

Indigenous perspectives on biodiversity

Fiona Walsh, Peter Christophersen and Sandra McGregor

Key messages

- * Aboriginal concepts that connect people to their 'Country' and to living things through a web of relationships are akin to the meaning of the English term 'biodiversity'.
- * Aboriginal people were, and in numerous cases still are, reliant upon plants, animals and ecological processes because bush foods, medicines and materials are components of Aboriginal economies, personal identity and culture.
- * Long-term observations, sustained residence and oral history inform Aboriginal people about changes in biodiversity.
- * Aboriginal solutions to declines in biodiversity focus on people and on their practical on-ground actions, particularly burning and the manipulation of target species for hunting and gathering.

INTRODUCTION

Aboriginal people shaped the pre-colonial environments of Australia for 50 000 years.¹ Today, formalised Indigenous land and sea management programs are increasingly significant in Australia, the origins lying in the relationships between Aboriginals and Torres Strait Islanders and their customary estates on land and sea – or ‘Country’ (Figure 6.1).^{2,3} It would be foolish to ignore Indigenous knowledge in helping shape future biodiversity management and research. So it is that this chapter gives voice to Peter Christophersen and Sandra McGregor, Aboriginal managers of lands adjacent to Kakadu National Park, Northern Territory.⁴ Co-author and scientist Fiona Walsh recorded discussions with Peter and Sandra and edited the text; their words are presented in italics, usually as one voice. Like most Aboriginal people, Peter and Sandra believe it inappropriate to speak for someone else’s Country. Hence, following their words on each topic, Fiona provides a wider perspective; then, in the chapter’s final section, she discusses recent national trends in Indigenous natural resource management.

- **Figure 6.1:** *There were more than 250 Aboriginal languages across Australia. This map indicates linguistic diversity. It is through language that people conceptualise and describe the variety of things on their lands. Today, language is one basis for Aboriginal protected areas, governance and decision-making related to biodiversity.*⁵





AN INDIGENOUS PERSPECTIVE ON BIODIVERSITY

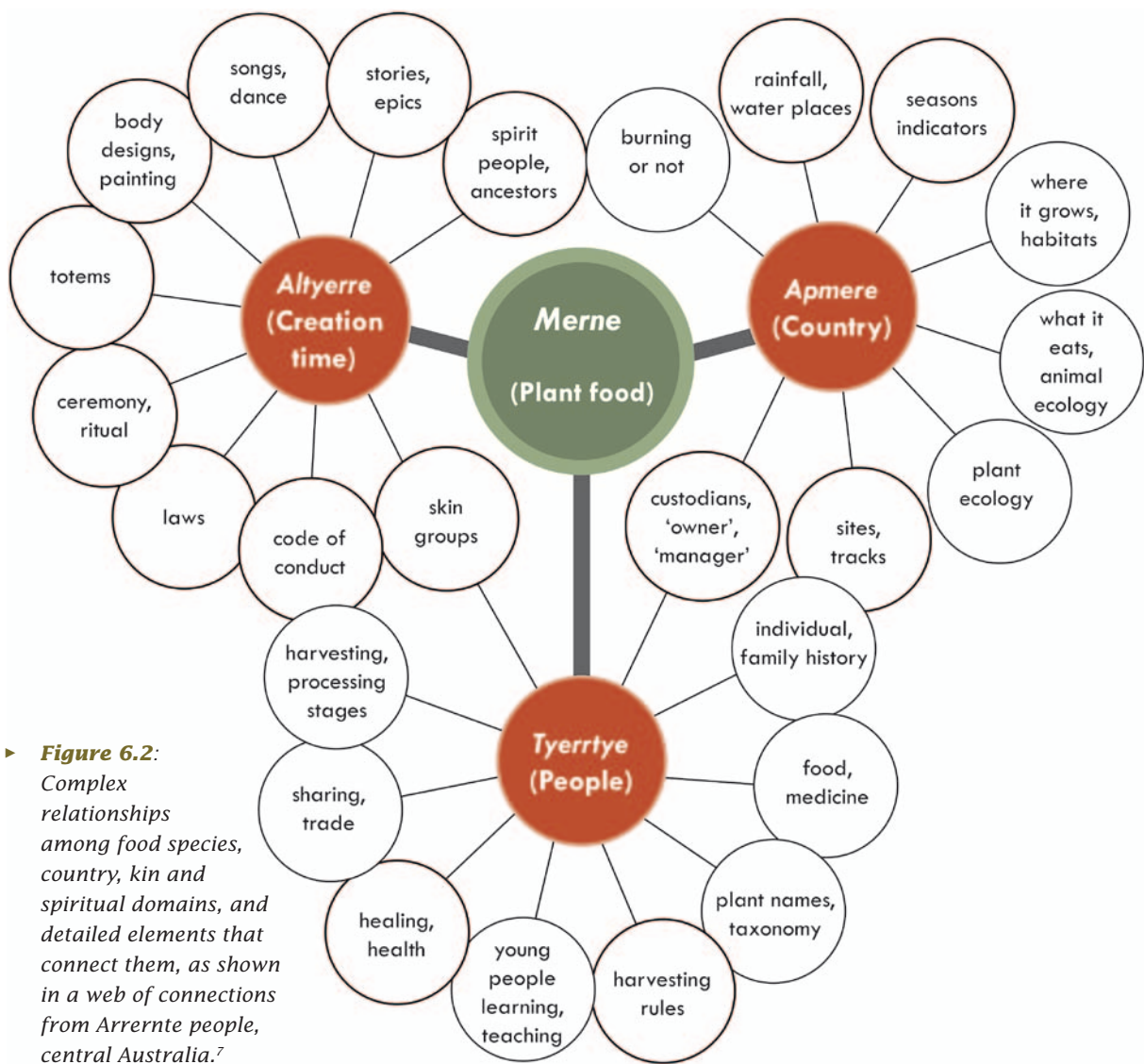
What is biodiversity and why is it important?

We look at Country as everything all living together. When you look, it's healthy because everything's got order and connection. Everything living and non-living: the birds and the rocks, and the relationship things have with each other. It is not just animals and plants. It includes humans, weather and all – not just those things that are living there but also the relationships, how everything functions together. In our eyes, humans are a part of the system. Biodiversity is not a word we use.

For us a healthy wetland means looking at the health of all. We're looking at all the individual species of plants that would enhance magpie geese and ducks. We know how to manage those plants to enhance the geese. Geese are important because we eat them. They are our bush foods. The other night we were talking about rewards. For everything we do here, there's something that we get out of it. We're not just working and working with no benefit. This reward might be more or bigger geese, or it might be easier to hunt wallabies. A benefit for non-Aboriginal mob is to have this pristine-looking place with plenty of animals. Ours is the same, except that we also need to utilise the animals. We have an understanding of how all those pieces benefit each other. Then at the point when those pieces stop benefiting we've got to jump in and help nature along a bit.

The many Aboriginal dictionaries contain numerous references to plants, animals and ecological processes, but it is doubtful if in any language there was a single term that directly translates to 'biodiversity'. Related words do exist, for example in Yanyuwa⁶ *yumbulyumbulmantha ki-awarrawu* – all kinds of things from Country – and in Arrernte, *anpernirrentye* – kin relationships among all things.⁷ Both terms embed people among plants and animals and their interrelationships, all of which is a result of the creation of the world in the time known as the Dreaming when the laws governing Country and people were established (Figure 6.2). Aboriginal people commonly refuse to separate people from ecosystems, or the social from the natural and spiritual worlds.

For Indigenous people, native plants and animals provided all food, medicine, materials, and life necessities equivalent to those from supermarkets, pharmacies or hardware stores.⁸ Precise classifications often exist; for example, Yanyuwa people from around Borroloola in the Northern Territory recognised 21 categories of bony fish and eels classified by habitat and utility, and 16 terms for *waliki* (dugong, *Dugong dugon*) of different gender and life stages.⁶ Aboriginal languages also encoded details of landforms, climate and ecological processes (Figure 6.3). Today, some Aboriginal people are still materially dependent upon native species.^{9,10} For any single species used as a resource, several others are often needed to make it useful. To treat a burn, for example,



► **Figure 6.2:** Complex relationships among food species, country, kin and spiritual domains, and detailed elements that connect them, as shown in a web of connections from Arrernte people, central Australia.⁷

a healer in desert Australia would apply the silk bag of a processionary caterpillar (*iwepe*, *Ochrogaster* spp.) with a poultice of emu bush (*utnerrenge*, *Eremophila longifolia*) (Figure 6.4). Five further species were also required for effective healing, but at a step distant in the process.¹¹ In turn, each of these species has multiple other interrelated uses, as expressed by Peter and Sandra: *how everything functions together*.

- 1 *Yijan balarrinjarra* – marks made by the Dreamings
- 2 *Lhirrilhirri* – shell grit

- 3 *Janjirikirri* – tidal rubbish
- 4 *Liyi-wankalawu* – piles of shells left by the old people



- A *Ma-murnda* – Beach vine
- B *Murranyurrany* – Island spinifex
- C *Ma-rilkarra* – Supplejack vine
- D *Nukurnu* – Tamarind tree
- E *A-waynkuwaynku* – Coastal casuarina

- F *Na-wulawulanga* – Vine thicket
- G *Ma-wunjurrwunjurr* – Billy goat plum
- H *Wurrurru* – Beach cedar
- I *Ma-kawurka* – Wattle tree
- J *Wakuwaku* – Cypress pine
- K *Budanja* – Messmate 'stringybark'

- L *Balwurawura* – Thick vine
- M *Wulban* – Tea tree
- N *Waraji* – Paperbark
- O *Ma-wurkarra* – Spiral pandanus
- P *Ma-lharrkuntha* – Water reeds
- Q *Ma-wurrayu* – Banyan tree

Antha – sea
Na-wuku – hill
Ngayulu – island spring water

Mankuru – saltpan
Narnu-wurru – beach
Waliyangu – island country

Na-anjinja – cave
Narnu-wuthan – intertidal zone
Yiji – soft white sandstone

▲ **Figure 6.3:** One of ten land units recognised on Yanyuwa Country, Northern Territory. These physical landscapes describe the habitats that underpin species and their ecological connections, and the places that are home to Yanyuwa. The Yanyuwa spiritual view of the environment is interlaced with this physical view.⁶

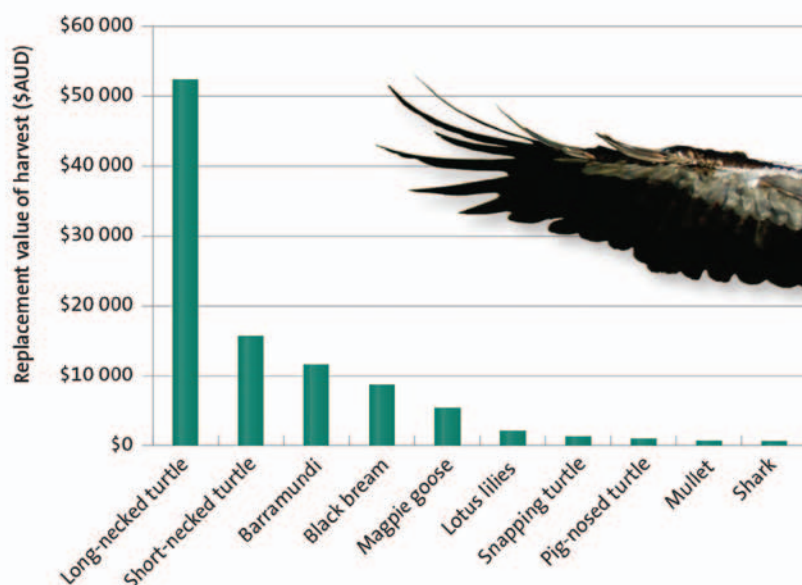
How is biodiversity tracked?

We know how Country has changed from talking to old people like Sandra's grandmother. She's about 74 years old. Sandra took her to her place, where once there were freshwater billabongs. The old lady said there used to be lilies; you could get turtles, millions of them. Now those billabongs are salt water, a different landscape. The old lady sort of knew the area but didn't know the place she'd landed, it had changed so much in 50 years. There are changes in our lifetime too. Sandra visited Boggie Plain in 1986, and then we both went there in 2000. Sandra looked at it and thought, 'No, this is not how it is supposed to be. It needs fire. It needs a helping hand to get back the numbers of plants and animals that should be here.'

We know how Country is changing by keeping an eye on what is happening. Hunting gets you out there, and you pick changes up by sight or smell. For example, we live a half-hour drive from the billabongs. Last night there was a north wind and we could smell salty mud. We knew what was happening out there. It is high tide. Salt water is going over the mud. The geese are digging the mud again and again. They are turning the mud to get food to condition themselves for one last flight before the Wet. This is going to be our last chance to get fat geese before they lose condition (Figure 6.5).



► **Figure 6.4:** In an Aboriginal worldview various ecological–human connections need to occur to make a natural product suitable for human use. Arrernte people describe the connections between insect and plant species needed to make a medicinal dressing. The iwepe (*Ochrogaster lunifera*, itchy grub, processionary caterpillar) is critical to these connections. This diagram records some of what Arrernte people say about the biology of connected species. The knowledge documented is the intellectual and cultural property of Arrernte and other desert people familiar with these species. Photos portray Veronica Dobson, Patricia Drover, Rena McCormack. Photos: (3) You Ning Su, Australian National Insect Collection; (9) Josie Douglas, CSIRO; (13) B McDonald; (14) Veronica Dobson, CSIRO; others by Fiona Walsh, CSIRO.¹¹



▲ **Figure 6.5:** The volume of bush foods, such as magpie geese, *Anseranas semipalmata*, turtles and fish, that were eaten by Aboriginal people at Daly River from 2008 to 2010 was equivalent to \$100 000 of store-bought foods. This figure only shows the ten 'most valuable' species.¹⁰

Aboriginal people living on or close to their Country accumulate observations of species and ecological interactions over a lifetime and pass them across generations, allowing tracking and monitoring of change. Such observations are now frequently represented as ecological calendars (Figure 6.6).¹² In contrast, scientists are usually short-term visitors who require historical documents to identify changes.

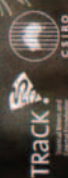
What is the condition of biodiversity?

It is hard to say really whether things are bad or good. We know it is getting worse. There is a big decline in mammals. That's really bad. They are missing and we're not really sure what's doing it, whether it's been cane toads coming in or bad burning or other things; we just can't put a finger on it. We look at one area of woodland and it seems in bad condition, then another area looks in good condition yet still doesn't have mammals. That's confusing. But it does not directly affect us as we don't hunt and eat those little mammals.

But then you see little things tweaked that benefit an animal. The cane toad came in and the goannas and a lot of snakes are disappearing. Now many ground-dwelling birds don't have those predators hammering them so there are more birds. Perhaps there is a new balance. The goannas used to dig up the long-necked turtle eggs, but now we're getting more little turtles. Maybe. We're just wondering about these links.

The goanna¹³ is very important to us. When the cane toad jumped in we found dead goannas everywhere. That tore our heart out. But we didn't rush out and hunt goannas down before they all got killed. We decided to let this change run its course. We decided we can't hunt that goanna

Daly River, Northern Territory, Australia



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anymore. We've got to look at how this animal adapts to the toad. We've found some goannas are still mating, and killing cane toads. We've found baby goannas, so there's a hope that there might be populations in future. The only goanna killed in a while was by an old lady. She had to get one because her grandson was nine years old and she needed to show him you eat goanna. 'This is how you kill it. This is how you prepare it.' Every now and then we have to sacrifice a goanna. The next generations need to know this is the way you hunt it, how you manage for that animal.

About hunting, different people have different ways. Some clans spend time to look after their land. They manage it so that their families can get food, more animals. But sometimes it is a sad situation. Some families can't manage their area. They might come and take from someone who is managing their land better. They take animals, get as much as they can, take and take. This has only happened a few times but it's hard.

The porcupine [*echidna*, *Tachyglossus aculeatus*] should be walked and tracked for, hunted for food. We don't see this animal very often, and have to work hard for it. Now if we find a porcupine on the road we walk them into the scrub. We rub the tracks out so no one can see to hunt them. We let them go because we worry maybe we're not managing the place properly or maybe something else is harming these animals. But our biggest problem is that if we don't utilise that animal then we might not remember how to manage for it.

This idea we have of biodiversity, of how everything's linked – that's why we feel that it's important to kill an animal every now and then. Doing this reminds us where this animal fits and how we've got to manage for it. Every time you lose an animal you lose a bit of knowledge – then animals and knowledge are gone.

Long-term recollections by Aboriginal people indicate that the diversity of bush foods and resources is often declining and associated cultural knowledge fragmenting.¹⁴ Declines of species are strongly felt because they affect nutrition, health and psychological wellbeing – people speak of being wounded or struck ill by these losses. The costs of biodiversity loss are obviously higher for those more reliant upon local species for food. Further, older Aboriginal people express concern at losing opportunities for future generations to learn, for they see such knowledge as critical to the cultural identity of their children.



*The environmental weed buffel grass, *Cenchrus ciliaris*, has invaded riparian systems of central Australia and displaced many bush food species. Here, Veronica Dobson points out an isolated plant of native pear, *Cynanchum floribundum*. Although it persists, it is vulnerable to both weed competition and wildfires fuelled by the weed. Native pears are highly valued for their edible fruit and foliage, and as hosts to important insects. Photo: Fiona Walsh, CSIRO.*

Aboriginal people identify many threats to the abundance of resources, some concurring with those seen by scientists. Sandra and other Aboriginal people say that bush food plants and animals are being pushed out by weeds (or 'stranger plants') and feral animals.¹⁵ Some introduced animals have replaced native animals as foods.¹⁶ Additionally, Aboriginal people attribute declines to human factors; for example, the passing away of rainmakers was said in some regions to explain a decline in rainfall.

What solutions are there to biodiversity decline?

Solutions? We're flat out trying to make a living and can't spend as much time managing this land as we want to. We spend a lot of time out here. With more time we'd be looking after cultural places, shooting feral animals, spraying weeds, burning, there's just never enough time. People's lives have changed and everyone is flat out doing other things. We're living here but still we're breezing over Country. We go out, assess things, utilise areas, do maintenance or management. It's hectic but even so we can't put in the time and effort needed to look after Country in fine detail.

The majority of Australians live in cities. They visit our Country, they say it's beautiful. They expect that a national park will be looked after well, but really you can't do it properly. There's a lot of Country where countrymen are living, trying to make a living, but they can't look after it really well because there's not enough money for it. Everyone's got to get little jobs. More money for countrymen to get rewarded for looking after Country properly would really enhance that biodiversity aspect.

There's value in keeping the land and improving its health. We know we could keep Country healthy if there was an economy built around that. Something like carbon farming, then there'd be a lot more Aboriginal mob out here working and looking after the place. Our primary role could be to manage the landscape and make sure it's all as good as we can make it. Surely that's got to be of benefit to all Australians.

On the wetlands we look at everything. At a point we say 'Oh! This species of plant is not doing so well, and so there aren't enough geese here.' Or 'It's getting harder to get turtles. So in the next



*Aboriginal fire management has increased the biodiversity and resources on Yellow Water's wetlands. Areas densely covered in mudja, *Hymenachne acutigluma*, (a) are replaced after burning by a variety of habitats, larger areas of open water and more species, such as wild rice and spike rushes (b). The number of animals favoured by Aboriginal people to eat, such as long-necked turtles and magpie geese, increases significantly. Photos: CSIRO.*

couple of years, we've got to burn this wetland.' We jump in to reset the clock. We know that when those plants come back after a burn the birds will be attracted back. We change the vegetation so that the goose benefits, the plants benefit, and we benefit.

For woodland, it's similar. We manipulate the grass with fire – it creates green pick to encourage animals to feed. We put a certain fire in and it'll help different grasses to grow and then it brings in the animals that we want – might be an agile wallaby, black wallaroo or other kangaroos. You've got acute knowledge of an animal built up over such a long time of managing for it. If someone says 'Oh! We're going to burn this off' and not think about the animals, that's craziness. Before we burn we're always thinking about what's happening in that area with its plants or animals.

Science can provide another layer of knowledge, particularly on long-term predictions. But sometimes we have different views. Scientists might look at climate change like it's going to damage the wetlands. We're saying though 'In the meantime weeds are going to come in and destroy a lot of those wetlands before climate change hits us. Then we'll need salt water to come in to knock out the weeds.' But that other layer of technical knowledge can help us predict. It is important in helping us make long-term decisions about Country. Science gives deeper understanding of future issues. Then we've got to work out how we work to adapt to all that change.

Many Aboriginal and Torres Strait Islander people combine traditionally derived and Western solutions in the face of biodiversity decline. Sandra and Peter emphasise the rewards for managing Country that include hunting. They also operate a small-scale business to harvest native seeds for mine-site rehabilitation. Enterprises based on natural resources for rehabilitation of vegetation, production of artefacts and niche foods or bush medicines are important to many Aboriginal groups.¹⁷ These enterprises rely upon a diversity of species.



Karnu (Nancy Taylor) hunting on a recent burn with high species diversity bordering a long-unburnt area dominated by spinifex in the Great Sandy Desert. Photo: Fiona Walsh, CSIRO.

Peter Christophersen, Sandra McGregor and their children. Children are guided in the ignition of small, careful, safe burns and so gain experience from a young age. Photo: Randy Larcombe.



The future

What I'd like to see in the future? I'm scared of that question because it's not going to pan out how I might want it to be. I'd like to see this country how it was before it was proclaimed as a park, where Aboriginal people are more active on their lands and live on their clan areas on outstations rather than in communities. Where we teach, pass knowledge on and preserve it. That's the only way I see biodiversity keeping in good order.

But we run our own business; we contract to the mining company, and that takes a lot of our time. Our children, we've got two that have left school and gone into a mining company. At the end of the day, you have to earn money. You can have all the knowledge but it's not going to help you get an income to buy a car or visit another country. We hope that all our kids will continue our work, but realistically it might be one or two of our four children. One older girl has a lot of knowledge and a good attitude. The other one, he enjoys Country but really he loves computers. It's not worth us saying 'No! You shouldn't do this, you should do that.' It'd be better to let him get that technology under his belt, bring him back and get him to apply it to managing the Country. If we don't take on new ideas then we won't be able to operate into the future. It's the mixture of the old and the new. He might be good at understanding all those concepts, whereas the girl would be good at doing the physical jobs. They complement each other – that's great.

Connection and care inspire us. The more we do, the more we understand, the more knowledge we gain. It's interesting finding out more about how things work, how the plants, animals and weather inter-link. Learning is really inspiring. So is teaching kids, teaching other people – sharing our little bit of knowledge and hopefully winning over another person to keep looking after this Country.

All people want a future for their children, and many Aboriginal people see the health of Country as integral to this aim. Feeling good about the future leads to action to make things better. Biocultural diversity will not be maintained through inaction or negativity, which weaken people and perpetuate apathy. When the careful, pragmatic optimism expressed by Sandra and Peter is aggregated in concept through many Aboriginal people and groups across Australia, it provides a pointer towards significant national benefit.

INDIGENOUS LAND AND SEA MANAGEMENT: NATIONAL APPROACHES

Overview

The 2011 State of Environment report identified increasing formal involvement of Indigenous people as one of four standout trends in environmental management in Australia over the last decade (Figure 6.7). Major components are summarised in Table 6.1.²

Table 6.1: Drivers of contemporary Indigenous land and sea management

Major drivers	Outcomes
Customary obligations to younger generations and Country	Culture as primary basis for Indigenous management of Country; education of Aboriginal children in cultural practices; strengthened relationships among people, their Country, species and Dreaming
Recognition of Indigenous rights in land	Indigenous interests in land now recognised over 60% of Australia: through tenure; where Native Title is held over land in whole or in part; or through Indigenous Land Use Agreements with other users
Indigenous leadership at multiple levels of decision-making	Opportunity for people to lead initiatives, such as advisory committees to government ministers, regional alliances and community ranger groups
Markets for land management and associated goods and services	Openings for Indigenous owners to benefit from programs enhancing natural resource management, such as commercial harvest of bush resources and the Indigenous Carbon Farming Initiative
Indigenous and co-managed conservation areas	53 declared Indigenous Protected Areas covering 36 million ha, 30% of the National Reserve System, and increasing numbers of co-managed national parks
Multiple benefits	Environmental benefits – reductions in weeds and feral animals, healthier fire regimes, fisheries management, border protection, carbon sequestration – married to wider social and economic gains in health and wellbeing via reduced antisocial behaviour, reduced welfare payments, and increased revenues from the closely related arts and crafts industries
Investment	Growing confidence in Indigenous environmental management leading to increased proportions of applicable Commonwealth Government funding (less than \$1 million a year in 1992, about \$90 million in 2012)

The rising success of Indigenous land and sea management stems principally from motivation, because activities on Country are driven by an expression of identity. Traditionally oriented Aboriginal and Torres Strait Islander people believe that their totemic Dreaming characters shaped both ecosystems and human existence.^{6,7} Plants, animals and landscapes are foundations of identity at several levels, through creation by ancestral characters of a person's sense of self, family and place. And human identity is matched by responsibility for undertaking activities on Country that are needed to keep it 'alive', actions that are critical to ecosystem function. Increasingly, ecologists

and natural resource managers see people as a part of ecosystems too, but they tend to classify people as 'resource users' or 'managers' and conceive these roles to be held by different individuals or groups. Aboriginal people connected to Country believe they are inside an ecological system – they hold and are held by Country, and their roles are both users and managers.

Indigenous people believe that their activities continue to exert practical and spiritual influence today. Both deliberately and inadvertently, people manipulate resources on land and near shore through hunting, burning, redirecting surface water, dispersing plants, cleaning water sources, and many other practices.^{1,6,7,8} Species of plants and animals and their relationships remain currencies of life: species are the focus of Aboriginal spirituality, comparable to the church and holy artefacts of Christian traditions. In this respect, support for management of biodiversity in an Aboriginal context may be seen as responding to the biocultural values highlighted in Chapter 1.

Among Aboriginal and Torres Strait Islander people are varied perspectives on the concept of biodiversity, just as in the wider Australian population. Many Indigenous people care strongly for their Country; others, however, may not express any views about biodiversity. Some are preoccupied with hardship, and others live in towns distant from their homelands. Still others pursue mining and mainstream economic opportunities without regard for biodiversity. Nevertheless the connection to biodiversity remains a widespread aspect of Aboriginal lives, as portrayed especially by artists from the bush and the city too. For example, in Melbourne Reko Rennie expresses his Gamilaraay ancestry in artworks of red kangaroo, echidna and other species.¹⁸



Indigenous artworks are rich in species, relationships and meanings. A painting by two Martu sisters of Karlamilyi (Rudall River) identifies 14 bush food and medicine species, six landforms, 26 places and six Dreaming characters. The painting asserts their family history and passion for these species and places. It stamps their authority to be recognised in decisions about land use.¹⁹

Legend

● Indigenous Protected Area Consultation Projects 2013 (34)

● Co-Management Consultation Projects - 2013 (7)

Indigenous Land Use Agreements (ILUAs) - 2013

■ Registered (702)

■ Notified (41)

■ Subject to objection (1)

NNTT Determination Outcomes - 2013

■ Native title exists in the entire determination area (80)

■ Native title exists in parts of the determination area (98)

■ Native title does not exist (48)

Landuse of Australia Version 4, 2005-06

■ Area managed primarily for traditional indigenous use

Australian Land Tenure 1993

■ Aboriginal Reserve

■ Aboriginal Deed of Grant

■ Aboriginal Freehold Land (inalienable)

■ Aboriginal Freehold Land (alienable)

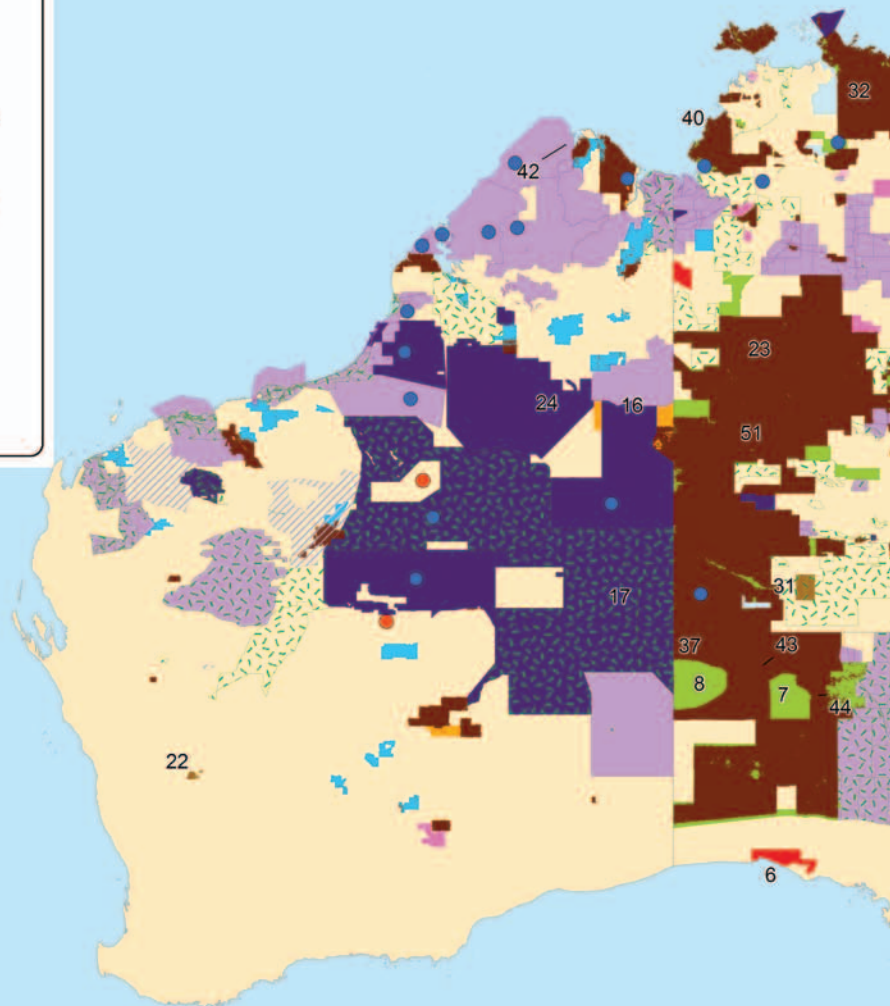
■ Aboriginal Local Government Lease

■ Aboriginal held lease (other than pastoral)

■ Aboriginal held pastoral lease

■ Multi feature Aboriginal freehold-National Park

► **Figure 6.7:**
Indigenous interests in country have been recognised to varying extents for more than half of Australia under different tenure regimes. Legal recognition of Indigenous rights and interests in land is a key driver of Indigenous land management.³ Map prepared by Petina Pert, CSIRO.



Map prepared by CSIRO, Ecosystem Sciences

Date: 1 March 2013

Data Source: Declared IPAs, and CAPAD10

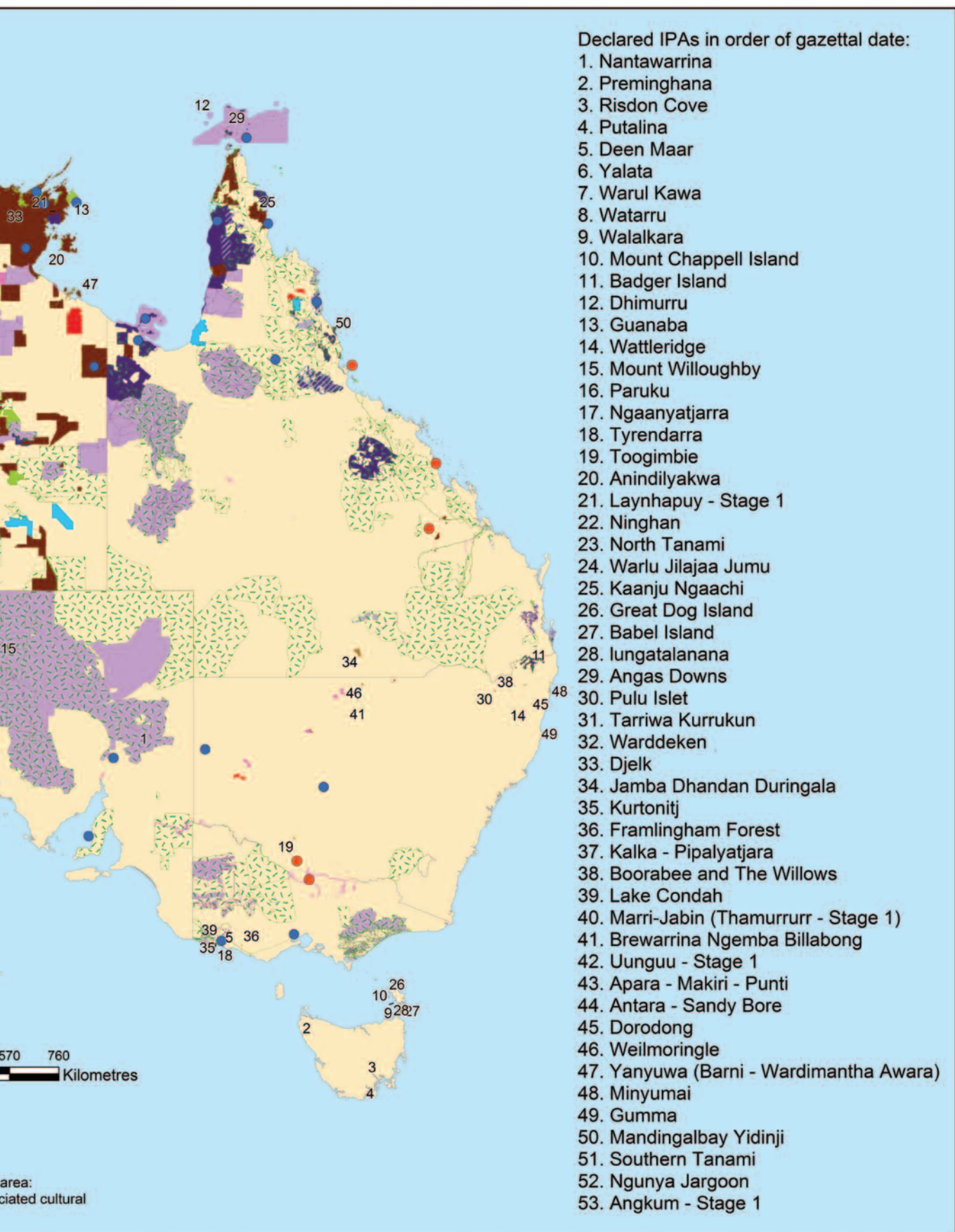
Indigenous Protected Areas Section,

Parks Australia, (c) Department of Sustainability Environment Water Population & Communities 2011, Geoscience Australia, NNTT.

The Registrar, the National Native Title Tribunal and its staff, members and agents and the Commonwealth (collectively the Commonwealth), accept no liability and give no undertakings, guarantees or warranties concerning the accuracy, completeness or fitness for purpose of the information provided. In return for you receiving this information you agree to release and indemnify the Commonwealth and third party data suppliers in respect of all claims, expenses, losses, damages and costs arising directly or indirectly from your use of the information and the use of the information you obtained by any third party.

Note: Some or parts of some determinations may not yet be in effect or on the Native Title Register. Some are also subject to appeal or in the appeal process.

The Collaborative Australian Protected Areas Database (CAPAD) 2010 provides both spatial and text information about government, Indigenous and privately protected areas for continental Australia. State and Territory conservation agencies supplied data current for various dates between June 2010 and January 2011. CAPAD provides a snapshot of protected areas that meet the IUCN definition of a protected area "A protected area is an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated resources, and managed through legal or other effective means" (IUCN 1994).



The successes in Indigenous resource management are patchy. They need to be strengthened, while being realistic about challenges resulting from socio-economic and educational inequities. Features that will widen the successes include the following:

- * Support to Indigenous land and sea management sustained by Indigenous people
- * Programs that help stimulate connections between Indigenous people and markets, creating employment and economic activity and reducing welfare dependency
- * Indigenous-specific and multi-year funding based on local cultural knowledge, practices and time-frames
- * Equitable, two-way engagement between Aboriginal people and scientists.³

On-ground solutions

Hands-on approaches are central to Indigenous natural resource management because many people have practical skills and prefer activities that take them regularly onto their Country. As Sandra and Peter pointed out, hunting is the rationale, tool and reward for managing land, while emphasising that hunting carries with it responsibilities to nurture the Country. Working with natural resources – notably hunting, gathering, fishing and burning – is especially necessary in Aboriginal minds for biodiversity conservation.



Martu rangers plan burns to protect populations of warru (black-footed rock-wallaby, Petrogale lateralis) with staff of the regional land management organisation (Kanyirninpa Jukurrpa) and the Western Australian Department of Environment and Conservation. Photo: Fiona Walsh, CSIRO.

Across remote Australia, the burning conducted by Aboriginal people is a major means by which biodiversity is manipulated.²⁰ Wildfire abatement and carbon sequestration through fire management provide vivid examples of beneficial Indigenous management.²¹ Aboriginal observational skills and local knowledge also provide increasing potential in controlling weeds and pests. In deserts, springs and rock-holes are cleaned and fenced. In tropical and temperate regions, Aboriginal people want strong roles in decisions about water allocations so their resource and cultural needs are sustained as well as biodiversity. Income to support management is essential and so businesses based on natural resources, such as seed harvesting and carbon offsets, have some consistency with Aboriginal attitudes to biodiversity.

The most significant Australia-wide development may be the growth of Indigenous ranger groups. Since 2007 more than 83 such groups have formed, employing more than 660 individuals.³ The initiatives have steadily developed capacity among rangers, especially through exchanges between traditional and scientific knowledge, and they deliver environmental as well as employment, economic and cultural benefits. Some Aboriginal groups incorporate cultural variables into their biodiversity assessments (Figure 6.8). Many ranger groups have taken up scientific tools such as Cybertracker and other hand-held data recorders for monitoring long-term change.

TARGET	KEY PARTS OF TARGET				OVERALL HEALTH
	LANDSCAPE/ SEASCAPE HEALTH	CULTURAL HEALTH	BIOPHYSICAL CONDITION	SIZE	
Wanjina Wunggurr Law - our culture	GOOD	POOR			FAIR
Right way fire	FAIR	FAIR	FAIR	FAIR	FAIR
Aamba and other meat foods	GOOD	FAIR	GOOD	GOOD	GOOD
Wulo	GOOD	FAIR	GOOD	GOOD	GOOD
Yawal	VERY GOOD	FAIR	GOOD	GOOD	GOOD
Bush plants	GOOD	FAIR	GOOD	GOOD	GOOD
Rock art	GOOD	POOR	FAIR		POOR
Cultural places on islands	GOOD	POOR	FAIR		POOR
Fish and other seafoods	GOOD	FAIR	GOOD	GOOD	GOOD
Mangguru and balguja	GOOD	FAIR	GOOD	GOOD	GOOD
Health of Wunambal Gaambera Country					FAIR

▲ **Figure 6.8:** Reports on monitoring now include biocultural targets and indicators of land condition. Here, the overall cultural and biophysical health of Country in the northern Kimberley is assessed to be 'fair'.²²

Conflicts can be associated with Indigenous use of biodiversity. Populations of some resource species were originally enhanced by Aboriginal activity, for example, provision of green pick for kangaroos through burning. However, with the introduction of guns and vehicles some species may be vulnerable to overharvesting. Hence, when hunting and gathering are decoupled from traditional management then the current threats and pressures causing declines may be exaggerated.

CONCLUSION

In recent decades, Aboriginal and Western approaches to biodiversity management have converged in some important ways. Indigenous Protected Areas and Indigenous land management organisations have led to expanded numbers of Aboriginal ranger groups and more Indigenous employment. More work is required to build upon these initiatives and to ensure that management of biodiversity will continue improving through incorporation of Indigenous views. The complementarity of Western and Aboriginal systems can lead to respectful two-way exchanges which are likely to give rise to locally driven, practical and more successful actions that maintain biodiversity or slow its decline.

FURTHER READING

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