibility studies exploring the science and viability of carbon abatement programs and methodologies
   - studies to determine mechanisms by which Aboriginal people may best interact with potential emerging carbon markets
   - carbon abatement opportunities that offer the potential to offset existing costs associated with IPA management, specifically those related to feral animal control and fire management.

CHAPTER 9

Monitoring, Evaluation and Review

Senior men from the Southern and Northern Tanami IPAs (Thomas Jangala Rice and Jerry Jangala Patrick), watching the progress of burning work near Papinya, 2015

9.1 Monitoring

Monitoring changes in the condition of the values of the IPA over time is essential for gauging the success or otherwise of the management strategies being used to achieve the IPA management objectives as stated in this plan.

As it is not possible to measure the condition of all values within the IPA, a selection of performance indicators is required, with their selection based on priority issues and an understanding of their significance, sustaining processes and threats. In respect of the four management themes of this plan, performance indicators for monitoring and subsequent evaluation should be aligned with the key objectives of each theme.

It is a condition of IPA funding that a Program Logic and Monitoring, Evaluation, Reporting and Improvement (MERI) plan be completed and implemented. The purpose of a MERI plan is to ensure that milestones related to Caring for Our Country targets, as well as traditional owner objectives and aspirations outlined in this plan, are met. Though MERI plans are developed for the life of an IPA funding agreement (usually five years), they are reviewed annually with the aim of fostering an adaptive management approach.

It is the role of the IPA Coordinator to collate data generated against MERI criteria on an ongoing basis and to undertake a desktop evaluation of project outcomes prior to reporting at the end of each financial year. The extent and scope of a MERI plan for the IPA will be contingent on the resourcing, capacity and funding available to implement this plan.

Ranger using CyberTracker to record fauna survey data, 2014

Establishment and maintenance of a monitoring schedule to measure progress against key performance indicators related to the four management themes of this management plan will require:

- establishment and maintenance of an appropriate, representative data collection schedule tailored to suit locally specific values and threats and designed such that rangers are the principal people involved in data collection
- striking a balance between qualitative and quantitative measures to ensure strong community engagement in the monitoring and evaluation process and a rigorous scientific basis to future management decisions
- monitoring sites and methodologies that, wherever possible, conform to existing IPA, CLC, regional or national monitoring initiatives
- establishment and maintenance of a monitoring database in which to store and integrate baseline and historical information related to key performance indicators
- tailoring of the design of CyberTracker or other digital data collection platforms to link with, and inform, reporting against key performance indicators
- training of rangers and key traditional owners in data collection and monitoring program design and implementation.

9.2 Evaluation and Review

Understanding the nature and rate of change in the condition of values as indicated by the results of monitoring allows the effectiveness of chosen management regimes to be evaluated, adapted and improved.

It is the role of the IPA Coordinator, with assistance from relevant CLC staff, to collate MERI data for comparison against the previous year's performance. Added to this, IPA Management Committee members are required to undertake qualitative evaluation of IPA performance through identifying and recording 'stories of most significant change'.

This annual evaluation of performance is circulated to the IPA Advisory Committee in advance of its annual meeting. Committee members are required to provide advice and feedback regarding the effectiveness of management efforts particular to their areas of expertise and, where necessary, recommend changes to management strategies. In liaison with the Australian Government, such changes can be made through periodic reviews of the plan. Such reviews can also provide opportunities for traditional owners to address shortcomings regarding achievement of their aspirations or governance arrangements. They may also address proposals to add or remove areas from the IPA.

9.3 Management Strategies

Management Objective 9.3(a)

Develop and implement a monitoring, evaluation and review framework to optimise management effectiveness

Management Strategies

1. Complete a Program Logic and MERI Plan within one year of the IPA Plan of Management publication.
2. Establish an appropriate and representative data collection schedule in line with the MERI plan and management plan provisions. Ensure this schedule is tailored to suit specific values and threats of the IPA and to accommodate ranger data collection skills. The schedule will include data directed at gauging progress against key management objectives for each of the four management themes.
3. The monitoring regime for the IPA will include the collection of information concerning:
   - game species and bush resource availability (Management Strategies 5.3.3[b]3 and 8.4.3[a]3)
   - soil erosion site remediation effectiveness (Management Strategy 6.2.3[a]4)
   - water place condition responses to management actions (Management Strategy 6.3.3[b]3)
   - weed-related matters, including effectiveness of weed control efforts (Management Strategies 6.4.3[d]9 and 6.4.3[d]10)
   - feral animal control effectiveness (Management Strategy 6.5.3[d]7).

4. Work collaboratively with key CLC staff to develop CyberTracker (or other relevant digital recording platform) sequences and training schedules relevant to the collection of data by the rangers and aligned with MERI plan and management plan requirements.

5. Provide training in the design and implementation of monitoring programs (including track plot monitoring for fauna) to relevant IPA and ranger staff.

6. Establish an IPA database in line with CLC land resource information management systems to store and analyse data collected through the implementation of the MERI and management plans.

7. Liaise with staff of adjoining protected areas to develop complementary monitoring programs for shared values and threats so as to facilitate the identification of trends in condition in relation to management actions across the greater landscape.

8. Prepare an annual evaluation report for consideration by the IPA Management Committee and Advisory Committee based on MERI results and progress in implementing the provisions of the management plan. Consider making changes to the contents of the management plan and any relevant subsidiary documents in response to feedback on annual evaluation reports.

9. Undertake a limited five-year review of the IPA management plan to assess:
   - traditional owner views on the adequacy of the plan in reflecting their aspirations
   - effectiveness of the IPA governance structure, management arrangements and partnerships
   - proposals to add or remove areas from the IPA
   - suitability of the monitoring program to measure changes in the condition of values
   - changes required in response to the findings of monitoring program results
   - pertinent new research findings, the emergence of previously unforeseen management issues or opportunities and the identification of significant new values.

10. Commence a full review of the management plan approximately 10 years after its formal adoption.

CHAPTER 10

Plan Implementation

Rangers and traditional owners studying fire maps

Plan Implementation

Implementation of this management plan will be undertaken within the context of the annual works programs of the North Tanami Rangers and those of other regional or specialist CLC staff. Where appropriate, partner organisation support will be used to expedite implementation of the plan provisions. The rate and degree of plan implementation will depend on the availability of core and supplementary funding, together with staffing and resourcing levels.

Each individual management strategy or action in this plan will be assigned a relative priority (as listed below) using the following criteria:

High

Critical to achieving stated management objectives; if deferred could potentially result in an unacceptable loss of cultural/biological/economic values

Medium

Important to achieving stated management objectives; can be deferred without an unacceptable loss of cultural/biological/economic values

Low

Actions to be undertaken once high/medium priorities have been completed

Ongoing

Actions to be undertaken as required.

High priority actions are regarded as key milestones that should be implemented within two to five years of the adoption of the plan. In many instances, these actions will provide a framework to implement a large number of related actions and will serve as a foundation for the orderly and strategic achievement of key management objectives.

Priority levels will be allocated to all management strategies and actions by the IPA Management Committee within one year of the publication of the Plan of Management.

Selected Relevant References

Allan, G.E. (2009). *Managing fire in the southern Tanami Desert.* pp. 17–78. In: "Desert Fire: fire and regional land management in the arid landscapes of Australia." Desert Knowledge CRC Report 37. Desert Knowledge CRC, Alice Springs.

Broun, G. and Allan, G. (2011). CBFiM in the Tanami Desert region of central Australia. Annex 4. pp. 67–78. In: "Community-based Fire Management – A review." FAO Forestry Paper 166. Food and Agriculture Organization of the United Nations, Rome. Accessed online: http://www.fao.org/docrep/015/i2495e/i2495e.pdf.

Burbidge, A.A., Johnson, K.A., Fuller, P.J. and Southgate, R.I. (1988). "Aboriginal Knowledge of the Mammals of the Central Deserts of Australia". *Australian Wildlife Research* Vol.15(1), 9–39.

Burrows, N.D., Burbidge, A.A., Fuller, P.J. and Behn, G. (2006). "Evidence of Altered Fire Regimes in the Western Desert Region of Australia". *Conservation Science of Western Australia* Vol.5(3), 272–284.

CLC (2001). *Lajamanu Rangers: Strategic Land Management Plan for Lajamanu Homelands, Community Document 8.3.* Internal report, Central Land Council, Alice Springs.

CLC (2004). *Lajamanu Warlpiri Wildlife Survey: September to October 2003.* Internal report, Central Land Council, Alice Springs.

CLC (2006). *Northern Tanami Indigenous Protected Area Draft Plan of Management.* (Draft). Internal report, Central Land Council, Alice Springs.

CLC (2009). *Looking out for walpajirri (Bilby). A monitoring plan for the Walpajirri on the Northern Tanami IPA*. Internal report, Central Land Council, Alice Springs.

Dudley, N. (Editor) (2008). *Guidelines for Applying Protected Area Management Categories*. IUCN, Gland, Switzerland.

Duguid, A., Barnetson, J., Clifford, B., Pavey, C., Albrecht, D., Risler, J. and McNellie, M. (2005). *Wetlands in the arid Northern Territory*. A report to Environment Australia on the inventory and significance of wetlands in the arid NT. Parks and Wildlife Commission of the Northern Territory. Alice Springs. Accessed online: http://www.lrm.nt.gov.au/plants-and-animals/landscapes-and-wetlands/aridwetlands.

Edwards, G.P. and Allan, G.E. (eds.) (2009). *Desert Fire: fire and regional land management in the arid landscapes of Australia*. Desert Knowledge CRC Report 37. Desert Knowledge CRC, Alice Springs.

Edwards, G.P., Zeng, B, Saalfeld, W.K., Vaarzon-Morel, P. and McGregor, M. (2008). *Managing the impacts of feral camels in Australia: a new way of doing business*. DKCRC report 47. Desert Knowledge CRC, Alice Springs.

Eldridge, S. and Paltridge, R. (2011). *Feral Animal Strategy for the Northern Tanami IPA*. Report prepared for the Central Land Council, Alice Springs.

Eldridge, S. and Paltridge, R. (2012). *Monitoring Feral Camels on the Northern Tanami IPA*. Report prepared for the Central Land Council, Alice Springs.

Gibson, D.F. (1986). *A Biological Survey of the Tanami Desert in the Northern Territory*. Conservation Commission of the Northern Territory, Alice Springs.

Harrison, L., McGuire, L., Ward, S., Fisher, A., Pavey, C., Fegan, M. and Lynch, B. (2009). *An inventory of sites of international and national significance for biodiversity values in the Northern Territory*. Department of Natural Resources, Environment, the Arts and Sport, Darwin.

Hill, R., Walsh, F., Davies, J., and Sandford, M. (2011). *Our Country Our Way: Guidelines for Australian Indigenous Protected Area Management Plans*. CSIRO Ecosystem Sciences and Australian Government Department of Sustainability, Water, Environment, Population and Communities, Cairns. Accessed online: http://www.environment.gov.au/indigenous/ipa/toolkit/pubs/guidelines.pdf

Holmes, M. (2010). *Law for Country: The Structure and Application of Warlpiri Ecological Knowledge*. PhD Thesis. University of Queensland, Brisbane.

Kimber, R.G. (1983). "Black Lightning: Aborigines and Fire in Central Australia and the Western Desert". *Archaeology in Oceania* Vol.18(April), 38–45.

Kurdiji (2014). *Kirda-Kurdungurlu* Chart. Produced by the *Kurdiji* group of senior Warlpiri, as part of the CLC Warlpiri Law and Governance project. Accessed online: http://www.clc.org.au/files/pdf/Kurdungurlu_kirda_final.pdf.

Land Claim by Warlpiri and Kartangarurru-Kurintji (1979). Report by the Aboriginal Land Commissioner to the Minister for Aboriginal Affairs and to the Minister for the Aboriginal Northern Territory. Australian Government Publishing Service, Canberra.

Laughren, M., Hoogenraad, R.H. and Locke, K. (1996). *A Learner's Guide to Warlpiri*. Institute for Aboriginal Development, Alice Springs.

Morton, S.R, Short, J. and Barker, R.D. (1995). *Refugia for Biological Diversity in Arid and Semi-Arid Australia*. Report to the Biodiversity Department of Environment, Sport and Territories. CSIRO, Australia.

Northern Territory Government (2007). *Introduction to Soil Erosion*. Factsheet. Vegetation & Land Management, Natural Resource Management Division, Alice Springs.

Paltridge, R. (2012). *Bilby Monitoring in the Northern Tanami IPA*. Report prepared for the Central Land Council, Alice Springs.

Pavey, C. (2006). *Recovery Plan for the Greater Bilby*, Macrotis lagotis, *2006–2011*. Northern Territory Department of Natural Resources, Environment and the Arts, Alice Springs.

Pawu-Kurlpurlurnu, W.J., Holmes, M. and Box, L. (2008). *Ngurra-kurlu: A way of working with Warlpiri people*, DKCRC Report 41. Desert Knowledge CRC, Alice Springs. Accessed online: http://www.nintione.com.au/resource/DKCRC-Report-41-Ngurra-kurlu.pdf.

Reid, J., Potts, R., Ziembicki, M. and Jaensch, R. (2006). *Aerial survey of waterbirds in the northern Tanami Desert*. Wetlands International – Oceania, Brisbane. Accessed online: http://www.wetlands.org/Portals/0/Tanami_Waterbirds_2006_report_rev3.pdf

Southgate, R. and Moseby, K. (2008). *Track-based monitoring for the deserts and rangelands of Australia*. WWF, Australia. Accessed online: http://www.wwf.org.au/crawl_publications.cfm?1884%2FTrack-based-monitoring-for-the-deserts-and-rangelands-of-Australia.

Vaarzon-Morel, P. and Gabrys, K. (2008). "Fire on the horizon: contemporary Aboriginal burning issues in the Tanami Desert, central Australia". *GeoJournal* Vol.74(5), 465–476.

Varzon-Morel, P. (2010). "Changes in Aboriginal Perceptions of Feral Camels and of their Impacts and Management". The Rangeland Journal Vol.32(1), 73–85.

Walker, J. (2011). "Processes for effective management: learning from agencies and Warlpiri people involved in managing the Northern Tanami Indigenous Protected Area, Australia". PhD Thesis. Charles Darwin University, Alice Springs.

Walsh, F. and Mitchell, P. (2002). *Planning for country: cross-cultural approaches to decision making on Aboriginal lands*. Jukurrpa Books/IAD Press, Alice Springs.

White, W., Albrecht, D., Duguid, A., Latz, P. and Hamilton, M. (2000). *Plant species and Sites of Botanical Significance in the Southern Bioregions of the Northern Territory Vol 2: Significant Sites*. A report to the Australian Heritage Commission from the Arid Lands Environment Centre, Alice Springs.

PART C

APPENDICIES

APPENDIX 1
Abbreviated Forms

ALT	Aboriginal Land Trust
BIITE	Batchelor Institute of Indigenous Tertiary Education
CAT	Centre for Appropriate Technology
CLC	Central Land Council
CLM	Conservation and Land Management
DD	Data Deficient
EPBCA	*Environment Protection and Biodiversity Conservation Act 1999*
GMAAAC	Granites Mine Affected Area Aboriginal Corporation
IEK	Indigenous Ecological Knowledge
IPA	Indigenous Protected Area
IUCN	International Union for the Conservation of Nature
MERI	Monitoring, Evaluation, Reporting and Improvement (Plan)
NRS	National Reserve System
NT	Near Threatened
PPL	Perpetual Pastoral Lease
RTO	Registered Training Organisation
SOBS	Sites of Botanical Significance
SOCS	Sites of Conservation Significance
TPWCA	*Territory Parks and Wildlife Conservation Act 2000*
VRDCA	Victoria River District Conservation Association
WELL	Workplace English Language and Literacy
WETT	Warlpiri Education and Training Trust
WHCAC	Wulaign Homelands Council Aboriginal Corporation
WONS	Weeds of National Significance

APPENDIX 2
Warlpiri Glossary

jajina	brush-tailed mulgara – *Dasycercus blythi*
janganpa	common brushtail possum – *Trichosurus vulpecula*
janmarda	bush onion – *Cyperus bulbosus*
Jarnami	Tanami
jaru	language
jila	springs
jilja	sandhills
jinjimari	zebra finches – *Taeniopygia guttata*
jintangka	all with one
jintilyka	grasshopper
jipilyaku	ducks
Jirlpirli	Winnecke Hills (site / area)
Jiwaranpa	Lake Talbot and Kamira Lake
Judbarra	formerly Gregory National Park
juju	ceremonies / evil being
Jukurrpa	Law / Dreaming
jukurru	northern orange – *Capparis umbonata*
jurlarda	native honey bee
jurlpu	birds
jurnpurnpa	wild tobacco – *Nicotiana benthamiana*
jurntu	limestone, calcrete
jurru-pirrjirdi	swamp buffalo – *Bubalus bubalis*
kalajirdi	soft spinifex – *Triodia pungens*
kalawurru	floodplain monitor – *Varanus panoptes*
Kamira	Kamira Lake (near Coomarie Spring)
kampurarrpa	desert raisin – *Solanum centrale*
kanyarla	euro – *Macropus robustus*
Kara-purda	windy weather after winter (wind in all directions)
Kardiya	whitefella / person of non-indigenous descent
karlangu	digging sticks
karrinyarra	silkyheads – *Cymbopogon obtectus*
karru	creeks
kawalya	cold weather
kawartawara	camel – *Camelus dromedarius*
Kirda	'boss' (through Law) for area of country
Kurdungurlu	'manager' (through Law) for area of country
kurlarda	spears
kurlinjirri	scooped dishes for women
kururrungku	northern nailtail wallaby – *Onychogalea unguifera*
kuruwarri	sacred design / Law
kuyu	animals
laju	witchetty grub – *Xyleutes biarpiti*
lingka	poisonous snake
Lirnpa-pirda-pirda	rainbow bee-eater – *Merops ornatus*
lungkarda	centralian blue tongue – *Tiliqua multifasciata*
mala	rufous hare-wallaby – *Lagorchestes hirsutus*
manangkarra	sandplain country
mangarri	bush foods / seeds / damper
mangkuru	floodouts / floodplain country
manja	mulga – *Acacia aneura*
manyani	salt lake shrub with edible grub – *Pluchea tetranthera*
marlu	red kangaroo – *Macropus rufus*
marna	spinifex – *Triodia* species
marnakiji	conkerberry – *Carissa lanceolata*
marrawaji	desert walnut – *Owenia reticulata*
marrkirdi	plumbush – *Santalum lanceolatum*
mayi	plants
Milarlpa	spirit of relative
milwarna	Stimson's python – *Antaresia stimsoni*
Milwayi	Coomarie Spring
milyirtiri	night skink – *Liopholis striata*
minija	cat – *Felis catus*
minini	mouse – *Mus musculus*
Miririnyungu	Duck Ponds
mirnirri	thorny devil – *Moloch horridus*
mujunyku	rabbit – *Oryctolagus cuniculus*
mulju	soakages
muluwurru	salt lake or playas
mungilypa	samphire (various *Tecticornia* species)
nantuwu	horses – *Equus caballus*
ngapa	water, rain

Ngapa-yiri-yiri	rainy season
ngapiri	river red gum – *Eucalyptus camaldulensis*
ngarlajiyi	pencil yam – *Vigna lanceolata*
ngarlamarurru	crested pigeons – *Ocyphaps lophotes*
ngarlu	sugarbag
ngartarta	freshwater crab
ngatijirri	budgerigar
Ngumbin	Aboriginal person (Gurindji word)
Nguringku	Lake Buck
ngurlu	native seeds
ngurra	country / home / the land
Ngurra-kurla	principle cultural elements of *ngurra* (land), *kuruwarri* (Law), *jaru* (language), *juju* (ceremony), and skin and their interrelations
nurlku	snappy gum – *Eucalyptus brevifolia*
Nyukulku	Wilson Creek Floodout
pakarli	inland tea tree – *Melaleuca glomerata*
pakuru	golden bandicoot – *Isoodon auratus* (extinct in the Tanami region)
pamarrpa	hilly country / rocky ridges
parnpa	ceremonies
pikirri	spear-throwers
pilpilli	paleodrainage system
pirli	rocky hills
pirlilrrpa	male spirit of relative
pujarr-pujarrpa	southern marsupial mole – *Notoryctes typhlops*
pujuma	fox – *Vulpes vulpes*
puluku	bullock/cattle – *Bos taurus*
purlapa	open ceremonies
rdajalpa	woma python – *Aspidites ramsayi*
tangkiyi	donkey – *Equus asinus*
wajirrkinyi	rainy season
wakirlpirri	dogwood – *Acacia sericophora*
walakarri	supplejack – *Ventilago viminalis*
walanja	silver leaf box – *Eucalyptus pruinosa*
walpajirri	bilby – *Macrotis lagotis*
walya	rocks / soil
wampana	spectacled hare-wallaby – *Lagorchestes conspicillatus*
wanakiji	bush tomato – *Solanum chippendalei*
wanta	hot weather / summer
wanurkurdu	whitewood – *Atalaya hemiglauca*
wapilingki	coolabah – *Eucalyptus coolabah* subsp. *arida* or smooth-barked coolabah – *E. victrix*
Wardalya	Spider Lake
wardapi	sand goanna – *Varanus gouldii*
wardilyka	bush turkey or bustard – *Ardeotis australis*
warlu	fire
Warnayaka	Northern Warlpiri language group
warnayarra	water snake / rainbow serpent
warnirri	rockholes
warrana	great desert skink – *Liopholis kintorei*
warrarnpa	swamps and lakes
watiya	wood / tree
wawukurl-pari	flock bronzewing – *Phaps histrionica*
wijirrki	rock fig – *Ficus brachypoda*
wilyari	native truffle
wintiki	glossy ibis – *Plegadis falcinellus*
winyi-winyipa	grey falcon – *Falco hypoleucos*
wirntiki	bush stone-curlew – *Burhinus grallarius*
wirrkali	bloodwood – *Corymbia terminalis*
wurkumanu	senior women
wurlna	burrowing bettong – *Bettongia lesueur* (now extinct)
wuulupu	low-lying sandplain
yakirra	desert Flinders grass – *Yakirra australiensis*
yama	shade shelters
yankirri	emu – *Dromaius novaehollandiae*
Yapa	Aboriginal person (Warlpiri word)
Yapa-kurlangu	Warrego Track
yapuralyi	sugar-leaf/lerp
yarla	bush potato – *Ipomoea costata*
yarraji	edible grass seeds
yarrarntinyi	native currant – *Psydrax latifolia*
Yartulu-yartulu	The Granites
yarunpa	inferior native tobacco – *Nicotiana velutina*
yawulyu	women's open ceremony
yinarlingi	echidna – *Tachyglossus aculeatus*
yinirnti	bean tree – *Erythrina vespertilio*
yipilanji	red gum witchetty grub
Yulyurrpu	cold weather / winter
yunkuranyi	honey ants
yurnturrkunyu	black-headed python – *Aspidites melanocephalus*
yuturnrpa	termites

APPENDIX 3
IPA Consultation Summary

Date	Location	Issues discussed / description
July 1999	Various	Country visit with Warlmanpa traditional owners to cultural sites between Lajamanu and the boundary of the Karlantijpa ALT
November 1999	Lajamanu	Planning meeting and country visit to discuss men's and women's issues
March 2000	Lajamanu	Planning meeting to discuss issues relating to the Yapa-kurlangu Track
August 2000	Wuyagiba outstation in Arnhem Land	Attended second Annual Aboriginal Rangers' Conference at Wuyagiba outstation in Arnhem Land with six Lajamanu community members to investigate options of local indigenous land management group
July 2000 – June 2001	Mirridi, Lul-tju, Mirirrinyungu and Parnta outstations	Field assessments of Mirridi, Lul-tju, Mirirrinyungu and Parnta outstations; investigating local land management issues with traditional owners
October 2001	Lajamanu	Community meeting to discuss ranger group development and to seek approval for the draft 'CLC Lajamanu and Outstations Strategic Plan'
2001–2006	Various	Community meetings and on-country activities as part of ranger program development and IPA feasibility planning
March 2006	Lajamanu	IPA consultation: • Extent of the protected area • Intent, content and provisions of the Plan of Management • Structure, role and powers of the IPA Management Committee • Role and responsibilities of (former) Wulaign Rangers in managing traditional lands • Declaration of IPA over traditional lands
April 2006	Lajamanu	IPA consultation: • IPA Declaration preparations • IPA Declaration preparations • Committee membership and rules
April 2006	Kalkarindji	IPA consultation: • Intent, content and provisions of the Plan of Management Declaration of IPA over Gurindji lands • Structure, role and powers of the IPA Management Committee • Role and responsibilities of North Tanami Rangers in managing traditional lands • Declaration of IPA over Gurindji land
June 2006	Lajamanu	Inaugural meeting of the proposed Northern Tanami IPA Management Committee attended by 33 traditional owners and CLC staff
April 2007	Lajamanu	Declaration of the Northern Tanami IPA at a ceremony attended by Australian Government representatives, traditional owners, CLC staff, community members and media
March–August 2009	Lajamanu	Six IPA Plan of Management workshops to seek information from the Management Committee to update the draft Plan of Management for the IPA
May 2015	Lajamanu	Two-day workshop with Management Committee to review revised Objectives and Strategies in the 2015 IPA Plan of Management

APPENDIX 4
IPA Plant Species List

Records for the IPA from the Northern Territory Government flora database, cross-checked by Peter Jobson, Botanist at the Alice Springs Herbarium.

* denotes introduced species

Abutilon fraseri subsp. *fraseri*	Dwarf Lantern Bush
Abutilon leucopetalum	Desert Lantern Bush
Abutilon macrum	Slender Lantern Bush
Abutilon malvifolium	Gilgai Lantern Bush
Abutilon otocarpum	Desert Chinese Lantern
Acacia abbreviata	Tanami Wattle
Acacia acradenia	
Acacia adoxa var. *adoxa*	
Acacia adsurgens	Whipstick Wattle
Acacia alleniana	
Acacia ampliceps	Spring Wattle
Acacia ancistrocarpa	Fitzroy Wattle, Pirraru
Acacia argyraea	
Acacia aneura	Mulga
Acacia aptaneura	Mulga
Acacia bivenosa	Hill Umbrella Wattle
Acacia chippendalei	Chippendale's Wattle
Acacia colei var. *colei*	Kalkardi
Acacia cowleana	Halls Creek Wattle
Acacia cuthbertsonii subsp. *cuthbertsonii*	Silver Wichetty, Pirili
*Acacia doreta (*syn. *A. grasbyi)*	Red Witchetty
Acacia drepanocarpa subsp. *latifolia*	
Acacia elachantha	
Acacia estrophiolata	Ironwood
Acacia hemignosta	Club Leaf Wattle
Acacia hilliana	Flying Saucer Bush
Acacia holosericea	Silver Wattle
Acacia inaequilatera	Fire Wattle
Acacia jensenii	Spear Wattle, Mulyati
Acacia kempeana	Witchetty Bush
Acacia ligulata	Umbrella Bush
Acacia lycopodiifolia	
Acacia lysiphloia	Turpentine Wattle
Acacia maconochieana	Salt Wattle
Acacia maitlandii	Maitlands Wattle
Acacia melleodora	Waxy Wattle
Acacia minutifolia	Small-leaved Flying Saucer Bush
Acacia minyura	Desert Mulga

Acacia monticola	Hill Turpentine
Acacia neurocarpa	
Acacia pachycarpa	
Acacia perryi	
Acacia pruinocarpa	Black Gidgee
Acacia retivenea subsp. *retivenea*	
Acacia sericophylla	Dogwood
Acacia stellaticeps	
Acacia stenophylla	River Cooba
Acacia stipuligera	Scrub Wattle, Kurapuka
Acacia stipulosa	
Acacia synchronicia	
Acacia tenuissima	Broom Wattle, Minyana
Acacia torulosa	Torulosa Wattle
Acacia tumida var. *kulparn*	Pindan Wattle
Acacia victoriae	Bramble Wattle
Acacia wickhamii subsp. *wickhamii*	Wickhams Wattle
Acacia wiseana	Wises Wattle
Achyranthes aspera	Chaff Flower
Acrachne racemosa	
Aenictophyton reconditum subsp. *reconditum*	
Aeschynomene indica	Budda Pea
Alternanthera angustifolia	Narrow-leaf Joyweed
Alternanthera nana	Hairy Joyweed
Alternanthera nodiflora	Common Joyweed
Amaranthus cochleitepalus	
Amaranthus induratus	
Amaranthus undulatus	
**Amaranthus viridis*	Green Amaranth
*Ammannia fitzgeraldii (*syn. *Nesaea repens)*	
Ammannia multiflora	Jerry Jerry
Ampelocissus frutescens	Wild Grape
Amphipogon caricinus var. *caricinus*	Grey Beard Grass
Amphipogon sericeus	
Amyema miquelii	Box Mistletoe
Androcalva loxophylla	Desert Fire Weed

Aristida contorta	Bunched Kerosene Grass
Aristida exserta	
Aristida holathera var. *holathera*	Erect Kerosene Grass
Aristida hygrometrica	Northern Kerosene Grass
Aristida inaequiglumis	Curly Wire Grass
Aristida latifolia	Feathertop Wire Grass
Aristida pruinosa	Blue Wire Grass
Astrebla pectinata	Barley Mitchell Grass
Atalaya hemiglauca	Whitewood
Bacopa floribunda	
Basilicum polystachyon	Musk Basil
Bergia ammannioides	Water Fire
Bergia henshallii	
Bergia occultipetala	
Bergia pedicellaris	
Bergia perennis subsp. *obtusifolia*	Desert Mat
Bergia trimera	Small Water Fire
Blumea diffusa	
Blumea integrifolia	
Blumea saxatilis	
Blumea tenella	
Boerhavia coccinea	Tar Vine
Boerhavia dominii	
Boerhavia gardneri	
Boerhavia paludosa	Black Soil Tar Vine
Boerhavia repleta	
Bonamia deserticola	Creep Weed
Bonamia media var. *media*	
Bonamia pannosa	
Bothriochloa ewartiana	Desert Bluegrass
Brachyachne convergens	False Couch
Brachyachne prostrata	
Brachychiton multicaulis	
Brachychiton paradoxus	
Brunonia australis	Blue Pincushion
Buchnera asperata	
Buchnera linearis	Dainty Bush Flower
Buchnera ramosissima	
Bulbostylis barbata	Short-leaved Rush
Byblis filifolia	
Cajanus cinereus	
Cajanus marmoratus	
Cajanus pubescens	
Calandrinia pumila	Tiny Parakeelya
Calandrinia stagnensis	
Calotis breviseta	
Calotis erinacea	
Calotis porphyroglossa	Channel Burr Daisy
**Calotropis procera*	Rubberbush
Calytrix carinata	
Calytrix exstipulata	Kimberley Heather
Capparis lasiantha	Split-arse Jack
Capparis loranthifolia var. *loranthifolia*	Wild Orange
Capparis umbonata	Northern Wild Orange
Carissa lanceolata	Conkerberry
Cassytha capillaris	Hairless Dodder Laurel
Cassytha filiformis	Hairy Dodder Laurel
**Cenchrus ciliaris*	Buffel Grass
Centipeda minima subsp. *macrocephala*	Spreading Sneezeweed
Centipeda minima subsp. *minima*	Spreading Sneezeweed
Centipeda nidiformis	
Centipeda racemosa	Erect Sneezeweed
Centrolepis banksii	
Centrolepis exserta	
Chamaecrista absus var. *absus*	Hairy Cassia
Chamaecrista symonii	Dwarf Cassia
Cheilanthes brownii	Northern Rock Fern
Cheilanthes sieberi subsp. *sieberi*	Mulga Fern
Chenopodium auricomum	Swamp Bluebush
Chenopodium nitrariaceum	Nitre Goosefoot
**Chloris barbata*	Purple Top Chloris
Chloris pectinata	Comb Chloris
Chrysopogon fallax	Golden Beard Grass
Chrysopogon pallidus	Ribbon Grass
Cleome viscosa	Tick Weed
Clerodendrum floribundum	Smooth Clerodendrum
Codonocarpus cotinifolius	Desert Poplar
Coleocoma centaurea	
Commelina ensifolia	Wandering Jew
Corchorus aestuans	
Corchorus olitorius	Jute
Corchorus pumilio	
Corchorus sidoides subsp. *sidoides*	Flannel Weed
Corchorus sidoides subsp. *vermicularis*	Flannel Weed
Corchorus tridens	
Corchorus walcottii	Woolly Corchorus
Corymbia aspera	Rough-leaved Range Gum
Corymbia bella	Ghost Gum
Corymbia candida subsp. *dipsodes*	
Corymbia deserticola subsp. *mesogeotica*	Desert Bloodwood
Corymbia dichromophloia	Small-fruited Bloodwood
Corymbia drysdalensis	
Corymbia flavescens	Apple Ghost Gum
Corymbia opaca	
Corymbia pachycarpa subsp. *glabrescens*	
Corymbia sphaerica	
Corymbia terminalis	Bloodwood

Corynotheca micrantha var. *divaricata*	Sand Lily
Cressa australis	
Crinum angustifolium	Desert Lily
Crotalaria aridicola subsp. *densifolia*	
Crotalaria brevis	
Crotalaria cunninghamii subsp. *cunninghamii*	Bird Flower
Crotalaria medicaginea var. *neglecta*	Clover leaf Rattlepod
Crotalaria montana var. *angustifolia*	
Crotalaria novae-hollandiae subsp. *lasiophylla*	New Holland Rattlepod
Crotalaria ramosissima	
Croton aridus	
Croton arnhemicus	
Cucumis argenteus	Headache Vine
Cucumis melo	Bush Cucumber
Cullen balsamicum	
Cullen cinereum	Annual Verbine
Cullen corallum	
Cullen leucanthum	White Verbine
Cullen martinii	
Cullen pustulatum	
Cymbopogon ambiguus	Lemon-scented Grass
Cymbopogon bombycinus	Silky Oil Grass
Cymbopogon obtectus	Silkyheads
Cymbopogon procerus	Tall Silk Grass
**Cynodon dactylon* var. *dactylon*	Couch
Cyperus aquatilis	Flat-head Rush
Cyperus bifax	Downs Nutgrass
Cyperus blakeanus	
Cyperus bulbosus	Nutgrass, Yalka
Cyperus carinatus	
Cyperus castaneus	
Cyperus concinnus	Trim Sedge
Cyperus cunninghamii subsp. *cunninghamii*	
Cyperus dactylotes	
Cyperus difformis	Variable-leaf Sedge
Cyperus haspan subsp. *haspan*	
Cyperus holoschoenus	Umbrella Sedge
Cyperus iria	
Cyperus nervulosus	
Cyperus rigidellus	
Cyperus squarrosus	Bearded Flat Sedge
Cyperus tenuispica	Pink Root Sedge
Cyperus vaginatus	Stiff-leaf Sedge, Puta-puta
Dactyloctenium radulans	Button Grass
Dampiera candicans	
Dampiera cinerea	
Davenportia davenportii	White Morning Glory

Denhamia cunninghamii	Narrow-leaf Maytenus
Dentella asperata	Rough Mat plant
Desmodium filiforme	
Desmodium muelleri	
Dichanthium fecundum	Curly Bluegrass
Dichanthium sericeum subsp. *humilius*	Dwarf Bluegrass
Dichanthium sericeum subsp. *polystachyum*	Tassel Bluegrass
Dichanthium sericeum subsp. *sericeum*	Silky Bluegrass
Dichrostachys spicata	Single Thorn Prickly Bush
Dicrastylis costelloi	
Dicrastylis exsuccosa	Rusty Sand Sage
Digitaria brownii	Cotton Panic Grass
Digitaria ctenantha	Comb Finger Grass
Digitaria longiflora	
Diplatia grandibractea	Royal Mistletoe
Diplopeltis stuartii var. *stuartii*	
Dodonaea coriacea	Hopbush
Dodonaea hispidula var. *arida*	
Dodonaea lanceolata var. *lanceolata*	Hopbush
Dodonaea physocarpa	Balloon Hopbush
Dolichandrone heterophylla	Lemonwood
Drosera burmanni	Tropical Sundew
Drosera derbyensis	
Drosera indica	Narrow-leaved Sundew
Dysphania plantaginella	Crumbweed
**Echinochloa colona*	Awnless Barnyard Grass
**Echinochloa crus-galli*	Barnyard Grass
Ectrosia leporina	Hares-foot Grass
Ectrosia scabrida	Hares-foot Grass
Ectrosia schultzii var. *schultzii*	Hares-foot Grass
Ehretia saligna var. *saligna*	Coonta
Einadia nutans subsp.*eremaea*	Climbing Saltbush
Elacholoma prostrata	
Elatine macrocalyx	Claypan Waterwort
Eleocharis atropurpurea	
Eleocharis jacobsiana	
Eleocharis pallens	Pale Spike Rush
**Eleusine indica*	Crowsfoot Grass
Elytrophorus spicatus	Spikegrass
Enchylaena tomentosa var. *tomentosa*	Ruby Saltbush
Enneapogon cylindricus	Jointed Nine-awn
Enneapogon pallidus	Cone Top Nine-awn
Enneapogon polyphyllus	Woolly Oat-grass
Enneapogon purpurascens	Purple Nine-awn
Enteropogon acicularis	Curly Windmill Grass
Eragrostis confertiflora	Spike Lovegrass
Eragrostis cumingii	Cumings Lovegrass
Eragrostis desertorum	Desert Lovegrass
Eragrostis elongata	Clustered Lovegrass

Eragrostis eriopoda	Woollybutt Grass
Eragrostis exigua	
Eragrostis falcata	Sickle Lovegrass
Eragrostis fallax	
Eragrostis laniflora	Hairy Flowered Woollybutt
**Eragrostis minor*	Smaller Stinkgrass
Eragrostis olida	
Eragrostis setifolia	Neverfail
Eragrostis sp. erect spikelets	
Eragrostis speciosa	Handsome Lovegrass
Eragrostis tenellula	Delicate Lovegrass
Eragrostis xerophila	Knottybutt Neverfail
Eremophila duttonii	Red Poverty Bush
Eremophila latrobei subsp. *glabra*	Native Fuchsia
Eremophila longifolia	Emu Bush
Eremophila maculata subsp. *maculata*	Spotted Fuchsia
Eriachne aristidea	Three-awn Wanderrie
Eriachne armittii	Long-awn Wanderrie
Eriachne benthamii	Swamp Wanderrie
Eriachne ciliata	Slender Wanderrie
Eriachne melicacea	Fire Grass
Eriachne mucronata	Mountain Wanderrie
Eriachne obtuse var. short narrow inflorescence	Northern Wanderrie
Eriachne obtuse var. tall broad inflorescence	Sandhill Wanderrie
Eriachne pulchella subsp. *dominii*	Pretty Wanderrie
Eriachne pulchella subsp. *pulchella*	Pretty Wanderrie
Eriocaulon cinereum	
Eriocaulon pusillum	
Eriochloa pseudoacrotricha	Perrenial Cupgrass
Erythrina vespertilio subsp. *biloba*	Bean Tree
Erythrina vespertilio subsp. *vespertilio*	
Eucalyptus brevifolia	Snappy Gum
Eucalyptus camaldulensis subsp. *obtusa*	River Red Gum
Eucalyptus chlorophylla subsp. *chlorophylla*	Green-leaf Box
Eucalyptus coolabah subsp. *arida*	Coolabah
Eucalyptus cupularis	Halls Creek White Gum
Eucalyptus cyanoclada	
Eucalyptus microtheca	Black Box
Eucalyptus odontocarpa	Sturt Creek Mallee
Eucalyptus pachyphylla	Red Bud Mallee
Eucalyptus pruinosa subsp. *pruinosa*	Silver Leaf Box
Eucalyptus victrix	Smooth-barked Coolabah
Eulalia aurea	Silky Browntop
Euphorbia accedens	

Euphorbia albrechtii	
Euphorbia australis var. *erythrantha*	
Euphorbia australis var. *hispidula*	
Euphorbia australis var. *subtomentosa*	
Euphorbia biconvexa	
Euphorbia boophthona	Bottle Tree Caustic
Euphorbia centralis	
Euphorbia cinerea	
Euphorbia coghlanii	
Euphorbia drummondii	Caustic Weed
Euphorbia ferdinandii var. *ferdinandii*	
Euphorbia gregoriensis	
Euphorbia hassallii	
**Euphorbia hirta*	Asthma Plant
Euphorbia inappendiculata var. *queenslandica*	
Euphorbia mitchelliana	
Euphorbia papillata var.*papillata*	
Euphorbia parvicarbunculata	
Euphorbia petala	
Euphorbia porcata	
Euphorbia schizolepis	
Euphorbia schultzii var. *comans*	
Euphorbia tannensis subsp. *eremophila*	Caustic Bush
Euphorbia trigonosperma	
Euphorbia vaccaria var.*vaccaria*	
Euphorbia wheeleri	Wheelers Spurge
Evolvulus alsinoides var. *decumbens*	Blue Periwinkle
Evolvulus alsinoides var. *villosicalyx*	Blue Periwinkle
Ficus brachypoda	Wild Fig
Ficus cerasicarpa	
Fimbristylis aestivalis	Summer Fringe Rush
Fimbristylis ammobia	
Fimbristylis caespitosa	
Fimbristylis cinnamometorum	Fairy Rush
Fimbristylis corynocarya	
Fimbristylis depauperata	
Fimbristylis dichotoma	Eight Day Grass
Fimbristylis eremophila	Desert Fringe Rush
Fimbristylis furva	
Fimbristylis littoralis var. *littoralis*	
Fimbristylis microcarya	
Fimbristylis nuda	
Fimbristylis oxystachya	Lukarrara
Fimbristylis rara	Salt Fringe Rush
Fimbristylis simulans	
Fimbristylis squarrulosa	

Fimbristylis velata	Veiled Fringe Rush
Flaveria trinervia	Yellow Twin-stem
Flemingia pauciflora	
Frankenia cordata	Salty Heath
Fuirena ciliaris	Small Club Rush
Fuirena incrassata	
Fuirena nudiflora	
Galactia tenuiflora	Poison Pea
Gastrolobium grandiflorum	Desert Poison
Glinus lotoides	
Glinus oppositifolius	Hairy Carpet Weed
Glossostigma diandrum	
Glycine pullenii	
Glycine tomentella	Rusty Glycine
Gomphrena canescens subsp. *canescens*	Batchelors Button
Gomphrena diffusa subsp. *arenicola*	
Gomphrena lanata	
Gomphrena leptophylla	
Gonocarpus chinensis subsp. *chinensis*	
Gonocarpus eremophilus	
Goodenia armitiana	Narrow-leaved Goodenia
Goodenia azurea subsp. *azurea*	Blue Goodenia
Goodenia fascicularis	Silky Goodenia
Goodenia goodeniacea	Sandplain Goodenia
Goodenia heterochila	Serrated Goodenia
Goodenia hirsuta subsp. Run-on areas	
Goodenia lamprosperma	
Goodenia lunata	Heavy-soil Hand-flower
Goodenia modesta	
Goodenia scaevolina	
Goodenia strangfordii	
Goodenia triodiophila	Spinifex Goodenia
Goodenia vilmoriniae	Purple Hand-flower
Goodenia virgata	
Goodenia viscidula	
Gossypium australe	Tall Desert Rose
Gossypium bickii	Low Desert Rose
Grevillea eriostachya	Honey Grevillea
Grevillea juncifolia subsp. *juncifolia*	Desert Grevillea
Grevillea pyramidalis subsp. *leucadendron*	Caustic Bush
Grevillea refracta subsp. *refracta*	Silver Leaf Grevillea
Grevillea striata	Beefwood
Grevillea wickhamii subsp. *aprica*	Holly-leaf Grevillea
Gyrocarpus americanus	
Gyrostemon tepperi subsp. *pachyphyllus*	Helicopter Tree
Hakea arborescens	Yellow Hakea
Hakea chordophylla	Northern Corkwood
Hakea lorea subsp. *lorea*	Long-leaf Corkwood
Hakea macrocarpa	Flat Leaved Hakea
Halgania solanacea var. Rabbit Flat	
Haloragis uncatipila	
Helichrysum luteoalbum	Jersey Cudweed
Heliotropium ballii	
Heliotropium curassavicum	Smooth Heliotrope
Heliotropium dichotomum	
Heliotropium diversifolium	
Heliotropium fasciculatum	
Heliotropium glabellum	
Heliotropium haesum	
Heliotropium leptaleum	
Heliotropium ovalifolium	
Heliotropium pachyphyllum	
Heliotropium parviantrum	
Heliotropium pulvinum	
Heliotropium skeleton	
Heliotropium sphaericum	
Heliotropium subreniforme	
Heliotropium synaimon	
Heliotropium tanythrix	
Heliotropium tenuifolium	
Heteropogon contortus	Bunch Speargrass
Hibiscus austrinus var. *austrinus*	Yellow Hibiscus
Hibiscus brachysiphonius	Low Hibiscus
Hibiscus leptocladus	Variable leaf Hibiscus
Hibiscus meraukensis	Glaberous Hibsicus
Hibiscus sturtii var. *campylochlamys*	Sturts Hibiscus
Hibiscus sturtii var. *grandifloras*	Sturts Hibiscus
Hibiscus sturtii var. *platychlamys*	Sturts Hibiscus
Hibiscus verdcourtii	Bladder Ketmia
Hybanthus aurantiacus	Orange Spade Flower
Hybanthus enneaspermus	Blue Spade Flower
Hypericum gramineum	Small St Johns Wort
Indigastrum parviflorum	Small Flower Indigo
Indigofera ammobia	
Indigofera colutea	Sticky Indigo
Indigofera georgei	Georges Indigo
Indigofera haplophylla	
Indigofera hirsuta	Hairy Indigo
Indigofera linifolia	Native Indigo
Indigofera linnaei	Birdsville Indigo
Indigofera monophylla	
Indigofera trita	
Iphigenia indica	
Ipomoea coptica	
Ipomoea costata	Bush Potato
Ipomoea diamantinensis	Desert Cowvine
Ipomoea lonchophylla	Common Cowvine

Ipomoea muelleri	Native Morning Glory
Ipomoea polymorpha	Silky Cowvine
Iseilema macratherum	Bull Flinders Grass
Iseilema membranaceum	Small Flinders Grass
Iseilema vaginiflorum	Red Flinders Grass
Isotoma luticola	
Isotropis atropurpurea	Poison Sage
Isotropis wheeleri	Wheelers Lamb Poison
Jacksonia aculeata	
Jacksonia odontoclada	
**Khaya senegalensis*	African Mahogany
Keraudrenia nephrosperma	
Keraudrenia velutina	
Kohautia australiensis	
Lawrencia glomerata	Small Golden Spike
Lechenaultia filiformis	
Lepidium phlebopetalum	Veined Peppercress
Leptochloa fusca subsp. *fusca*	Small Flowered Beetle Grass
Leptosema anomalum	
Leptosema chambersii	Upside Down Plant
Levenhookia chippendalei	Tanami Pretty Pink
Lipocarpha microcephala	Button Rush
Logania centralis	
Lotus cruentus	Red Flower Trefoil
Ludwigia octovalvis	Willow Primrose
Ludwigia perennis	
Lysiana spathulata subsp. *parvifolia*	Flat Leaved Mistletoe
Lysiana spathulata subsp. *spathulata*	Flat Leaved Mistletoe
Macgregoria racemigera	Desert Snow
**Macroptilium lathyroides* var. *semierectum*	Phasey Bean
Maireana georgei	Satiny Bluebush
Maireana integra	
Maireana luehmannii	
Maireana triptera	Three Wing Bluebush
Maireana villosa	Silky Bluebush
**Malvastrum americanum*	Spiked Malvastrum
Marsdenia angustata	
Marsdenia australis	Bush Banana
Marsilea angustifolia	Leaf Nardoo
Marsilea exarata	Swayback Nardoo
Marsilea hirsuta	Hairy Nardoo
Melaleuca glomerata	Inland Tea Tree
Melaleuca lasiandra	Sand Hill Tee Tree
Melaleuca nervosa	Yellow Barked Paperbark
Melaleuca sericea	
Melaleuca viridiflora	Green Paperbark
Melhania oblongifolia	Velvety Hibiscus
Microstachys chamaelea	
Mimulus gracilis	Slender Monkey Flower
Mirbelia viminalis	Yellow Broom
Mitrasacme connata	
Mitrasacme exserta	White Flood Plant
Mitrasacme laricifolia	
Mitrasacme lutea	
Mitrasacme nidulifera	
Mnesithea rottboellioides	Blady Grass
Mollugo molluginea	
Muelleranthus parvalatus	Spinifex Pea
Muelleranthus stipularis	
Murdannia gigantea	Grass Lily
Myriocephalus rudallii	Small Poached Egg Daisy
Myriophyllum verrucosum	Red Water Milfoil
Najas graminea	
Neobassia astrocarpa	
Neptunia dimorphantha	Sensitive Plant
Neptunia monosperma	Native Sensitive Plant
Nesaea muelleri	
Nesaea repens	
Newcastelia spodiotricha	Sandhill Sage
Nicotiana benthamiana	Wild Tobacco
Notoleptopus decaisnei	
Nymphaea violacea	Blue water Lily
Nymphoides crenata	Wavy Marshwort
Nymphoides indica	Fringed Water Lily
Olax spartea	
Oldenlandia argillacea	
Oldenlandia galioides	
Oldenlandia laceyi	
Oldenlandia mitrasacmoides subsp. *mitrasacmoides*	
Oldenlandia pterospora	
Oldenlandia spermacocoides	
Operculina aequisepala	
Owenia reticulata	Desert Walnut
Oxychloris scariosa	Winged Chloris
Panicum decompositum var. *decompositum*	Native Panic
Panicum laevinode	Pepper Grass
Panicum mindanaense	
Paraneurachne muelleri	Spinifex Couch
**Parkinsonia aculeata*	Parkinsonia
Paspalidium rarum	Bunch Paspalidium
Paspalidium reflexum	
Peplidium muelleri	
Peplidium sp. Tanami	
Perotis rara	Comet Grass
Petalostigma nummularium	Quinine Bush
Petalostylis cassioides	Butterfly Bush
Phyllanthus carpentariae	
Phyllanthus exilis	
Phyllanthus maderaspatensis	
Phyllanthus minutiflorus	
Phyllanthus sp. Broad Tuberculate Seeds	
Physalis angulata	Wild Gooseberry

Pimelea ammocharis	
Pluchea dunlopii	
Pluchea ferdinandi-muelleri	
Pluchea rubelliflora	
Pluchea tetranthera	Pink Plains Bush
Polycarpaea corymbosa	
Polycarpaea holtzei	
Polycarpaea involucrata	
Polycarpaea spirostylis	Copper Plant
Polygala dependens	
Polygala galeocephala	
Polygala isingii	
Polygala pterocarpa	
Polygala tepperi	
Polymeria ambigua	Creeping Polymeria
Polymeria sp. Western Tanami	
Poranthera microphylla	Small Poranthera
Portulaca bicolor	
Portulaca digyna	
Portulaca filifolia	Slender Pigweed
Portulaca oleracea	
Portulaca oleracea var. Undoolya	Munyeroo
Portulaca oleracea var. Yuendumu	Munyeroo
Portulaca oligosperma	
**Portulaca pilosa*	
Portulaca sp. Clay Soil	
Portulaca sp. Elliott	
Pseudoraphis spinescens	Swamp Grass
Psydrax attenuata var. *myrmecophila*	
Psydrax latifolia	Native Currant
Pterocaulon serrulatum var. *velutinum*	Fruit Salad Bush
Pterocaulon sphacelatum	Apple Bush
Ptilotus astrolasius var. *astrolasius*	
Ptilotus calostachyus	Weeping Mulla Mulla
Ptilotus clementii	Limestone Pussycats Tails
Ptilotus exaltatus var. *exaltatus*	Large Pink Pussy Tails
Ptilotus fusiformis	Skeleton Plaint
Ptilotus helipteroides	Hairy Mulla Mulla
Ptilotus microcephalus	Large Green Pussy Tails
Ptilotus obovatus	Smoke Bush
Ptilotus polystachyus	Long Pussy Tails
Ptilotus schwartzii	
Ptilotus spicatus	
Rhagodia eremaea	Tall Saltbush
Rhyncharrhena linearis	Mulga Bean
Rhynchosia minima	Native Pea
Rhynchospora pterochaeta	
Rostellularia adscendens var. *clementii*	
Rotala diandra	
Rotala mexicana	
Rotala occultiflora	
Rothia indica subsp. *australis*	
Rutidosis helichrysoides subsp. *helichrysoides*	Mulga Daisy
Salsola tragus subsp. *grandiflora*	Buck Bush
Salsola tragus subsp. *tragus*	Roly Poly
Santalum lanceolatum	Plum Bush
Sarcostemma viminale subsp. *australe*	Caustic Vine
Sauropus huntii	
Scaevola amblyanthera var. *amblyanthera*	
Scaevola amblyanthera var. *centralis*	
Scaevola basedowii	
Scaevola browniana subsp. *browniana*	
Scaevola glabrata	
Scaevola laciniata	
Scaevola ovalifolia	Bushy Fanflower
Scaevola parvifolia subsp. *parvifolia*	Fanflower
Schenkia australis	
Schizachyrium fragile	Red Spathe Grass
Schizachyrium pseudeulalia	Short Leaved Silk Grass
Schoenoplectus dissachanthus	
Schoenoplectus laevis	
Schoenoplectus lateriflorus	
Scleria rugosa	
Sclerolaena bicornis var. *bicornis*	Goathead Burr
Sclerolaena clelandii	
Sclerolaena cornishiana	Cartwheel Burr
Sclerolaena crenata	
Sclerolaena glabra	
Sclerolaena lanicuspis	Woolly Copper Burr
Senna artemisioides subsp. *helmsii*	Blunt Leaf Cassia
Senna artemisioides subsp. *oligophylla*	Oval Leaf cassia
Senna artemisioides subsp. *sturtii*	Dense Cassia
Senna artemisioides subsp. *symonii*	
Senna costata	
Senna curvistyla	
Senna glutinosa subsp. *glutinosa*	
Senna glutinosa subsp. *pruinosa*	
Senna notabilis	Cockroach Bush
Senna oligoclada	
Senna planitiicola	Pepper Leaf Senna
Senna pleurocarpa var. *pleurocarpa*	Chocolate Bush

Senna sericea	
Senna venusta	Graceful Cassia
Sesbania cannabina var. *cannabina*	Yellow Pea Bush
Setaria apiculata	Pigeon Grass
Setaria surgens	Brown Pigeon Grass
**Setaria verticillata*	Whorled Pigeon Grass
Sida ammophila	Sand Sida
Sida arenicola	
Sida cardiophylla	
Sida cleisocalyx	
Sida cunninghamii	
Sida fibulifera	Silver Sida
Sida filiformis	Fire Sida
Sida macropoda	
Sida platycalyx	Teddy Bears Arsehole
Sida rohlenae subsp. *rohlenae*	Shrub Sida
Sida sp. Pindan	
Sida sp. Rabbit Flat	
Sida sp. Suplejack Station	
Sida sp. Wakaya Desert	
Sida spinosa	
Sida trichopoda	High Sida
Solanum centrale	Desert Raisin
Solanum chenopodinum	Wild Tomato
Solanum chippendalei	Bush Tomato
Solanum cleistogamum	Shy Nightshade
Solanum dioicum	Wild Tomato
Solanum diversiflorum	
Solanum echinatum	Wild Tomato
Solanum quadriloculatum	Wild Tomato
Solanum tumulicola	Black Soil Wild Tomato
Sorghum plumosum	Perennial Sorghum
Spermacoce auriculata	
Spermacoce dolichosperma	
Spermacoce hillii	
Sporobolus actinocladus	Katoora
Sporobolus australasicus	Australian Dropseed
Sporobolus caroli	Fairy Grass
Sporobolus mitchellii	Rat Tail Couch
Stackhousia clementii	
Stackhousia intermedia	Wiry Stackhousia
Stackhousia sp. Swollen Gynophore	
Stemodia florulenta	Blue Rod
Stemodia glabella	Smooth Blue Rod
Stemodia lathraia	
Stemodia lythrifolia	
Stemodia sp. Tanami	
Stemodia tephropelina	
Stemodia viscosa	Sticky Blue Rod
Streptoglossa bubakii	
Streptoglossa odora	Aromatic Daisy
Striga squamigera	
Stylidium adenophorum	
Stylidium desertorum	Desert Triggerplant
Stylidium floodii	
Stylidium floribundum	
Stylobasium spathulatum	Stone Fruit
**Stylosanthes hamata*	Verano Stylo
**Stylosanthes humilis*	Townsville Stylo
Swainsona burkei	
Swainsona tanamiensis	
Synaptantha tillaeacea var. *tillaeacea*	
Synaptantha tillaeacea var. Western Tanami	
Tecticornia halocnemoides subsp. *tenuis*	Grey Glasswort
Tecticornia indica subsp. *leiostachya*	Brown head Glasswort
Tecticornia pergranulata subsp. *elongata*	Black Seed Samphire
Tecticornia verrucosa	Mungilpa
Templetonia hookeri	
Tephrosia brachycarpa	Red Pea Bush
Tephrosia lasiochlaena	
Tephrosia leptoclada	
Tephrosia phaeosperma	
Tephrosia rosea	Flinders River Poison
Tephrosia simplicifolia	
Tephrosia sp. Barrow Creek	
Tephrosia sp. Bungaroo Ck	
Tephrosia sp. Mistake Creek	
Tephrosia sp. OT Station	
Tephrosia sp. Willowra	
Tephrosia stuartii	
Terminalia arostrata	Nutwood
Terminalia platyphylla	
Terminalia savannicola	
Teucrium integrifolium	Green Germander
Teucrium racemosum	Grey Germander
Thaumastochloa pubescens	
Themeda avenacea	Oat Kangaroo Grass
Themeda triandra	Oat Grass
Thysanotus chinensis	
Tinospora smilacina	Snake Vine
Trachymene glaucifolia	Wild Parsnip
Trachymene villosa	
Trianthema oxycalyptra var. *oxyclyptra*	
Trianthema pilosa	
**Trianthema portulacastrum*	Giant Pigweed
Trianthema triquetra	
Trianthema turgidifolia	
Tribulopis angustifolia	
Tribulus eichlerianus	Bindieye
Tribulus hirsutus	

Tribulus sp. Long-styled eichlerianus	
Tribulus sp. Saline Flats	
**Tribulus terrestris*	Caltrop
Trichodesma zeylanicum	Cattle Bush
**Tridax procumbens*	Tridax Daisy
Triodia bitextura	Curly Spinifex
Triodia epactia	
Triodia intermedia	Winged Spinifex
Triodia inutilis	
Triodia pungens	Soft Spinifex
Triodia salina	Salt Lake Spinifex
Triodia schinzii	Feathertop Spinifex
Triodia spicata	Spike Flowered Spinifex
Triumfetta centralis	
Triumfetta johnstonii	
Triumfetta micracantha	
Triumfetta plumigera	
Uranthoecium truncatum	Flat-stem Grass
Urochloa gilesii var. *gilesii*	Hairy-edged Armgrass
Urochloa gilesii var. *nothochthona*	
Urochloa holosericea subsp. *velutina*	Silky-top Armgrass
**Urochloa mosambicensis*	Sabi Grass
Urochloa piligera	Hairy Armgrass
Utricularia muelleri	
Vachellia valida	
Vallisneria annua	
Vallisneria nana	
Velleia macrocalyx	Pale Velleia
Velleia panduriformis	Pindan Velleia
Ventilago viminalis	Supplejack
Vigna lanceolata var. *filiformis*	
Vigna lanceolata var. *lanceolata*	
Vigna lanceolata var. *latifolia*	
Vigna sp. McDonald Downs	
Vittadinia virgata	
Wahlenbergia caryophylloides	Northern Bluebell
Wahlenbergia communis	Tufted Bluebell
Wahlenbergia queenslandica	
Wahlenbergia tumidifructa	Turgid Fruited Bluebell
Waltheria indica	
Waltheria virgata	
Whiteochloa cymbiformis	
Xerochloa laniflora	
Yakirra australiensis var. *australiensis*	Desert Flinders Grass
Zaleya galericulata subsp. *galericulata*	Hogweed
Zornia albiflora	
Zornia chaetophora	
Zornia muelleriana subsp. *muelleriana*	
Zornia muriculata subsp. *angustata*	

APPENDIX 5
IPA Fauna Species List

* denotes introduced species

\# denotes species not recorded from the IPA in the Northern Territory Government Fauna Atlas database, but which have been observed in the IPA by ecologist and former CLC employee Nic Gambold

Reptiles

Antaresia stimsoni	Stimson's Python
#Aspidites melanocephalus	Black-headed Python
Aspidites ramsayi	Woma Python
Brachyurophis fasciolatus	Narrow-banded Burrowing Snake
#Brachyurophis roperi	Northern Shovel-nosed Snake
Carlia munda	Striped Rainbow Skink
Carlia rufilatus	Red-Sided Rainbow Skink
Carlia triacantha	Three-Spined Rainbow Skink
#Cryptoblepharus metallicus	Metallic Snake-Eyed Skink
Cryptoblepharus plagiocephalus	Aboreal Snake-Eyed Skink
Cryptoblepharus ruber	Tawny Snake-eyed Skink
#Ctenophorus caudicinctus	Ring-tailed Dragon
Ctenophorus isolepis	Military Dragon
Ctenophorus nuchalis	Central Netted Dragon
Ctenophorus pictus	Painted Dragon
Ctenotus grandis	Grand Ctenotus
Ctenotus greeri	Greer's Ctenotus
Ctenotus helenae	Helen's Ctenotus
Ctenotus leonhardii	Leonhardi's Ctenotus
#Ctenotus militaris	Military Ctenotus
#Ctenotus pallescens	Pale-backed Ctenotus
Ctenotus pantherinus	Leopard Ctenotus
#Ctenotus piankai	Pianka's Ctenotus
#Ctenotus quattuordecimlineatus	Fourteen-Lined Ctenotus
Ctenotus robutus	Robust Ctenotus
Ctenotus saxatilis	Rock Ctenotus
Ctenotus schomburgkii	Schomburk's Ctenotus
Ctenotus tanamiensis	Tanami Ctenotus
Delma borea	Rusty-topped Delma
Delma butleri	Unbanded Delma
#Delma nasuta	Sharp-snouted Delma
Delma tincta	Black-necked Snake-lizard
Diplodactylus conspicillatus	Fat-tailed Gecko
Diporiphora bennerrii	Robust Dragon
Diporiphora lalliae	
Diporiphora winneckei	Canegrass Dragon
Emydura victoriae	Northern Red-faced Turtle
#Eremiascincus fasciolatus	Narrow-Banded Sand Swimmer
Eremiascincus intermedius	Northern Narrow-Banded Skink
Eremiascincus richardsonii	Broad-Banded Sand Swimmer
#Furina ornata	Orange-naped Snake
Gehyra australis	Northern Dtella
#Gehyra minuta	Dwarf Dtella
Gehyra montium	Centralian Dtella
#Gehyra pilbara	Pilbara Gecko
Gehyra purpurascens	Purplish Dtella
Gehyra variegata	Tree Dtella
Heteronotia binoei	Bynoe's Gecko
Lerista bipes	Two-Toed Lerista
#Lerista labialis	Sand Lerista
Liasis burtonis	Burton's Legless Lizard
Liopholis striata	Striated Egernia
Lophognathus gilberti	Gilbert's Dragon
Lophognathus longirostris	Long-nosed Water Dragon
Lucasium stenodactylum	Crowned Gecko
Menetia greyii	Grey's Menetia
#Menetia maini	Main's Menetia
Moloch horridus	Thorny Devil
Morethia ruficauda	Red-Tailed Snake-Eyed Skink
Nephrurus levis	Three-lined Knob-tailed Gecko
Notoscincus ornatus	Ornate Snake-Eyed Skink
Pogona minor	Dwarf Bearded Dragon
#Proablepharus reginae	Spinifex Snake-Eyed Skink
#Proablepharus tenuis	Slender Snake-Eyed Skink
Pseudechis australis	King Brown Snake
#Pseudonaja modesta	Ringed Brown Snake
Pseudonaja nuchalis	Western Brown Snake
#Pygopus nigriceps	Western Hooded Scaly-Foot
Ramphotyphlops endoterus	Interior Blind Snake
Rhynchoedura ornata	Beaked Gecko
Strophurus ciliaris	Spiny-tailed Gecko
Strophurus jeanae	Southern Phasmid Gecko
Strophurus taeniatus	White-striped Gecko
Suta punctata	Little Potted Snake
Tiliqua multifasciata	Centralian Blue-Tongued Lizard
#Tiliqua scincoides	Common Blue-Tongued Lizard
Tympanocryptis lineata	Lined Earless Dragon

#*Tympanocryptis tetraporophora*	Long-tailed Earless Dragon
Varanus acanthurus	Ridge-tailed Monitor
#*Varanus brevicauda*	Short-tailed Pygmy Monitor
Varanus eremius	Rusty Desert Monitor
Varanus giganteus	Perentie
Varanus gilleni	Pygmy Mulga Monitor
Varanus gouldii	Sand Goanna
#*Varanus mertensi*	Mertens' Water Monitor
Varanus panoptes	Floodplain Monitor
Varanus tristis	Black-tailed Monitor

Amphibians

Litoria australis	Giant Frog
Litoria caerulea	Green Tree-frog
Litoria coplandi	Copland's Rock Frog
#*Litoria cultripes*	Knife-footed Frog
#*Litoria maculosa*	Daly Waters Frog
Litoria maini	Main's Frog
Litoria rubella	Red Tree-frog
Neobatrachus aquilonius	Northern Burrowing Frog
#*Neobatrachus centralis*	Trilling Frog
Notaden nichollsi	Desert Spadefoot Toad
#*Opisthodon spenceri*	Spencer's Frog
**Rhinella marina* (syn. *Bufo marinus)*	Cane Toad
Uperoleia micromeles	Tanami Toadlet

Birds

Acanthagenys rufogularis	Spiny-cheeked Honeyeater
Acanthiza apicalis	Inland Thornbill
Acanthiza chrysorrhoa	Yellow-rumped Thornbill
Accipiter cirrhocephalus	Collared Sparrowhawk
Accipiter fasciatus	Brown Goshawk
Actitis hypoleucos	Common Sandpiper
Aegotheles cristatus	Australian Owlet-nightjar
Amytornis striatus	Striated Grasswren
Anas gracilis	Grey Teal
Anas rhynchotis	Australasian Shoveler
Anas superciliosa	Pacific Black Duck
Anhinga novaehollandiae	Australasian Darter
Anthus novaeseelandiae	Australasian Pipit
Aphelocephala leucopsis	Southern Whiteface
Aprosmictus erythropterus	Red-winged Parrot
Apus pacificus	Fork-tailed Swift
Aquila audax	Wedge-tailed Eagle
Ardea intermedia	Intermediate Egret
Ardea modesta	Eastern Great Egret
Ardea pacifica	White-necked Heron
Ardeotis australis	Australian Bustard
Artamus cinereus	Black-faced Woodswallow
Artamus leucorynchus	White-breasted Woodswallow
Artamus minor	Little Woodswallow
Artamus personatus	Masked Woodswallow
Artamus superciliosus	White-browed Woodswallow
Aythya australis	Hardhead
Barnardius zonarius	Australian Ringneck
Burhinus grallarius	Bush Stone-curlew
Cacatua sanguinea	Little Corella
Cacomantis pallidus	Pallid Cuckoo
Calidris acuminata	Sharp-tailed Sandpiper
Calyptorhynchus banksii macrorhynchus	Red-tailed Black-cockatoo (Top End)
Centropus phasianinus	Pheasant Coucal
Certhionyx variegatus	Pied Honeyeater
Chalcites basalis	Horsfield's Bronze-Cuckoo
Chalcites osculans	Black-eared Cuckoo
Charadrius ruficapillus	Red-capped Plover
Charadrius veredus	Oriental Plover
Chenonetta jubata	Australian Wood Duck
Cheramoeca leucosterna	White-backed Swallow
Chlidonias hybrida	Whiskered Tern
Chroicocephalus novaehollandiae	Silver Gull
Cincloramphus cruralis	Brown Songlark
Cincloramphus mathewsi	Rufous Songlark
Circus approximans	Swamp Harrier
Circus assimilis	Spotted Harrier
Cisticola exilis	Golden-headed Cisticola
Colluricincla harmonica	Grey Shrike-thrush
Columba livia	Rock Dove
Conopophila rufogularis	Rufous-throated Honeyeater
Conopophila whitei	Grey Honeyeater
Coracina maxima	Ground Cuckoo-shrike
Coracina novaehollandiae	Black-faced Cuckoo-shrike
Coracina papuensis	White-bellied Cuckoo-shrike
Corvus bennetti	Little Crow
Corvus orru	Torresian Crow
Coturnix pectoralis	Stubble Quail
Coturnix ypsilophora	Brown Quail
Cracticus nigrogularis	Pied Butcherbird
Cracticus tibicen	Australian Magpie
Cracticus torquatus	Grey Butcherbird
Cygnus atratus	Black Swan
Daphoenositta chrysoptera	Varied Sittella
Dendrocygna arcuata	Wandering Whistling-Duck
Dendrocygna eytoni	Plumed Whistling-Duck
Dicaeum hirundinaceum	Mistletoebird
Dromaius novaehollandiae	Emu

Egretta garzetta	Little Egret
Egretta novaehollandiae	White-faced Heron
Elanus axillaris	Black-shouldered Kite
Elseyornis melanops	Black-fronted Dotterel
Emblema pictum	Painted Finch
Ephippiorhynchus asiaticus	Black-necked Stork
Epthianura aurifrons	Orange Chat
Epthianura tricolor	Crimson Chat
Eremiornis carteri	Spinifexbird
Erythrogonys cinctus	Red-kneed Dotterel
Erythrura gouldiae	Gouldian Finch
Eulophus roseicapilla	Galah
Eurostopodus argus	Spotted Nightjar
Falco berigora	Brown Falcon
Falco cenchroides	Nankeen Kestrel
Falco hypoleucos	Grey Falcon
Falco longipennis	Australian Hobby
Falco peregrinus	Peregrine Falcon
Falco subniger	Black Falcon
Fulica atra	Eurasian Coot
Gelochelidon nilotica	Gull-billed Tern
Geopelia cuneata	Diamond Dove
Geopelia striata	Peaceful Dove
Gerygone fusca	Western Gerygone
Glareola maldivarum	Oriental Pratincole
Grallina cyanoleuca	Magpie-lark
Grus rubicunda	Brolga
Haliaeetus leucogaster	White-bellied Sea-eagle
Haliastur sphenurus	Whistling Kite
Hamirostra melanosternon	Black-breasted Buzzard
Heteromunia pectoralis	Pictorella Mannikin
Hieraaetus morphnoides	Little Eagle
Himantopus himantopus	Black-winged Stilt
Hirundo rustica	Barn Swallow
Hydroprogne caspia	Caspian Tern
Lalage sueurii	White-winged Triller
Lichenostomus flavescens	Yellow-tinted Honeyeater
Lichenostomus keartlandi	Grey-headed Honeyeater
Lichenostomus penicillatus	White-plumed Honeyeater
Lichenostomus plumulus	Grey-fronted Honeyeater
Lichenostomus virescens	Singing Honeyeater
Lichmera indistincta	Brown Honeyeater
Lophochroa leadbeateri	Major Mitchell's Cockatoo
Lophoictinia isura	Square-tailed Kite
Malacorhynchus membranaceus	Pink-eared Duck
Malurus lamberti	Variegated Fairy-wren
Malurus leucopterus	White-winged Fairy-wren
Malurus melanocephalus	Red-backed Fairy-wren
Malurus splendens	Splendid Fairy-wren
Manorina flavigula	Yellow-throated Miner
Melanodryas cucullata picata/ westralensis	Hooded Robin (Mainland)
Melopsittacus undulatus	Budgerigar
Merops ornatus	Rainbow Bee-eater
Microcarbo melanoleucos	Little Pied Cormorant
Microeca fascinans	Jacky Winter
Milvus migrans	Black Kite
Mirafra javanica rufescens/ forresti	Horsfield's Bushlark (Mainland)
Ninox novaeseelandiae	Southern Boobook
Nycticorax caledonicus	Nankeen Night Heron
Nymphicus hollandicus	Cockatiel
Ocyphaps lophotes	Crested Pigeon
Oreoica gutturalis	Crested Bellbird
Pachycephala rufiventris	Rufous Whistler
Pardalotus rubricatus	Red-browed Pardalote
Pardalotus striatus	Striated Pardalote
**#Passer domesticus*	House Sparrow
Pelecanus conspicillatus	Australian Pelican
Petrochelidon ariel	Fairy Martin
Petrochelidon nigricans	Tree Martin
Petroica goodenovii	Red-capped Robin
Phalacrocorax sulcirostris	Little Black Cormorant
Phaps chalcoptera	Common Bronzewing
Phaps histrionica	Flock Bronzewing
Platalea flavipes	Yellow-billed Spoonbill
Platalea regia	Royal Spoonbill
Plegadis falcinellus	Glossy Ibis
Podargus strigoides	Tawny Frogmouth
Poliocephalus poliocephalus	Hoary-headed Grebe
Pomatostomus temporalis	Grey-crowned Babbler
Psitteuteles versicolor	Varied Lorikeet
Psophodes occidentalis	Chiming Wedgebill
Purnella albifrons	White-fronted Honeyeater
Recurvirostra novaehollandiae	Red-necked Avocet
Rhipidura albiscapa	Grey Fantail
Rhipidura leucophrys	Willie Wagtail
Rostratula australis	Australian Painted Snipe
Smicrornis brevirostris	Weebill
Stiltia isabella	Australian Pratincole
Stipiturus ruficeps	Rufous-crowned Emu-wren
Sugomel niger	Black Honeyeater
Tachybaptus novaehollandiae	Australasian Grebe
Taeniopygia guttata	Zebra Finch
Threskiornis molucca	Australian White Ibis
Threskiornis spinicollis	Straw-necked Ibis
Todiramphus pyrrhopygius	Red-backed Kingfisher
Todiramphus sanctus	Sacred Kingfisher
Tribonyx ventralis	Black-tailed Native-hen
Tringa nebularia	Common Greenshank
Tringa stagnatilis	Marsh Sandpiper
Turnix pyrrhothorax	Red-chested Button-quail
Turnix velox	Little Button-quail
Tyto javanica	Eastern Barn Owl
Vanellus miles	Masked Lapwing

Mammals (extant species only)

**Bos taurus*	Cattle
**Bubalus bubalis*	Swamp Buffalo
**Camelus dromedarius*	Camel
Canis lupus	Dingo
Chalinolobus gouldii	Gould's Wattled Bat
Dasycercus blythi	Brush-tailed Mulgara
**Equus asinus*	Donkey
**Equus caballus*	Horse
**Felis catus*	Cat
Lagorchestes conspicillatus	Spectacled Hare-wallaby
Leggadina forresti	Central Short-tailed Mouse
Macropus robustus	Common Wallaroo
Macropus rufus	Red Kangaroo
Macrotis lagotis	Bilby
**Mus musculus*	House Mouse
Notomys alexis	Spinifex Hopping-mouse
Notoryctes typhlops	Southern Marsupial Mole
Nyctophilus geoffroyi	Lesser Long-eared Bat
Onychogalea unguifera	Northern Nailtail Wallaby
**Oryctolagus cuniculus*	Rabbit
Planigale ingrami	Long-tailed Planigale
Pseudantechinus macdonnellensis	Fat-tailed Antechinus
Pseudomys delicatulus	Delicate Mouse
Pseudomys desertor	Desert Mouse
Pseudomys hermannsburgensis	Sandy Inland Mouse
Pseudomys nanus	Western Chestnut Mouse
Pteropus alecto	Black Flying-fox
Pteropus scapulatus	Little Red Flying-fox
Sminthopsis macroura	Stripe-faced Dunnart
Sminthopsis youngsoni	Lesser Hairy-footed Dunnart
Tachyglossus aculeatus	Echidna
Vespadelus finlaysoni	Finlayson's Cave Bat
**Vulpes vulpes*	Fox

APPENDIX 6
IPA Weed Hygiene Procedures

1. Clean-down procedures

Mobile / On site

The cleaning of vehicles and machinery on site prevents weed seed contaminants being spread to an adjoining weed-free or less infested area/property/road.

Mobile/Field Site Selection

- The most important point to consider is run-off. Ensure the site is away from watercourses and drains. This will prevent weed seeds, grease and detergents polluting the stream.
- The site should be relatively flat (a slight slope or railway sleepers may prevent water logging) to help prevent run-off and for safety reasons.
- The site must be easily identified for future reference as this location will need monitoring for future outbreaks in the following seasons. The landholder/ trustee of the land should also be notified of this location (a painted post, tree, distinguishing landmark or GPS recording is ideal).
- An area that is well grassed will reduce mud during cleaning down and assist as competition for any weed seed that later germinates.
- Landholders should be consulted to determine a suitable clean-down site.
- The site should be close to the infested area to prevent further spread.
- Avoid crossing the property boundary prior to cleaning down (unless the infestation is also located on the adjoining property at similar or higher densities).
- Small clean downs may be conducted at the landholder's shed facilities (with permission) prior to leaving the property.

Suggested Equipment

- A mobile water tanker or spray unit is ideal.
- Water may also be pumped from a dam or cattle trough/tank.
- High pressure water from a gurney or pump should be used.
- An air compressor will be needed to remove dry material (radiators and grain headers).
- Use a broom/dust pan (for cleaning cabins) or small dust-buster vacuum.
- A garden hose may be adequate for small clean downs.

2. Vehicle inspection checklist for machinery operating in the IPA

(Checklists have been adapted from Queensland Weed Seed Spread Project 2000)

Cars, 4WD, Trucks and Trailers

1. Ensure that the vehicle is unlocked and you have access to the boot and bonnet.
2. Inspect the interior of the vehicle, especially:
   - foot wells, carpets and mats for burrs, seeds and mud
   - tool boxes.
3. Inspect inside the boot of the vehicle. Remove any contents if required to facilitate inspection of the following:
   - carpet (deposits of hay, weed seeds, burrs and/or soil or water)
   - spare tyre area
   - other recesses in the boot/rear of the vehicle.
4. Inspect the engine bay, especially:
   - radiator
   - grill
   - top of transmission gearbox
   - recess under windscreen wipers.
5. Inspect the underside of the vehicle, especially:
   - wheel arches, wheel trims, flares, step treads, bumpers
   - mud flaps
   - tyre rims (particularly the rear side)
   - axles and differentials
   - spare tyres on 4WDs and station wagons (note: these are often suspended underneath and are

potentially a high risk area as contaminants collect inside the horizontally-positioned rim).

6 Inspect boxes and/or cartons present in the vehicle if you cannot ascertain their contents.

7 For utes and trucks, inspect the floor of the tray and channels of tail gates, side guards and under chassis rails, gaps in the floor welds or boards, and bolt holes.

8 Inspect trailers – check wheels, guards, trays, channels of draw bar and under body.

Wheeled loaders and compactors

Check all areas, with particular attention to the following:

1 Driver's cab
- Check externally under and around driver's cab.
- Check under mats in cab.
- Remove/lift seat; remove/lift floor pans to allow checking to top of transmission. Check air conditioner filter (if fitted) – shake/tap filter to check if clean.

2 Tracks/track frame
- Examine tracks carefully.
- Ensure inspection/cover plates are removed to allow inside track area.
- Check idler wheels (these support the tracks).

3 Belly plates should be removed to allow inspection and cleaning.

4 Rear plates at back of dozer should be removed to allow inspection and cleaning.

5 Hydraulic cover plates should be removed to allow inspection and cleaning.

6 Engine
- Check radiator core and engine area for residues.
- Remove and check the air filter/cleaner (these often require destruction where they are clogged with Quarantine Risk Material).
- Carefully check the void space between the oil and radiator cores.

7 Battery box
- Lift/remove the battery to check for contamination (battery box may be at side/rear or under seat).

8 Fuel cells
- These are removable, therefore dirt and other material can pack between the tank and the frame.

9 Blade
- Ensure that the edge of the blade top/bottom is not split – this allows soil to be packed very tightly in the hollow.
- Check cutter points/wear blades.
- Check trunction arms.
- Carefully check the pivot points and adaptors at the rear of the front blade – these allow the blade to change height and angle. Sometimes soil has compacted and is difficult to dislodge.
- Check all hollow sections.

10 Ripper support frame is usually hollow.
- Check carefully if any contaminants have entered this section. The tynes may need to be removed.

11 Tynes
- Tynes need careful inspection. Often, contamination can be removed by water blasting, but in some case the tynes will need to be removed.

APPENDIX 7

IPA Road and Track Construction and Rehabilitation Guidelines

(Guidelines have been taken from those contained within CLC ALRA exploration deeds.)

For more specific details on constructing whoa-boys and undertaking other remedial earthworks, refer to Factsheet: Introduction to Soil Erosion (Northern Territory Government 2007).

1. Location

1.1 Proposed road locations will be identified on the ground and, where necessary, checked by interpretation of aerial photographs prior to finalising their positions.

1.2 The physical and biological environment and the identification of potential impacts outlined in the environmental profile will be considered when locating the roads to ensure they are in areas of low erodibility and low vegetation density and that the environmental impact of the road is minimised.

1.3 Wherever possible, roads will ascend or descend along ridges and be located along the contour when traversing slopes.

1.4 (a) roads will be kept out of drainage lines

(b) roads will avoid claypan areas and salt lakes

(c) road construction will avoid clearing stands of shrubs and trees

(d) roads will avoid restricted or unusual habitats as identified in the environmental profile.

1.5 Use of existing roads will be made wherever possible.

1.6 No more than one road will be constructed between any two sites of exploration activities, and all transport operations will be confined to this road.

1.7 If the CLC consents, a second access road may be constructed if it is necessary for the conduct of the project.

2. Construction

2.1 Roads constructed by pushing with a grader or bulldozer will be regarded as temporary dry weather access tracks. Vehicle use will be avoided during wet weather.

2.2 The blade depth used in road construction and the consequent windrow development will be minimised, especially on sand plains, dune systems, gibber plains and dissected tablelands.

2.3 Roads located across slopes should have adequate cross-drainage to disperse water across the road, to the down-slope side. Trafficable cross-banks will be constructed at regular intervals sufficient to catch water running down the road and divert it to the down-slope side.

Using this form of construction allows drains on the up-slope side of the road to be avoided, thus avoiding the need for culverts.

2.4 Borrow pits used in the construction and maintenance of roads will be managed according to specifications for effective rehabilitation of borrow pits.

3. Rehabilitation

3.1 Roads will be rehabilitated at the cessation of exploration activities (unless the company intends to utilise that road in the future and has approval from the CLC), and the rehabilitation will take place, where possible, prior to the next rains at the end of the field season for which the road was constructed.

3.2 The windrows of top-layer soil and vegetation created during construction will be re spread evenly across the track. The track will then be tyned with the grader rippers.

3.3 If the CLC directs, on completion of exploration activity the company will rehabilitate the access roads by deep ripping. If, in the opinion of the CLC, the seed store in the top layer and the re-spread vegetation proves to be non viable after the first rain after rehabilitation, the company will revegetate the access road.

APPENDIX 8
Environmental Conditions of CLC Grazing Licences

Article 1 Aboriginal People and Sites

1.1 The licensee must not hinder or interfere with the entry upon, occupation or use of the licence area by Aboriginal people entitled by Aboriginal tradition to do so.

1.2 The licensee must:

(a) comply with all requests for the protection of sites on the licence area that are sacred or otherwise significant according to the instructions of traditional Aboriginal landowners

(b) prevent its agents, employees and contractors from entering such sites unless they are entitled to do so in accordance with Aboriginal tradition.

Article 2 Sustainable Land Management

2.1 The licensee's cattle operation on the licence area must be environmentally sustainable and in accordance with current industry best practice for pastoral land management.

2.2 The licensee will stock the licence area conservatively, having regard to the availability of feed and water.

2.3 The CLC may engage an expert pastoral consultant to inspect the licence area and advise on appropriate pastoral management practices.

2.4 The licensee will implement any pastoral management practices that are recommended in a report prepared by an expert pastoral consultant referred to in clause 2.3.

2.5 The licensee must not do any of the following in the licence area without the written consent of the CLC:

(a) use the licence area for any other purpose than grazing cattle

(b) graze more than the maximum head of cattle (including calves and weaners) at any one time

(c) overgraze, i.e. graze more cattle than is environmentally sustainable

(d) cause soil erosion or other environmental degradation to the licence area

(e) lop, prune, damage or remove any native tree, timber, shrub, bush or other growth, alive or dead, other than for the purpose of maintaining improvements and fire breaks

(f) use fire

(g) introduce or propagate any new plant or animal species (other than stock horses)

(h) disturb or remove any rock, clay, sand, gravel or other constituents of the soil, other than the purpose of maintaining improvements

(i) disturb, destroy, bait or remove any wild animals or birds (including wild dogs) or other wildlife, other than feral horses, donkeys and camels

(j) interfere with any environmental monitoring points set up within the licence area.

2.6 The licensee must, at its own expense, maintain appropriate fire breaks around the licence area.

2.7 The licensee must comply with all reasonable requests made by the CLC on behalf of the licensors in relation to any monitoring points within the licence area, including taking and providing to the CLC photographs of the licence area.

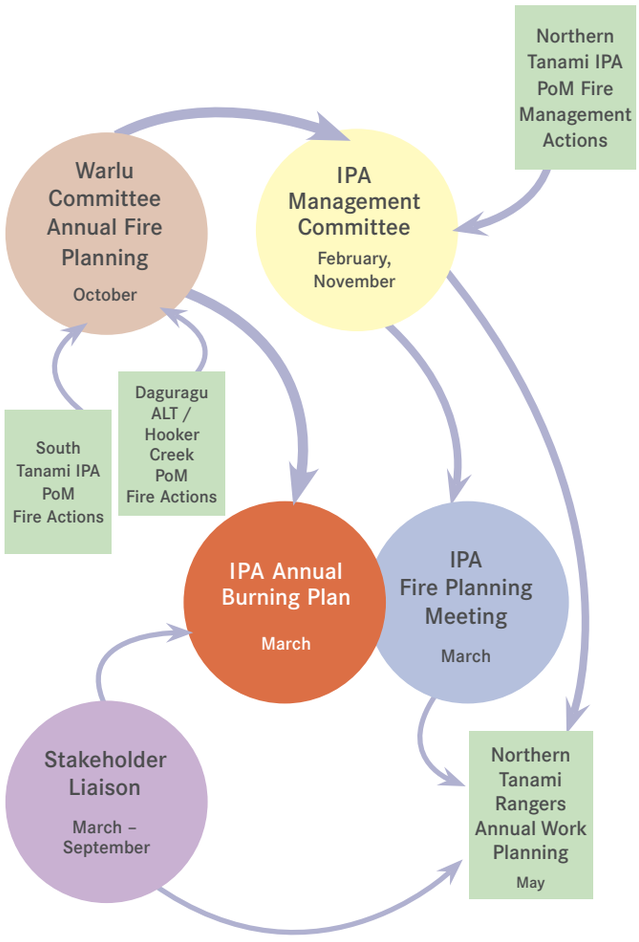
Article 3 Feral and Weed Control

3.1 The licensee is responsible for keeping the licence area free from feral horses, donkeys and camels.

3.2 The licensee is responsible for keeping the licence area free from declared weeds and must comply with relevant weed management plans approved pursuant to the Northern Territory *Weeds Management Act 2001*.

3.3 The licensee must comply with all notices and orders issued by any government department or agency requiring an infestation of a declared weed within the licence area to be removed or otherwise controlled. If the licensee fails to comply with a notice or order within a reasonable time, the CLC may arrange for the removal or control of the infestation and the licensee must pay the costs of the operation.

APPENDIX 9
Annual IPA and Regional Fire Planning Cycle



Fire Planning Stakeholder Summaries

Warlu Committee

This is the peak Aboriginal fire planning body for the Tanami and Barkly regions. It meets annually to define strategic fire management goals with regards to regional fuel loads, long-range forecasting and natural and cultural resource values. The committee has a key role in advocacy for and promotion of contemporary and traditional fire management.

Partners: CLC, Bushfires NT

Meetings: Annually, usually in October

Who: Elected delegates from communities in the Northern and Southern Tanami IPAs and the Barkly / Tennant Creek region

IPA Fire Planning Meeting

This community meeting is convened by IPA Management Committee delegates in Lajamanu and provides a forum for the identification of local fire management priorities and concerns. Regional planning and review outcomes from Warlu and IPA Management Committee meetings are presented to build and refine local burn plans and broker community participation in their implementation. Local fire management interests and concerns from community meetings feed up to the IPA Management Committee.

Partners: Regional Councils, Wulaign Homelands Council Aboriginal Corporation and local service providers, North Tanami Rangers

Meetings: Annually, usually in March

Who: IPA Management Committee delegates, traditional owners and interested community members

Stakeholder Liaison

A series of stakeholder consultation and planning meetings is required to enhance cross-border fire management outcomes and ensure the safe and effective execution of IPA fire management priorities. Stakeholder fire management interests and concerns identified here feed up to the IPA Management Committee.

Partners: Traditional owners of adjacent Aboriginal ALTs and personnel from neighbouring pastoral leases

Meetings: Periodic, depending on the level of interest shown by respective stakeholders or the need to resolve cross-border issues

Who: IPA coordinator, IPA Management Committee delegates, stakeholder representatives

KURDIJI

'Shield - to protect and discipline'

Lajamanu Law and Justice Group

Senior Warlpiri and Gurindji leaders declare the Kurdiji building open, 20th May, 2013
Photo: Penny Smith, Karungkarni Art and Culture Centre, Kalkaringi

To all non-Warlpiri visitors to Lajamanu:

We, as Kurdiji members, welcome you to Lajamanu and hope you enjoy your stay here. We encourage you to talk with us if this is your first time here.

We are a group of senior men and women from Lajamanu who are actively involved in promoting respect for Aboriginal and non-Aboriginal law and justice within the community. Kurdiji, or shield, is a Warlpiri word and carries the meaning 'to shield, block, protect or ward off'. The shield represents protection of the community and is also an integral part of the initiation ceremonies in which young men and women are taught knowledge about and respect for the law so they can be fully functioning members of our community (see below for more about kurdiji).

Together with Night Patrol, the Police, NAAJA (legal aid), the Central Land Council, the Art Centre, the shop and others, we are working to keep Lajamanu a peaceful and happy place.

This map and other information is here to help you understand a little bit about Lajamanu and make sure you are happy and safe here.

The map shows our ceremony areas which are restricted to Warlpiri people and their guests. These restricted areas are protected by Aboriginal and Anglo-Australian law. To avoid causing us great offence and breaking the law, please do not enter these areas at any time or for any reason unless invited by senior Warlpiri people.

The men's areas are for initiated men only. There are some access points that male workers can use, with the permission of senior people, but they should never have women or children with them.

There is also a women's area that men should never enter.

During ceremony there may be additional restrictions on movement. It's your responsibility to be aware of these, so please ask community members if you're not sure. Most ceremony happens between December and March, but can happen at other times.

We also ask that you exercise caution on the sorry ground and not drive vehicles through this area.

There are also other areas around Lajamanu that may be sensitive, so please talk with us before going to new areas. Please do not disturb or remove anything around Lajamanu.

Above: Some of the members of the Kurdiji group working in the Kurdiji office, March, 2014
Left to Right: - Nirrpiya (Judy) Napaljarri Walker, Yulngari (Biddy) Nungarrayi Long, Sharon Nampijinpa Anderson, Nanginarra (Elizabeth) Nungarrayi Ross, Jikirrlyipa (Jerry) Jangala Patick, Robert Jupurrurla Chapman (CLC governance project co-ordinator), Pirdakari (Joe) Japangardi Marshall, Minawarra (Josias) Japangardi Dixon

Photo credit: Dianne Smith

Below: One of the Kurdiji signs you may see in the Lajamanu community area.

Published March 2014 by the Kurdiji group with the support of the CLC Governance Project.

An explanation of land law from the Central Land Council

The Central Land Council has written this for us to explain kardiya (non-Aboriginal) law.
Please remember that our yapa (Aboriginal) law is still alive and applies to all our lands as well.

CENTRAL LAND COUNCIL

CENTRAL LAND COUNCIL STATEMENT

Anglo-Australian law governs Aboriginal land ownership in a number of ways. In the Northern Territory the most obvious way is the Aboriginal Land Rights (Northern Territory) Act (Commonwealth, 1976), which recognises Aboriginal freehold ownership of land. This means the owners of the land have as much right to their land as any other private landholder. This Act, often referred to simply as ALRA, applies to over 50% of the Northern Territory. The public may travel on roads in the area near Lajamanu however this does not include unrestricted access to the community for which a permit from the Central Land Council is still required.

Lajamanu sits on ALRA land (the Hooker Creek Aboriginal Land Trust).

Aboriginal sacred sites are also protected by the NT Aboriginal Sacred Sites Act, which may impose heavy penalties on unauthorised access or damage to sacred sites.

Common law trespass also applies to Aboriginal land, as it does to all private freehold land.

The Central Land Council works with traditional owners to help manage and use their land, to consult over third party proposals to access that land, to manage income arising from land use agreements and to represent the interests of Aboriginal people across central Australia.

The ALRA provides for a permit process for visitors wanting to access Aboriginal land and remote communities situated on Aboriginal land. These permit provisions were amended as part of the 'Intervention' in 2007. Now, permits are not required to access 'common areas' of communities. This does not include people's homes or any in-community accommodation. Extended visitation in a community on Aboriginal land still requires a permit. Access to all Aboriginal land outside of community boundaries, for example for camping or hunting, still requires a permit. Regardless of the specific rules governing permits, it is a strong wish of Lajamanu residents, and of Aboriginal people all across the whole Central Land Council region, that visitors apply for permits as a mark of respect.

Permits can be obtained via the Central Land Council. For more information visit:

http://www.clc.org.au/frequently-asked-questions/cat/permits or call 8951 6211. Permits are issued free of charge.

It is also important to know that Lajamanu sits within a declared Indigenous Protection Area (the Northern Tanami IPA); this area stretches a small distance to the north of Lajamanu and a vast distance to the south. Management of this area to preserve its unique natural and cultural values is the responsibility of the Lajamanu Wulaign ranger group at the direction of the traditional owners and custodians. Normal permit conditions apply.

Lajamanu Visitor Guide 2.

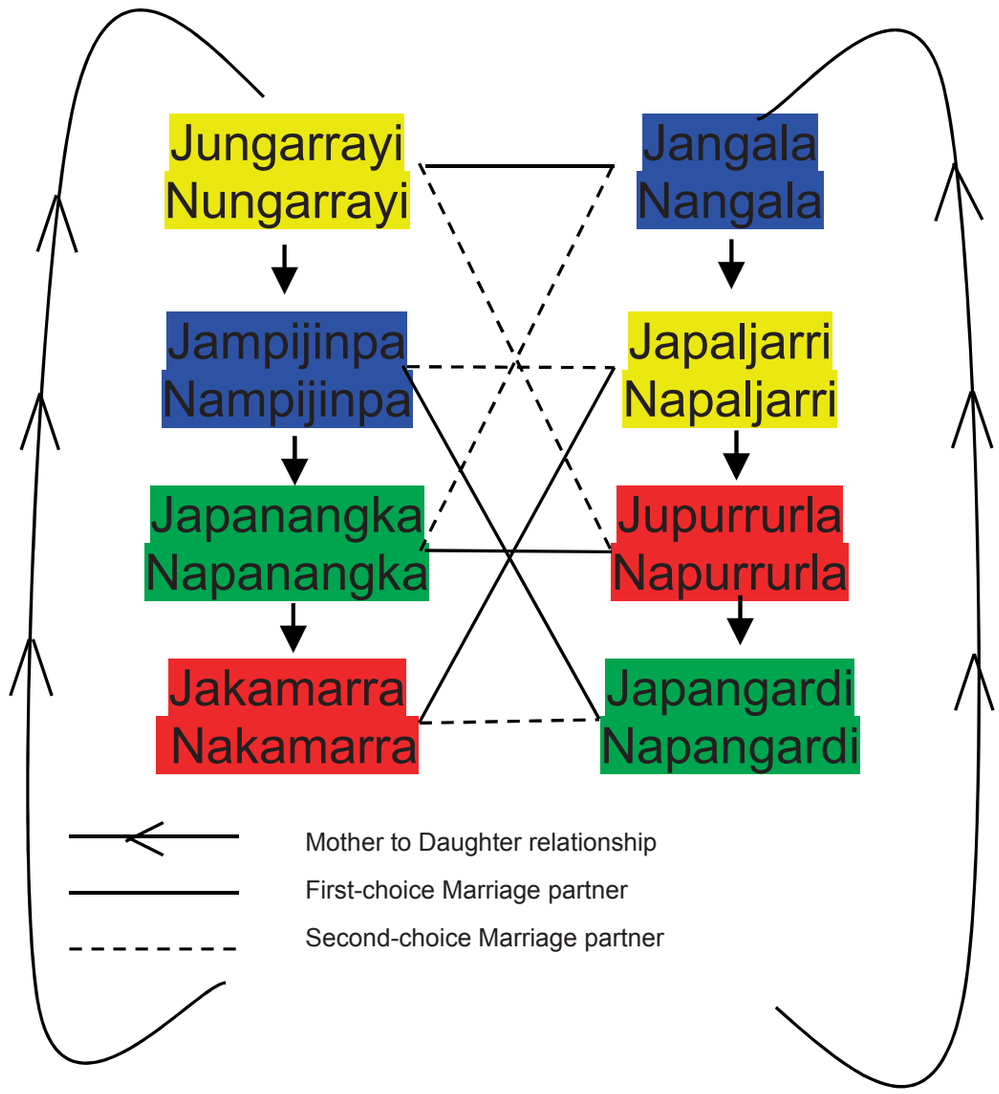
This is a map of the Northern Tanami Indigenous Protected Area showing some of the important sites.

3. Lajamanu Visitor Guide

Warlpiri kinship

One of the most important things that guides our way of living is family – or kinship. It's very important for us that everyone plays their part in a complex web of relationships. When we are all working together properly, observing correct behaviour with our family members and fulfilling our obligations, everyone is happy, good decisions can be made and we all move forward.

It will take a long time to understand Warlpiri kinship, but one of the basic things is understanding our skin names and how they relate to each other. This table can help:



The arrows show how the skin cycle is passed from mother to daughter. For instance if a woman is Napaljarri her daughter will be Napurrurla and her son will be Jupurrurla (male skins start with J and female ones with N). The solid connecting lines show the skin group from which your preferred marriage partner should come. The dotted lines show the second preferred alternative.

There is a lot more to even this simple diagram, but if you sit with your Warlpiri friends and learn this you will start to learn more!

Lajamanu Visitor Guide 4.

Welcome

Once again, we say welcome to our community. We are your friends and want to help you stay safe and happy in Lajamanu. Please come and talk to us and get to know us and share this place Lajamanu with us,
signed;

HENRY

JERRY Jikirrlyipa

JOE JAMES J

Leslie Robertson

GEOFFREY MATTHEWS

Robert George

Ny Patrick

GEOFFROY WANGAPA JUNGARRAYI BARNES

Peter Jigili

ANDREW Johnson

Pirdakari Joe Marshall

Josias MINAWARRA DIXON

Judy Walk Ngirrpiya

BIDDY

Elizabeth, Ross Nanginarra

Kitty Simon

Agnes Donnelly

Patrick

DORIS LEWIS

Sharon Anderson

5. Lajamanu Visitor Guide

More about kurdiji

The Lajamanu Law and Justice Committee was established in 1998 in response to a joint letter from the former Lajamanu Community Council and the Lajamanu Tribal council to the Chief Minister of the Northern Territory, the Minister for Police and the Minister for Aboriginal Development in September, 1997. They identified the need for customary law and the mainstream justice system to work together and asked for government assistance to establish a forum that could interface with the mainstream justice system and could work to bring the "two laws" together in a practical and meaningful way. Together with workers from the Office of Aboriginal Development (OAD), Aboriginal people established Law and Justice committees in Ali-Curung, Lajamanu, Yuendumu and Willowra. The OAD facilitated the development of a Lajamanu Community Law and Justice Plan through its Aboriginal Law and Justice Strategy (ALJS), which was also operating at Ali-Curung and Yuendumu. This Plan was signed by the Territory and Commonwealth Governments and community organisations in 1999. The Kurduju Committee, which was previously known as the "Combined Communities Law and Justice Committee", was established in 2001 with representation from the Lajamanu, Ali-Curung, Yuendumu and Willowra law and justice committees.

The Law and Justice Committees' primary functions were twofold:

1) a formal role

- To act as an interface with the law and justice system;
- Pre court conferencing;
- Victim-offender conferencing;
- Make recommendations to the Courts as requested;
- Assist with the development and management of community diversion programs;
- Report to Local Councils on law and justice trends and issues; and
- Act as a focal point for community law and justice concerns

2) an informal role

- Facilitate community dispute resolution;
- Coordinate the "community" response to law and justice, and
- Maintain sound relations between the community and law and justice agencies such as Police, the Courts and Correctional Services

The Law and Justice Committee, as signatories to their Community Law and Justice Plans, were the main community organisation with responsibility for overseeing and monitoring the implementation of government programs and commitments arising from the Plans.

Responsibility for the ALJS was transferred to the Department of Community Development, Sports and Cultural Affairs in 2001 and to the Department of Justice in 2003. The Lajamanu Law and Justice Committee and the overarching Kurduju Committee were, along with the other law and justice groups, de-funded in late 2003, although Community Corrections continued the pre-court conferencing aspect of the strategy until 2005.

Following community requests for its reinvigoration, the Lajamanu group reformed in 2010 with the assistance of NAAJA. Since then the group has met before each Lajamanu court sitting to discuss community safety issues and provide crime prevention advice and pre-sentence reports to the court. The Kurdiji group is routinely involved in informal dispute resolution, with the aim of proactively resolving small conflicts before they turn into larger problems. Since 2011, the Kurdiji have also been supported by the CLC's community governance project and have addressed a range of issues, including proactively addressing problems caused by outside conflict, representing community views to the Licencing commission and lobbying to have a direct line to the local police reinstated. They have successfully received community-controlled royalty funds for a major refurbishment of a disused building to be used as a kurdiji office and meeting space, travelled to neighbouring communities to discuss their work and initiate collaboration on issues of mutual concern, spoken to the media about issues affecting Lajamanu and presented at the Tennant Creek Strong Aboriginal Governance summit in April, 2013.

The CLC governance project

The CLC governance project worked with Lajamanu community to strengthen legitimate and effective decision-making structures in Lajamanu. The project operated from April 2011 to April 2014 and worked particularly closely with the kurdiji group.

The CLC and kurdiji members are currently seeking funding for the next phase of the project.

Lajamanu Visitor Guide 6.