

“ALL ABOUT HEALTHY COUNTRY”
ABORIGINAL PERSPECTIVES OF WEED MANAGEMENT IN
THE KIMBERLEY, WESTERN AUSTRALIA

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ABSTRACT

Aboriginal Australians are being employed through federally funded programs to undertake natural and cultural management (NCRM) of their ancestral country. These Aboriginal Ranger programs aim to provide economic and cultural opportunities for Indigenous communities to achieve positive environmental and conservation outcomes by drawing on Aboriginal knowledge and cultural connections to country.

A major component of Ranger work is the eradication of plants categorised as environmental weeds by land managers of various government and non-government agencies. Despite Aboriginal Ranger programs intending to foreground local Aboriginal perspectives to direct their work, Rangers predominantly manage environmental weeds according to the mainstream ecological paradigm. This thesis argues that the wholesale imposition of mainstream environmental weed discourse on Aboriginal NCRM programs disables Aboriginal Rangers from basing their weed management on culturally-embedded perspectives.

Based on my field research in the western and central Kimberley region of Western Australia, I show that Rangers and elders belonging to Bardi-Jawi, Bunuba, Ngurrara, Nyikina Mangala, Nyulnyul and Wilinggin country have nuanced, yet clear, understandings of 'healthy country' and the landscape change caused by plants. Through participant observation and field interviews, Rangers and elders from these groups challenged the current species-based approaches to weed classification and control and demonstrated that their views on weeds do not align with dominant environmental weed discourse and management. Instead, they highlighted the contextual and relational nature of weeds by linking them and their effects to the Aboriginal concept of 'healthy country'.

Significantly, these views are similar to the arguments made by ecologists and social scientists that are critical of mainstream invasion ecology and management of environmental weeds. Common to both groups are that weed problems are culturally and contextually specific and that weed management needs to maintain cultural and environmental values within changing landscapes by working alongside these changes, rather than constantly working against them.

These points of overlap provide vindication for Aboriginal Rangers to control weeds through a greater emphasis on site-based, rather than species-based management. Site-based management allows Rangers to connect their weed work to local and culturally specific visions for healthy country; integrate weed management into other aspects of Ranger work and in doing so frame weed management as promoting healthy country rather than destroying plants; and meet the practical constraints of Ranger work by focusing on a manageable scale.

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THESIS DECLARATION

This thesis contains no material that has been accepted for the award of any other degree or diploma in any university or other institution. To the best of my knowledge the thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

Signed:.....**Date:**.....

Thomas Bach

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LIST OF PLANTS CITED IN THE THESIS

COMMON NAME	BOTANICAL NAME	ALTERNATIVE NAMES
African mahogany	<i>Khaya senegalensis</i>	
Albay (Bardi-Jawi)	<i>Ficus virens</i>	
Bellyache Bush	<i>Jatropha gossypifolia</i>	
Birimhiri (Bardi-Jawi)	<i>Diospyros ferrea</i>	
Boab Tree	<i>Adansonia gregorii</i>	
Buffel Grass	<i>Cenchrus ciliaris</i>	
Bulrush	<i>Typhus orientalis</i>	Cumbungi
Butterfly Pea	<i>Clitoria terneata</i>	
Calotropis	<i>Calotropis procera</i>	Rubber Bush
Caltrop	<i>Tribulus terrestris</i>	Bindi
Chinee Apple	<i>Ziziphus mauritania</i>	Taylor fruit
Cobblers pegs	<i>Bidens pilosa</i>	
Coffee Bush	<i>Leucaena leucocephala</i>	
Freshwater mangrove	<i>Barringtonia acutangula</i>	
Gallon's Curse	<i>Cenchrus biflorus</i>	
Gamba Grass	<i>Andropogon gayanus</i>	
Goolay (Bardi-Jawi)	<i>Planchonia careya</i>	
Grader Grass	<i>Themeda quadrivalvus</i>	
Hairy Merremia	<i>Merremia aegyptia</i>	
Joongoon (Bardi-Jawi)	<i>Mimusops elengi</i>	
Kapok	<i>Aerva javanica</i>	
Khaki weed	<i>Alternanthera pungens</i>	
Konkeberry	<i>Carissa lanceolata</i>	Turkey Bush
Lantana	<i>Lantana camara</i>	
Melaleuca	<i>Melaleuca argentea</i>	Paperbark, Silver Cadjeput
Mimosa	<i>Mimosa pigra</i>	

Mimosa Bush	<i>Accacia farnesiana</i>	
Mintweed	<i>Hyptis suaveolens</i>	
Mission grass	<i>Pennisetum pedicellatum</i>	
Neem Tree	<i>Azadirachta indica</i>	
Noogoora Burr	<i>Xanthium Strumarium</i>	
Pandanus	<i>Pandanus spiralis</i>	
Parkinsonia	<i>Parkinsonia aculeata</i>	
Passionfruit Vine	<i>Passiflora foetida</i>	Stinking Passion Vine, Wild Passionfruit
Pindan wattle	<i>Acacia tumida</i>	Wongi in Bardi-Jawi
Rain Tree	<i>Albizia lebbek</i>	
Rosella	<i>Hibiscus sabdariffa</i>	
Rubber Vine	<i>Cryptostegia grandiflora</i>	
Sesbania	<i>Sesbania canabina</i>	Pea bush, Sesbania pea
Siratro	<i>Macroptilium atropurpureum</i>	
Soap Wattle	<i>Acacia colei</i>	
Speargrass	<i>Sorghum plumosum</i>	
Tamarind	<i>Tamarindus indica</i>	
Taro	<i>Colocasia esculenta var. aquatilis</i>	
Thornapple	<i>Datura inoxica</i>	
Walkabout weed	<i>Crotalaria crispata</i>	
Desert Walnut	<i>Owenia reticulata</i>	Turtjupart in Walmajarri
Yellow oleander	<i>Cascabela thevetica</i>	

GLOSSARY OF ACRONYMS

ACRONYM	DESCRIPTION
CALM	Western Australia Department for Conservation and Land Management (now DPaW)
CDEP	Community Development Employment Program
CLM	Conservation land management
DEC	Western Australia Department of Environment and Conservation (now DpaW)
DoTE	Department of the Environment (Federal Government)
DPaW	Western Australia Department of Parks and Wildlife
DPIF	Department of Primary Industry and Fisheries (Northern Territory)
EWSWA	Environmental Weeds Strategy Western Australia
IPA	Indigenous Protected Area
IPPP	Invasive Plant Prioritisation Process
IUCN	International Union for the Conservation of Nature
IEK	Indigenous ecological knowledge
KLC	Kimberley Aboriginal Land Council
KSCaCS	Kimberley Science and Conservation Strategy
LSMU	Land and Sea Management Unit
NCRM	Natural and cultural resource management
NLC	Northern Land Council
NRM	Natural resource management
NRS	National Reserve System
NT	Northern Territory
PBC	Prescribed Body Corporate
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities
TEK	Traditional ecological knowledge
WA	Western Australia
WKRVEP	West Kimberley Rubber Vine Eradication Project
WoNS	Weeds of National Significance

THESIS DEFINITIONS

Aboriginal refers to the original inhabitants of Australia. Specific names for Aboriginal groups in the Kimberley are used in context.

Country is an Aboriginal expression, described by Rose (1996) “nourishing terrain” that encompasses all living and non-living parts of a landscape as well as the interactions between them. While sometimes referring to a place (for example ‘Bunuba country’ or ‘Ngurrara country’), it highlights the interconnectedness of humans, animals, plants, and spirits to that place.

Environmental weeds are plants that are deemed unfavourable by mainstream environmental and conservation land management agencies. They are typically plants that are non-native, invasive, and affect local ecosystems.

Healthy country is an Aboriginal English phrase that describes the proper functioning of country.

Indigenous refers to the original inhabitants of any place.

Kartiya is a Kimberley Aboriginal term used to describe outsiders, usually non-Aboriginal people. The term can also be attached to other words to describe things that are not local to the area or the Kimberley (such as objects, language, and concepts).

Mainstream (institutions, organisations, NRM etc.) refers to the norms of the larger (non-Aboriginal) Australian population and structures of government. In terms of land management, it refers to non-Indigenous agencies and the ideas and practices that they regard as normal or conventional (which are usually informed by scientific rationale).

Science/scientific is used to describe a Western tradition that seeks to explain the world through the application of a method of discovery that derives empirical and objective truths. This is separate from the scientific traditions of other cultures including China, India, Islam and other earlier civilizations whose science does not dominate today’s institutions.

Weeds are plants growing where they are not wanted. A discussion of the numerous definitions for ‘weeds’ is included in the thesis.

Western (science, society etc.) refers to a philosophy and epistemology arising from Western Europe, which now informs and dominates the cultural norms of the globe, particularly of settler societies.



INTRODUCTION

The Bardi-Jawi Ranger coordinator paused and told the Rangers “Now we’re going to talk a bit about our weed work”. Shoulders slumped, two Rangers got up and left; no one looked interested...

This meeting with the Bardi-Jawi Rangers was my first with a Kimberley Ranger group. It occurred at their Ranger base at Ardyaloon (One Arm Point), a community on the North-eastern tip of the picturesque Dampier Peninsula. Since I had entered their single-room office I had wondered how the six Rangers in front of me could possibly manage weeds over the vast landscape I had driven across for two hours that morning to get there. I wondered how uncomfortable their weed work must be in the heat and humidity that had made me sweat even just walking the short distance from my air-conditioned four wheel drive to their air-conditioned Ranger base.

As the Ranger coordinator initiated the meeting, I could see that he felt somewhat sorry for me. Talking about weeds was dull, particularly coming directly after the Rangers’ chat about dugong and turtle tagging with researchers from the Western Australia Marine Science Institute. Nevertheless, he introduced me with great enthusiasm and spoke about my interest in researching the weed work that the Rangers do on their country.

I followed on, stood up and described my research project. I saw the boredom and disinterest on the Rangers’ faces, but kept at it in the hope that something I said would spark enthusiasm and get them talking. It was hard work. I spoke about how my research was not about practical weed management, but about how Aboriginal Rangers incorporated cultural reasons for weed work. Still, no interest registered. I battled on a little longer, until I realised I needed a short time-out from the presentation to come up with a different strategy. I could sense their relief when I suggested a tea break.

During the break Larry, a senior Ranger and cultural advisor, invited me to bring my cup of tea outside for a chat. We sat in the shade and spoke about various things, starting with the most reliable staples of conversation among men: sport and vehicles; Australian football, fishing, my four-wheel drive vehicle that I had driven up to Broome from Melbourne.

I asked him about his job, how had he decided to become a Ranger? Like almost every Ranger I met during my fieldwork in the Kimberley, Larry shared his story of how his life had transformed after getting a job with his Ranger group. He had struggled to gain employment in his community, had relied on welfare, had thought about moving away in order to work in the mining industry. But he felt a strong connection to his country that made it difficult to leave. He felt rooted to the place, "it means everything living here, I can't leave this country".

Larry had been intermittently employed as a land manager, what he called a "labourer", through the 1990s and early 2000s as a part of the Federal Government's Community Development and Employment Program. This introduced him to working on land management problems such as weeds. Although he found the work hard, it provided him with employment, albeit inconsistent and unsecure, and allowed him to work on his country. In 2006, when the Bardi and Jawi Niimidiman Aboriginal Corporation established a formalised Ranger program with the assistance of the Kimberley Land Council, Larry jumped at the opportunity to become a Ranger. Being a good worker and a strong cultural figure in his community he was given a position as a senior Ranger. The implementation of the Federal Government's Working on Country Program in 2008 secured the Ranger group's funding for the following five years and gave the Ranger group control of how they wanted to care for their country.

Larry talked about the benefits of his life as a Ranger, particularly the opportunity it gave him to work on country and provide a strong cultural role model for his family and community, to show how he was "caring for country according to our culture".

Just before we went back inside to recommence our discussion about weeds with the rest of the group, he looked at me in a puzzled way and asked, "Weeds, eh?" I didn't respond, wondering where his question might be going. After a pause he continued, "A *kartiya* (non-Aboriginal person), all the way from Melbourne, has come to ask us about weeds". I asked why it seemed strange that a researcher would ask Rangers about weeds. Larry replied that although weed work is a large part of Ranger work "We don't know about weeds, weeds are a *kartiya* problem...we just do what they tell us".

Background

In 2008, the Australian Government implemented the Working on Country Program to employ Aboriginal people living in remote parts of Australia to join the national conservation effort. The program provides employment for Aboriginal 'Rangers' to serve as a remotely based workforce, using their local knowledge to control major environmental threats – most notable of which in Australian land management are the 'big three' of environmental weeds, uncontrolled fire and feral animals. The Working on Country Program has assisted the development of Ranger groups across the country; it currently funds 95 Ranger groups, employs 680 full time Aboriginal Rangers and is the flagship of Aboriginal natural and cultural resource management (NCRM) in Australia.

Three years after the implementation of Working on Country, the Western Australian government released its Kimberley Science and Conservation Strategy (KSaCS), in which it talked about managing the Kimberley for its natural assets and biodiversity (see DEC 2011). A large part of the document focused on controlling environmental weeds, that is to say, non-native and invasive plants that had spread into the Kimberley. The document underscored the "key role" of Aboriginal Ranger groups for implementing the strategy, particularly in terms of environmental weed control. Emphasising their "rich and living" connection to country, the document noted that the employment provided to Aboriginal Ranger groups enabled them to manage their environment on behalf of their people and according to their cultural values.

The development of Working on Country and the inclusion of Aboriginal Ranger groups in the KSaCS paper represent a growing trend in large-scale environmental management in Australia. They appear to signal a new chapter in land and resource management where Aboriginal groups have a significant say and role in managing their country according to their culture. This is the explicit statement made in these policies, particularly in the context of the 'big three' – which includes environmental weed management. My research project focuses on this aspect. It investigates how weed management in the Kimberley is carried out by Aboriginal Ranger groups. In particular, it asks: How are local Aboriginal perspectives incorporated in the weed work that their Ranger groups carry out on their country?

The context of my research

The opportunity for this project came through an Australia Research Council funded project that looked at the movement of plants around the Indian Ocean and investigated how local cultures viewed and managed these plants. One of the study sites of this project was the Kimberley.

The Kimberley was always a place that I had wanted to go and the topic of Indigenous and community-based land management was something that I had been interested in from my undergraduate studies. My honours project had worked with a rural community in Thailand researching how they had reacted and dealt with the land use changes, removal of livelihoods and land management problems that followed the construction of a dam. This project made me realise the importance of understanding and incorporating cultural values into any social or environmental development project. When I saw that a PhD scholarship was advertised that would allow me to research similar social-environmental issues in the Kimberley, I applied for it and was selected.

The brief that the scholarship gave was simple: I had to work in the Kimberley; I had to focus on some aspect of plants that had been introduced to the region from elsewhere; and I had to investigate how different groups viewed these plants. Given these parameters, I set about looking at the available material. None of it made much sense until I went up to the Kimberley with my advisor for a preliminary scoping visit in 2011. We visited the offices of the Department of Environment and Conservation (DEC) in Broome and were introduced to the freshly released KSaCS. The staff members we spoke to were happy that KSaCS provided increased funding to tackle weeds but were particularly excited that the Strategy allowed them to support Aboriginal Ranger groups and work alongside them on Aboriginal country. This was new for the government department, which had previously only focused on the management of National and State Parks.

We were advised by the DEC staff in Broome to meet the Wungurr Ranger coordinator in Derby and that we should also meet with the DEC staff in Kununurra. The Wungurr Ranger coordinator told us about the Working on Country program, the Kimberley Aboriginal Land Council's Ranger Network, and about the weed work that his Ranger group does. As a part of our discussion he mentioned that he had "no idea what the Rangers think about weeds" but that "someone needs to ask" because he had found it tough to motivate them to undertake weed work. As we made our way through these offices in Broome, Derby and Kununurra, it became apparent that weed management was a large, yet largely unsuccessful part of what Aboriginal Rangers were employed to do.

Indigenous people managing non-Indigenous species; there was a special irony to this relationship, and I found myself becoming intrigued by it. The relationship was a bit ambiguous to me until we met a DEC staff member in Kununurra. As we chatted about KSaCS and what we wanted to research, she told us, “Aboriginal knowledge is important, but they don’t know about weeds because these were introduced after colonisation. They need to be educated about how non-native invasive species harm the environment and need to be trained to control them with modern methods.” The comment seemed jarring to both of us and we wondered how this kind of perception matched up with the principles of Working on Country and what was written in KSaCS and other materials we’d been handed.

Later that trip, I attended a Landcare meeting in Darwin and chatted with one of the government agency weed management officials there. He told a very similar story about the relationship between Aboriginal Rangers and environmental weed work in the Northern Territory. Specifically he said, “Aboriginal Rangers are completely apathetic towards weeds...if your project can find out why, we’d love to hear it”.

These comments preyed on my mind as I worked on developing my research proposal in Melbourne. There are surprisingly few studies of Indigenous perspectives about non-Indigenous species in the invasion ecology literature, save two or three studies situated on the margins of environmental weed and invasive species discourse.

Norgaard (2007) considered Indigenous perspectives as a key component in her analysis of the “politics of invasive weeds” in rural California. Bhattacharyya *et al.* (2011), and Bhattacharyya and Larson (2014) investigated the relationship between Indigenous people and ‘wild’ or ‘feral’ horses in British Columbia, Canada. These studies highlighted the importance of incorporating Indigenous perspectives and paying closer attention to Indigenous voices in invasive species discourse.

In Australia, I found that some, like Smith (2000:16) also keenly recognise the importance of such research and have been calling for more to be undertaken:

“With increasing documentation on Aboriginal management of the environment in the Northern Territory...western scientists are at last starting to understand the ways Aboriginal people manage their land. Despite this, very little work has been targeted specifically at weed issues to determine Aboriginal perceptions of weeds, to gauge

the perceived effects of weeds on country and to investigate alternative approaches to weed control.”

Some inquiry has occurred in the Australian context, such as the ground-breaking work undertaken by Rose (1995) who investigated Aboriginal perceptions of mainstream land-management issues in central Australia. Among these was the issue of introduced or ‘feral’ animals. Trigger (2006, 2008) explored Aboriginal perceptions of introduced species in the Australian landscape. Focusing on the links between concepts of nativeness and belonging, he highlighted the possibility of introduced species becoming “culturally naturalised” within Aboriginal cultures. Robinson *et al.* (2005) contrasted Aboriginal and mainstream attitudes towards introduced animals in Kakadu National Park. They looked at the implications of these differences for the co-management of the park, advocating in particular a more cautious approach to dealing with the contentious issue of introduced species. Smith (2013) investigated Cape York Aboriginal people’s perceptions of non-native plant species, in which he found:

“that Aboriginal people hold a wide range of attitudes towards non-native plants, from intellectual incorporation, to tolerant ambivalence, to ‘not belonging’, and that Aboriginal motivations for, and approaches to, managing weeds differ from those of Western scientists and government agencies”. (iii)

It struck me that each of these authors highlighted the capacity of Aboriginal people to process and interpret issues of introduced species and by doing so countered the problematic assumptions that Aboriginal knowledge for weeds does not exist, or that Western and Aboriginal views about weeds align. Instead, each author suggested that a more careful and refined lens needs to be applied to investigate Aboriginal perspectives of non-native species, including environmental weeds.

This was highlighted by Barbour and Schlesinger (2012:37), who looked at Aboriginal weed management in the context of Aboriginal NCRM and found that the current paradigm “can often leave out the ideas of Indigenous people, and does not empower Indigenous people in ways that current policy may have intended.” They emphasised that Aboriginal people and their perspectives must guide the weed management process, regardless of whether or not these perspectives align with mainstream environmental weed management.

These studies seemed to vindicate my reactions from our scoping trip, in that they confirmed that Aboriginal perspectives about weeds needed to be investigated further. This thesis is the outcome of the investigation.

Research aim and objectives

This project investigates how Aboriginal perspectives about weeds are incorporated into Aboriginal weed work in the Kimberley. It aims to understand Aboriginal people's perspectives about weeds and propose how these may guide Aboriginal Rangers' weed work.

In particular, the thesis asks the following questions:

1. How do Aboriginal Rangers manage weeds in the Kimberley?
2. What are Aboriginal people's attitudes to weed management and what are their perspectives on weeds?
3. How might Aboriginal weed management be guided by these perspectives?

Each of these questions addresses a part of the overall aim: the first asks what weed work is happening on the ground; the second asks about Aboriginal people's reactions to this work and what are their perspectives about weeds; and the third focuses on how these perspectives may guide weed work.

Case study area: The Kimberley and Kimberley Aboriginal people

The Kimberley region is located in the northern part of Western Australia, extending north of the Pilbara, Great Sandy Desert and Tanami Desert, and east to the Northern Territory border (Figure 1.1). It encompasses a land area of 420,000km² and is geologically, climatically and ecologically diverse. The majority of the Kimberley is affected by a tropical and monsoonal climate, but also includes areas of semi-arid and arid desert. It also encompasses a significant area of sea country, with a coastline that spans over 12,000km and includes in excess of 2,500 islands (Scott 2012).

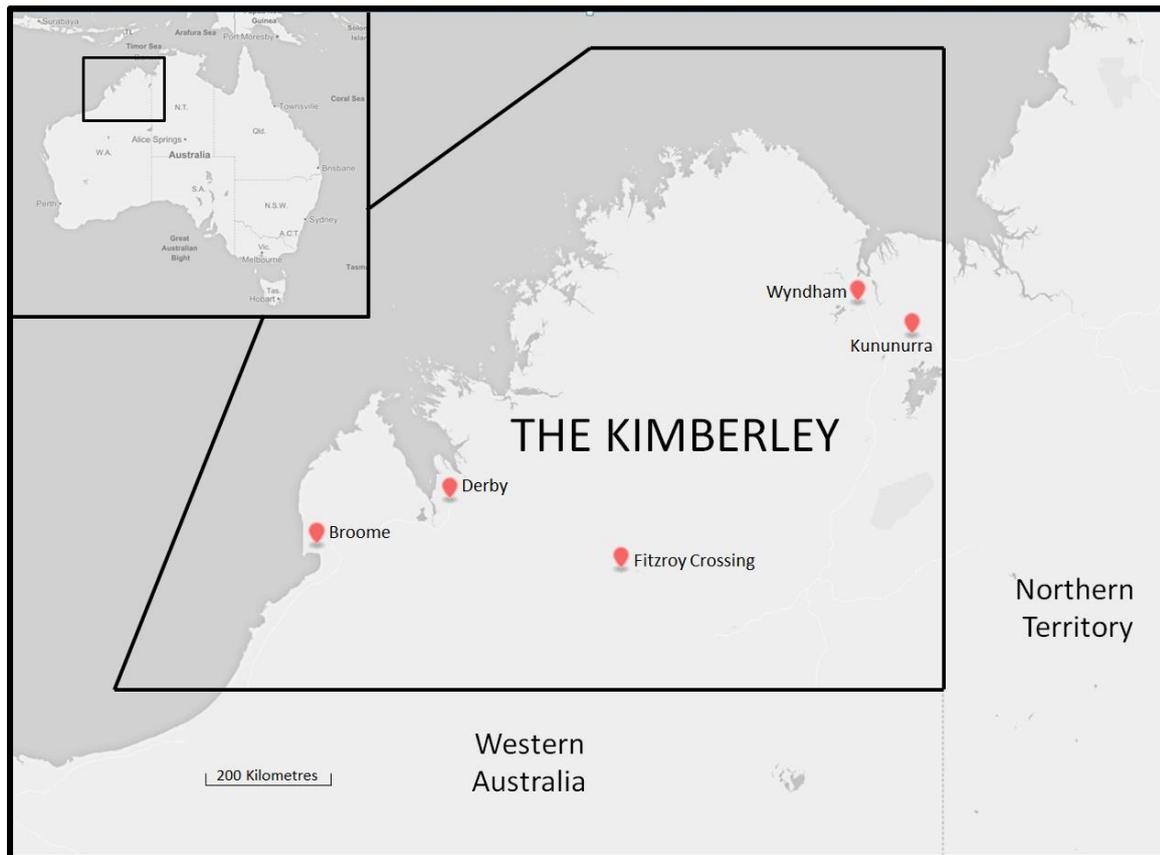


Figure 1.1 The Kimberley Region of Western Australia and its major townships

The Kimberley is widely recognised for its environmental significance and in 2011 was added to Australia’s Natural Heritage List. It is remote and has been relatively untouched by human-induced landscape change. This positions it as a region of high conservation value and as a key target for environmental and conservation organisations. Its attractiveness to environmental and conservation organisations has recently been enhanced because of a constant push towards industrial development in the region, particularly in terms of resource extraction/processing and the development of major water extraction and agricultural schemes.

As of 2011, 44 percent of the resident Kimberley population (of around 48,000) is of Aboriginal descent (KDC 2011), made up of 27 language groups and a number of tribal and clan-based groups. Aboriginal people in the Kimberley maintain a strong connection to their cultural identity and to their country. This is despite the mass dispossession of Aboriginal people and their dislocation from their homelands that occurred there – as it did during colonial contact throughout Australia. According to Griffiths and Kinnane (2010:23), this connection to country is fostered through:

“the continued practice of traditional Law and custom, including the use of languages, using proper names for Country, plants and animals, undertaking Law business, observing cultural protocols and the stories and rules that keep the spirit of the country alive.”

Over the last two decades, the connection of Kimberley Aboriginal people to their ancestral country has been officially recognised through the ceding of Native Title lands back to their Traditional Owners. Numerous protracted legal battles have secured Native Title for Kimberley Traditional Owners to around 70% of the Kimberley, with some claims still to be declared (KLC 2013).¹ This puts Aboriginal people in control of significant environmental and cultural assets on their country and has permitted these groups to establish Ranger programs and integrate into formal NCRM initiatives such as Working on Country.

[Aboriginal groups and Ranger groups involved in the project](#)

I worked with six Kimberley Aboriginal Ranger groups and elders from each of the Aboriginal groups that these Rangers represent. I undertook the bulk of my research with Bardi-Jawi, Bunuba, Wanjina-Wunggurr Wilinggin and Ngurrara. To a lesser extent, I worked with the Nyulnyul and Nyikina Mangala Rangers. Aside from Bunuba, all of these groups are associated with the Kimberley Aboriginal Land Council’s Ranger Network.

I worked with these groups because they were they were the ones that I was put in touch with and were the ones that were willing and able to work with me. Even though I did not get to choose the groups that I worked with, I was happy that they comprised a diversity of landscapes and were in differing stages of Ranger group development. I was comfortable that this provided a varied, yet accurate picture of Aboriginal weed work in the Kimberley.

¹ This figure is as of June 30, 2013 and has increased dramatically in the last 10 years, rising from 30% in 2007 to 55% in 2010 and again to over 70% midway through 2013.



Figure 1.2 Kimberley Aboriginal Ranger groups involved in the project and their Native Title determinations



Bardi-Jawi country is located on the northern part of the Dampier Peninsula and includes its sea country and the islands immediately to its north and east. The majority of the population lives in the communities of Djarindjin-Lombadina and Ardyaloon; however there are a number of outstations, mostly located on the coast, in which family groups also reside. The Bardi-Jawi Rangers are based out of Ardyaloon community and manage more than 3500km² of country. They focus much of their work on their 250kms of coastline and are increasingly doing work on the many islands of their sea country. They are the longest-established Ranger group in the Kimberley and are

widely recognised as one of the best organised in the Kimberley Ranger Network.²



Bunuba country is located in the central Kimberley, to the north and west of the town of Fitzroy Crossing. The Bunuba Rangers are unlike the other Ranger groups in this project in that they are run separately from the KLC's Land and Sea Management Unit. Instead, they are an independent Ranger organisation working on behalf of the Bunuba Dawangarri Aboriginal Corporation. The Ranger group is partly funded by the Western Australian Department of Parks and Wildlife (DPaW, formerly DEC) to focus on the National Parks and Conservation estates under DPaW jurisdiction. The Ranger group was formed in 2009 as an initiative to have Bunuba people working on country, despite Bunuba not yet having had their Native Title determined. Bunuba people established Native Title in 2013 and are currently looking to develop their partnership with DPaW through a formalised joint-management arrangement.



Ngurrara country is located in the northern part of the Great Sandy Desert and is home to people from the Walmajarri, Wangkajunga, Mangala and Juwaliny language groups. The Rangers are based in the Djugerari community, approximately 80kms south-east of Fitzroy Crossing. Ngurrara country is the largest of all Native Title holdings in the Kimberley, covering 77,000km², much of which is not accessible by maintained vehicle tracks.



Wanjina-Wungurr Wilinggin country is located in the central Kimberley and covers more than 60,000km² of hill and river country. The Wungurr Rangers work on Wilinggin country on behalf of the Ngarinyin people. Despite being originally based in Derby (a town not on Wilinggin country), the Wungurr Rangers recently relocated to Ngallagunda (Gibb River Station), located on the Gibb River Road, approximately 360km from Derby, so that they could be based on country and in closer proximity to the sites at which they work.

² The Bardi-Jawi Ranger group is frequently referred to as 'Ranger Fairyland' by other KLC Ranger groups due to the smoothness and effectiveness of its operations.



Nyulnyul country is located in the central part of the Dampier Peninsula, to the south of Bardi-Jawi country. Nyulnyul country is formally recognised under the Bindunbur Native Title claim which is shared by a number of Aboriginal groups whose country is located on the central and southern parts of the peninsula. The Nyulnyul Rangers are based out of the community of Beagle Bay and focus their land and sea management on their coastlines and inland freshwater places, which includes springs, streams and lakes.



Nyikina Mangala Rangers look after Nyikina and Mangala country which stretches from King Sound in the North, to the Great Sandy Desert in the south. A main feature of this country is the Fitzroy River, which runs through it and connects many important cultural sites for Nyikina and Mangala people. As such, the Fitzroy River is a focus of the Nyikina Mangala Rangers who currently operate out of the community of Jarlmadangah.

What is a weed? And other tricky terms

The thesis uses some culturally and politically tricky terms. Although I have provided definitions for most of these terms in the glossary, some require further explanation or justification:

Weeds

The question 'What is a weed?' has provided the grist for intellectual debates since, at least, the beginning of the 20th century (Praeger 1912, Bracken 1921, Campbell 1923, Salisbury 1964). Amid these debates there is little consensus, with most researchers and practitioners favouring different definitions for different reasons (Leopold 1999, Mabey 2012). For the purpose of this thesis I consider a weed to be 'a plant growing where it is not wanted'. Although this is by far the most common definition for a weed, it is widely criticised as being far too open and subjective and, as such, useless in any management sense (Baker 1985, Rotherham 2005, Cowie 2007, Hattingh 2010). I disagree and use the term because I embrace its openness and subjectivity.

The subjectivity and openness of the concept of weeds as unwanted plants foregrounds the cultural and human aspects of weeds. It allows weeds, as a concept tied to human perception, to be contestable and understood as culturally relative. I acknowledge that within environmental

management and invasive species discourse, the concept 'environmental weeds' has come to represent a group of plants based on a set of biogeographic, biological and ecological characteristics. However, I argue that this conceptualisation restricts different groups of people – coming from different backgrounds and viewing the issue through different cultural lenses – from arriving at different understandings of what makes a plant a weed. While environmental managers and invasion ecologists do not like plants that display particular characteristics, this should not restrict other groups, such as Aboriginal people, from deciding on the plants they do not want in a particular place and the reasons why they do not want them. Therefore, by embracing rather than sidelining or avoiding the subjectivity of 'weeds', Aboriginal voices are able to contribute to weed management discourse with equal legitimacy.

Indigenous and Aboriginal

Both terms pose problems as they can be ambiguous and are highly stigmatised. In this thesis I use the term Indigenous as a generic term, referring to the 'original' inhabitants of any given area. I use the term Aboriginal when specifically talking about the original inhabitants of Australia. In terms of my project, where possible I use the name of the local Aboriginal or Ranger group.

Indigenous (ecological) knowledge

I use the term 'Indigenous' rather than 'traditional' to speak about these knowledges as this is more common in Australia. Although the term and concept of Indigenous ecological knowledge (IEK) is widely used, particularly in discussions of NCRM, I prefer the phrase Indigenous knowledge. This is because it does not attempt to dissect the ecological parts of the knowledge from the non-ecological parts. The non-ecological parts interact with, and strongly influence, the ecological parts, as such any separation of the two is extremely difficult and can distort meaning and significance.³

Traditional Owner and Elder

The term 'Traditional Owner' is a construct of the colonial legislature of Australia. It is a term that originated through Native Title legislation and is fundamentally grounded in Western concepts of land tenure and ownership. Although it has become widely used by those involved with Aboriginal NCRM it represents an externally produced and fundamentally colonial construct.

³ The difficulty and problematic nature of this ecological dissection is discussed in more detail in Chapter Three.

Instead, the terms 'elder' and 'old person' are used by Aboriginal people to speak about those who are culturally revered as holders of knowledge and wisdom. In this thesis I use the term Traditional Owner when referring to a formal relationship between an elder and an institution, such as an elder involved in an advisory role for the Working on Country program. I use the term elder in a less formal sense, or as I would relate to them as a person and as a researcher.

Chapter outline

Following the introduction, chapters two and three provide a literature review of environmental weeds discourse and cultural approaches to environmental management. I split the literature review in such a way because the two fields are disparate and considering them separately allows a clearer discussion.

Chapter Two reviews environmental weeds discourse. It shows how the concept of weeds evolved from subjective origins towards increasingly quantitative and ecological meanings through the development of Weed Science. It outlines the development and expansion of invasion ecology and its influence on the current concept of environmental weeds. The chapter then explores some challenges to invasion ecology and dominant environmental weeds discourse. These challenges destabilise the certainty of mainstream environmental weeds discourse and management. This destabilisation demonstrates that the dominant environmental weed management paradigm is culturally relative, and that alternative ways of conceptualising and managing weeds are possible.

Chapter Three reviews Indigenous (ecological) knowledge and natural and cultural resource management. The chapter provides a discussion of IEK, the growth of its enquiry and the increasing recognition of its value in mainstream NRM and NCRM. This leads to a discussion of NCRM that traces its origins and outlines its proposed benefits over centralised, top-down NRM. The chapter explores some of the critiques of how IEK is produced, represented and integrated in mainstream and NCRM discourse. These critiques point to the epistemological and institutional politics that impede the translation of NCRM rhetoric into practice.

Chapter Four outlines my research approach for the project. I introduce the concept of political ecology and discuss it in relation to my conceptual framework. I introduce my methodology using a metaphor that frames me (as a researcher) as a weed in order to highlight the challenges of cross-cultural fieldwork in an Australian Aboriginal context. My methodology

discusses my timing of fieldwork, selection of the case study area, ethical requirements of my research, selection of participants, and the research methods that I used.

Chapter Five brings together environmental weed management and Aboriginal NCRM in the contexts of Australia, Western Australia and the Kimberley. I focus the first part of the chapter on environmental weeds and ask two specific questions. Firstly what makes a plant a weed in environmental management discourse? And secondly how are weeds controlled by mainstream environmental management agencies? In the second part of the chapter I discuss Aboriginal NCRM in Australia and the Kimberley. This discussion traces the origins of Australian Aboriginal NCRM and its trajectory towards the current Working on Country Ranger program. It then focuses on the structure and operation of the Kimberley Aboriginal Ranger Network. Environmental weeds are brought back into the discussion, and the chapter finishes by looking at Aboriginal weed management in Australia.

Chapter Six describes Aboriginal weed work in the Kimberley. The chapter is based on my participant observations and interviews in the field and describes the major weed projects for the Bardi-Jawi, Bunuba, Ngurrara, Nyikina Mangala, Nyulnyul and Wunggurr Rangers. It describes the weed work that was undertaken by each of these groups, explores the motivations behind the work, and looks at the outcomes of the work.

Chapter Seven provides Aboriginal people's reflections on weed work and the mainstream concept of environmental weeds. The first part of the chapter outlines Rangers' and elders' reactions to weed work and their insights into the factors that disconnect it from its cultural significance. This leads to Aboriginal reflections on mainstream environmental weeds classification. Together, these reflections suggest that there is a desire among Kimberley Aboriginal Rangers and elders to conceptualise and manage weeds differently.

Chapter Eight looks at the relationship between weeds and the Aboriginal concept of 'healthy country'. The chapter introduces the concept of healthy country and then uses it as a framework to explore Aboriginal perspectives of weeds. The chapter emphasises the importance of context and place in Aboriginal considerations of weeds.

Chapter Nine considers the implications that Aboriginal perspectives on weeds have for Rangers' weed work. I use the chapter to propose a shift towards a greater emphasis on site-based weed work as a way of connecting it to Aboriginal perspectives of healthy country. I outline the growing recognition that site-based weed management is receiving in Australian

environmental weed policy and highlight the cultural and practical outcomes that it has for Aboriginal weed management.

Chapter Ten revisits the main themes that emerge through the thesis and emphasises why the findings of this research matter for Aboriginal NCRM, environmental weed management and Aboriginal weed work.

2 CHAPTER TWO

INVASIVE SPECIES AND ENVIRONMENTAL WEEDS DISCOURSE

While conducting preliminary research on weed management in Western Australia, I came across the website of an organisation based in Perth called *The Environmental Weeds Action Network* (EWAN). What attracted my attention to the group was that they mobilise under the terrifically ambiguous motto “*Weeds or Wildflowers?*” My immediate reaction to this motto was that they were posing a legitimate question that highlighted the ambiguity and subjectivity of weeds. Can *weeds* be considered *wildflowers*? Or conversely, can *wildflowers* be *weeds*? The creative possibilities these questions stimulated were exciting, especially in research so consistently dominated by ecological rhetoric of militaristic conflict or environmental despair. Instead, of course, EWAN under their ambitious mission statement of trying to “save our indigenous flora from the threat of weeds” were posing the question as an ultimatum between two potential environmental conditions. The question was really, would you prefer weeds or wildflowers? You can have one or the other. What struck me was that underpinning this ultimatum lay the assumption that the status of both *weed* and *wildflower* are fixed in time, place and culture, and that the two are ecologically mutually exclusive. I found this notion of environmental weeds as a *fait accompli* unsettling.

By coincidence, during fieldwork I encountered a member of EWAN while attending a Kimberley Land Council Ranger Forum – for the sake of this story let’s call this person Ewan. During afternoon tea I was approached by Ewan who had been working on environmental weed projects with two KLC ranger groups. Ewan told me that they wanted to speak to me about my research. I was a little surprised when Ewan’s immediate question was “who are you with?” I didn’t really understand the question so I explained that I was *with* Monash University. That answer wasn’t sufficient, so Ewan clarified, asking “no, I mean *who are you with?*”. I eventually realised that Ewan was attempting to ascertain my position regarding a number of debates around invasion ecology and environmental weeds. My ambivalence towards these debates frustrated Ewan. At length he imparted his opinions about the debates and environmental weed

management, basing these opinions on his substantial field experience and evidence from invasion ecology. Ewan told me that “the world has moved beyond the debates”, it has decided that “alien invasive plants present major problems to ecosystems”, that this “requires urgent management action” and that invasion ecology needed to inform this management. It was all very straightforward.

For Ewan, any discussions or arguments that explored the history, culture or politics of environmental weeds or invasion ecology were “counterproductive” and “entirely superfluous”. In short, anything that was critical of the current paradigm of invasion ecology and invasive species management was wasting time that could be better spent “fixing the problem”.

In relation to my research, Ewan asked why, as a social scientist, I was researching an ecological issue (a question I was exposed to so frequently I developed immunity to). I explained that I was interested in understanding the way that culture influenced how people classify a plant to be wanted or unwanted in a particular place and how this was incorporated into management. Ewan told me that ‘wanted’ and ‘unwanted’ had nothing to do with weeds. This was followed by a warning to be very careful when considering cultural values in relation to Aboriginal weed work, because “culture and values can be used to subvert the science”. I tried to understand why Ewan felt that *culture* and *values* were irrelevant and posed such a threat to the ‘science’ of environmental weeds. In response I only heard reasons which blindly subscribed to the superiority of Western principles of conservation and invasion ecology.

What stood out, particularly considering the context of an Aboriginal Ranger forum, was that the story Ewan told about environmental weeds excluded anyone from outside of invasion ecology from contributing to discourse – lest they be labelled “counterproductive” and their views “entirely superfluous”. According to Ewan, there are *weeds* and there are *wildflowers*; Science has decided which is which.

This chapter tells the story of environmental weeds. The story begins with weeds as unwanted plants based on ‘human caprice’, but tells how they evolved through agriculture and Weed Science to become a more ecological, scientific and objective concept. The rise in regional and global biotic transfer brought about by colonialism and increased global trade caused major plant redistributions, some of which had unforeseen and unwanted ecological and economic consequences. Invasion ecology developed to understand and guide management of these

redistributed species. Through invasion ecology's alliance with environmental management, plants that were non-native, invasive and impacted local ecosystems were classed as environmental weeds and became the target of control.

Invasive species and environmental weeds discourse is becoming increasingly contested. Critiques have arisen that challenge dominant ways of viewing, researching and managing these phenomena. The second part of this chapter discusses these critiques, the debates that they have provoked and the conceptual alternatives that have arisen from these debates. This discussion highlights the politics of invasive species and their management. In particular, it demonstrates the cultural relativity of the current paradigm and creates space for alternative ways of conceptualising and managing environmental weeds.

A brief history of weeds

A weed is most commonly defined as a "*plant that is growing where it is not wanted*" (Harlan and de Wet 1965, Smith 2000, Mabey 2012, DPaW 2013a). Variations on this general principle exist such as a "*a plant growing where it is desired that something else shall grow*" (Georgia 1916) or a "*plant out of place*" (Blatchley 1912); however, most definitions represent the same concept: a plant that people do not want to be growing where it is growing (Buchholtz 1967). Although this definition is utterly subjective, very seldom do weed scholars – even those considering environmental weeds – attempt to entirely dismiss this subjectivity.⁴ As some emphasise, weeds constitute a "psychological category" (Stearn 1956) without any concrete reality or existence outside of "human caprice" (Campbell 1923:50), and that "it's in our gift to demonise or accept them" (Mabey 2010:5). According to Evans (2002:xiv) "designating certain plants as weeds represents a cultural activity".

The most useful starting point for a discussion about weeds lies with agriculture. The concept, language and study of weeds developed predominantly through agriculture, to describe and understand plants that were perceived to be detrimental to food production. There have been mentions of weeds through records of agricultural and environmental history. Timmons (1970) cites biblical references to thistles and other nuisance plants. Salisbury (1964) cites a list of plants that were thought to "doe moch harm" in the 1523 publication the *Boke of Husbandry*, and demonstrates that these same plants remain some of the worst weeds in England. In his 1733

⁴ In fact a few scholars even embrace this subjectivity as an idiosyncrasy worthy of noting and choose to explore it in their work (see Dwyer 2011, Low and Peric 2011, Mabey 2012).

Essay on the Principles of Tillage and Vegetation, Jethro Tull defines weeds as plants which were guilty of “robbing Legitimate Plants of their Nourishment”:

Within earlier weeds discourse, human-centred classification of a weed as ‘unwanted’ plants remained generally accepted – plants were weeds because they grew in spite of human desires. Writing in the early 20th century, in his essay *What is a Weed?* published in *Science*, Campbell (1923:50) writes:

“We have an odd rule, under which any plant in the universe may instantly become a weed without the slightest change in character, habitat or position. Under this rule, a plant is a weed, not according to specific qualities nor by a definite concept in the mind of any man, but by human caprice.”

Towards the middle of the 20th century there was a feeling among weeds scholars such as Stearn (1956), Bunting (1960) and Pritchard (1960) that this anthropocentric and subjective basis to classifying and understanding weeds should be replaced by a more objective ‘Weed Science’ (Radosevich *et al.* 2007). Although they acknowledged the anthropocentric nature of weeds, they believed that this did not hold any practical potential for improving people’s ability to understand or manage these unwanted plants (Harlan and de Wet 1965, Radosevich *et al.* 2007). The field of Weed Science evolved to develop an understanding of weeds as a category of vegetation defined by objective ecological characteristics rather than subjectivity (Ahlgren *et al.* 1951, Zimmerman 1976).

It had been observed by earlier researchers (Praeger 1912, Georgia 1916, Bracken 1921, Campbell 1923) that certain biological and ecological characteristics common among weeds were responsible for their unfavourable habits (Zimdahl 2010). These characteristics became the foundations of ecologically-based definitions and understandings of weeds, which superseded the general and subjective ‘unwanted plant’ (Radosevich *et al.* 2007, Zimdahl 2007). These definitions primarily emphasised the propensity of ‘weedy’ plants to spread and grow quickly in a range of habitats and to be particularly successful where human disturbance has occurred (Bunting 1960, Pritchard 1960, Baker 1985). Descriptions for weeds arose such as “*pioneers of secondary succession*” (Bunting 1960) and “*opportunistic species that follow human disturbance*” (Pritchard 1960), which ascribed ecological attributes as their defining characteristics. The descriptor ‘weedy’ and the concept of ‘weediness’ became common as a way of representing and describing the characteristic ecological traits of rapid dispersal, local abundance and the tendency to fill niches created by human disturbance (Baker 1974).

Alongside Weed Science's study of the ecology and physiology of these plants, a post-Second World War surge in chemical herbicide research and development significantly altered the trajectory of the discipline and weed management (Timmons 1970, Evans 2002, Zimdahl 2007). The production of industrial chemicals during this time resulted in a shift in agricultural weed management from predominantly mechanical and manual removal to the widespread use of herbicides. The increased scale at which farmers could kill plants through chemical herbicides improved agricultural productivity to such an extent that Zimdahl (2007) named this one of the four most significant advances in the history of agriculture, alongside the development of mineral fertilizer, agricultural mechanization and genetic modification.

Although the development and proliferation of these chemicals resulted in such significant gains for agricultural productivity, their use had serious negative consequences for human and environmental health (Evans 2002, Zimdahl 2007). Despite the public attention and apprehension about these consequences, the use of chemical herbicides remains the dominant mode of modern weed management among agriculturalists, gardeners and horticulturalists (Zimdahl 2007, Holmgren 2011). At the same time, and despite public alarm, the effectiveness and efficiency of chemical herbicides has seen them adopted by environmental managers as the most common way of controlling environmental weeds. The following section discusses how environmental weeds have become a problem that requires such management.

Species redistributions and the conservation ethic

Colonial expansion resulted in the redistribution of vegetation across the globe. Although plants have always moved around the world through non-human and human agency, colonial expansion allowed biotic transfer across far greater scales and at a much accelerated rate (Crosby 2004, Kull and Rangan 2008, Carruthers *et al.* 2011). The transfer of plants to, from, and between colonies, resulted in a monumental shift in global biogeography (Crosby 1972, McNeely 2001, Lockwood *et al.* 2009). For a variety of practical and cultural reasons empires and individuals readily transferred and exchanged plants and animals around the world, seemingly without any thought as to how they might affect the environments to which they were being transferred (Vitousek *et al.* 1996, McNeely 2001, Lever 2009). According to Elton (1958:31), this exchange represented "one of the great historical convulsions in the world's fauna and flora". Botanical institutions such as Kew Gardens in England led the way in formalising the collection and spread of plants from and between colonies — a case of ecological imperialism and empire building (Griffiths and Robin 1997, Crosby 2004). This formalised regime of 'acclimatisation' and

'environmental enhancement', combined with incidental biotic transfer, has accelerated alongside a growing human population and global trade. Now, tallying the number of introduced plants, even at a national scale, is nearly impossible.

Some of these introduced plants behaved, and continue to behave as they 'ought to'. However, others have become recalcitrant. That these new plants spread quickly into new ranges led to the terms 'invasive' and 'weedy' being used as an organising description of their behaviour. Until the middle of the 20th century concern about the invasive behaviours of these plants remained predominantly in the realm of agricultural Weed Science, with only limited and cursory attention being given to their effects in 'non-human' or 'natural' landscapes (Kitching 2010, Richardson 2011, Simberloff 2012). With the development of the field of ecology and the cultural popularisation of environmental conservation and environmental ethics, a shift of emphasis occurred towards understanding and redressing the ecological effects of these 'invasive species' in natural places (Davis 2009, Simberloff 2010).

Aldo Leopold, who helped form this emerging conservation ethic, was significant in shaping perceptions of introduced species and their effects on native ecology. In his extremely influential work, *A Sand County Almanac*, Leopold committed a chapter to Cheatgrass (*Bromus tectorum*), emotively entitled "*Cheat Takes Over*" (Leopold 1949). This publication has been given credit as a pioneering discussion in that Leopold shifts the concept of a weed away from its agricultural roots to non-native and invasive species that have disrupted a natural ecosystem (Freyfoyle and Callicott 1999, Temple 1999). One passage reads:

"Today the honey-colored hills that flank the north-western mountains derive their hue not from the rich and useful bunchgrass and wheatgrass which once covered them, but from the inferior cheat which has replaced these native grasses. The motorist who exclaims about the flowing contours that lead his eye upward to far summits is unaware of this substitution. It does not occur to him that hills, too, cover ruined complexions with ecological face powder."(155)

Throughout the passage, Leopold is ascribing values to the plants that he refers to. His descriptions of bunchgrass and wheatgrass as "rich" and "useful" refer to their agricultural value as fodder but more importantly to their ecological and ethical value as "native". Despite the success of cheatgrass relative to the other plants that he mentions, he refers to it as 'inferior'. In an ecological sense this claim of inferiority does not make sense as it has displaced the other plants that previously grew there. In agriculture, cheatgrass is considered marginally inferior to other

pasture fodder; however in an essay that is attempting to deconstruct the power of agriculture in weed discourse, this is unlikely to be Leopold's main reason for so describing it. It is judged inferior in its 'environmental' or 'ecological' value — it is not native, a preference stemming from Leopold's conservation ethic, which valorises native species and ecosystem stability (Warren 2007, Preston 2009, Chew and Hamilton 2010). This conservation ethic of valuing native, stable ecosystems spread through the discipline of ecology and, as the rest of this chapter demonstrates, remains embedded in environmental weeds discourse.

Viewed by ecologists and the public through the lens of environmental conservation, the changes to 'natural' landscapes caused by introduced and invasive species were of serious concern. These changes threatened the structure and functioning of natural ecosystems and the biodiversity that these systems harbour (Pimm and Gilpin 1989). In response to this broad-scale and drastic threat, the field of invasion ecology developed to study these biological invasions and suggest actions to redress their effects.

Invasion ecology

Two events are commonly cited as catalysing the origins and development of invasion ecology. The first is the 1958 publication of Charles Elton's *The Ecology of Invasions by Animals and Plants*, which highlights the dramatic increase in the spread and impacts of non-native and invasive species. The second is the 1982 meeting of the Scientific Committee on Problems of the Environment (SCOPE) general assembly in Ottawa, which recognised that biological invasions posed a significant threat to the health of the global environment.

Although Elton is commonly ascribed as the founder of invasion ecology, Chew (2006) has demonstrated that he was in fact building on the attitudes of scholars and naturalists who had preceded him. Of particular influence over the formation of his ideas and the development of invasion ecology is Elton's engagement with environmental ethics and with actors from within the conservation movement such as Aldo Leopold. Elton's close correspondence with Leopold left a legacy of conservation imperatives that became embedded in his work (Freyfoyle and Callicott 1999, Temple 1999, Simberloff 2012a).

Elton was by no means the first to observe or describe the ecological impacts of introduced species (Chew 2006, Davis 2009, Chew and Hamilton 2010, Simberloff 2010). Instead, his work is influential in that it set the moral course of modern invasion ecology, a course Davis (2009) refers to as the "conservation-oriented Eltonian paradigm" (191).

It is important to note that *The Ecology of Invasions by Animals and Plants* was not offered by Elton as an objective account of invasive species, nor was it aimed at a purely scientific or academic audience (Davis *et al.* 2001). Elton's intention was as much to emphasise the threat of non-native and invasive species and create a culture of fear around it as it was to propose a productive path for research activity or to engineer a separate discipline of scientific enquiry (Davis 2009, Chew 2011). As he put it, the "drier summaries of textbooks" lacked "a feeling of urgency and scale" that was needed to communicate the gravity of the issue (31).

The emotive and militaristic language that Elton deliberately employed emphasises the threat that invasive species might have on humanity and the environment. The book begins by juxtaposing the volatile social and political context following the Second World War with the issue of ecological "convulsions" and "explosions":

"Nowadays we live in a very explosive world, and while we may not know where or when the next outburst will be, we might hope to find ways of stopping it or at any rate dampening down its force. It is not just nuclear bombs and war that threatens us, though these rank very high at the moment: there are other sorts of explosions, and this book is about ecological explosions." (Elton 1958: 15)

Elton concludes his first chapter "*The Invaders*" with a quote from Conan Doyle's *Lost World*, likening ecological invasions to the "typical decisive battles of history – the battles which have decided the fate of the world", posing the questions, "But how will it be decisive? Will it be a lost world? These are the questions ecologists ought to try to answer" (31). Elton's work is a cultural and ecological call to arms rather than an objective ecological treatise. This call to arms, although made within an ecological and biogeographical context, is in response to a particular conservation view of the world, one which perceives ecological change and the loss of environmental control as inherently threatening (Chew and Hamilton 2010).

Elton's book was, and remains, enormously influential in the field of invasion ecology, with citations of the work rising parallel to research output. As Ricciardi and MacIsaac (2008:34) comment, Elton's book "sounded an early warning that... has become a clarion call that resonates in the work of invasion ecologists worldwide". However, despite this well-recognised influence, *The ecology of invasions* failed to provoke any significant rise in immediate research activity.

The 1982 SCOPE general assembly in Ottawa is commonly recognised as the catalyst for *modern* invasion ecology and by extension, environmental weed discourse (Mooney and Drake 1989, Lockwood *et al.* 2009, Simberloff 2010, Simberloff 2012). At this general assembly, SCOPE, a

subsidiary of the International Council of Scientific Unions, proposed that biological invasions posed a significant and global threat to the health of the environment. This threat was linked to the emerging trends in conservation ecology, environmental sustainability and biodiversity protection (Lodge 1993). The SCOPE program recommended that an advisory committee should be established to coordinate and facilitate research into the ecological behaviours of invasive species and their effects on natural systems (Groves and Burdon 1986, Drake *et al.* 1989). It launched the SCOPE Programme on the Ecology of Biological Invasions, which aimed to “build on the considerable knowledge base available on invaders of agricultural systems but that it should concentrate its efforts on natural systems where there had been considerably less attention” (Drake 1989:xxiii).

The SCOPE program and its working groups generated worldwide interest in invasive species. Publications on ecological invasions increased rapidly through the 1980s and 90s, with a number of syntheses being compiled during this period (see Usher 1988, Drake *et al.* 1989, Humphries *et al.* 1991, Williamson 1996).

This research emphasised the environmental and economic costs of invasive species. In their overview of the SCOPE program Mooney and Drake (1989:503) stated that invasive species had created a “new biological order” and predicted that biotic invaders would continue to spread in “ever increasing numbers”. Pimm and Gilpin (1989) asserted that invasions by non-native species are responsible for a greater loss of global biodiversity than any other factor besides habitat loss and direct human exploitation – an assertion that is now widely cited.⁵ Lodge (1993:133) blamed introduced and invasive species for “homogenizing the earth’s biota” and posing a threat to “global biodiversity” that even the “movements of the earth’s crustal plates could never accomplish”.

Through its mounting research output, invasion ecology appealed for increased and improved invasive species management. Environmental agencies responded by focusing increasingly large parts of their time and resources on controlling invasive species.

Environmental weeds

Introduced and invasive plants became ‘unwanted’ in environmental management because of their adverse effects on natural environments, particularly their threat to conservation objectives

⁵ For some of these citations see: Westman (1990), Randall (1996), Adair and Groves (1998), Rosenzweig (2001), Pimentel *et al.* (2005).

and native biodiversity (Adair and Groves 1998, CALM 1999). These plants were unwanted in an ecological sense and hence attracted the label 'weed'. The term 'environmental weed' emerged to differentiate the weeds that affect natural landscapes from the weeds that affect agricultural, or other cultivated landscapes (Fagg 2007).⁶

Although there is some local variation between definitions, the global influence of invasion ecology has produced a particular and dominant categorisation of environmental weeds which seek to define them by combining one or more of three characteristics. These characteristics are their *origin*, *behaviour* and *impact*: where origin refers to a plant's status as 'introduced' or 'non-native' to a particular region; behaviour refers the tendency of the plant to become invasive in particular ecological circumstances; and impact refers to the ecological effects that the plant causes (or is anticipated to cause) to local ecosystems. These three broad and general characteristics of environmental weeds have directed the bulk of global and national lists of invasive species and environmental weeds (Fagg 2007, Kull and Rangan 2015). In turn, these broad-scale lists have directed the bulk of environmental weed management (Williams and West 2000).

Environmental weed management now constitutes a major component of almost every environmental management program. Extensive and intensive environmental weed management has occurred across the globe since the 1980s. This management focuses on preventing the spread of weeds, controlling and removing weeds *in situ*, and redressing the ecological impacts that the weeds cause (Fagg 2007, Downey *et al.* 2010).

Challenges to invasion ecology and environmental weeds discourse

Invasion ecology and environmental weeds discourse have recently been the target of heavy and sustained critiques on both philosophical and scientific fronts (Sagoff 1999, Theodoropoulos 2003, Warren 2007). This is linked to a wider and growing recognition that ecological phenomena exist within wider social, political and cultural contexts (Cronon 1996a, Robbins 2004a, Waitt *et al.* 2006). In this sense, environmental 'problems' are becoming seen as culturally defined rather than purely ecological.

Larson (2007:994) highlights this "cultural turn" in environmental studies by using invasive species as an example, declaring that "invasive species serve as a stark reminder that we cannot

⁶ The term 'environmental weed' is particularly popular in Australia.

study environmental issues as if they are divorced from human perception and human values". Tassin and Kull (2015:68) connect invasive species and environmental weeds to the cultural processes which produce and interpret them, suggesting that:

"Biological invasions are both biological phenomena (movements, distributions, and community dynamics of species) and cultural phenomena (how people – including scientists – in different places facilitate, are affected by, interpret, react to, label, and judge invasions and the landscape changes they induce or represent). This is quite different from saying that biological invasions have a cultural impact: this is to say that they are cultural."

The majority of the critiques of dominant invasive species discourse have emphasised this, arguing that it has largely ignored the historical, social, cultural and political contexts in which these issues are situated (Rotherham and Lambert 2011b). This attention has specifically concentrated on the subjectivity of invasion ecology's morally-laden normative assertions, the language that is used to communicate its findings, and its increasing influence in environmental management discourse (Sagoff 2009, McNeeley 2011, Rotherham and Lambert 2011). More recently, a turn towards critical self-reflection within invasion ecology has provoked a number of its scholars to question and rethink some of the first-premises of their field (Hobbs *et al.* 2006, Davis 2009).

These criticisms focus on the 'triad' of invasive species and environmental weed classification: their *origins*, *behaviour*, and their *impacts*.

[Questioning 'origins'](#)

A plant's origins exert a major influence on the field of invasion ecology, to the extent that 'nativeness' is considered an organising principle of invasive species discourse and environmental management (Sagoff 1999, Smout 2003). As Davis *et al.* (2011:153) explain:

"Over the past few decades, 'non-native' species have been vilified for driving beloved 'native' species to extinction and generally polluting 'natural' environments. Intentionally or not, such characterizations have helped to create a pervasive bias against alien species that has been embraced by the public, conservationists, land managers and policy-makers, as well as by many scientists, throughout the world."

Origins, manifested through the concept of biotic nativeness, the separation between native and non-native species, and the general designation of native species as more favourable than non-native species are coming under heavy scrutiny within broader invasive species discourse. This scrutiny focuses on two main issues. Firstly, that the concept of biotic nativeness is geographically and historically discursive, entirely dependent on the cultural context and the spatial and temporal scale at which a species is being considered (Chew and Hamilton 2010). And secondly, that the native/non-native dichotomy is not as ecologically significant as what invasion ecology has made of it, and instead merely reflects human and cultural preferences of native over non-native species (Peretti 1998, Sagoff 2005, Warren 2007). These critiques are combined and summarised by Chew and Hamilton (2010:36) who argue that:

“[the] categorical meaning and significance [of biotic nativeness] both dissolve under scrutiny. Biotic nativeness is theoretically weak and internally inconsistent, allowing familiar human desires and expectations to be misconstrued as essential belonging relationships between biota, places and eras.”

The first major critique of nativeness examines the question of ‘what makes a species native or non-native?’ This question problematises the concept of biotic nativeness (and non-nativeness) as being fixed in any universal way. In doing so, it undermines any unambiguous separation of native from non-native species. In his overview of Australian Indigenous plants, Bean (2007:10) laments that “there have been no research-based explicit definitions for indigenous (native) or alien (non-indigenous, exotic, introduced) plant species in Australia”. Such ambiguity destabilises nativeness as an organising ecological principle in environmental weeds discourse (Shrader-Frechette 2001, Hattingh 2010).

Part of this ambiguity is due to what Head and Muir (2004:202) call the “temporal threshold of nativeness”, which critics use to ask how long a species must occur in one place before it might be considered ‘native’. From a biogeographical perspective, answers to this question are almost always relative, if not historically arbitrary, due to the consistent movement of species across regions and continents for millennia (Kull and Rangan 2008, Carruthers *et al.* 2011). Range expansion and contraction can occur across a variety of temporal and geographical scales, so to draw any particular timeline to demarcate native from non-native becomes a selective, historical, culturally relative, and political exercise (Trigger 2006). Head (2012)

highlights this historical and culturally relative temporal demarcation in Australia by “decentring 1788” as the moment that separates native from non-native plants. In particular she argues that “the concept of nativeness in plants is constituted as a temporal boundary between before and after, and a conceptual boundary around humans, rather than arising from the properties of the plants themselves” (4).

The separation between native and non-native plants also relies on a separation between human and non-human, in that after any plant has been moved by human agency it is automatically and irrevocably rendered as non-native (Warren 2007). However, scholars argue that such a process of separation, described by Chew and Hamilton (2010:36) as a “mutagenic denaturing”, should never be understood as clear or fixed. These scholars build on the substantial work in the social sciences that has comprehensively dismantled boundaries between human and non-human, culture and nature (Cronon 1996a, Peretti 1998, McNeely 2001). By dismantling the divide between culture and nature, human-influenced plant movements are able to be viewed as a ‘natural’ process (Chew and Hamilton 2010, Head 2012). Connecting plant movements with human agency, and human agency with human ‘nature’, it constitutes a ‘renaturing’ of these plants and acts as a direct affront to the stability of any fixed or clear divide between native and non-native species.

The second critique of nativeness asks, in quite simple terms; *so what* if a plant is native or non-native? It asks this on both ecological and moral grounds. Critics who ask this question suggest that the ecological relevance of a species’ origin is not as significant as what invasion ecology has made of it, suggesting instead that such a fixation “is empty and misleading” and simply disguises social and cultural preferences for native over non-native species (Slobodkin 2001:1). As Gould (1997:17) argues:

“‘native’ plants cannot be deemed biologically best in any justifiable way... ‘Natives’ are only the plants that happened to arrive first and be able to flourish... while their capacity for flourishing only indicates a status as “better than” others available, not as optimal or globally ‘best suited’.”

This challenges the assumption that native species are ‘better’ for the environment and that non-native species are necessarily ‘worse’, and highlights that any normative judgement on the *value* of a species is ultimately subjective and outside the realm of objective science (Levine 2000, Davis *et al.* 2011). Mabey (2005:46) remarks that “those who believe their policy towards aliens

[non-native plants] is determined by some objective scientific standards are living in ivory towers." For contrast, critics point out that only a small fraction of naturalised, non-native plants become problematic and therefore to demonise all non-native plants is nonsensical (Schlaepfer *et al.* 2011). Furthermore they draw attention to the positive economic, cultural and even conservation outcomes that many non-native species contribute (Christopher 2008, Schlaepfer *et al.* 2011). Therefore as Chew and Hamilton (2010:40) argue, biotic nativeness merely reflects "some common beliefs about humans, but nothing about the essences of biota or of particular taxa".

From the social sciences, scholars interrogate the moral underpinnings of this preference for native over non-native species. They primarily point to the history of ecology and invasion ecology and their links to environmental conservation. The close historical links between the fields demonstrate the moral bent which underpins preferences for native over non-native species (Chew 2006, Davis 2009). This is highlighted in particular by the close relationships between actors such as Charles Elton and Aldo Leopold whose work demonstrates a preference of ecological stability and a fervent dislike of non-native species.

At the more extreme end, contributions to invasive species discourse that uncritically call for the eradication of non-native species have been likened to a form of biotic xenophobia (Sagoff 1999, Mirmohamadi 2006, Warren 2007, McNeeley 2011). Critical scholars highlight the similarities between cultural attitudes towards 'non-native' plants and 'non-native' peoples, suggesting that they stem from the same inherent dislike of difference. Some scholars even cite specific empirical examples of xenophobic "vegetative politics", including policies from Nazi horticulture and other 'fascist' environmental discourses (Warren 2007:435). While most critical scholars acknowledge that conscious xenophobia is unlikely in current invasion ecology, they suggest that certain attitudes towards introduced species maintain an uncritical xenophobic resonance (Larson 2005). Those from within invasion ecology have been quick and decisive to distance themselves and their field from any attitudes or policy that might be construed as xenophobic. Indeed a significant amount of energy has been spent in attempts to categorically separate invasion ecology from xenophobia (Simberloff 2003, Colautti and MacIsaac 2004, Richardson and Ricciardi 2013). As Richardson *et al.* (2008:296) suggest, asserting that "Xenophobes obsessed with eradicating all organisms that evolved somewhere else on the planet operate on the fringe of the conservation movement, as do those who link informed efforts to manage introduced species with xenophobia".

Within invasive species discourse, nativeness has been constructed to connote belonging and inversely non-nativeness to connote a lack of belonging (Warren *et al.* 2011). However, in an increasingly multicultural and cosmopolitan world, calls are being made for the links between nativeness and belonging to be reconsidered (Mirmohamadi 2006, Trigger 2008, Bonetto 2011, Warren *et al.* 2011). In Australia, social scientists have pointed out the cultural touchiness of the concept of nativeness and its relationship to a sense of 'belonging' in the context of a relatively young and multicultural settler-state (Mirmohamadi 2006, Trigger 2008, Bonetto 2011). These commentators suggest that the Australian history of oppressive colonial relations cultivates a "heightened symbolic significance" for the concept of 'nativeness' in Australian environmental management discourse which, in turn, informs and legitimises a "moral hierarchy of cultural belonging" of native over non-native species (Trigger *et al.* 2008:1274).

Questioning 'behaviour'

The invasive qualities of environmental weeds are seen to render them as ecologically destructive over wide areas and therefore in need of control and management. However, similar to the concept of nativeness, the idea of invasiveness has come under scrutiny due to its theoretical inconsistency and the moral subjectivities that are attached to it.

This inconsistency is highlighted by the confusion over what the terms invasive, invasiveness and 'biological invasion' represent. As Valery *et al.* (2008:1346) point out, within invasion ecology and invasive species discourse and management, there remains "persistent basic disagreements about what invasion actually is". Colautti and MacIsaac (2004:136) explain that the casual usage of the term has caused it to become a highly ambiguous concept and has resulted in it being used "as a taxonomic description rather than to describe an ecological phenomenon". They point out five divergent uses of the term invasive within invasion ecology discourse and suggest that this has led to "divergent interpretations and a confusion of concepts and theory [which] can become problematic if they cloud conceptualization of the processes they are meant to describe". They argue that although this criticism might seem merely semantic, this lack of conceptual and definitional clarity "leads to the lumping together of different phenomena, and the splitting of similar ones" which "can confuse ideological debates and undermine management efforts" (135). This renders invasiveness as an inherently relative term, reinforcing its subjectivity and as such further undermines it as an objective ecological principle.

The ideological confusion is seized upon by critics who problematise the automatic association of invasiveness as ecologically undesirable. Critics highlight that such an association constitutes the attachment of an ideological judgement to an objective ecological behaviour (Larson 2007, Rotherham and Lambert 2011a). They argue that while invasion ecology suggests that it can objectively determine that a species might naturalise widely and spread rapidly (read, become invasive), any assessment of this behaviour as unfavourable represents an interjection of human values (Davis 2009).

In an objective and purely ecological sense, any automatic, acontextual association between invasive and 'unfavourable' contradicts evolutionary biology, particularly the concept of biological fitness. In contrast to this negatively framed association, some weed scholars provide alternative perspectives which frame invasive plants as ecologically beneficial (Whisenant 1999, Davis 2009, Marris 2011, Mabey 2012). As Zimdahl (2007:20) suggests in relation to invasive plants and weeds, "their ability to grow in habitats that have been disturbed by man makes them a kind of ecological Red Cross: They rush right in to disturbed places to restore the land". Such a switch in perspective highlights the moralistic attachments of invasion ecology and mainstream environmental weeds discourse (Schlaepfer *et al.* 2011).

Within weeds discourse, this dislike for rapidly spreading plants is linked to the fact that they are difficult to control and can disrupt human designs of where plants *ought* to be. As Mabey (2012:1) writes "plants become weeds when they obstruct our plans, or our tidy maps of the world. If you have no such plans or maps, they can appear as innocents, without stigma or blame". Or as Dwyer (2011:83) suggests, "our need for order is also reflected in the unease, fear even, that we feel about the absence of control" hence "out of control plants often attract the label weed".

This discussion of fear and unease is taken further to explore the morally-laden and militaristic language which has become embedded in invasive species and weed discourse. Over the last decade, scholars have become critical of the role that language plays in the production and reinforcement of negative attitudes towards invasive species (Larson 2005, Seddon 2005, Dwyer and Eldershaw 2012, Tassin and Kull 2013). It is widely acknowledged that commonly used language can distort and confuse the communication of invasive species discourse (Colautti and MacIsaac 2004, Hattingh 2010, Dwyer 2011, Larson and Kueffer 2013). Simple and commonly used terms such as 'invasion' and 'infestation', combined with militaristic management metaphors that promote a 'war on weeds', dominate invasive species and environmental weed discourse (Larson 2007a, Dwyer 2011). Such emotive and sometimes violent expression clouds

the objectivity of invasion ecology and, as Larson (2005:495) points out “may actually undermine conservation objectives”. This is supported in the Australian context by Downey (2011:86) who suggests that instead of promoting successful and effective practice “the analogy of a war has actually stifled and hampered weed management”. This has led commentators such as Larson (2005) to highlight the importance of “demilitarising invasion ecology”, while in Australia, Dwyer (2011:85) has suggested the need for Australian environmental management to “seek a more peaceful co-existence with [weeds]... as a way to make peace”.

Questioning ‘impacts’

It is accepted that non-native, invasive species have an effect, in some way or another, on the ecosystems in which they occur. However, these impacts – whatever they might be – are commonly uncritically interpreted as harm by invasion ecologists and environmental managers (Davis 2009, Rotherham and Lambert 2011). While the impacts of non-native, invasive plants might be objectively outlined by invasion ecology, for these impacts to be interpreted as harmful, critics highlight that they must first be processed through a particular contextual and cultural lens which interprets them as such (Pfeiffer and Voeks 2008, Rotherham and Lambert 2011a). Tassin and Kull (2015:168) explain that:

“What humans dislike about invasive species is not their effects on nature *per se*, but their effects on a particular desired nature. The characteristics of that desired nature are highly contextual to different people and different landscapes, and are defended with reference to different ethical, ideological, and material perspectives.”

Therefore, depending on the ‘desired nature’, plants and their impacts will be interpreted differently, which will, in turn, inform different policy and management outcomes. Within ecology – particularly invasion and conservation ecology – the change caused by non-native, invasive plants is interpreted as harmful, which in turn legitimises their designation and destruction as environmental weeds (Sagoff 2005, Schlaepfer *et al.* 2011). Here, again, critical scholars highlight invasion ecology’s historical association with the conservation movement and the legacy which has produced an “uncritically accepted conservation and environmental agenda – that was, and perhaps still is, practised without a self-conscious and critical scrutiny of the value assumptions informing its practice” (Hattingh 2010:366). Davis (2009:196) explores this association and traces the development of what he refers to as the “Eltonian normative and conservation approach to non-native species”, which frames ecological stability as preferable over

environmental change and dynamism (Hinchliffe 2008, Sarkar 2011). Such preferences are evident in the works of early ecologists such as Leopold who suggests in his influential book *A Sand County Almanac* (1949:242) that “A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.” Rotherham (2005:53) builds on this idea, but counters it, suggesting in relation to ecological change caused by environmental weeds “we tend to dislike change...Change and fluidity are troubling to us, and yet all we know of the environment and landscape history confirm the scale of changes, and the ebbs and flows in the state of the world.”

Alongside a growing appreciation of ecosystem instability as a part of ecology and human-environment interactions (as characterised by the designation of the current era as the Anthropocene), these morally-grounded preferences of integrity and stability over change and dynamism are becoming contested. Challenges have arisen that call for invasive species discourse to confront its normative and value-based attitudes towards the change caused by non-native, invasive species (Sagoff 2005, Marris 2011). According to Davis (in Borrell 2011:76), the field needs to “wait a minute” and ask “Is this harm, or is this just change?” He continues, to suggest that:

“The fact that certain native species may become less abundant, is that really harm, or is that just change? It’s socially irresponsible to call those changes harm. Once we declare something as invasive or harmful, it makes society obliged to reduce or mitigate this harm, which draws on scarce resources. I don’t believe we can justify using social resources to support projects that are often little more than claims of personal preference.”

Some of the ecological premises which designate the effects of invasive species as harmful are also being contested by ecologists. Among these challenges are that the negative impacts of invasive species have been exaggerated by invasion ecology; that biological invasions actually increase local biodiversity; and that biotic invasions have occurred for an extended period of time prior to the Anthropocene so the current trend is not something to be overly concerned about (see Lonsdale 1999, Levine 2000, Houlihan and Findlay 2004, Briggs 2013, Thomas, 2013).

Defending invasion ecology

The critiques outlined above have generated a response from invasion ecology and led to lively debates in the literature. The zealous responses that the critiques have provoked highlight the contentiousness of these debates (Simberloff 2003, Simberloff 2005, Richardson and Ricciardi 2013).

In particular, the concept of nativeness and its ecological significance is fiercely defended by invasion ecologists. Those defending nativeness suggest that its critics from outside the field inherently mislead the debate and go as far as to “parody modern conservation biology” (Richardson *et al.* 2008:296). They offer two broad defences to the critiques.

The first defence is that the influence of biotic nativeness within invasion ecology is exaggerated by its critics (Richardson and Ricciardi 2013). It is suggested that critics “assail a straw man” by selectively seizing upon particular, usually marginal voices within invasion ecology, and cast these voices as representative of the entire field (Simberloff 2011a:36). This defence downplays the significance of nativeness as an organising principle and instead points to invasion ecology’s overwhelming focus on the invasiveness of species, and on the impacts which these species have on ecosystems (Richardson *et al.* 2008). As Simberloff (2003:179) argues:

“Critics of efforts to control invasions often ignore their ecological and economic impacts. These impacts, rather than aesthetic judgments or appeals to questionable concepts of naturalness, constitute a cogent, ethical basis for management of introduced species. Claims that modern introduced species activity targets all introduced species, not just invasive ones, and neglects benefits of certain introduced species have no basis in fact and becloud an urgent, important issue.”

The second defence argues that the distinction between native and non-native is important, even crucial to understanding a species’ potential impact on its ecology (Simberloff *et al.* 2011, Paolucci *et al.* 2013). Simberloff (2005) puts it bluntly, asserting that “Non-native species *do* threaten the natural environment!” This perspective is expanded upon by Richardson and Ricciardi (2013:1463), who contend that:

“Ignoring biogeographic origins as a mediator of impact ignores the importance of evolutionary context in species interactions. Non-native consumers inflict greater damage on native populations. The more ‘alien’ an established animal, plant or

microbe is to its recipient community, the greater the likelihood it will be ecologically disruptive.”

It is clear that defences of invasion ecology fall back on the *impacts* of non-native naturalised plants. This emphasis is common to both sides of the debates. Whatever the critique, and whichever side of the debate the commentator is positioned, most recognise the importance of an approach to invasive species and environmental weeds that focuses on the impact of the plant in a particular context and whether or not it is perceived as a problem in that context (Larson and Kueffer 2013). This is noted and summarised by Davis (in Borrell 2011:76), who straightforwardly argues that “there should simply be less preoccupation with where a species is from and more of a focus on whether or not it really is a problem”.

New directions in invasive species discourse

Stemming from these critiques and debates, new directions have emerged for framing, understanding and managing invasive species and their effects on ecosystems (Heger *et al.* 2013). Two of these approaches are Species Redistribution Ecology and novel ecosystems.

Scholars have suggested the need to create a “neo-invasion biology” which moves beyond the moral loadings embedded within current invasive species discourse and which concentrates on species redistributions, rather than species ‘invasions’ (Davis 2009:196, Bridgewater *et al.* 2011, Cronon 2013, Hobbs 2013). As an alternative, Davis advocates for the uptake of Species Redistribution (through the acronym SPRED) ecology, which seeks to understand species’ movements in a more value neutral way. Such an approach would create space for an appreciation of the role that humans have played, and continue to play in plant movements. Davis argues that this is particularly pertinent considering the imminent and potentially drastic changes to current and future species distributions caused by climate change.

Davis argues that this would address the concern that many scholars and practitioners have raised regarding the need for an appreciation of the human and cultural context of species redistributions and biological invasions (McNeely 2001, Rotherham and Lambert 2011, Tassin and Kull 2015). Such a refashioning of invasion ecology could continue to investigate the movement of species and their interactions with new ecosystems, avoid the morally laden language which dominates management discourse, and understand environmental change without the conservation tendency to automatically conflate this change with harm.

The growing acceptance of ecological change (and the possibility that such changes might be positive) in an increasingly dynamic and cosmopolitan nature, has also led to the evolution of new ways of viewing and understanding the ‘recombinant ecologies’ which they produce (Peretti 1998, Barker 2000, Milton 2003, Hobbs *et al.* 2006, Marris 2011). In particular the concept of ‘novel ecosystems’, which are also termed ‘emerging’ or ‘hybrid’ ecosystems, has emerged to describe, understand, and promote an acceptance and appreciation of:

“assemblages of species that have not co-occurred historically; such ecosystems result directly and indirectly from human activities, are relatively stable, and occupy space alongside existing semi-natural or natural ecosystems in the world’s landscapes and seascapes.” (Bridgewater *et al.* 2011:423).

Testament to the scale of environmental change during the Anthropocene, these ecosystems are currently said to constitute approximately 40% of the ice-free land on earth, and encompass many of the ecosystems in which humans are in close connection with the environment (*ibid.*). Within invasive species and environmental management discourse, the concept of novel ecosystems encourages an appreciation of environmental change and a more dynamic approach to conceptualising and managing the impact of invasive species. It recognises that ‘nature’ is ecologically, socially, culturally and politically dynamic. Such an understanding frames invasive species as a part of this dynamism, as contributing to “melting pots of biodiversity” (Kull *et al.* 2013), rather than an attack on a pristine or unchanging ‘nature’. In addition to the changes caused by novel species, novel ecosystem ecologists draw on the impacts of other impending and inevitable large scale environmental change (namely climate change and expanding urbanisation) in order to highlight the importance of understanding, appreciating and managing nature as dynamic (Bridgewater *et al.* 2011, Hobbs 2013).

The concept of novel ecosystems has attracted criticism from invasion ecologists and environmental managers. Critics of the concept (or at least the popularisation of the concept and its uptake into environmental management) feel, again, that invasion ecology has been misrepresented by proponents of novel ecosystems (Richardson and Ricciardi 2013). Specifically they repeat their point that the field does not have an innate or unwarranted bias towards all non-native, invasive species, nor does it automatically interpret the change caused by these species as inherently harmful (Alyokhin 2011, Lockwood *et al.* 2011). They argue that an approach that simply accepts novel ecosystems and works alongside change might constitute a slippery slope

towards a 'do nothing' and 'wait and see' attitude in management (Simberloff 2011a). Nevertheless, they do acknowledge that more measured, value neutral and concentrated invasive species management is required (Schlaepfer *et al.* 2011, Hobbs 2013, Richardson and Ricciardi 2013).

Proponents of novel ecosystems are careful to point out that the concept does not promote a 'do nothing' attitude in management, nor does it undermine the conservation of 'pristine' or ecologically unique areas (Jackson and Hobbs 2009). Instead, novel ecosystems simply call for a more judicious interpretation of environmental change, where change is not automatically seen as harm. Most novel ecosystem ecologists propose that by understanding and accepting novel ecosystems it will in fact help to streamline conservation efforts, particularly in terms of invasive species management (Hobbs *et al.* 2006). By not wasting energy trying to restore places to their prior state, advocates propose that it will free-up and focus management attention towards protecting and conserving pristine places in more efficient and effective ways (Sarkar 2011, Hobbs 2013).

Conclusion

The original concept of weeds was comfortably subjective; it recognised that a plant might be a weed or a wildflower depending on one's perspective. However a turn toward more objective definitions, particularly through the development of Weed Science, saw the concept take on biological and ecological characteristics. The emergence of environmental conservation ethics during the middle of the 20th century, combined with the expansion of invasion ecology during the 1980s and 90s, produced the concept of 'environmental weeds' based on a plant's *origin*, *behaviour* and *impact*. Specifically, environmental weeds became plants that are non-native, invasive, and change the ecosystems in which they are naturalised. Such objective and scientific classifications removed the subjectivity of weeds and produced a definite distinction between *weeds* and *wildflowers*.

This definite distinction has become contested. Although Ewan suggested that the "world has moved beyond the debates", they seem to be alive and well in the literature. Critical scholars continue to unpack invasion ecology and environmental weeds discourse to expose their subjective bases and cultural relativity, which had been veiled by an objective and scientific veneer. These criticisms challenge the dominance of invasion ecology in invasive species

discourse and have provoked debate about how environmental weeds should be conceptualised and managed.

Although the debates are intensely disputed, three points are agreed upon. Firstly, that a better understanding is needed of exactly what ecological change is occurring due to the naturalisation of novel species. Secondly, invasive species and the environmental change they cause are contested and political phenomena that will be interpreted differently according to the cultural lens through which an individual or group perceives them. And thirdly, that management rests upon these interpretations and is therefore political, cultural and contextual.



3
CHAPTER THREE

INDIGENOUS ECOLOGICAL KNOWLEDGE IN NATURAL AND CULTURAL RESOURCE MANAGEMENT

Towards the end of my first round of fieldwork I spent an extra weekend in a community to take up an invitation to go fishing with Bob, a senior Ranger and his family. Bob and his family are proud of their culture and are happy about having a local Ranger group that can foster it by caring for country. Bob is lucky to have a job, but even luckier to have a Ranger job that allows him to engage with his country and his culture. During our time together Bob and his family shared their knowledge and culture generously.

We caught a lot of fish on the first day. Cooking them up for lunch, Bob asked me if I was having fun. I answered along the lines of “This is the life.” “Nah Tommy” he replied “this *is* life.” He chuckled and asked where my notebook was so that I could “write that one down”. Later that evening he reminded me of this exchange, saying that on each visit I had made to their community we had been talking *about* knowledge, but that this wasn’t the way he ‘thought’ or ‘knew’ about things. His way of ‘thinking’ and ‘knowing’ was by living his culture on his country, sharing it with his family in the presence of his ancestors and through his Law. Being out on country and fishing *is* culture and *is* knowledge. Culture and knowledge are not separate from place and practice.

This *living* of knowledge and living through Law is the way that people care for their country. His father added (almost apologetically) that this is what couldn’t be captured by all the scientists and researchers who came to study Aboriginal ‘knowledge’; it couldn’t be written down in notebooks and it can’t be bound by Western understanding or fit Western models. He told me, “You can’t write it down, can’t take it from me...can’t take it from here.”

As we returned to the community the following afternoon Bob asked me to pull over because we needed to burn some country. I asked him why he was burning this particular place

at this particular time. I was surprised when he told me that they were burning because the fire-ecologist from the Kimberley Land Council had told the Rangers that they should. He followed this up with a vague and confused explanation that touched on climate change, carbon emissions, dewpoint, Carbon Farming Initiative targets and the North Australia Fire Information website satellite images. Bob did not mention *anything* cultural or local. It seemed bizarre that a senior Ranger and such a knowledgeable Traditional Owner for that country – someone who lived through his Law and connection to his country – should be burning because a fire-ecologist told him to, for reasons that he later acknowledged were pretty abstract and confusing to him. I asked Bob's father if this burning made sense to him. He replied that he didn't know, but he "guessed so" because this was "Ranger business".

What struck me was that Bob had separated cultural practice from the 'Ranger business' of burning. When I asked what the difference was between cultural practice and 'Ranger business', I was told that 'Ranger business' was a new way of doing things and was what he got paid to do. However, 'Ranger business' is supposed to foreground cultural practice, not place it behind Western and scientific rationale. This act of 'Ranger business' was a marked contrast to the rest of the weekend, which had been a lived cultural experience.

This example is symbolic of many cultural contradictions that I observed as a part of Aboriginal NCRM in the Kimberley. Aboriginal people have strong cultural connections to their country and are grateful for the opportunity that Ranger work provides to manage country according to culture. However beyond the rhetoric they are limited in the ways that they are able to express and practise their knowledge in the arena of contemporary 'Ranger Business'. This chapter explores the literature to find how this might have come about.

Indigenous people hold locally specific knowledge through which they relate to and manage their environment. This knowledge has developed over long periods of time and underscores an intimate connection between people and place. Since the 1970s, Indigenous people and Indigenous ecological knowledge (IEK) have become recognised as fostering sustainability and environmental conservation. This has led to the incorporation of Indigenous knowledge in mainstream environmental discourses and large-scale management.

Alongside this recognition and incorporation of IEK into mainstream environmental discourse, natural and cultural resource management (NCRM) developed to offer decentralised and democratised alternatives to top-down, command-and-control NRM. Central to NCRM was

that it created space for local groups to manage their lands according to their culture. On top of environmental and conservation outcomes, this aimed to empower local communities by sharing control of resource management and invigorating local culture. While the rhetoric of IEK and its integration into NCRM suggests that it produces positive environmental and social outcomes, in practice, these initiatives have not always delivered such benefits.

This chapter provides a background of IEK by tracing its enquiry and integration into mainstream NRM and NCRM. It discusses the origins of NCRM and its evolution at the intersection of social and environmental movements. The second half of the chapter outlines critical voices that exist in IEK and NCRM discourse. These voices make visible the epistemological, cultural and institutional politics that enclose the production of IEK and its integration into NCRM.

Indigenous Ecological Knowledge

Indigenous ecological knowledge is a term used to encapsulate the body of understanding possessed and practiced by 'Indigenous' peoples throughout the world. Over time and across a diverse range of environments, different cultures have developed different ways of understanding their environments and their relationship to it. These understandings have sustained the lives of people and the viability of cultures for centuries and millennia (Freeman 1992, Gadgil *et al.* 1993). The concept of IEK represents an Western and primarily academic attempt to encompass the diversity of these understandings (Berkes 1993, Agrawal 1995, Holmes 2010).

IEK is highly context-dependent; it is particular to the people who hold that knowledge and the places in which they hold it. Despite the diversity this creates, there are common aspects of IEK. These aspects are combined by Berkes (2000:1252) who defines it as:

“a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment.”

A number of alternate labels exist for IEK including 'traditional ecological knowledge' (TEK), 'local knowledge' and 'folk knowledge', as well as more broad conceptualisations such as 'Indigenous knowledge systems' (Brokensha *et al.* 1980, Lewis 1993).⁷

IEK enquiry primarily evolved from the fields of anthropology and more recently ecology. Initially motivated by anthropological curiosity and a desire to preserve cultural diversity, the field sought to understand the ways in which 'Indigenous' or 'Traditional' peoples viewed and interacted with their environments (Berkes 1993, Turnbull 2009).

Most of the early work of IEK was carried out under the labels of ethnobiology, ethnoecology or folk science and focused on comparing Indigenous and scientific taxonomies (Brokensha *et al.* 1980, Boster 1987, Nader 1996, Berkes 2000, Turnbull 2009). These early studies intended to redress the rapid loss of IEK. This was undertaken by recording, cataloguing and categorising Indigenous names for environmental features, including animals, plants and landscape. The descriptions of Indigenous observations were then often compared and validated by the scientific view of the landscape and its ecology (Baker and Mutitjulu 1992). This list-making tradition viewed Indigenous knowledges in a way that fit in to ecological paradigms of taxonomic classification (Hunn 1993a, Bradley *et al.* 1997). Many of these early studies into IEK were solely concerned with *what* is known, not *how* or *why* it is known.

Although this ecological and taxonomic approach dominated the origins of the field, environmental anthropologists recognised that ecological comparisons could only understand a small and superficial part of Indigenous knowledge.⁸ They suggested that the ecological explanations and ethnobiological approach had merely resulted in a transfer of *information* rather than *knowledge* (Berkes 1993, Agrawal 1995, Nader 1996, Scott 1996). They suggested that *knowledge* implies a deeper understanding of meaning as well as the relationships between plants, animals, landscapes, and spirits (Tanner 1979, Nelson 1986).

To understand Indigenous *knowledges* hence became the motivation of researchers. This change in motivations also changed the approaches of researchers toward developing a more culturally embedded understanding of Indigenous relationships to, and knowledge of their environments. The search for knowledge as *meaning* rather than knowledge as *information* uncovered profound relationships between Indigenous people and their environment, which are rooted in philosophical and spiritual connections to place. As Berkes (2008:11) noted:

⁷ The label of Traditional Ecological Knowledge is commonly used in North America and Europe.

⁸ For examples of this shift in emphasis refer to Tanner (1979), Nelson (1986), Berkes (1993), Nader (1996), Rose (1996) and Scott (1996) (among others).

“Indigenous knowledge systems are characterized by embeddedness of knowledge in the local cultural milieu; boundedness of local knowledge in space and time; the importance of community; lack of separation between nature and culture, and between subject and object; commitment or attachment to the local environment as a unique and irreplaceable place; and a non-instrumental approach to nature.”

These philosophies of respect for the environment combined with intricate local ecological knowledge were recognised as valuable by environmental groups, who saw Indigenous people and their knowledge as offering a sustainable contrast to Western modernity’s extractive relationships with nature. This positioned IEK as a tool for mainstream environmental management, particularly as a part of the emerging discourses of sustainable development and biodiversity conservation.

IEK meets NRM

Alongside the anthropological curiosity and the ethical imperative of preserving cultural diversity, increased enquiry into IEK highlighted its utility for mainstream NRM (Preuss and Dixon 2012). Many scholars, including Freeman (1992:9), recognised “It is important to note that traditional ecological knowledge has been found to have management relevance, especially in regard to sustainable use of renewable resources”. As Becker and Ghimire (2003:1) noted, tapping local and Indigenous knowledge offers “a diverse set of institutional solutions for ecological sustainability”. Johannes (1989:5) pointed out that this should be intuitive:

“Imagine people who confidently assume they can best describe and manage the natural resources of an unfamiliar region alone – ignoring local hunters who know every cave and waterhole and the movements and behaviour of a host of local animals – overlooking the farmers who know the local soils, microclimates, pests and seasonal environmental changes – disregarding the native fishermen who know the local currents and the movement and behaviour of the marine life in their waters. Such, historically, has been the custom of most environmental scientists and natural resource managers working in unfamiliar environments.”

Furthermore, scholars pointed out that local and Indigenous communities remain heavily invested in promoting the sustainability of local ecosystems, as many continue to rely on these ecosystems for their productivity and viability (Hunn 1993, Williams *et al.* 1993, Lynch *et al.* 2010).

They suggested that local people will therefore become involved in movements which promote the conservation of local environments (Gadgil *et al.* 1993, Becker and Ghimire 2003).

This was recognised at a global scale towards the end of the 20th century by intergovernmental organisations, national governments, academics and NRM practitioners (Huntington 2000, Drew 2005, McGregor 2006, Turnbull 2009). Perhaps most significantly, IEK was recognised by the 1987 World Commission on Environment and Development's publication *Our Common Future*, commonly known as the *Brundtland Report* (see UNWCED 1987), which acknowledged the contribution that Indigenous people and their knowledge could make to the emergent goal of 'sustainable development'. It reads:

"Tribal and Indigenous peoples'...lifestyles can offer modern societies many lessons in the management of resources in complex forests, mountain and dry-land ecosystems." (12)

"These communities are the repositories of vast accumulations of traditional knowledge and experience that link humanity with its ancient origins. Their disappearance is a loss for the larger society, which could learn a great deal from their traditional skills in sustainably managing very complex ecological systems"(114-115).

Further global appreciation for IEK followed in 1992 when it was recognised by the *Convention on Biological Diversity*. Specifically, Article 8(j) states that each Party to the Convention shall:

"subject to national legislation respect, preserve and maintain knowledge, innovations and practices of Indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge innovations and practices".

This international recognition was ground-breaking for Indigenous people. According to McGregor (2006:2), it represented

"a significant shift in the discourse on Indigenous peoples and the environment— from the representation of Indigenous peoples as problems to be solved and/or

victims to be rescued, to the positive contribution that they can make to global sustainability by virtue of their millennia of experience in living sustainably on the land.”

These transnational conventions catalysed more localised enquiry into IEK’s potential contributions to sustainable land management. The International Union for Conservation of Nature and Resources (IUCN) established the Traditional Ecological Knowledge Working Group in the 1980s, which promoted the value of TEK to scientific land managers. The Working Group’s 1993 publication *Traditional Ecological Knowledge; Wisdom for Sustainable Development*, which stemmed from a workshop in Canberra in 1988, “was founded on the idea that the value of traditional ecological knowledge for natural resource management had been grossly undervalued by western (or western-trained) ‘scientific’ managers” (Williams *et al.* 1993:1). To redress this, the Working Group aimed to promote the utility of IEK as a useful tool for achieving sustainable development and the conservation of natural resources at a number of scales. This compilation of case studies was unique for its time as it acknowledged and highlighted the complexity of IEK beyond the previous trans-national representations and demonstrated an understanding of local idiosyncrasies which might affect its integration into scientific discourses of sustainable development and environmental management (Head 1993, Rose 1993).

Natural and Cultural Resource Management

NCRM originated during the last third of the 20th century, in response to the growing recognition of the utility of IEK in environmental management, in combination with critiques of large-scale, centralised, command-and-control NRM. The development of NCRM was supported by environmental and social movements, which developed through conservation and human rights discourses, and were usually presented by nongovernmental organisations working closely with local and Indigenous communities (Dressler *et al.* 2010). These groups sought to create and extend novel versions of NRM that combined the promotion social justice with environmental conservation (Fabricius 2004; Armitage *et al.* 2007). This occurred as a “loosely woven transnational movement” that promoted the decentralisation of NRM power away from State and corporate bodies, towards local people and their communities (Brosius *et al.* 1998:157). The democratisation of NRM structures allowed a greater number of local actors to participate in making decisions about the management of local resources (Marsden 1994). These local and Indigenous people were thought to be better suited to manage local resources than distant State

or corporate environmental managers because of their close connection to these resources and their histories of sustainable use (Howitt 2001, Raymond *et al.* 2010).

NCRM has expanded significantly in developed and developing countries alike and has been promoted by transnational institutions such as the World Bank, national governments and local/regional NRM agencies. A variety of models of NCRM have been developed. These structures include (among others): community-based NRM; collaborative or cooperative management (otherwise termed co-management or joint-management); integrated conservation and development programs; and community-based conservation. I use the term 'NCRM' because it is the term that is used in the context of Australian Aboriginal land management and Ranger programs in the Kimberley.

These different models of NCRM are often formalised between governments or other mainstream funding bodies and local groups. These formal arrangements demarcate clear rights, roles and responsibilities for each of the groups involved. Despite differences between and within each of these models, Kellert *et al.* (2000:706) recognise five characteristics common to all NCRM initiatives, these are:

- A commitment to involve community members and local institutions in the management and conservation of natural resources.
- An interest in devolving power and authority from central and/or state government to more local and often Indigenous institutions and peoples.
- A desire to link and reconcile the objectives of socioeconomic development and environmental conservation and protection.
- A tendency to defend and legitimize local and/or Indigenous resource and property rights.
- A belief in the desirability of including traditional values and ecological knowledge in modern resource management.

Berkes (1993) describes NCRM conceptually as a bridge that is constructed and constantly reconstructed to link government or mainstream systems, which are usually centralized authorities and informed by scientific information, with local-level systems usually informed by locally specific, Indigenous knowledge. This way, NCRM can be understood as a practical and theoretical link between government-based or mainstream-based mechanisms and local-based mechanisms of management.

NCRM has been widely adopted due to its potential to provide social outcomes in addition to environmental sustainability. These social outcomes centre on the idea that NCRM is able to empower local people and their communities by promoting participation, invigorating democracy, providing employment and revitalising local culture.

The empowerment of local people through the invigoration of democracy is suggested as being at the heart of NCRM (Sivaramakrishnan 2002, Larson and Ribot 2004, Campese 2009). The sharing of power in NRM is undertaken through the political process of decentralisation – known as devolution in terms of the spreading of power to more local governments (Larson and Ribot 2004). By spreading power away from central institutions (usually government agencies) NCRM allows the participation of a greater number of interest groups and individuals (Yandle 2003, Cooke and Kothari 2004, Hickey and Mohan 2004). The dominant NCRM narrative suggests that as decentralisation of power occurs, there is greater potential for citizen and community participation which in turn leads to an invigoration of democracy at a variety of scales. Democracy represents the sharing of power towards ensuring the ability of all people to contribute to, or participate in making decisions which will affect their lives. By invigorating democracy, NCRM empowers previously excluded individuals, groups and communities to participate in making decisions that affect how local resources are managed (Sivaramakrishnan 2002, Hickey and Mohan 2004).

By increasing participation, NCRM employs local people to work locally. In many cases NCRM exists in remote areas where there are minimal job opportunities, let alone employment that is culturally meaningful (Altman and Whitehead 2003, Becker and Ghimire 2003, Kerins 2008). The economic benefits of local employment flow on through the communities (Smyth 2014). As such, some NCRM initiatives, including those in Australia, have originally stemmed from Indigenous and local employment schemes. A popular international example, and one which is similar to Aboriginal weed management in Australia, is the Working for Water Program in South Africa. Although Working for Water is primarily concerned with the removal of invasive plants, its engagement with local social agendas and poverty reduction has meant that it is lauded as a successful and sustainable social and environmental initiative (Aitken *et al.* 2009, van Wilgen *et al.* 2011).

Using IEK in NCRM is promoted to sustain and revitalise local culture. The preservation of culture, knowledge and language relies on them being used rather than just recorded (Stevenson 1998, Christie 2007). NCRM provides an outlet for culture and knowledge to remain vital and invigorate its use, particularly with younger people (Langton 1998). By demonstrating its

practical applicability to contemporary environmental issues, it is thought that IEK gains legitimacy, particularly considering the tendency for it to be devalued through its constant juxtaposition with the dominance of scientific knowledge (Agrawal 1995, Berkes *et al.* 2003).

Critiques of IEK and NCRM

The linear narrative that presents the integration of IEK into NCRM as leading to environmental conservation and community empowerment has become broadly criticised. These critiques point to the politics of IEK production and NCRM practice. These politics are often invisible to those working on the ground but have been powerful in constructing a particular imagination of IEK and restricting Indigenous voices in NCRM discourse.

The production of IEK and the 'project of integration'

As the incorporation of IEK into mainstream NRM and NCRM has increased, critical attention from scholars and practitioners has highlighted the political nature of this "project of integration" (Nadasdy 1999). They suggest that the production of IEK and its representation in scientific discourse constructs a particular version of IEK that has been used to support mainstream conservation agendas: but which misrepresents the contextual and locally specific meaning of these knowledges (Simpson 1999, Rolls 2007).

For IEK to be integrated into mainstream land management or NCRM it must first be made 'legible' to these discourses (Brosius 2004, Bohensky *et al.* 2013). Western traditions of knowledge production and communication are grounded in the assumption that knowledge is universal and can be removed from its original source, transferred, and re-presented into new contexts more or less intact and unchanged (Agrawal 1995, Nader 1996, Scott 1996). In contrast, Indigenous knowledges represent highly contextual understandings which are largely "singular, non-transferable, tacit and unable to be expressed in words", and which cannot be separated from "the routine processes of everyday life" (Christie, 2007: 86,87).

The processes by which IEK is produced and integrated into NRM largely ignores this (Stevenson 1998, Nadasdy 1999, Wohling 2009). Christie (2007:86) points out that the need to make IEK legible leads to a selective dissection of highly contextual understandings. Muller (2012:59) agrees and argues that the production of 'legible' IEK can distort its meaning, explaining that:

“some elements of Indigenous knowledge are easily understood, documented and objectified by non-Indigenous scientists with other, less tangible aspects being ignored and marginalised.”

Ellen and Harris (2000:15) argue that Indigenous knowledge systems are commonly dissected to fragments so that they can be re-presented as discrete “bite-sized chunks of information that can be slotted into Western paradigms”. In order for Australian Aboriginal knowledge to contribute to NCRM discourse, Holmes (2010:108) suggests that they must first be “fractured and decontextualized so as to conform to positivist methodologies”.

The need to make Indigenous knowledge “conform to positivist methodologies” has meant that the ‘bite sized chunks of information’ are usually produced to align with a particular scientific discipline. Addressing this reductionist alignment Semali and Kincheloe (1999:21) suggest that:

“...to speak of Indigenous knowledge systems in Western terms such as botany, pharmacology and medicine...is to inadvertently fragment knowledge systems in ways that subvert the holism of Indigenous ways of understanding the world.”

In land management and NCRM discourse the parts of Indigenous knowledge that are extracted from this ‘holism’ are usually of an environmental or ecological nature. Stemming from this ecological dissection are the frequently used terms IEK and TEK. IEK is used as a way to “collectivize” the ecological parts of these diverse Indigenous understandings and connections to their environments (Semali and Kincheloe 1999, Christie 2007). That these terms include the word ‘ecological’ provides the illusion that it is possible to separate the ‘ecological’ parts of Indigenous knowledge from other parts of their systems (Berkes 1993, Holmes 2010).

Untangling ‘ecological’ parts of Indigenous knowledge from the ‘non-ecological’ parts is impossible in most Indigenous knowledges as they rely on and are integral to spirituality, kinship and social order (Bradley *et al.* 1997, Yunupingu and Muller 2009, Muir *et al.* 2010). Therefore to extract the ‘ecological knowledge’ from an Indigenous knowledge system involves a dissection of its cultural fabric (Simpson 1999, Holmes and Jampijinpa 2013). It is this cultural fabric which provides the meaning to the ‘ecological’ parts of knowledge, therefore to separate what scientific management discourse deems ‘ecological’ often undermines its significance for the local people that its ‘integration’ is intended to empower (Rose 1997, Johnson 2011).

Scholars are critical of the inherently political nature of dissecting or decontextualizing knowledge (Bradley and Johnson 2015). They point out that any de-contextualisation of knowledge inevitably leads to a re-contextualisation of that knowledge or parts of that knowledge (Ellen *et al.* 2000). Through such re-contextualisation, knowledge might be realigned or re-presented in order to play any number of roles in any number of discourses – a process which Johnson (2011:302) refers to as a “consistent devaluation, remodelling or ‘refashioning to fit’”. Who performs the de/re-contextualisation, and the reasons for why it is performed will ultimately influence how knowledge will be remodelled or “refashioned to fit” (Bradley and Johnson 2015). Seen like this, the reduction of Indigenous knowledge is a political act through which these knowledges, or “bite-size chunks of information” from these knowledges, become discursively malleable to serve the will of those who have the power to de-contextualise or dissect them (Stevenson 1998, Simpson 1999, Rogers 2006). Scholars have argued that this has led to the appropriation and co-optation of IEK by mainstream discourses of environmental conservation (Rolls 2007, Bradley and Johnson 2015).

While the ‘Western gaze’ into IEK has achieved significant social and political breakthroughs by promoting Indigenous people’s legitimacy and rights to participate in land management, this has primarily been achieved by highlighting IEK’s potential to contribute to mainstream agendas (Brosius 1997, Schnierer and Woods 1998). From the literature, IEK is considered according to how it can serve: international development (Brokensha *et al.* 1980, Green 1999, Gorjestani 2004, Briggs 2005); environmental conservation (Dwyer 1994, Becker and Ghimire 2003, Drew 2005, Butler *et al.* 2012); mainstream NRM and NCRM (Houde 2007, Luckert *et al.* 2007, Ens *et al.* 2012, Bohensky *et al.* 2013); and most notably sustainable development (UNWCED 1987, Williams *et al.* 1993) and biodiversity conservation (Gadgil *et al.* 1993, Colchester 1994). In each of these cases, and many more, IEK is intrinsically linked to how it might work *for* mainstream society.

The ‘master narratives’ of sustainable development and biodiversity conservation have become extremely influential in directing mainstream NRM and NCRM (Brosius 1997, Escobar 1998, Lynch *et al.* 2010). Linked to both is a formally stated recognition of the role that Indigenous knowledge and Indigenous people can contribute towards each of these environmental targets. However, by interrogating the recognition afforded by each of these narratives it demonstrates particular and restrictive imaginations of Indigenous knowledge (Fortier 2002, Rolls 2007).

The Brundtland Report considers IEK as something which “link humanity with its ancient origins”, “can offer modern societies many lessons” and the loss of which would be “a loss for larger society”. By doing so it leaves Indigenous knowledges as temporally locked to their “ancient origins” and separate from “modern society”. Effectively this positions IEK as static and frames it as a solution to the problems of “larger” (read ‘non-Indigenous’) society rather than as legitimate in its own right.

This positioning relative to ‘larger society’ is reinforced by the Convention on Biodiversity, and produces a utilitarian view of Indigenous knowledge (Fortier 2002). The opening caveat in which it states that IEK should be employed “Subject to national legislation”, immediately binds these knowledges to the current geographical and political boundaries of their colonisers, recognising and legitimising the power of the (settler) State. The phrase “traditional lifestyle” negates the adaptive capabilities and lifestyles of Indigenous peoples, rooting them in a ‘traditional’ past whereby the ‘loss’ of these ‘traditional’ lifestyles entails a loss of knowledge. Furthermore, that the knowledge should be “relevant for the conservation and sustainable use of biological diversity” constructs the conservationist ends to which these knowledges should contribute.

The IUCN’s Traditional Ecological Knowledge Working Group and their publication “TEK: Wisdom for Sustainable development” approached the issue through a more local lens, which attempted to emphasise the “cultural significance of traditional ecological knowledge” (Williams *et al.* 1993). However by its own admission, still offers a “very pragmatic ‘reading’ of TEK” whereby the bulk of the discussions in the compilation remain preoccupied with promoting and legitimising TEK’s utility as “a conservation tool, a reservoir of natural history wisdom, in lieu of, or to augment scientific knowledge” (Cordell 1995:44). Perhaps what is most striking about this compilation of case studies and viewpoints is the lack of any Indigenous contributor. Instead IEK and Indigenous voices are spoken for, according to how they might contribute to or be integrated into mainstream environmental discourse.

Indigenous people across the world have become acutely aware of their lack of control over their knowledge and how it is becoming co-opted to serve non-Indigenous goals. As, Fortier (2002:21), a Shuswap First Nations man and Canadian regional fisheries manager, highlights:

“We’re not a part of the game as Indigenous peoples, wherever we are in the world. Have you ever noticed that Indigenous people are always advising others and are never in control? This is institutional racism. At the [convention on biodiversity],

Indigenous people are advisors and at the UN they're advisors ... I don't see us making decisions."

Non-Indigenous scholars echo such views, highlighting that the 'integration' of IEK into mainstream discourses is rarely made by, or is even in the interests of Indigenous people (Cordell 1995, Hawthorne 2001, Brosius 2004a, Smith 2005). Instead, as Hawthorne (2001:78) suggests Indigenous peoples and their knowledge have come to be seen and treated as "a global capital resource". In this sense Stevenson (1998) argues that:

"Many Aboriginal groups and individuals consequently feel that efforts by the dominant culture to access their Traditional Knowledge represents just another form of exploitation. Having taken over Aboriginal lands, mined Aboriginal resources and marginalized Aboriginal peoples, government and industry have turned their attention to [Traditional Knowledge]." (4)

According to Brosius (1997:66), representations of Indigenous knowledge which see it subsumed within "dominant culture" and "environmentalist discourse...has the potential to transform [Indigenous] knowledge into something it is not" and thereby rendered it meaningless to the people who once possessed it.

The mechanistic and reductionist production of IEK and its incorporation into mainstream discourse have led to it being imagined and represented as being static, of the past and environmentally benign (Kohen 1995, Rolls 2007). Some scholars link this to its label as 'Indigenous' or 'traditional' in that these ways of knowing are seen to be confined to the past and are as such no longer relevant (Berkes 2000, Antweiler 2004). Others, such as Sackett (1991:244), have linked this to the popular imagination of the "extremely noble Aborigine", represented as "ideal exemplars" of environmental conservation, revered within land management discourse as a "conservationist effigy".

The 'extremely noble Aborigine' is bound within a pre-colonial and primitive past and by extension so is their knowledge (Scott 1996, Langton 1998, Adams 2008). According to Hemming and Rigney (2010:767), the tendency to romanticise Indigenous cultures and knowledge, particularly by connecting them to conservationist goals, perpetuates "Aboriginalist myths that translate Indigenous interests into past-oriented curiosities". For Sackett, (1991), this "promotes primitivism", "perpetuates racist stereotyping" and tends to "cloak rather than uncover" Indigenous articulations about possible environmental futures.

In 'contemporary' NCRM that deals with 'dynamic' environmental issues, it has been suggested that such representations marginalise Aboriginal voices in discourse. As Rowland (2004:3) writes, "When Indigenous peoples are stereotyped as 'noble savages'/'ecologically noble savages', they are frozen in the past, with little to contribute to human history or to the environmental crisis facing us today". Hemming and Rigney (2010:767) argue that such stereotypes "rarely produce positive transformations for Indigenous communities".

These 'static' constructions of Indigenous people and IEK have been heavily criticised, both for the way that they marginalise Indigenous voices in 'contemporary' environmental discourse and because they inaccurately deny Aboriginal agency in shaping their current landscapes (Rowland 2004, Adams 2008, Gammage 2011). In response, scholars highlight that Indigenous knowledges are dynamic by nature, as they have needed to change over time to address changing environmental, social and political conditions. It is this dynamism underlies IEK's empirical connection to reality and truth (Nelson 1986, McGregor 2006). If it were static and unchanging, IEK would be unable to adapt to changing conditions and would have died out alongside the lives and cultures which it underpinned (Christie 1990, Williams *et al.* 1993). Scholars therefore suggest that it is unfair to frame IEK in a way that denies its capacity to evolve and understand changing environments (Berkes 2009).

[Critiquing NCRM practice](#)

Three critiques of NCRM practice point to the factors that restrict Indigenous voices in its discourse: Firstly, that pre-existing and lingering politics prevents any true power-sharing in land management; secondly, that decentralisation and increased participation does not automatically bring democratic invigoration or empowerment; and thirdly that the multiple expectations of NCRM must be constantly negotiated between different actors.

Despite NCRM giving the impression that it provides a space for democratic dialogue outside cultural politics, critical voices suggest that there is no such apolitical setting in which NCRM can exist (Agrawal and Gibson 1999, Howitt 2001, Cooke and Kothari 2004, Doubleday 2007, Porter 2010). Instead, NCRM will always be embedded within a particular historical, economic, cultural and political context.

Johnson (2011) uses a chess game analogy to introduce how pre-existing cultural politics linger in the space of settler state NCRM. He explains that by virtue of having the first move, the white piece should always remain one move ahead and so be able to dictate the state of play. The initial disadvantage for the black player will be compounded should they have not have played before, or if they do not understand the rules of the game. In such cases, the white player will be the one responsible for teaching the rules “while questions as to why the game is being played this way or whether the rules even make sense, seldom arise” (71).

Within settler state contexts, NCRM is ultimately circumscribed by structures of mainstream and colonial environmental management, which Howitt (2001:47) describes as “legacies of previous areas of injustice and denial”. These systems privilege particular knowledges and have a history of marginalising alternative ways of understanding the world (Pillow 2003, Porter 2010). Nadasdy (2004:268) suggests that because NCRM operates within these institutional structures and on particular epistemological terms, it “makes certain types of behaviour possible and others impossible – and sometimes even unthinkable”. From within this pre-existing political system he points out that “to be ‘empowered’ local people must first agree to the rules of the game, rules that they had no role in creating and that constrain what is possible to do and think” (2005:220). To participate in NCRM therefore implies an acceptance of the dominance of this system and signifies a future of being restricted by its epistemological and ontological terms. As Moreton-Robinson (quoted in Hemming and Rigney 2010:759) argues, this does little to unsettle the “‘possessive logic of patriarchal white sovereignty’ that is continually reaffirmed in the relations of power found in spaces such as natural resource management”.

Rose (1999:177) argues, that this fundamentally limits the role which Indigenous voices can play in NCRM and suggests that it merely provides an illusion of democratic dialogue:

“a critical feature of the system is that the ‘other’ never gets to talk back on its own terms. The communication is all one way, and the pole of power refuses to receive the feedback that would cause it to change itself, or to open itself to dialogue. Power lies in the ability not to hear what is being said, not to experience the consequences of one’s actions, but rather to go one’s own self-centric and insulated way...

The self sets itself within a hall of mirrors; it mistakes its reflection for the world, sees its own reflections endlessly, talks endlessly to itself, and, not surprisingly, finds continual verification of itself and its world view. This is monologue masquerading as conversation, masturbation posing as productive interaction; it is a narcissism so profound that it purports to provide a universal knowledge when in fact its practices

of erasure are universalising its own singular and powerful isolation. The pole of 'self' is both a deformed and deforming power: deforming because it seeks to bend all else to its will, and understands all else only in terms of itself; deformed because it thinks (or gambles) that its will is the will of the universe".

Palmer (2006:34) suggests that this inability to for Indigenous actors speak and be heard from within these NCRM structures underscores "the political inadequacy of democratic projects that seek to create spaces of inclusion for Indigenous peoples within existing environmental governance arrangements".

NCRM's links to democratic invigoration have been questioned. In particular, scholars have problematised the assertion that increased participation through decentralisation of management automatically leads to improved democracy. They argue that the uncritical rhetoric of decentralisation and participation that is present in NCRM discourse can actually lead to the illegitimate exercise of power and reinforce power inequality, rather than achieving democratic invigoration and empowerment (Dubois 1999, Dressler *et al.* 2010).

Cooke and Kothari (2004) confront the problematic notion of 'participation' focusing their argument on four main critiques. Firstly, narratives of participation are blinkered towards focusing on the local scale rather than looking at wider structures of injustice. Secondly, these narratives are based on an over-simplified idea of how power and politics operate, which in turn inhibits understandings of how empowerment (the transfer of this power) might occur. Thirdly, in the field there is a widespread lack of understanding about the role of structure and agency in social change. And finally, practitioners and policy makers understand participation purely as a project methodology rather than a political pathway towards empowerment.

Relevant to Cooke and Kothari's first critique, scholars frequently point out that the rhetoric of participation is often espoused by governments without any fundamental restructuring of power to local communities (Dressler *et al.* 2010). Shackleton *et al.* (2002) point out in their review of devolution of power in community-based NRM, that regardless of the extent to which any central government or authority decentralises its NRM and prioritises participation, it will never cede all, or even the majority, of its power to these local bodies.

This links to the first critique of NCRM practice in that pre-existing structures of authority still hold powers to dismiss or modify any decisions made by local groups (Howitt 2001, Altman and Kerins 2012). Therefore it is asked, if the decisions that these local groups make can

always be superseded by a higher central authority, does increased participation ever actually bring about democracy?

One of the most lauded aspects of NCRM is that it combines social, cultural, economic and environmental outcomes. While in some instances these outcomes are complementary, in others they are not. In practice, meeting the varying expectations of different groups can create confusion and tension over what NCRM is actually trying to achieve. Brosius *et al.* (1998:158-9) highlight the differing expectations of different groups:

“Conservationists, both Indigenous and foreign, hope to involve local people in transnational conservation and resource management goals as a means of protecting biological diversity and habitat integrity. Development organizations...aim to promote local participation in ‘conservation and development’. Populist activists hope to empower local groups in their conflicts with state resource management agencies and national and transnational capital. Indigenous peoples’ spokespersons argue for a new respect for local rights, knowledge, and culture.”

These differences in expectations also play out across a variety of scales. For instance, where a NCRM initiative is being funded by a transnational organisation, organised by a national agency and undertaken by local people, each group might have competing interests for management (Shackleton *et al.* 2002). Brosius *et al.* (1998:159) point out the difficulty in reconciling these competing interests and the need for advocates, analysts and practitioners at each scale to focus on the “contested and changing variety of cultural and political agendas and contexts in which [NCRM] programs are being imagined or implemented”.

Contested expectations for management outcomes lead to difficulties in assessing NCRM programs and initiatives. While some groups look at the social outcomes as indicators of success, other will assess management based on its environmental outcomes. From their review of NCRM in Nepal, Kenya and the United States, Kellert *et al.* (2000:713) found that goals for environmental conservation are “often subordinated and undermined by an inordinate emphasis on social and economic development” and that overall they “seriously question whether [Community]NRM can effectively integrate and reconcile the goals of socioeconomic development and environmental protection.”

Together, these scholars suggest that differing expectations can cause confusion and tension between groups that can undermine the collaborative objectives of NCRM and can set new political contests into play (Notzke 1995, Brosius *et al.* 1998).

Although these critiques pose concerns for the legitimacy of IEK's integration into NCRM, most scholars recognise that these initiatives should still be pursued. Despite its shortcomings, it is generally held that NCRM provides considerable improvements to top-down, centralised, command-and-control environmental management which focuses solely on conservation outcomes (Hickey and Mohan 2004). This attitude resounds throughout NCRM literature and is neatly expressed by Dressler *et al.* (2010:6) who suggest that, "despite [NCRM's] current crisis of legitimacy, there remains considerable potential for refocusing the approach toward its core objectives: social justice, material well-being and environmental integrity."

Conclusion

The rhetoric of NCRM suggests that Bob should not separate the 'Ranger business' of burning from cultural practice. Instead, NCRM should create a space in which Bob and his family become empowered by using their cultural practice to guide Ranger business. Bob's experience is not isolated. From the literature discussed in this chapter we see that, in fact, Bob's reality is symptomatic of wider issues within IEK and NCRM discourse that disconnect Aboriginal people and their knowledge from making significant and meaningful shifts in how environmental management is undertaken.

Although indigenous people possess IEK, they are rarely in charge of how it is produced, represented or integrated into contemporary land management paradigms – within which NCRM is usually steadfastly situated. Bob's father asserted that his knowledge is embedded in place and in culture and could not be taken from him or his country. Yet the production of IEK relies on abstracting Indigenous knowledge into "bite-sized chunks of information" so that it is legible to scientific NRM. These fragments of 'ecological' knowledge are extracted from their local, cultural and spiritual context so they can be integrated into mainstream discourse and provide outcomes for environmental agendas. This production and application of IEK constructs Indigenous people as a "conservationist effigy" whose knowledge and values are static "past oriented curiosities" and marginalises their potential to contribute modern environmental issues.

NCRM intends to provide a democratic space for IEK and Indigenous values to guide, rather than just 'inform' management. Despite these intentions, NCRM remains situated within mainstream institutional and epistemological structures of environmental management. Within this space Indigenous people must play by the rules of a particular game, which they have not necessarily agreed to and which make only partial sense to them.

Together, these epistemological and institutional politics restrict and distort the potential for Ranger business to be connected to cultural practice.

A blue decorative graphic with a white number '4' and the text 'CHAPTER FOUR' below it.

4 CHAPTER FOUR

RESEARCH APPROACH: CONCEPTUAL FRAMEWORK AND METHODOLOGY

“So, are you an ecologist, or a botanist, or an anthropologist, or a geographer, or what?” I answered that I was a geographer, but that I understood how it might seem confusing considering the nature of my project. Participants such as this KLC employee struggled to position me and my research. Even so, most were quick to pigeonhole me as belonging to one field or another (most commonly as an ecologist) but always recognised that I was never strictly undertaking that sort of research alone.

I explained that I consider myself a geographer because geography provides a meeting point for the social and natural sciences involved in my project. Importantly, geography is also closely affiliated with the interdisciplinary analytical approach of political ecology, which views environmental issues and their management as products of ongoing politics, rather than natural or preordained states. In this way, being a geographer and harnessing political ecology, it allowed me to understand Aboriginal weed work and view it as contested – and contestable.

Because my project straddled a number of disciplines, I needed to understand each of these fields in isolation, as well as where and how they overlap. As importantly, I needed to develop an awareness of how my own project fit between these fields and how it would explore these overlaps. I developed a methodology that used research methods from ecology, botany, anthropology and geography. Crucial to my interdisciplinary methodology was understanding and acknowledging the strengths and weaknesses of these methods.

This chapter outlines my conceptual framework and methodology. The conceptual framework revisits the politics that frame environmental weeds and NCRM in order to show how and why I invoked a political ecology approach. My methodology discusses my approach to framing, designing and undertaking the research project. This includes a discussion of the selection of the case study area, timing of fieldwork, ethical requirements of my research, selection of participants, and the research methods that I used.

Conceptual Framework

The debates discussed in the previous two chapters demonstrate that environmental weeds and IEK's integration into NCRM are political.

That weeds are unwanted plants makes them subjective and contested. That the concept of environmental weeds has developed to represent something narrow and rigid means that a process of enclosure has occurred. This enclosure is political in that it has privileged particular voices and particular knowledge in discourse and has marginalised alternative ways of viewing plants in relation to place. The translation of this discourse into management is also political in that it has produced and reified a particular way of controlling plants for particular outcomes. The critiques of invasive species discourse that uncover its cultural relativity and ecological assumptions highlight that weeds and weed management are contested political spaces.

IEK and NCRM are also embedded in politics. The production of IEK and its integration into NCRM requires it to be de-contextualised and re-contextualised in terms that are legible to mainstream scientific discourse. This process makes IEK discursively malleable and means that although Indigenous people might possess this knowledge, they do not have power over how it is used in NCRM.

This is especially the case considering that NCRM is usually bound to institutions and structures of governance that are built on cultural inequality and exclusion. Therefore, although NCRM might provide the illusion of an apolitical space in which different actors, cultures and knowledges interact to produce land management, how actors are able to contribute to discourse is restricted by pre-existing and entrenched cultural politics. Despite NCRM's mandate towards pluralism, participation and democracy these cultural politics privilege and reinforce mainstream, contemporary scientific land management.

The epistemological and institutional politics of IEK and NCRM are recognised and criticised by scholars, advocates and practitioners. In Australia, the politics embedded in the interactions between Aboriginal people and N(C)RM is the focus of significant research. This research concentrates on the production of Aboriginal knowledge (Rose 1999, Bradley and Seton 2005, Christie 2007), its integration into NCRM (Jackson 2006, Palmer 2006, Ens *et al.* 2010, Muller 2012), and the institutional structures that govern NCRM policy (Howitt 2001, Altman 2012, Kerins 2012, Muller 2014).

Political ecology frames environmental change and management within the social, economic, cultural and historical spheres in which they exist. This interdisciplinary approach developed in the 1980s and 90s in response to the failure of ecological and technological solutions for mounting environmental problems. Through political ecology, scholars brought together “the concerns of ecology and a broadly defined political economy” in order to focus on the social and political nature of environmental phenomena and how natural (and cultural) resource management addresses them (Blaikie and Brookfield 1986:17). Adopting a political ecology approach, scholars such as Blaikie and Brookfield (1986), Peet and Watts (1996) and Robbins (2004) argued that any investigations or solutions to ‘environmental’ or ‘ecological’ problems need to recognise and address the wider social and political factors that produce and interpret them.

Political ecology has been brought into the arena of invasive species and weeds. Renowned political ecologist Paul Robbins (2013) underscores their political nature, noting that:

“Each species has a different political constituency...They are good for some people and bad for others. So those are going to get worked out as struggles over what sorts of nature we should produce. That is politics.”

Confronting the political ecology of invasive species, Robbins (2004a) and Head and Muir (2004) focused on the social and political causes of species invasion and how the effects of these invasions feed back into local culture and politics. Rother and Lambert (2011b) compiled a book of contributions from across the globe that investigated invasive and introduced species according to the human and political contexts that produce, perceive and manage them. Atchison and Head (2013) investigated the politics that produce how people in northern Australia conceptualise, speak about, and manage environmental weeds. Kull and Rangan (2015) looked at the politics that create “truth discourses” around environmental weeds and their management.

This engagement between political ecology and invasive species/environmental weeds discourse highlights that weeds and their management are embedded within historical, economic and cultural politics. Together, they emphasise that alongside the growing scientific research into these phenomena, greater attention needs to be paid to these politics.

I adopt a political ecology approach to guide my conceptual framework because it allows me to explore the politics that produce and reinforce Aboriginal weed work in the Kimberley. Figure 4.1

shows how political ecology is used to look at Aboriginal weed work, which I see as sitting between environmental weeds discourse and NCRM.

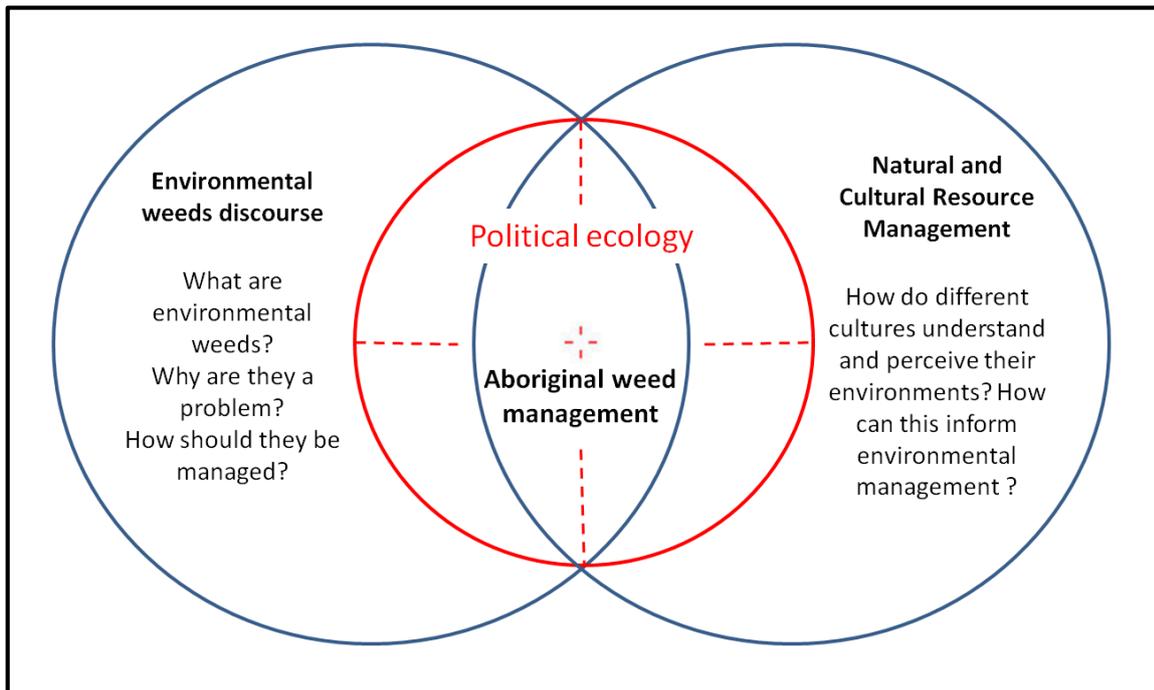


Figure 4.1 A political ecology approach for looking at Aboriginal weed management.

Viewing Aboriginal weed work through the lens of political ecology recognises weeds, their effects on ecological and cultural landscapes, and their control by Rangers as contested spaces. It demonstrates that Aboriginal weed work in the Kimberley is a product of mainstream environmental weed management on the one hand, and Australian Aboriginal NCRM on the other. This is displayed by Figure 4.2 and explained below.

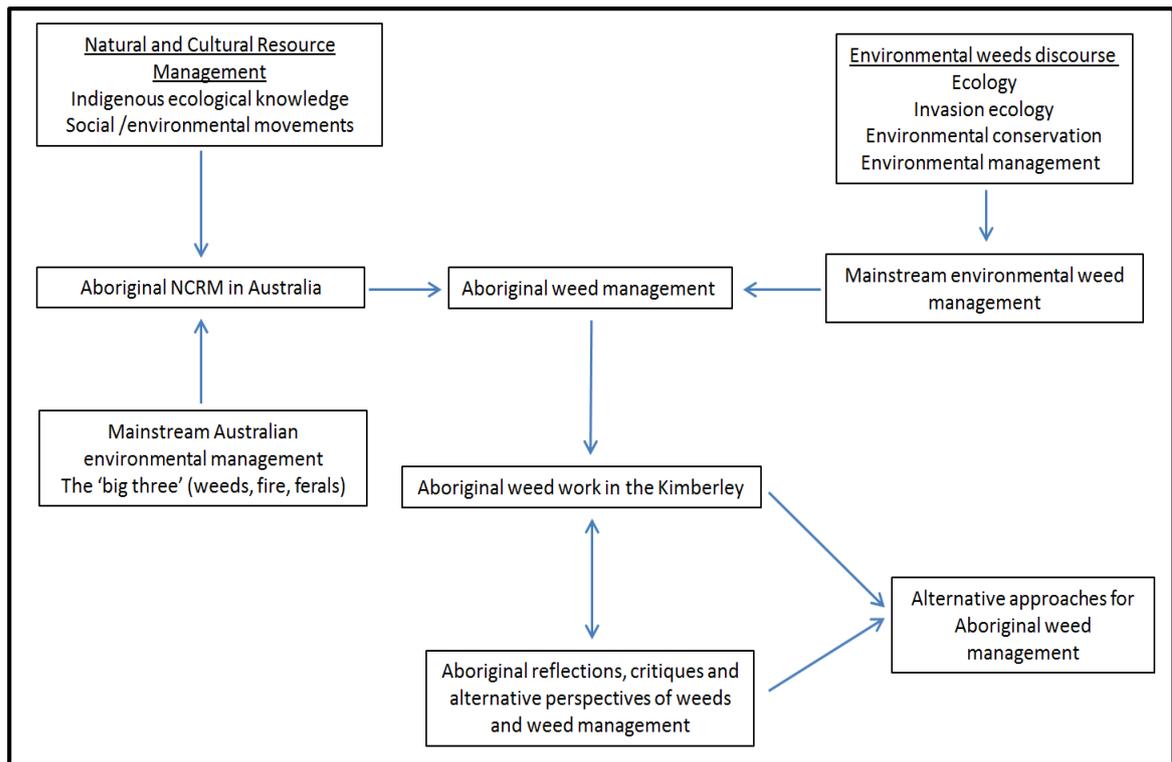


Figure 4.2 Conceptual framework for this project

On the left hand side of the framework is Aboriginal NCRM in Australia. This sits at the intersection of NCRM (with its focus on IEK and social/environmental outcomes) and mainstream Australian environmental management (with its focus on the ‘big three’ environmental threats of environmental weeds, fire and feral animals).

On the right hand side of the figure is mainstream environmental weed management, which I view as a product of environmental weeds discourse. Environmental weeds discourse is a product of larger invasive species discourse, which has been informed by ecology and invasion ecology, both of which are grounded in ethics of environmental conservation.

The meeting point of Aboriginal weed management provides the theoretical and contextual background for my project. By looking at Aboriginal weed work in the Kimberley and investigating Aboriginal people’s reactions to this work, as well as their perspectives on weeds, the project is able to propose alternative approaches for Aboriginal weed management.

Methodology

At the outset of my research in the Kimberley I possessed the traits of a weed. I was not wanted, I did not belong, I had little to no use, I was an alien who disturbed the natural working of a system. A logical management inference would be that such an individual is 'bad' and should be removed or destroyed. Although I was never removed or destroyed, very early on it did feel as though a mist of herbicide lingered over meetings and interactions I had with particular individuals and organisations. As with weeds, these traits are largely based on subjective perceptions and not fixed in place or time – lucky for me.

This metaphor came from a discussion with Marty, a Wilinggin elder, regarding the nature of researchers in Aboriginal communities. Although I had visited Marty a number of times over the course of my first four months in the field, he had not yet shown interest in participating in my project. He was conscious of an ever-increasing number of researchers coming to study him, his knowledge, his country and his culture. Like many Aboriginal people in the Kimberley, Marty had begun to see researchers as a drain on the time and resources of community members, particularly the elders. He told me that, just as weeds are a pest to Rangers, researchers can be pests to Aboriginal communities. He qualified this, explaining that he only disliked some of the plants that the Rangers considered weeds, while others were "OK if they had a use". Similarly, 'weedy' researchers could become useful if they incorporated local aspirations into their projects. To separate the 'weedy' researchers from the 'useful' researchers, Marty had developed his own informal screening procedure, entailing multiple visits by the researcher to his community. These visits played a number of roles; firstly, they showed a commitment to return even if the researcher had not immediately achieved his or her aims; secondly, they provided opportunities to build a relationship with the researcher, to decide whether or not local people liked the researcher and wanted to work with them; thirdly, it ensured that local people had a chance to understand the researcher's project and test whether or not the researcher was receptive to adjusting their project to incorporate the ideas and directions of the local people. The third screen in particular elicited the weed metaphor because, like plants, "Researchers are OK if they have a use." Finding the 'use' of the researcher was a collaborative process between the community and the researcher.

A second discussion elaborated on the weed metaphor. This occurred in Fitzroy Crossing with Scott, a *kartiya* who had worked with Aboriginal youth programs across northern Australia. Scott understood Marty's metaphor to be about relationships and belonging. To Scott, 'weeds' are plants that do not belong; where 'belonging' only exists within relationships. In terms of

weeds, the relationships are between people, plants and place. 'Belonging' develops over time as people are given the opportunity to develop and make sense of these relationships. It is only through personal relationships that anyone's role (as a community member, researcher, youth worker, community worker, government worker) can be appreciated. Like weeds, the factors that make someone belong or not belong are complex and should not be assumed to be about 'usefulness' alone. To emphasise this, Scott alluded to a Federal Government suicide prevention program and the failure of such programs in towns like Fitzroy Crossing. He shared his frustration that these government workers were 'blow-ins' and criticised their assumption that they could "belong without really ever *being there*". The people running these programs didn't care to build relationships in order to 'belong', assuming that their utility as 'specialists' and 'experts' was sufficient. Because they were not perceived to belong no one would visit these people while they were in town and the project inevitably failed. Despite their potential usefulness as 'specialists', their lack of belonging condemned them as 'weeds'. Scott contrasted this to my approach, suggesting that the potential and relevance of my project had developed through building relationships with people and developing networks among the Rangers. People's growing interest in working with me was not because of my project's perceived 'usefulness'. Rather, including local people's interests and desires in my project was more symbolic than practical. That I took time to listen and build relationships signified my commitment to belonging.

Establishing genuine relationships with participants and formulating a project meaningful to local people were the two most critical methodological aspects of my project. In my last three months in the field I accomplished as much data collection as I had in the previous 11 months. To an outsider my first five and a half month stint in the field could have been perceived as 10% research and 90% 'hanging-out'. Although this type of breakdown of my time in the field seems extraordinary, at that time it felt as though there was no alternative; without taking time to establish good relationships and a meaningful project, there was no interest, no participants and no project.

[Building relationships](#)

Early in my fieldwork I needed to tread carefully in order to develop and maintain good relationships and a viable project. Such an approach is widely recognised within ethnographic fieldwork; Sluka (2012:137) emphasises that the success of this type of research "is in large

measure determined by the ability to establish good rapport and develop meaningful relations with research participants”.

Our scoping trip to the field in 2011 allowed me and my supervisor to introduce ourselves to local people and gauge their interest in my project. Although access to Aboriginal people was limited during this trip, several mainstream environmental management organisations expressed interest in developing research partnerships. My interest in working with these organisations was tempered by a warning from a KLC employee that associating with mainstream environmental management organisations, particularly DPaW, could leave my reputation compromised within Aboriginal groups. Despite the networking ease and funding security that partnering with a mainstream environmental management organisation provided, their history of poor engagement with Aboriginal groups meant that ‘guilt by association’ could jeopardise a researcher and their project from the outset.

On my return to the field in 2012 I sought to independently develop relationships with the KLC and Aboriginal groups. Understanding how to develop these relationships was tricky. I was encouraged by some to partner with the KLC, but warned away from it by others because of the varied legitimacy it holds among Aboriginal groups. I was encouraged by the KLC to network through Ranger groups, but was told by the Ranger groups that that such networking was sometimes seen as underhanded and displaying incorrect cultural protocol. I was told that I should work through Aboriginal prescribed body corporates (PBCs) and to do this I should first to speak to elders.⁹ However, before I could speak to elders I needed PBC approval. When I spoke to PBCs and elders they usually directed me back to the Rangers. The messiness of the advice that I received helped me to understand that, while I might endeavour to build relationships to negotiate such research politics, I would only be in limited control of how my project and I might be perceived.

Having been consistently referred back to the Rangers, I invested time and energy building relationships with them. I gained access to Ranger groups through referrals from the KLC LSMU who selected groups that were undertaking weed work and were in a position to work with researchers. Much of my time I spent ‘hanging out’ with Rangers. By taking time to get to know Rangers, accompany them in day-to-day (usually non-weed-based) activities, I was able to earn trust and understanding with these groups. Rangers are well-connected, well-respected

⁹ Prescribed Bodies Corporate are established under Native Title legislation as the representative bodies of the Aboriginal Native Title claim groups. They oversee the administration and operation of the Aboriginal Native Title group, which includes Ranger groups.

and influential members of their communities. Therefore, my relationships with Rangers and my research being associated 'with the Rangers' or 'on Ranger business' afforded me belonging and legitimacy from PBCs and the KLC which would have been very difficult, even impossible to earn otherwise.

Developing a 'useful' and workable project

The need to consistently validate my project (and myself as a geographer) to people in the field made me ask fundamental and reflexive questions about my project and the role of geographical research. Initially, I solely intended to investigate Aboriginal people's perspectives on environmental weeds. However, potential participants suggested that such a project in isolation would yield minimal outcomes for them and generate minimal interest.

Debates within human and cultural geography have called attention to the lack of 'useful' research being produced since geography's 'cultural turn' towards constructivist enquiry (Soulé and Lease 1995, Gill 2006). Hamnett (2003:1) addresses this, outlining major concerns that the 'cultural turn' and the rise of post-modern human geography:

"has led [it] into a theoretical playground where its practitioners stimulate or entertain themselves and a handful of readers, but have in the process become increasingly detached from contemporary social issues and concerns. The risk is that much of human geography will cease to be taken seriously in the world beyond the narrow confines of academe. It will be seen simply as a corner of the post-modern theoretical playground, possibly entertaining to study for a while, but something which can be safely ignored while the grown ups get on with the business of changing the world, often for the worse."

Although I believe there is significant value in employing critical and constructivist approaches to human geography enquiry, I recognise the importance of conducting research which is 'useful' to those on the ground. My desire to produce 'useful' research was not so much for the sake of keeping human geography out of the 'corner of the post-modern theoretical playground', as it was from the frustration of those in the field regarding the expanding gulf between academic research and on-ground practice. This is particularly the case in research with Aboriginal Australians, where despite the quantity and quality of previous ethnographic and

environmental research, its influence has been minimal in producing positive outcomes *in situ* (Holmes 2010, Mahood 2012).

The production of 'useful' research is not and cannot simply be about the researcher obeying every request of the 'user', or vice versa. Instead, as Gill (2006) points out, it is an ongoing process that is negotiated to reach a common understanding of what is required by each group and what each group is able to provide. Time spent building relationships provided opportunities for this negotiation by speaking to local people (both Aboriginal and non-Aboriginal) in order to introduce my research and gauge the issues that held practical relevance. One of the overwhelming issues that arose through these discussions was the need to continue to improve Ranger 'capacity' while ensuring that greater space is created for Aboriginal perspectives to guide management.

Securing participation of Ranger groups often meant incorporating the particular needs of each group into my fieldwork. Each Ranger group requested different things from me. All of these requests required attention as these were the people I was working with and to whom I was accountable. I extended myself to meet as many of these requests as I could, despite not being an expert or even experienced at most of them. Alongside my fieldwork, I assisted in writing environmental management grant applications, recorded and produced videos displaying the work that Rangers undertake, developed data management programs for two Ranger groups that allowed them to record and display their work, assisted with biodiversity surveys and plant identification, and helped to set up sites for local meetings and celebrations.



**Figure 4.3 Assisting the Ngurrara Rangers develop a data recording and management system
(Source: Glen MacLaren)**

At the same time as trying to accommodate these desires I needed to be up front about my limitations. It was at times difficult to admit that requests were beyond my capacity lest it jeopardise my chances to work with a group. However as Ward (2002:77) suggests, researchers need to:

“Always tell the truth to Aboriginal people, because they have a one-track mind – yes or no. Don’t say maybe. This is very important ... But explain yes or no – give the reasons. And don’t make promises if you can’t keep them!”

Most importantly I needed to be honest about the amount of time that I would be able to spend in the field. Working with Aboriginal people usually takes longer than expected, particularly if it is done the ‘right way’ where mutual benefits are sought and achieved (Ward 2002). The temptation to rush through particular parts of research was ever-present; however, I was frequently reminded by participants and other researchers that to rush this type of research was to ‘rush into trouble’.

As a ‘receptive’ researcher, people on the ground perceived me to be able to ask questions that they could not. This encouraged them to ask questions which they might not have thought

possible before and allowed me to access some of the key concerns of Rangers, elders and their communities. This loosening of what could be asked prompted some of the key questions in my project, particularly in relation to the history and politics of Indigenous knowledge and Aboriginal NCRM.

Ethical requirements

Amid all of the research that occurs on Aboriginal land and with Aboriginal people there is a lack of *genuine* engagement with the wishes and requirements of the local people (Devitt 1988, Dodson 1996). When research agendas and on-ground agendas do not match up, research agendas usually continue along unaltered (Barbour and Schlesinger 2012). Although there are usually ethical checks that a researcher will 'do no harm' there are few as to whether or not they might actually conduct research which does any good (Christie 2006, Holmes 2010). This has left some Aboriginal people and communities feeling exploited by researchers, as expressed by Dodson (1996:35), who stated that "Our Aboriginality provides much fuel for a burgeoning PhD industry". Schnierer and Woods (1998:39) suggest that research that does not benefit local Indigenous people, is in fact, inherently harmful:

"We [Aboriginal Australians] are probably the most researched group in this country, if not the world, yet we seem to derive little benefit from all this activity. If anything research has led to the development of biased policies for Indigenous peoples based on what others interpret as good for us and not what we think. Research, historically, has led to the continuing oppression of Indigenous peoples."

For my project, the pressure to develop a locally acceptable and accountable project, combined with having Ranger groups guide the research, ensured that it would address local aspirations and assured it a more sound ethical footing.

In order to undertake research in the field I was required to comply with institutional ethics requirements, which I sought and received from Monash University and the KLC. As I would be working with Aboriginal people I was required by Monash to undertake its 'high risk' ethical clearance. The KLC, on behalf of its Traditional Owners, requires all researchers to obtain approval through its Research Ethics and Access Committee (REAC). REAC assesses proposals on the basis of the project application, compliance with the KLC Research Protocol and Intellectual Property and Traditional Knowledge Policy, as well as the researcher's responses to

15 questions about how the research will affect Traditional Owners. The concurrent ethics processes, although understandable, gridlocked my progress while each institution required ethics approval from the other before granting their own. This stand-off lasted more than four months and significantly delayed my first round of fieldwork. Overall these approvals took almost nine months to be processed. At times this was frustrating, however having REAC approval (renowned for its difficulty in obtaining) demonstrated my patience, persistence and commitment to conducting research the 'right way' to those in the field.

Ethical obligations to local groups and participants do not finish when researchers leave the field (Schnierer and Woods 1998, Ward 2002). As researchers finish their stint in the field and depart for far removed locations to write and publish their findings, local people are often left to guess what these findings might entail (Walsh and Mitchell 2002). Many Aboriginal people who participated in my project expressed interest in knowing what I had found and seeing something that it had produced. Therefore after each round of fieldwork I presented my data, photos and findings to each of the Ranger groups to hold on behalf of their PBCs and communities. This involved presenting groups with a brief report in plain English and where possible accompanying this with a short oral presentation on my return visit. One group even expressed interest in having a hard-copy of this thesis sent to them. I asked if anyone would actually read it to which they admitted "probably not" but they would like it for their 'library' all the same.

[On-ground fieldwork](#)

Selection of the case study area and timing of fieldwork

I conducted my fieldwork in the Kimberley over five visits between September 2011 and April 2014. The first visit was conducted as a scoping trip during which my chief supervisor and I visited potential study sites between Broome and Darwin. The trip aimed to identify a specific research region, develop an understanding of the issues are important to people on the ground and begin building relationships with individuals and groups who would become research partners and participants. The west and central Kimberley stood out as a region where people were particularly receptive to the prospect of participating in my project. Logistically, the high concentration of Aboriginal Ranger groups in this (relatively) small area would also allow me to access and work with a variety of groups across a range of landscapes.

In 2012 I spent five and a half months in the field from June until November. During this visit I invested the majority of my time in developing relationships with people on the ground. I

spent the bulk of this time with Ranger groups learning about the structure, nature and politics of Ranger work. I conducted interviews with mainstream environmental managers about their organisation's weed management projects and engagement with Aboriginal groups. These interviews provided insights into the complex arrangement of the many agencies involved in NRM in the Kimberley. Towards the end of this time in the field I accompanied Ranger groups to on-country work (including weed work) and began interviewing Rangers and elders.

My third trip to the field occurred between April and August 2013. This visit was able to capitalise on the time spent building relationships during the previous two trips. During this trip I participated to a much greater extent in Ranger activities. As a part of this participation I was able to gain greater access to Aboriginal elders and conduct the bulk of my interviews. I was invited to attend numerous trips to country with Rangers and elders, which allowed me to conduct participant observation and interviews more frequently and at more reliable intervals.

My fourth visit to the field was a two month trip that occurred during September and October 2013. This trip provided opportunities for a number of follow-up interviews with Rangers and elders. Just as importantly it allowed me to present my data, photos and findings to the Ranger groups and communities who had participated in my research. This presentation fulfilled an important role in reintegrating knowledge back to the people who had shared it with me and allowed these people to provide feedback about my findings and their potential significance.

My fifth visit to the field occurred in 2014 and involved my participation in Ranger groups' weed management planning workshops and Indigenous Protected Area work plan development. This allowed me to present my findings to that point, undertake reviews of current weed management approaches and interview elders and Rangers about how they would like to approach weed management in the future.

The timing of my fieldwork limited the weed work I could observe. Weed work for some Ranger groups is predominantly a wet-season activity (from December to May). However field-based research during these months is not feasible because of frequent flood-induced road closures. To keep me up to date, after each absence I would be taken to sites to be shown the weed work the Rangers had done in the meantime. Although being present when the work is being done is optimal, I was still able to ask relevant field-based questions about the work.



Figure 4.4 Heavy rains and unsealed roads make travel in the Kimberley difficult and dangerous between December and April

I used the time between visits to analyse my data and methodology and provide written reports back to Ranger groups. During these breaks from the field I was able to reconnect with theory and literature as well as identify gaps in my data and methodology. This allowed a dynamic and adaptive approach to my research whereby each visit to the field could be strategically tailored to address particular questions. This targeted approach proved valuable given the time and resource constraints of my PhD candidature.

Selecting participants

Most mainstream environmental management agencies that carry out weed management in the Kimberley are looking to increase their participation with Aboriginal groups. This means that they are generally enthusiastic to work with researchers who are interested in building links between Aboriginal and non-Aboriginal knowledges and NCRM practice. Therefore, gaining interest from these groups was not an issue and I could be selective with those that participated. In terms of these organisations I focused on those that were influential in setting weed management priorities or else those who were actively involved in weed projects with Aboriginal

groups. This led to selecting the Western Australia Department of Parks and Wildlife, Environs Kimberley, Rangelands NRM and to a lesser extent Greening Australia.

I was not able to be as selective with Aboriginal groups. Of the Ranger groups that the KLC put me in touch with, certain groups reacted positively to what I could offer and expressed interest in working together, others did not. Occasionally, circumstances changed within groups, which affected their ability to continue working with me. In the case of the Nyikina Mangala Rangers, the change of a Ranger coordinator and a reshuffle of its strategic approach meant that they were no longer in a position to continue to work with researchers. In the case of the Ngurrara Rangers, the Ranger base was relocated to a remote outstation, which made continued research with this group logistically difficult and resulted in fewer research visits.

The selection of elders from each of these groups was largely dependent on who would and could participate. Rangers acted as the pivots in my research and would select elders who they felt would be appropriate to work with me. 'Appropriate' participants are limited among Aboriginal elders. The number of people who hold knowledge in Aboriginal groups is shrinking, and a small number of elders are being stretched by increasing research demands (Smith 2013). Access to these people is becoming more difficult and potential sample size of participants in Aboriginal groups is limited.

Rangers are well placed to select the most appropriate elders. Rangers work with these elders throughout the year to seek their cultural guidance. Therefore the majority of the elders who were selected to participate in my project were those involved in the planning of Ranger work as a part of Ranger groups' Cultural Advisory Committees. Theoretically, the perspectives and knowledge of these elders guide how the Rangers manage weeds. Understanding how these people think about weeds was therefore critical. These elders could also provide insights into work plan formulation and how integration of Aboriginal knowledge takes place. Pragmatically, these elders are generally selected for roles on Cultural Advisory Committees because of their ability and experience in cross-cultural communications, which also makes them prime research participants.

In addition to elders on Cultural Advisory Committees, Rangers identified culturally appropriate knowledge holders. While nobody possessed knowledge of 'weeds' *per se*, Rangers usually identified participants with good knowledge of plants. This worked well at times, however without any cultural protocol around who was able to speak about weeds, it sometimes caused confusion. The possession of knowledge in Aboriginal societies is highly personal, as

particular people hold knowledge for particular parts and aspects of country. (Jackson 1995, Rose 2000). If a researcher does not have access to the right person or group of people then the researcher has no way of obtaining that knowledge (Rose 1999).

An example of this occurred during a week out on country. During this week I was told repeatedly that to answer questions about the plants on that country I needed speak to Rosie who held exceptional knowledge of plants. However, Rosie was not present on this field trip; therefore, nobody was able to answer my questions. Although the week provided a number of productive opportunities for interviews and observations, many of the stories and much of my analysis relied on knowledge that only Rosie could provide. Despite my intensive and persistent search for Rosie, which endured until the end of my time in the field, I could not find her. As a consequence, several critical questions about plant names and histories remained unanswered and cannot be used in my analysis.

Gender is an important consideration in research with Aboriginal people and became an issue during my fieldwork (Wightman 2003). In most of the groups that I worked with, men make decisions about what research can be done and who the researcher should work with. Most Ranger groups are predominantly made up of male Rangers, who felt more comfortable accompanying me to male elders for interviews and discussions. Of all the Rangers I worked with during fieldwork, 32 were male and 12 were female. Therefore, early interviews with elders were dominated by male participants – at one point the male to female ratio was 25:5. However towards the end of my research I was able to address the initial gender imbalance in my participant sample, simply by requesting to speak to more women elders.

[Methods of data collection](#)

I employed a qualitative approach to data collection in the field and used the methods of participant observation and semi-structured interviews. Qualitative approaches to data collection usually involve small-scale, in-depth research which seeks to understand specific and complex social or cultural phenomena (Robinson 1998).

The imbricated nature of my research questions means that there were overlaps in research methods. For instance, participant observation and semi-structured interviews were frequently employed together to address all three research questions at the same time.

Nevertheless, the following discussion isolates each of the methods to discuss some important issues regarding my approach.

A homeostatic method

Thus far it might seem that my project was largely at the discretion of others, as I adapted my project design and methodology to secure participation and overcome my 'weediness'. Although this is partly true, my desire to understand common themes between groups necessitated the development of a consistent approach to data collection between and within groups. This required me to develop a 'homeostatic' approach to my methods, which could be regulated to maintain relative stability amid changing conditions. This was difficult in view of the varying expectations of me and my project, combined with the diversity of environmental, cultural, social and political contexts within which Ranger groups operate.

Participant observation partly involved understanding this diversity, therefore trying to make each Ranger group the same 'control' group was counterproductive. Instead I developed particular questions that I sought to answer with each of the groups. Much of my participant observation was therefore opportunistic, remaining alert and seizing opportunities to address my questions as they arose.

Interviews also needed to be adaptable. Interviews occurred across a variety of contexts and with a variety of participants. Therefore, the structure of each interview needed to be adapted to suit its context, but still needed to follow a similar line of questioning. Answers to certain questions were often context dependent. For instance, a person's response to a question might depend on whether or not we were on country or in a town. Therefore for the sake of consistency I could only ask certain questions in certain contexts. This meant either waiting until the right conditions arose or trying to engineer them.

As expectations for me to participate grew these opportunities became easier to maintain homeostatic research. For example, leading Ranger weed surveys on country allowed me more control over trips on country. This allowed me to select sites, select participants (to an extent) and to observe and ask questions of elders and Rangers through a more consistent approach.

Participant observation

Participant observation is widely recognised as a foundational method in ethnographic and social science enquiry (Spradley 1980, DeWalt and DeWalt 2010, Schensul and LeCompte 2012). As Schensul and LeCompte (2012:83) propose “Participant observation represents the starting point in ethnographic research”, providing the following reasons for its importance:

- It is central to identifying and building relationships important to the future of the research endeavour.
- It gives the researcher an intuitive as well as intellectual grasp of the way things are organised and prioritized, how people relate to one another, and the ways social and physical boundaries are defined.
- It demonstrates—and over time can confirm—patterns of etiquette, political organization and leadership, social competition and cooperation, socioeconomic status and hierarchies in practice, and other cultural patterns that are not easily addressed or about which discussions are forbidden.
- It legitimises the presence of the researcher in the community.
- It provides the researcher with the cultural experiences that can be discussed with key informants or participants in the study site and treated as data.

I used participant observation to gain an understanding of how Aboriginal weed work is planned and undertaken and how it fits in with other Ranger activities.

‘Hanging out’ as participant observation

Prior to my second visit to the field I received sound advice from my supervisor that, when conducting participant observation with Aboriginal people, I should always wear two ‘hats’. One ‘hat’ should be worn ‘in the moment’ to genuinely engage with people and context, while the other is worn as the objective, observant, analytical researcher. With this in mind I became increasingly aware that my time developing relationships and ‘hanging out’ was an important form of participant observation. This is in line with Geertz (1996:260) who suggests that as a part of the ‘ethnographic tact’ of participant observation “it is necessary to hang around with [people] – to attend to them as experiencing subjects”.

Rangers and elders often reminded me to slow down, sit down and forget ‘*kartiya pace*’. Slowing down allowed me to appreciate that these times hanging out were opportunities to learn and be taught Aboriginal culture and get to know the lived experience of Ranger work. I quickly

learned that asking questions frequently yielded fewer answers than not asking questions. Accepting something so counter-intuitive made me far more receptive and appreciative of what I was being taught by the Rangers and elders. In other words, the more I invested in wearing the first 'hat' the more I was able to observe and analyse under the second. This is in line with Ward (2002:77), who urges researchers "Don't ask questions of Aboriginal people when you're out in the field, because they're teaching you already. They will explain when they're ready, or when you're ready."

Realising that every moment in the field was an opportunity to learn and be taught allowed me to overcome these time-based anxieties of '*kartiya pace*'. However the persistent stress of having limited time in the field hampered my ability to always be as patient and 'hang out' as I would have liked. As I approached the end of my second trip to the field, limited funding opportunities and deadlines might have made this my last significant stint in the field. I forgot about being in the present and anxiously rushed around each of the groups attempting to tie up as many loose ends as possible. During this rush, I was met with greater resistance than I had encountered even at the start of my fieldwork. I accomplished close to nothing (aside from 2000kms in my vehicle). Upon my return to the field five months later, people reflected on the rush that I had been in towards the end of my previous trip. One elder in particular mentioned that I had sped up too much to be taught and asked why anyone would have bothered trying to talk to me or teach me about anything in such a short time.

Participant observation to observant participation

The degree of participation that occurs in participant observation is understood as a continuum from 'non-participation' or 'complete observation' on the one end to 'complete participation' on the other (Spradley 1980, DeWalt and DeWalt 2010). Over the course of fieldwork, my research became a lot more about participating than observing. As I became more familiar with the way that the Rangers worked and trips to country operated I was expected to participate to a larger extent. In the common typologies of participant observation presented by Atkinson and Hammersley (1994), this transition could be explained as a shift from 'complete observer' to 'observer as participant' (also see: Gold 1958, Junker 1960).

I became involved in the planning and work of weed management. I was asked to develop a number of weed management strategies in partnership with Ranger groups and was also able to undertake weed work alongside Rangers (see Figure 4.5). Participating in these

activities allowed me to engage with the Rangers in a different way and elicit responses which might not have arisen elsewhere.



Figure 4.5 Participating in weed removal with the Ngurrara Rangers

As well as participating in weed work, participation involved taking on a number of roles within Ranger groups that were peripheral to my research. I participated in the writing of grant proposals, learned local language, and participated in other Ranger activities such as fire management, rubbish removal, fencing, data recording, digging waterholes and feral animal trapping. Becoming an ‘actor’ in Ranger work provided insights into the competing demands and politics that Aboriginal Ranger groups constantly negotiate.

Although this embeddedness made my observations less objective it allowed me to access knowledge and gain insights as a participant in ways that would otherwise have been impossible (Geertz 1974). To remain aware of my research questions, I developed a checklist of questions that I needed to focus on prior to each stint in the field. This focused my attention on particular issues or discussions and ensured that I remained aware of how my observations contributed to my project.

Thick description

I employed the qualitative approach of 'thick description' to record and communicate my participant observations. The method of thick description is widely used in qualitative and social science research, particularly in combination with participant observation (Denzin 2001, Schwandt 2001, Ponterotto 2006). In a review of literature on thick description, Ponterotto (2006:543) offers this working definition:

"Thick description accurately describes observed social actions and assigns purpose and intentionality to these actions, by way of the researcher's understanding and clear description of the context under which the social actions took place."

'Thick' description is often discussed in contrast with 'thin' description. In these discussions, 'thick' is set apart from 'thin' description by the level of detail provided, however more importantly by the addition of analysis, commentary and interpretation to the description (Geertz 1973, Lincoln and Guba 1985, Geertz 1994). As Schwandt (2001:255) emphasises, "It is this interpretive characteristic of description rather than detail per se that makes it thick." In this sense Denzin (1989:83) suggests that thick description "...does more than record what a person is doing. It goes beyond mere fact and surface appearances." To Ponterotto (2006:543), the depth sought by thick description means that it "leads to thick interpretation, which in turn leads to thick meaning of the research findings for the researchers and participants themselves, and for the report's intended readership." Geertz (1973:312) suggests that this is favourable in ethnography, as this pursuit is "not an experimental science in search of law but an interpretive one in search of meaning."

Thick description is valuable for describing Rangers' weed work. It allows description of the 'lived-experience' of Rangers' weed work to be combined with interpretation of this lived experience. Where thin description would limit the discussion to the weed work that was undertaken; thick description "assigns purpose and intentionality to these actions" (Ponterotto 2006:543). Specifically, this allows descriptions that examine the motivations behind weed work, as well as interpretations of the Rangers' reactions to this work.

Semi-structured interviews

Semi-structured interviews are used in qualitative research when a greater level of detail is being sought from informants and it is reasonable to rely on the information provided by a relatively

small number of participants (Robinson 1998, Schwandt 2001). I interviewed mainstream natural resource managers, Aboriginal Rangers and Aboriginal elders by asking open-ended questions that explored perspectives regarding weed work and environmental weeds. Some of these open-ended questions had fairly intuitive answers. Asking questions such as “Why don’t you like having that prickly bush around your waterhole?” led to some awkward moments in which participants no doubt started to question my common sense. I needed to constantly overcome the temptation to minimise this awkwardness by putting answers in the mouths of participants or avoiding the questions altogether lest the answers be left as assumed.

Interviews varied in structure and detail, however certain themes were consistent across groups, particularly the core theme that investigated people’s perspectives on weed work and weeds.

Mainstream NRM employees

During the course of fieldwork, I conducted interviews with 22 mainstream environmental management employees from four different organisations. These organisations were DPaW, Rangelands NRM, Environs Kimberley and Greening Australia. These participants were usually familiar with working with researchers and were receptive to more structured interview formats.

As most of these groups were easily contactable and receptive to continued participation, I was able to approach them for multiple interviews over the course of my research. This constant contact and the multiple interviews helped me to explore certain questions further as my project and thoughts developed.

Interviews primarily investigated how these organisations defined, prioritised and managed environmental weeds as well as how they engaged with Aboriginal groups. Specific questions which relate to each of these themes are included in Table 4.1.

Table 4.1 Semi-structured interview questions for mainstream weed managers

Theme:	Questions:
Perspectives on weed work and weeds	What is a weed/how do you define a weed? How are weeds prioritised? How are weeds managed?
Engagement with Aboriginal groups	Does your organisation partner with Aboriginal groups? Why did your organisation develop these partnerships? How do you view the future of these partnerships? Does/how does your organisation engage with Indigenous knowledge?

Rangers

During the course of fieldwork I interviewed a total of 44 Rangers from six different Ranger groups. These interviews were undertaken individually or in small groups and frequently followed, or were followed up by discussions at particular weed work sites or in the presence of particular plants. Interviews with Rangers focused on their weed work and how they think about weeds, as well as some general questions about other parts of their Ranger work, Aboriginal NCRM and the role of Aboriginal knowledge in such work. The specific questions that relate to these themes are outlined in Table 4.2.

Table 4.2 Semi-structured interview questions for Aboriginal Rangers

Theme:	Questions:
Perspectives on weeds	What is a weed? What makes a plant a weed?
Ranger weed work	<u>General weed management questions:</u> Why do you conduct weed management? How do you plan weed management? Where do you learn about weeds and weed management? What role does Aboriginal knowledge play in weed work? What directs/guides weed management? <u>In terms of specific weed management operations:</u> What management was undertaken at that site? Which plants were managed?

	Why were these plants managed?
	Why was that site selected?
	Could this management have been improved? If so, how?
Aboriginal NCRM, Ranger work and Indigenous knowledge	What is your role as a Ranger?
	What are your favourite parts of Ranger work?
	What are your least favourite parts of Ranger work?
	What are the most important parts of the work you do?
	What role does Aboriginal knowledge play in Ranger work?
	What role does mainstream environmental management play in directing the work you do as a Ranger?
	How might Ranger work be improved?

Initially it was difficult to take interviews or discussions with Rangers into any sort of abstract or non-practical dimensions. Rangers are trained to think and talk about their work in practical terms so when I initially explained that my project was investigating the concept of environmental weeds and wanted to know the reasons behind weed management, I struggled to raise much discussion. ‘Why’ Ranger work is done is largely taken for granted on the ground, where the focus is on ‘what’ needs to be done and ‘how’ it should be done.

In order to help Rangers engage with the underlying questions of my project I developed an activity that explored the multiple ways in which people perceive plants. This activity involved conducting an on-country survey of a particular site to list the environmental weeds that occurred there. Each Ranger would then assess the severity of the weed by providing a grade on a scale from one to five. This grade was shared aloud to the group and the Ranger would justify why they had given that grade. The activity required the Ranger group to also provide a grade on behalf of someone else, for instance a mainstream weed manager, or an elder. Grades differed markedly according to each person’s perspective (refer to Table 4.3). This exercise opened up the possibility to explore and discuss the factors that affect perspectives about plants and weeds. It highlighted the subjective nature of weeds and demonstrated that there might be different ways of thinking about, prioritising or approaching their management. This activity was particularly useful prior to having Rangers accompany me during interviews and discussions with elders. It also identified the Rangers who had a clear understanding of the research questions so that they could be chosen to accompany me during these interviews.

Table 4.3 Extract of the weed 'rating' exercise for the Bardi Jawi Ranger group

	Damo	Bill	Roger	Thomas	Frank	Bardi-Jawi elder	Weed manager
Passionfruit vine	3	4	5	2	2	1	4
Caltrop	4	4	3	5	4	5	1
Hairy Merremia	3	2	3	2	2	2	3
Buffel Grass	4	2	3	3	4	4	5
Butterfly pea	3	2	3	2	2	1	3

As fieldwork progressed, I was able to base interviews on shared experiences. This was particularly helpful because my questions could be grounded and supported by context rather than relying on anything abstract or hypothetical. Interviews could therefore explore questions with direct reference to particular work, particular plants and particular places. As relationships with Rangers developed they also shared their perspectives about Aboriginal NCRM and Aboriginal Ranger programs more generously.

Elders

Interviews with Aboriginal elders were much less structured than with either of the other groups. Rangers usually led the interviews and discussions with elders, which allowed them to negotiate cultural protocol and act as interpreters of language and meaning. It also allowed Rangers to be a part of the research, taking the knowledge and perspectives directly back to the Ranger groups. To maintain consistency among participants I had a general structure of questions, which I would share with the Rangers prior to the interview. This general structure is presented in Table 4.4.

Table 4.4 Semi-structured interview questions for Aboriginal Elders

Theme:	Questions:
Perspectives on weeds	<p>What is a weed?</p> <p>What makes a plant a weed?</p> <p>What plants are bad on country?</p> <p>What makes a plant bad for country?</p>
Regarding sites and the health of country	<p>Why is this site/part of country important?</p> <p>How are particular plants affecting the health of this country?</p>

Weed management	<p>What do you think about the way that the Rangers manage weeds?</p> <p>Do you talk to the Rangers about weeds?</p> <ul style="list-style-type: none"> - If so, what do you talk about? - If not, why not? <p>Do you have a say in Ranger weed management?</p> <p>What do you think about a particular weed management project at a particular site?</p> <p>Where/why should the Rangers manage weeds?</p>
Aboriginal NCRM, Ranger work and Indigenous knowledge	<p>What are the most important parts of Rangers work?</p> <p>What role does Aboriginal knowledge play in Ranger work?</p> <p>How might Ranger work be improved?</p>

The most productive interviews were conducted on-country, where questions could be grounded in the context of actual places or in the presence of particular plants.

It was not always possible to conduct interviews in the field as some elders are unable to access their country. However, most elders who were selected for interviews are well connected to their country and have a good knowledge of places and the plants that exist there. This meant that interviews could still be grounded in particular cases, which the elder, the Ranger and I were all familiar with. Even so, prompting these discussions in a way that could elicit meaningful discussion was sometimes difficult.

Having weed books and fliers available for elders to look through during interviews was a valuable method of overcoming these difficulties. Participants would look through these books and provide comments, which frequently generated discussions about where that plant existed, how long they had noticed its presence, how they perceived it to interact with country and how they felt about it. This type of unsolicited discussion provided natural responses to a number of plants and highlighted the attentiveness of these elders to vegetation changes on their country.

Data recording, analysis and cross-checking

To record and document my participant observation in the field I took comprehensive field notes and several hundred photos. As I was usually following rather than dictating the speed of interactions I used my mobile phone to record voice memos, which could be written and expanded on later. This was also useful because the time stamps of these voice memos could be matched up with photos taken at the same time.

Note-taking was my primary method of recording during interviews. I did not conduct video or audio recording of interviews with participants. Recording cultural information in these ways has legal implications for the storage of traditional knowledge and intellectual property. I was advised prior to conducting ethics approvals that many elders would not feel comfortable being recorded. The notes taken during the interviews with elders would be elaborated after each interview during a debriefing with the Ranger.

It was sometimes necessary to cross-check responses by asking the same question in a number of ways and across a number of different contexts. During preliminary interviews with Rangers this method showed up inconsistencies between individual's responses. However, as Rangers became more familiar with me and my project, their answers became more consistent. I mentioned this to one Ranger who told me that most Rangers will initially just tell researchers what they think they want to hear. The Ranger likened interviews and discussions to examinations, as though researchers are there to 'test' the Rangers under the assumption that there was a 'right' and 'wrong' answer to each question. As repeat visits occur and trust develops, Rangers begin to give more open, considered and honest answers without feeling as though they are being examined. The same trend did not exist with elders, who tended to give much more consistent responses across questions and between visits. The same Ranger told me that elders do not perceive this pressure to give right or wrong answers. They added that having a Ranger present during interviews meant that elders were more likely to give honest and considered answers because they were speaking as much to the Ranger as to the researcher.

Perhaps surprisingly, only minor translation issues arose during the project. Interviews were mainly conducted in English, as most of the elders selected by Rangers were proficient English speakers. Parts of interviews (particular questions, discussions or answers) sometimes involved participants speaking Kriol or the local Aboriginal language.¹⁰ During these parts of the interviews I relied on Rangers to remember what was being said and translate it to me

¹⁰ All quotations used in this thesis are from English. None are translated versions.

immediately following the discussion. Rangers are not trained interpreters and although this is not ideal, Rangers never struggled to translate and interpret what had been discussed. If I did not understand the Rangers' interpretation I would ask for clarification.

After each interview, group of interviews or field visit I would debrief with the Ranger or Rangers who had accompanied me. Elders commonly responded to my questions with stories. These stories held the answers to my question but situated them alongside other culturally relevant knowledge. My tendency to dismantle these stories in order to isolate the answers to my questions troubled some of the Rangers. They encouraged me instead to understand the answers to my specific questions within the 'bigger picture' of healthy country. Debriefing with Rangers after interviews was therefore crucial to checking that my interpretations of the bigger picture and healthy country were accurate. I also used these debriefing sessions with Rangers to confirm my understanding of any translation or interpretation that occurred during the interview.

I kept a field diary in which I recorded informal and personal reflections on each day in the field. At the time I considered this field diary to be more about catharsis than data collection. However, revisiting it has provided insights about the significance of relationships with participants, the development of my project and its recurrent themes. As I have remarked, I was often being taught without realising it and maintaining a comprehensive field diary has helped me to recall many of these lessons. Returning to particular passages in my diary has helped to explain methodological and analytical decisions made during particular stages of fieldwork. Many of the stories that I use in the thesis come from this diary.

Data analysis

Data was collected in the form of interviews, stories/narratives, field notes, personal reflections, and photos. I analysed the bulk of this data as soon as it was obtained so that it did not become too cumbersome and bulky, lest it be done all at once.

I analysed the data by identifying the common themes that arose during fieldwork. For interviews, stories, field notes and personal reflections I identified themes by looking at the repetition of specific words or phrases and the recurrence of particular ideas or meaning – what Patton (1990:306) refers to as “indigenous categories”. I also noted the repetition of particular stories or references to case studies, plants and places. This identification was done without the assistance of a formal computer program.

I identified themes as they occurred in each data type, for example, the themes came out of interviews, the themes emerging from field notes, and themes arising from personal reflections. I then did cross-comparisons of the themes by these data types, for example, how do the themes identified in interviews compare with the themes that have come from field notes. This provided a good overall picture of the data that I had collected and how it addressed the three main questions of my research.

From this larger, overall and thematic picture, I returned to my primary data, such as interviews and field notes, to find particular case studies, examples, quotes and anecdotes that I could use in my thesis. This 'drilling' back into my data also allowed me to re-check whether or not the themes I had identified could be empirically and robustly substantiated."

Document analysis

I used document analysis to investigate the history and current state of mainstream environmental weed management, Aboriginal NCRM and Aboriginal weed management. These documents were obtained from a variety of sources including Government agencies and their websites, local environmental organisations, Aboriginal PBCs, Aboriginal Ranger groups and the KLC. As well as providing background and context to the current state of Aboriginal weed management in the Kimberley, I used these documents to substantiate and supplement data collected through participant observation and interviews.

Documents regarding mainstream and Aboriginal weed management included: Federal, state, regional and local weed policies and strategies (including KSaCS); weed management plans of local environmental agencies and Aboriginal Ranger groups; weed management publications and pamphlets; grant applications for weed management projects; as well as local and regional weed lists and weed maps.

Documents regarding Aboriginal NCRM and Ranger work included: Federal Indigenous policies and programs (particularly the Working on Country and Indigenous Protected Areas programs); reviews of Federal Indigenous policies; State Government documents regarding the engagement of Aboriginal groups in environmental management programs (such as KSaCS); The Kimberley Aboriginal Caring for Country Plan; and other Kimberley-based Aboriginal NCRM related publications and pamphlets, particularly those produced through the KLC.

Plant identification

Elders and Rangers did not always know the names of plants on their country (particularly new plants) and there would sometimes be confusion about particular plants during interviews. Accurately identifying and classifying plants in the field and during interviews was crucial to my research.

To ensure that confusion and mistakes in identification were minimised I employed methods of cross-referencing plant identifications. These included the use of botanical guide books (namely *Plants of the Kimberley Region of Western Australia, 2nd Edition* and *Western Weeds: A guide to the weeds of Western Australia*) and the collation of specimen photos, which were matched alongside botanical, common and Aboriginal names for a given plant. Should a lack of certainty remain, these could be cross-referenced against FloraBase (florabase.dpaw.wa.gov.au), the Western Australia Herbarium's online flora database. Through FloraBase, my records were cross-referenced with WA Herbarium collections. These records could be searched or checked according to a plant's common and botanical names, specimen photos, recorded locations, morphological and floral characteristics, and common habitats. I also used the WA government search engine NatureMap to verify the locations of particular plants. The NatureMap system, although useful, is incomplete as it only includes records of plants where voucher specimens have been recorded and stored in the WA Herbarium. This limited its utility for my project, which is seeking to investigate plant changes, some of which might have occurred only recently.

When asking questions about a particular plant in interviews, I would take a sample of that plant to the interview and present it alongside photos from my records and weed books. Rangers usually knew where that plant existed on their country and were able to explain this to the elders, who sometimes struggled to recognise the plant until this context was provided.

Conclusion

Although I initially possessed the traits of a weed, I came to belong by building relationships and developing a useful project for local people. This project centred on investigating Aboriginal perspectives on weeds and weed work. This involved understanding the current state of Aboriginal weed work in the Kimberley as well as the politics that have produced and reinforced it. I adopted a political ecology approach to guide my conceptual framework as this framework

contextualises Aboriginal weed work within the wider historical, social, cultural and environmental politics that have produced it. Significantly, it shows that the current state is not a natural fact, but that it is political and contestable.

This approach requires an understanding of the historical, social, cultural, political and ecological processes that interact to produce environmental phenomena and their management. Therefore my methodology straddled a number of natural and social science disciplines. I needed to recognise the strengths and weaknesses of these disciplines' methods and remain aware of the effects that my interdisciplinary methodology would have on my findings.

Research with Aboriginal people and on Aboriginal country presents challenges – but it is also really enjoyable. Taking the time to adhere to cultural protocol and negotiate the personal and institutional politics (overcome my weediness) was difficult, especially bearing the constant weight of needing to produce a robust academic research project within time and resource constraints. Being perceived as a weed forced me to slow down and realise how much fun I was having in the field, it also made sure that my project will not follow the extractive line of Aboriginal research that has taken place in the past.



5
CHAPTER FIVE

ENVIRONMENTAL WEEDS MEET ABORIGINAL RANGERS

“Mate, it might seem like we’re in charge of what we’re doing but it’s a bloody minefield up here. There are that many programs and protocols it’s impossible to keep up with, weeds are just one of the things that have a million rules attached to them...A word of warning, Ranger groups are generally overworked and understaffed; busy chasing our tails most of the time, we just go with the flow, [we’re] following, not leading.”

These are the words of Tim, an employee of the Kimberley Land Council’s Land and Sea Management Unit. More than the actual work that is undertaken on the ground, the ‘chasing of tails’ that Tim spoke of related to administrative tasks such as: keeping up to date and complying with changes to national, state and local weed policies; adhering to and reporting on Ranger groups’ work plans; and proactively seeking new grants and funding opportunities.

He offered his “word of warning” in the context of making sure that I was aware of the institutional and administrative structures of mainstream weed management and Aboriginal NCRM in the Kimberley; suggesting that even though it “might seem like we’re in charge of what we’re doing” these “programs and protocols” have a significant influence how the Rangers approach and conduct their weed work.

This chapter outlines the main discourses, institutions, and policies of environmental weed management and Aboriginal NCRM. Understanding how these fields have developed and are organised as well as how they have come together to produce Aboriginal weed work is crucial for setting the context of the rest of the thesis.

The first part of the chapter looks at mainstream environmental weeds discourse and management in Australia. This focuses on how environmental weeds are currently prioritised and managed by mainstream environmental agencies. The second part of the chapter looks at

Aboriginal NCRM, connecting it to its roots in land rights struggles and the assertion of Aboriginal desires to live on and care for their country. It discusses the origins of formalised NCRM initiatives, and their trajectory towards current Federal Government Ranger programs. The chapter concludes by bringing together environmental weed management and Aboriginal NCRM to provide a picture of the current state of Aboriginal weed management in Australia.

Environmental weed discourse and management in Australia

Ever since the SCOPE program in the mid-1980s, invasive species have been one of the major targets of Australian environmental management. The isolation of the Australian 'island' continent is suggested to have made it ecologically vulnerable and susceptible to biotic invasion. Popular examples of introduced animals such as the rabbit and the cane toad were used to emphasise this vulnerability around the time of the SCOPE program (Groves and Burdon 1986).

In northern Australia during the 1980s and 1990s, invasive species and environmental weeds discourse and management concentrated largely on Mimosa (*Mimosa Pigra*), which was rapidly invading wetlands and grasslands (Lonsdale 1993, Storrs *et al.* 1999). Mimosa was perceived as extremely threatening to biodiversity in the tropical and sub-tropical savannahs of the Northern Territory and Queensland (Miller and Schultz 1993). The case of Mimosa combined with the threat posed by a number of non-native invasive grass species in northern Australia highlighted the need for strategic weed policy and management at various scales and with a variety of landholders (ARMCANZ 1999, NRMMC 2006).

Since the late 1990s, this need for a more strategic approach to weed management at the national scale has resulted in two national weeds strategies: the National Weeds Strategy in 1999 (ARMCANZ 1999) and the Australian Weeds Strategy in 2006 (NRMMC 2006). As directed by these strategies, there was also increased research into environmental weeds, largely through new national Cooperative Research Centres (Downey 2011).

Environmental weed policy in Australia comes under a complex range of overlapping bureaucratic and institutional structures. The practice of weed management remains the responsibility of landholders, with state and territory governments responsible for administration, legislation and enforcement. The size of some infestations and the scale of the projects to manage them have necessitated the development of partnerships between a range of actors, from private landowners to the Federal Government. There is significant collaboration between federal, state, regional and local NRM agencies over the classification, prioritisation and management of

environmental weeds. A corpus of academic and industry-based networks share knowledge and experience in journals such as *Plant Protection Quarterly*, at annual meetings such as the *Australian Weeds Conference* and through forums such as the *Council of Australian Weed Societies*. Across these groups there is significant overlap in perspectives and approaches to environmental weed management.

The following sections look at these perspectives and approaches, focusing on how environmental weeds are defined, prioritised and managed. Each section addresses Australian, Western Australian and Kimberley environmental management to ask: Firstly, what makes a plant an environmental weed? Secondly, how is weed management organised and undertaken?

[What makes an environmental weed?](#)

The ‘triad’ of invasive species discourse is mirrored in Australian classifications of environmental weeds: they are plants that are **non-native, invasive and have a negative impact on ecosystems**. Using weed policy and literature from Australian, West Australian and Kimberley environmental management, the following discussions outline how each of these concepts is invoked to contribute to the classification of plants as environmental weeds.

‘Not from here’: Non-native species

All definitions of environmental weeds by Australian land management agencies include the idea that the plant being considered is not in its place of biogeographical origin. This is frequently implied through the use of the terms *non-native, exotic, introduced, alien* and might be applied across spatial scales from the nation to a patch of urban bushland. Ross and Walsh (2003:iii) suggest that a plant’s origins are crucial in terms of management because the classification of a plant as ‘non-native’ or ‘introduced’ results in “conscious efforts being made to eradicate populations”.

In Western Australia, the Department of Parks and Wildlife (DPaW) puts the status of ‘introduced’ first and foremost in its classification of an environmental weed, defining it as “an *introduced* plant that establishes in natural ecosystems and adversely modifies natural processes, resulting in the decline of invaded communities”.

This emphasis on the native–non-native polarisation in environmental weed classification is also present in Western Australian weed guide books such as *Western Weeds* (Hussey *et al.* 2007). *Western Weeds* is immensely popular, widely used and influential in weed management circles in Western Australia.¹¹ Taken together, the following quotes from its introduction assert that weeds are weeds because they are from elsewhere:

“Western Australia, the Wildflower state! Not all the ‘wildflowers’ are truly native to Western Australia, some are migrants, and have arrived here in recent times, introduced by human beings...This book will help you to identify these introduced species.” (xi)

“Does it matter whether a plant is a newcomer to Australia, or has been evolving here in isolation for the last 50 million years? Yes, it does!”(xi)

“There are no weeds in nature! In this book we have assumed that all introduced plants growing outside where they were cultivated are weeds.” (xiv)

Across Australia, enormous emphasis is placed on considering plants’ origins. Bean (2007) dedicates an article to reviewing numerous previous systems for determining ‘Indigenous’ plants in Australia, before providing his own particular system of assessment which is based on complex ecological, phytogeographical and historical criteria. Low (2001) argues for a more refined scale in considering origins, suggesting that:

“in Australia today an ‘exotic’ plant to most people is one from overseas, and a ‘native’ plant a plant from Australia. But ‘exotic’ should apply to any plant established outside its normal distribution.”

A workshop held by the Weed Society of Victoria sought to address this by asking, “*Can Australian Native Plants be Weeds?*” – to which their resounding answer to their questions was ‘Yes’.¹² In this workshop academics and practitioners explored problems caused by ‘native’

¹¹ As the lead author Hussey recalls, the popularity of the book far exceeded the expectations of the authors and the Weeds Society of Western Australia:

“I was not involved in the first meeting to discuss publishing *Western Weeds - a Guide to the Weeds of Western Australia*, but apparently debate raged as to whether 500 or 1000 copies should be published. In the end, the committee made a very bold decision and 2000 copies were printed in September 1997. All 2000 copies were sold before Christmas of that year. This was beyond the wildest dreams of the authors and committee members of the Society, and another 2000 copies were printed. These also sold out.” (Hussey and Lloyd 2002)

¹² This conference contributed its proceedings to a subsequent issue of the journal *Plant Protection Quarterly* (see *Plant Protection Quarterly* 2001, 16:3)

Australian plants within Australia however outside of their “pre-European geographic range” (Carr 2001).

This is taken up in Western Australia by Keighery and Longman (2004:14) who point out that “many Australia wide checklists of weeds list only exotics” referring to those plants that have entered Australia from another country since the British arrived in 1788, and suggest that plants from other parts of Australia should also be included in environmental weed lists. Keighery (2002) focused on the scale of introduction in his emotively titled paper “*The enemy within: native environmental weeds of Western Australia*” proclaiming that “there are native species that truly are weeds” and that “one of the problems in recognising and controlling environmental weeds in Australia is an understanding that Australian native species can be serious problems out of their natural ranges and habitats” (93). He suggests that “as native plants are not considered weeds the biogeographic and taxonomic issues that restrict exotic importations to WA do not apply” (93), concluding that “[Western Australian weed managers] should treat all eastern Australian species as exotics, not as natives, for weed management” (94). Keighery and Longman (2004) follow this with an examination of the “*Naturalised plants of Western Australia*” in which, they discuss whether or not certain plants are “native or naturalised”, suggesting that “there are still continuing issues with determining the native or naturalized status” of a number of widespread taxa occurring in Western Australia.

Together, this research and emphasis on plant’s origins is evidence of how important this characteristic is to environmental weeds classification in Australia and Western Australia.

Invasiveness

Invasiveness – generally considered as the ability of a plant to readily colonise and grow rapidly in new areas – is a key factor in the classification of environmental weeds in Australia. This characteristic is represented by the national legislation on Weeds of National Significance, in which invasiveness or ‘weediness’ of a species is the primary factor taken into account (Thorp and Lynch 2000). The significance of invasiveness is mirrored in both the *Environmental Weed Strategy of Western Australia* and the *Western Australia Invasive Plant Prioritisation Process*, which also prioritise weeds according to their invasiveness (CALM 1999, Passeretto and Powell 2012).

In DPaW’s response to the question “What are weeds?”, they suggest that “In simple terms, a weed is a plant growing where it is not wanted. Both introduced and native plants have the potential to become weeds, if they have certain invasive characteristics” (DPaW 2013a).

Paraphrasing this quote, a ‘weed’ can be understood as ‘any plant that is not wanted, *as long as it has invasive characteristics*’.

This is because the more invasive a plant is, the more difficult is to control. The Federal Department of the Environment recognises this, stating that “throughout Australia, weeds are spreading faster than they can be controlled and management of them is consuming an enormous amount of resources” (Department of the Environment 2012). Therefore, the more invasive a species is, the more threatening it becomes – which determines how species are prioritised for management.

This has occurred to the extent that some government agencies and environmental managers have begun to refine their focus from ‘environmental weeds’ to ‘invasive plants’, hence the *Environmental Weed Strategy of Western Australia* (EWSWA) being succeeded by the *Western Australia Invasive Plant Prioritisation Process* (IPPP) in 2008 (Passeretto and Powell 2012).

Negative impacts on ecosystems

Invasion ecology and environmental managers suggest that environmental weeds are unwanted plants because they adversely affect the natural ecosystems in which they occur. As the Australian Weeds Strategy states:

“[environmental] weeds are one of the major threats to the natural environment. They are destroying native habitats, threatening native plants and animals and choking our natural systems including rivers and forests”
(NRMMC 2006)

The *Environmental Weeds Strategy of Western Australia* (see CALM 1999:4) defines environmental weeds as:

“plants that establish themselves in natural ecosystems (marine, aquatic and terrestrial) and modify natural processes, usually adversely, resulting in the decline of the communities they invade”.

Humphries *et al.* (1991) define environmental weeds as plants that are “undesirable from an ecological perspective” and take the idea further by categorising the severity of environmental weeds by their ability to ‘modify’ ecosystems:

“Serious environmental weeds are defined as those that cause major modification to species richness, abundance or ecosystem function. Very serious environmental weeds are those that can totally and permanently destroy an ecosystem.”

DPaW (2013a) provide a detailed outline of the ecological mechanisms through which environmental weeds might deplete the health of ecosystems, saying:

“Weeds can have a significant impact on natural values by:

- successfully out-competing native species for available nutrients, water, space and sunlight
- reducing the natural diversity by smothering native plants or preventing them from growing back after clearing, fire or other disturbance
- replacing the native plants that animals use for shelter, food and nesting
- altering fire regimes, often making fires hotter and more destructive.”

The weed identification guide *Kimberley Weeds*, produced by the environmental organisation Environs Kimberley (see Environs Kimberley 2008), provides a list of the major environmental weeds in the Kimberley region. While no general definition for ‘weed’ is provided, each of its sections begins with a brief, ecologically-grounded explanation of why those plants are weeds:

- Grass weeds: *“They push out native plants, and create dry fuel for hot fires.”*
- Tree & shrub weeds: *“They dominate areas and push out native plants.”*
- Herb weeds: *“They dominate areas and push out native plants.”*
- Water weeds: *“They can quickly cover and choke waterways. Water weeds that form mats can block out sunlight and stop oxygen from mixing with water. Water weeds can also change how water flows through creeks and rivers. Many fish, plants, waterbugs and other animals can be affected.”*
- Weedy vines and scramblers: *“They smother grass and small trees. They spread easily and as they dry out they become fuel for hot fires.”*

Clearly, these justifications revolve around a weed’s effect on ecosystems, particularly on native plants.

Considered together, **non-native, invasive** plants that **negatively impact ecosystems** constitute environmental weeds within Australian environmental management discourse. The following

section discusses how these plants are prioritised and controlled, highlighting management's emphasis on species-led strategies.

How are environmental weeds prioritised and managed?

At the national scale

Although weed management in Australia is the responsibility of landowners and legislation is set by each state, the Federal Government has a significant influence over the way weeds are prioritised and managed. This influence largely comes from the formulation of national weed lists and the provision of funds directed to control these listed weeds.

The most influential piece of weed policy in Australia is a list of 32 plant species declared as Weeds of National Significance (WoNS) by the Australian Weeds Committee. The development of the WoNS list was part of the Australian Weeds Strategy's aim to "establish consistent guidance for all parties, and [identify] priorities for weed management across the nation" (NRMMC 2006:2). The WoNS list compiled in 1999 included 20 weed species; however, after reviews in 2007 and 2009, a further 12 species were declared in 2012 (Australian Weeds Committee 2012). The aim of the WoNS list is to identify, rank and target those "weed species [that] are so widespread and insidious that they have become of national significance" (Thorp and Lynch 2000). WoNS are classified by "invasiveness and impacts" criteria and take into account a species' potential to affect economic values (mainly through agriculture and forestry), environmental values (mainly through the loss of biodiversity) and social values. Each WoNS has a national coordinator and management group/steering committee, which oversees strategic plans for the nationwide management of that species (Department of the Environment 2012a).

The initial WoNS list was complemented at the national level in 2000 by the *National Environmental Alert List* (the Alert List). This list is differentiated from the WoNS in being environmentally focused, targeting weeds that are not listed as WoNS however that still pose "a high or serious threat to the environment". Along the lines of mainstream environmental weeds discourse, the Alert List includes "28 **non-native** weeds that have **established naturalised populations in the wild**" and "have the potential to become a **significant threat to biodiversity** if they are not managed" (ibid, emphasis added).

In addition to the WoNS list and the Alert List, the Australian Weeds Committee compiled a list of 17 "sleeper weeds" in 2003 (Department of the Environment 2012c). The idea of

'sleeper weeds' stems from the widely held presumption in environmental weed discourse and invasion ecology of the 'guilt' of all exotic species before they have been proven 'innocent'. This 'guilt' rests scientifically on the idea of a time-lag in the invasive behaviour of introduced species; and ethically on the notion of the precautionary principle (Groves 1999, Pyšek *et al.* 2008).¹³

According to the Federal Government Department of the Environment, "sleeper weeds" are:

"plants that appear benign for many years, but which may suddenly spread rapidly following certain natural events such as flood, fire, drought, climate change, or change in land or water management. Sleeper weeds are not always recognised as a significant problem, even though the potential threat they pose to industry, people or the environment may be extreme."

According to Groves (1999:636), who brought the issue to the attention of Australian weed scientists and managers:

"The important category of sleeper weeds cannot continue to be overlooked by weed scientists and funding agencies in Australia if we wish to avoid an inexorable increase in the number of major weeds and the resources spent on their control in the future."

These three national weed lists – totalling 77 separate species – feed into the state and regional weed lists and influence how natural resource managers at these levels approach weed management. Most significantly, the lists direct a species-specific focus within Australian environmental weed management. As Downey and Sheppard (2006:265) state, "The National Weeds Strategy set a species-based foundation to contemporary weed management practice in Australia".

¹³ A number of studies, following Groves (1999), cite *Mimosa* as a quintessential 'sleeper weed' that remained 'dormant' in Australia for 70 years before expanding its range and becoming one of Australia's worst environmental and agricultural weeds (see Cunningham *et al.* 2003, Pyšek *et al.* 2008).

In Western Australia:

There are many land management groups active in environmental weed control in Western Australia; however, through its role in the development of environmental weed policy, DPaW is particularly influential in directing the prioritisation and management of environmental weeds.

Environmental weed policy was first addressed in Western Australia in 1999 with the Environmental Weed Strategy for Western Australia (EWSWA). This strategy proposed “an integrated approach to environmental weed management” and looked at control from “weed led, site led, resource led, threatened species and communities led, and cause led” approaches (CALM 1999). Despite the multiple approaches outlined by the strategy, the majority of its attention and resources went into compiling a comprehensive list of environmental weeds that occur in each of the main regions of the state. Through this environmental weed identification process, the strategy identified and listed 1350 environmental weeds, and ranked 34 of these as ‘high’ risk (CALM 1999, Passeretto and Powell 2012).

The EWSWA was criticised as being “ad hoc and non-strategic” (Passeretto and Powell 2012:116) and “too broad to be of use from an on-ground operational perspective” (DPaW 2013:1). To “progress this strategy and [develop] an integrated approach to weed management in WA” the EWSWA was replaced by the Invasive Plant Prioritisation Process in 2008 (IPPP) (Passeretto and Powell 2012). The IPPP focuses on a “species-led” and “an asset-protection-based” approach to “control the threat of environmental weeds within WA”. In the IPPP, species-led prioritisation is considered to be of foremost importance for creating practical priorities for weed managers.

This species-led approach is favoured by DPaW staff and environmental weed managers at a cross-regional scale. Passaretto and Powell (2008:116) point out that the IPPP’s species-based focus “will be used to inform regional priorities and hence allow for the strategic allocation of funds for the best return for investment and the best long term outcomes for weed management and asset protection”. They state that this type of “prioritisation process also gave regional staff a greater awareness of the weeds that are in, or just outside, their region” (117).

Bettnik and Keighery (2008:1) highlight the importance of species-led weed assessment in their *Swan NRM Regional assessment* – which was later expanded to become the state-wide IPPP template:

“with large numbers of environmental weeds (in excess of 900 taxa [in the Swan Natural Resource Management region alone]), this regional assessment is necessary

to identify the most threatening species, in order to prioritise works programs and effectively allocate resources”.

Through the IPPP’s species-based focus, its strategy highlights the species “that have the highest ecological impact, most extensive potential distribution, highest invasiveness, lowest current distribution and highest feasibility of control” (DPaW 2013:5). In order to undertake this identification and ranking process, “species-led prioritisation workshops” were held in each of the nine DPaW regions, including the Kimberley, between 2008 and 2010 in order to “score all weeds which occurred in each of the DPaW Regions” and thereby “assist DPaW regions in priority setting for weed management on DPaW-managed lands” (DPaW 2013:2).¹⁴ According to Passaretto and Powell (2012:117) these species-led prioritisation workshops “were attended by relevant DEC staff who had expert knowledge about weeds occurring in their region, including locations, impacts and past control efforts”. Participation in these workshops did not extend beyond DEC/DPaW staff and hence limits the ways in which weeds were considered and prioritised.

The asset-protection-led process of the IPPP begins at the point the species-led process concludes. As DPaW (2013a) says, “The next stage of the process is to identify high value biodiversity assets, the weeds that pose a threat to these assets, and the sites where control will have the greatest benefit and cost effectiveness.” A prerequisite for this stage is having the priority list of weeds as “this [species] list will assist with prioritising weed control during the asset-protection-based process” (DPaW 2013:3).

Aside from the more recent IPPP including “feasibility of control” in its species-led assessments, the IPPP and the EWSWA are quite similar. Both take a species-led approach and include place/context-based considerations after species have been prioritised. The IPPP’s ‘asset-protection-based’ control can be seen as a combination of the “site led, resource led, threatened species and communities led and cause led” control approaches of the original EWSWA (iv). This represents a streamlining of four place/context-based criteria into one, leaving “social, cultural and economic assets ... [to] be considered at a later stage of the process” (DPaW 2013:1).

¹⁴ The DPaW Kimberley Rankings Summary developed by the IPPP was still under review at the time of writing (the only one of the nine regions not to have been finalised and published). However, a number of the Kimberley Ranger groups have adopted a DEC Kimberley Environmental Weed List published in 2010 as a guiding document for their own weed surveys, censuses and management strategy.

In the Kimberley

Environmental weed management in the Kimberley is undertaken by government organisations including DPaW, the Western Australia Department of Water, and local shire councils and non-governmental groups including Kimberley Aboriginal Ranger Groups, Environs Kimberley, Rangelands NRM, and more recently Greening Australia. Although these organisations operate separately (often competing for funding through Federal Government environmental management grants), there is an increasing trend towards partnership and collaborative, cross-tenure weed management.

The role and influence of DPaW has increased in the Kimberley since the implementation of the Kimberley Science and Conservation Strategy in 2011. KSaCS allows DPaW to take a tenure-blind approach to cross-tenure matters such as weeds (as well as fire and feral animals). Whereas DPaW was formerly only able to conduct management on the DPaW estate and on unallocated crown land, KSaCS has allowed DPaW to pursue “collaborative action with land managers at a landscape scale” and to work alongside private landholders – particularly Native Title holders – in order to manage region-wide issues (DEC 2011:8).¹⁵ DPaW’s sphere of influence has therefore increased, and the IPPP’s weeds lists and species-led strategy have also become dominant among its weed-management partners.

As in the national and state strategies, environmental weed management in the Kimberley is dominated by a strong species-specific focus. Mainstream weed managers in the Kimberley focus on particular species, using a national or state weed list to support their selection. Some of the notable weed management actors and projects are described below.

Environs Kimberley is an active group in environmental conservation in the Kimberley and has conducted several significant environmental weed management programs over the last decade. In 2008 Environs Kimberley established the Community WEED Project through funding it received from a Federal Government environmental management grant. The project was partnered and supported by local shire councils, the Western Australian Environmental Weeds Action Network and the Weeds Society of Western Australia; it liaised with Kimberley Aboriginal Ranger Groups to undertake some of the management work. Along with on-country weed management the project produced and disseminated an identification handbook of Kimberley environmental weeds (refer to Figure 5.1). This handbook has been distributed widely across the Kimberley and is used extensively by Aboriginal Rangers to identify and learn about weeds.

¹⁵ The DPaW estate includes all national parks, state parks and conservation lands in the State of Western Australia.

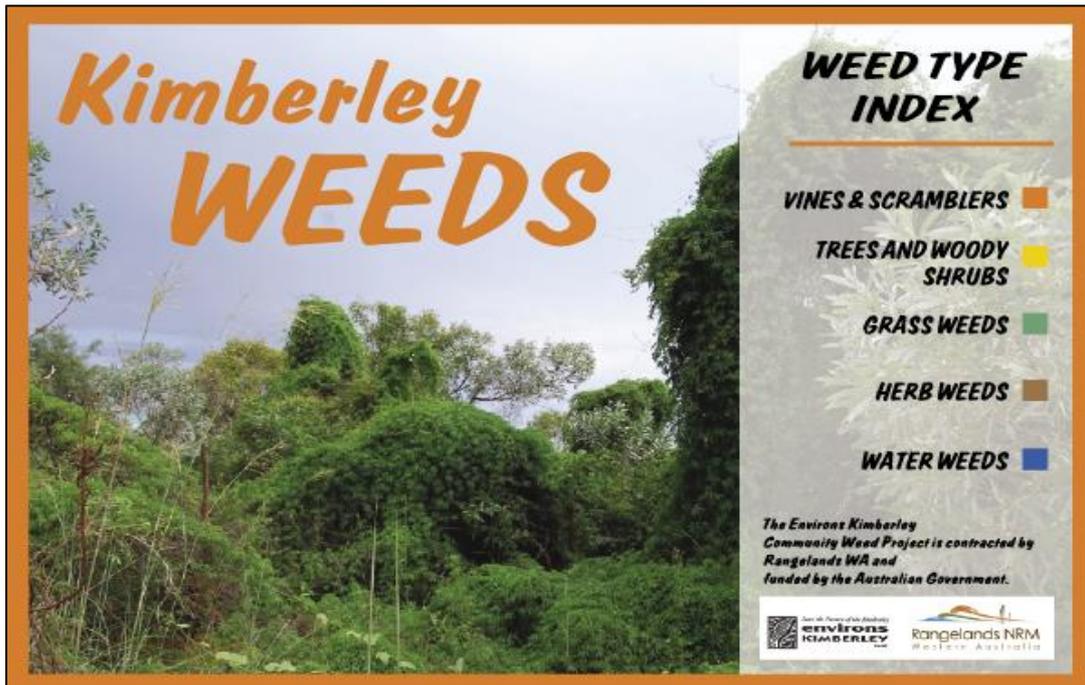


Figure 5.1 Kimberley Weeds identikit produced by Environs Kimberley

Alongside the identikit, the WEED Project produced *Derby Declares WAR ON WEEDS*, a promotional pamphlet which spruiks the dangers of specific weed species (Figure 5.2). It defines these species as weeds for the same reasons as *Kimberley Weeds* (their invasiveness and effects on native vegetation). As well as providing material for identifying and controlling weeds, it urges people to grow native plants, suggesting that “local trees are adapted to local conditions, grow better and have less diseases”.

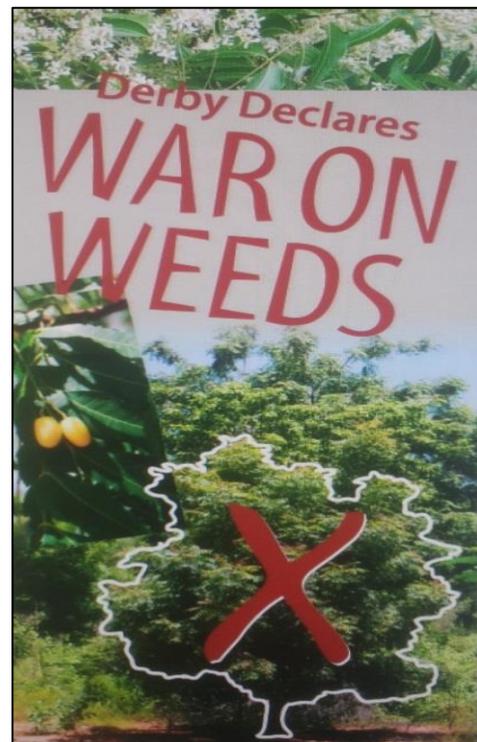
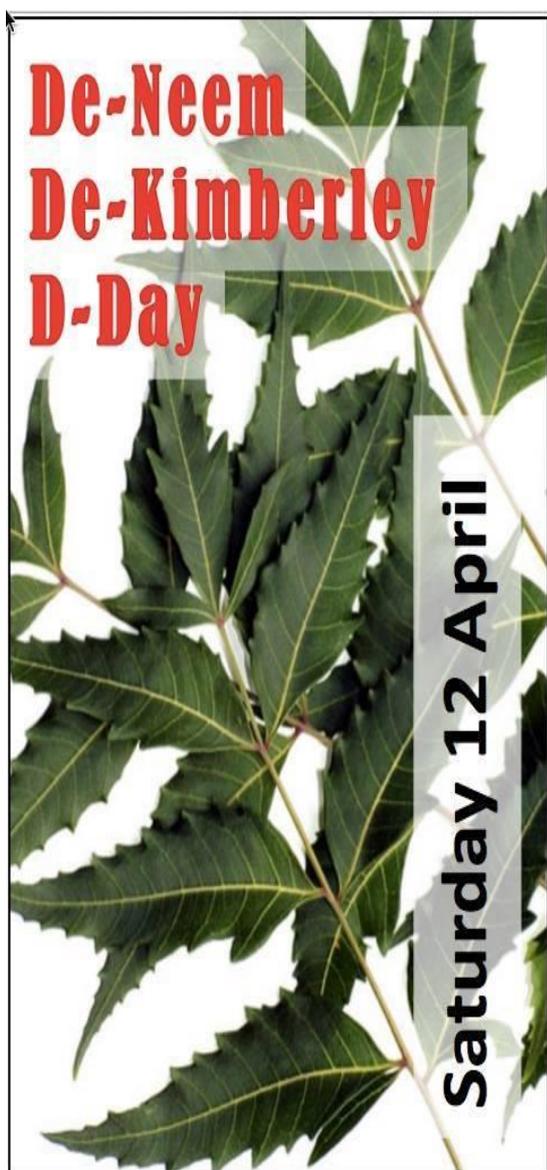


Figure 5.2 Derby Declares War on Weeds pamphlet



**Figure 5.3 Community program to manage
Neem trees in Kununurra**

containment approach included the establishment of a “Noogoora Burr Quarantine Zone” along the Fitzroy River, from Fitzroy Crossing through to the river mouth at King Sound (a distance of around 400kms), particularly near areas of high recreational and agricultural use. The high profile of the project and its legacy of Noogoora Burr Quarantine Zones (see Figure 5.4) made the project and the weed well known in the Kimberley, particularly among those who live near and use the Fitzroy River.

Both of these publications demonstrate a strong emphasis on species-based management of weeds and warn about the effects they might have on native vegetation and ecosystems.

In the Kimberley, as elsewhere, large-scale weed management projects by NRM agencies and NGOs have been directed at the management and control of specific species such as those on the WONS list, rather than holistic or contextual landscape management (Duff 2012). Alongside a growing emphasis on the control of Neem Trees (as demonstrated by the program to de-Neem de-Kimberley in Figure 5.3). Two major environmental weed projects stand out, which targeted Noogoora Burr and Rubber Vine.

The Noogoora Burr control project, which began in 1984 and continued into the 2000s, was intended to control and contain the plant around the Fitzroy River catchment (Coyle 1997). The project initiated intensive chemical and bio-control treatment in isolated upstream infestations, in an attempt to eradicate the plant from these areas while containing it downstream. This

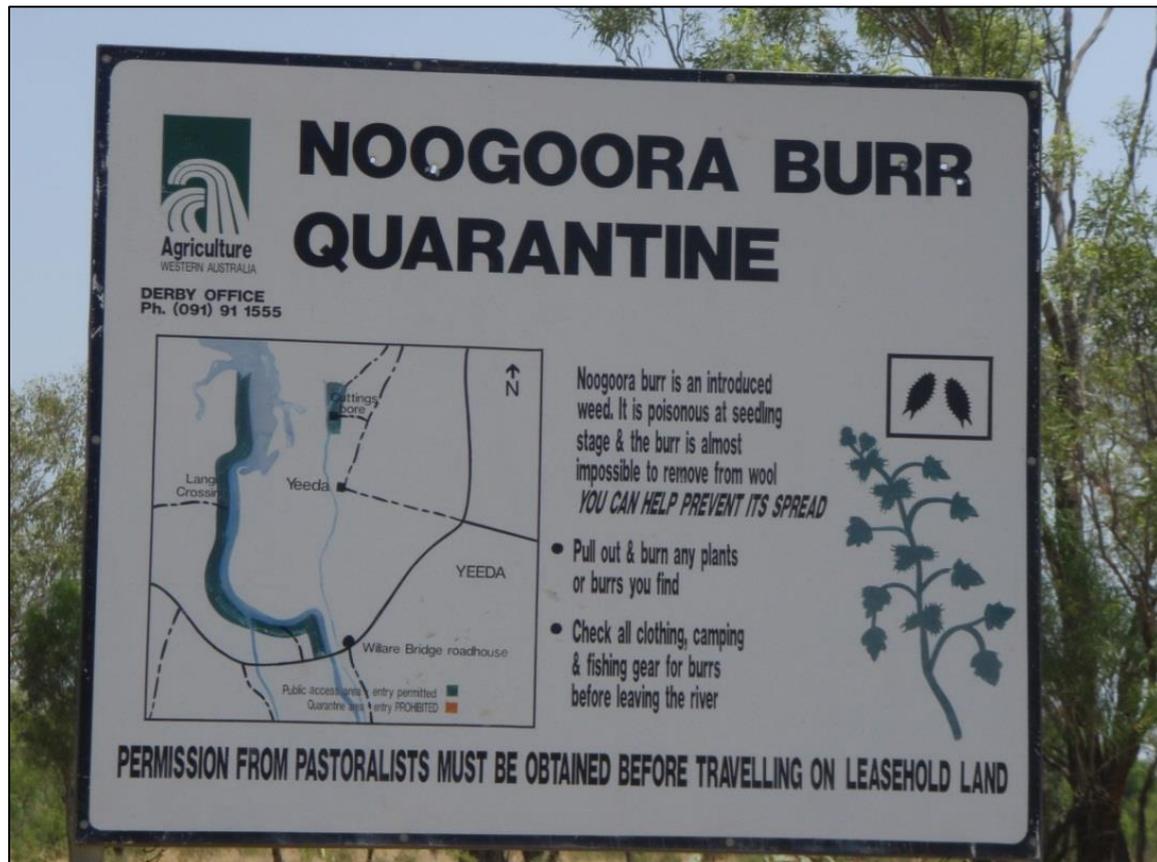


Figure 5.4 Noogoora Burr quarantine area on the banks of the Fitzroy River

A more recent example of a species-specific approach is the ‘West-Kimberley Rubber Vine Eradication Project’ (WKRVEP), which began in 2011. The WKRVEP is jointly funded by WA State NRM Strategic Grants and Rangelands NRM, which obtained its portion of funding from a Federal Government environmental grant – largely due to Rubber Vine’s classification as a WoNS. The WKRVEP has been solely focused on the eradication of rubber vine from over 25,000 hectares of the lower Fitzroy River catchment (Rangelands NRM 2014). While successful in its attempt to eradicate Rubber Vine from specific parts of the Kimberley, the WKRVEP failed to manage the other weeds that were also affecting these places.

There has recently been a slight shift in emphasis in the Kimberley toward site-based weed management. One case highlights this. As a part of its West Kimberley Nature Project, Environs Kimberley initiated a monsoonal vine thicket project. Monsoonal vine thickets are a type of rainforest ecosystem that occurs in discrete patches on the coastal sand dunes of the Dampier Peninsula (to the north of Broome). Through the efforts of Environs Kimberley these vine thickets have been listed as a ‘Threatened Ecological Community’. The Peninsula Vine Thicket Project focuses on conserving and restoring the health of these sites. Environs Kimberley therefore considers weeds at these sites in the context of the protection of vine thickets and has

controlled weeds according to how they negatively affect these places. Even though this project has been widely considered as successful, species focused projects still dominate weed work in the Kimberley.

Aboriginal Natural and Cultural Resource Management in Australia

Australian Aboriginal NCRM has allowed Aboriginal people to formally participate in the management of their country. This opportunity developed at the intersection of the global movement towards the decentralisation of NRM, the growing appreciation of Indigenous ecological knowledge in environmental management, and the Aboriginal land rights movement. This section explores these origins and outlines the current structure and major programs of Aboriginal NCRM in Australia. It then focuses on its development and structure in the Kimberley.

The Aboriginal land rights movement

Aboriginal NCRM in Australia exists on the back of a lengthy Aboriginal land rights movement. My discussion begins with this movement.

Prior to the formal recognition of Aboriginal land rights through the passage of Native Title legislation, Aboriginal people had begun to move back to their country and reassert their custodianship of their ancestral homelands. In what is known as the 'outstation' or 'homelands' movement, Aboriginal people moved away from the town reserves, government settlements and missions in which they had been forcibly placed, and returned to their country in order to establish communities, to live and to reengage with their country (Altman 2006, Glaskin 2007). This movement was in large part because of equal pay legislation handed down in the late 1960s. This legislation forced pastoralists, who had previously depended on cheap Aboriginal labour, to pay Aboriginal and non-Aboriginal workers equally. Pastoralists decided they could no longer pay, feed and house Aboriginal workers and their families, who were thrown off the stations in the early 1970s to live in poor conditions in town reserves.

Although Coombs (1974) described the outstation movement as a simple relocation of people, or a "decentralisation trend", Glaskin (2007:201) explains that it should be "understood as a return by those people who had been in exile from their country". This movement coincided with the end of Federal Government policies aimed at cultural assimilation and demonstrated a strong step towards Aboriginal cultural and political self-determination (Altman 2006).

According to Altman (2006:5) this was significant in that such a “rural exodus”, at such a time, represented

“an Aboriginal rejection of the modernisation or development paradigm as experienced at government settlements and missions ... [and was] predicated on the rejuvenation of customary economic practices that many had assumed defunct.”

This desire to reconnect with country and reinvigorate cultural identity is seen by many as the first step towards the mainstream recognition of Aboriginal people’s connection to country that is manifested in current Aboriginal NCRM (Altman 2006, Weir 2012). Testament to the significance of the outstation movement and its enduring influence on Aboriginal NCRM is that many of the Aboriginal Ranger stations are based in communities which were established as a part of this movement.

Aboriginal Australians encountered a protracted legal struggle to be formally recognised as the custodians of their ancestral country. This recognition has only come recently through a number of legislative battles that culminated in the passage of significant land rights legislation, namely the *Aboriginal Land Rights (Northern Territory) Act 1976* and the *Native Title (Commonwealth) Act 1993*.

At the point of British colonisation Australia was legally rendered as *terra nullius*, based on the assumption that Aboriginal people’s relationship to their country “had not amounted to ‘ownership’ because they were ... too ‘unsettled’ or [did] not involve sufficient ‘cultivation’ of the land” (Duff and Weir 2013:5). However the historic *Mabo v Queensland (No 2)* case in 1992 ruled that *terra nullius* was not valid because Aboriginal people had laws of land ownership prior to European colonisation that must be recognised and upheld by Australian law. In order to comply with the Mabo determination, *The Native Title (Commonwealth) Act 1993* was enacted at the federal level. Native Title provides legal recognition of the continuing relationships between Aboriginal and Torres Strait Islander peoples and their customary estates.

The legal recognition of land rights afforded through Native Title determinations has allowed some Aboriginal groups to re-establish greater control over the management of their traditional estates. However, Native Title legislation is complex and its effects are highly variable. The level of control is dependent on what type of tenure a group possesses. While some Aboriginal groups hold the strongest form of title, ‘exclusive possession’, which, according to the

Native Title Act (1993), entitles them “to the possession, occupation, use and enjoyment of the land and waters to the exclusion of all others”, those who hold ‘non-exclusive’ title only have the right to hunt, fish, gather food and conduct ceremonies on the land. Non-exclusive Native Title might be overlaid on land that is already held by others, such as a pastoral lease, in which case the rights of the Traditional Owners are subordinated to the rights of the existing landholder (Duff and Weir 2013). Although providing legislative *recognition*, Native Title may cede only limited and conditional control of this land to Aboriginal people, leaving many Native Title groups facing continual land-use negotiations with non-Indigenous landholders (Weir 2012).

The Indigenous estate, the ‘big three’ and Aboriginal NCRM

As more Aboriginal groups gained greater control over their land through Native Title legislation, the ‘Indigenous estate’ continued to expand. In general terms, the Indigenous estate refers to all Indigenous held lands in Australia. However the diversity of land tenures, rights and interests in these types of Aboriginal land holdings makes such a generalised term problematic. Nevertheless, the concept is useful as a way of highlighting the extent of land with formalised recognition of Aboriginal tenure.¹⁶

The Indigenous estate now comprises more than 20 per cent of Australia, including a significant amount of northern Australia’s coastline, some of the country’s major rivers, wetlands and riparian zones and a large diversity of bioregions and ecosystems (Altman *et al.* 2007). The estate also includes a number of areas that had been extensively used for pastoralism, upon which Aboriginal pastoral enterprises have been developed (Gill 2005). As Morrison (2007:250) explains, the extent, diversity and ecological richness of the Indigenous estate “places Indigenous people firmly in control of globally significant land and sea assets”. Young *et al.*’s (1991:1) report *Aborigines and Land Management* commissioned by the Australian National Parks and Wildlife Service suggested that the “remoteness and apparent lack of commercial value” of much of the Indigenous estate means that it “has as yet escaped the worst ravages of [land] degradation”. The ‘intact’ environmental condition of much of the Indigenous estate also highlights its significance as an environmental asset and its importance to the national conservation effort.

Despite its relatively ‘intact’ status, the Indigenous estate, was threatened by many of the same ecological pressures as the rest of the country, particularly environmental weeds,

¹⁶ For more in depth discussion of the Indigenous estate see Altman (2006).

uncontrolled high intensity fire and feral animals – what I refer to as the ‘big three’ (Altman *et al.* 2007, Morrison 2007).

Aboriginal people who had returned to live on their traditional estates became recognised by mainstream environmental agencies as a potential remotely based workforce of natural resource managers (referred to as Rangers) who could monitor and protect areas of significant environmental value, while culturally and spiritually reconnecting with their homelands (Young *et al.* 1991, Luckert *et al.* 2007).

The perceived advantage of having Aboriginal people on country coincided with the growing recognition and appreciation within Australia of the potential of Indigenous knowledge to contribute to the national conservation effort (Altman and Whitehead 2003). Many, including Dodson (1996:26) called for partnerships between Indigenous groups and Western environmental agencies:

“What I am suggesting is the need for integrating the views, and experiences of Indigenous peoples into the national strategies for environmental and conservation management. What I am suggesting is a partnership...between Western knowledge and ‘scientific’ approaches to land management and environmental management, and Indigenous knowledge and approaches. Such a partnership, I suggest should provide the basis for sound, sustainable environmental management and protection.”

Particularly in the Northern Territory, this collaborative potential was recognised and seized upon by mainstream conservation agencies who worked alongside Aboriginal groups to develop joint-management initiatives. From this period, Young *et al.* (1991:161) reported that:

“A number of conservation agencies...have in recent years cooperated with Aboriginal groups to develop innovative approaches to land and natural resource management based on both Aboriginal knowledge and also on scientific approaches.”

Aboriginal representative bodies such as Aboriginal Land Councils sought to enhance their environmental management capacity through the development of Land and Sea Management Units (LSMU). Aboriginal Land Councils are organisations with ‘statutory authority’ to enforce legislation on behalf of the Aboriginal groups they represent. Although they were originally established for this purpose, most Land Councils have now expanded their focus towards local capacity building, through which their engagement with Aboriginal NCRM has evolved. The main roles of LSMUs were to liaise with Traditional Owners regarding the management of their

country, as well as act as intermediaries between emergent Ranger groups and environmental management agencies.

At the same time, Aboriginal agency in land management and enterprise development had been demonstrated through an expanding Aboriginal pastoralism industry (McGrath 1985, Baker 1999). These pastoral businesses primarily developed to provide opportunities for Aboriginal groups to derive commercial gain from native title lands that had previously been used for grazing cattle. Beyond the commercial aspect of these businesses, they also served to maintain a strong cultural connection between Aboriginal culture and pastoralism that had developed during 'station time' (McGrath 1985, Baker 1999, Gill 2005).

Alongside this wider movement towards enterprise development, LSMUs established community-based Aboriginal Ranger groups during the early 1990s. Traditional Owners strongly supported this, viewing these programs as capitalising on newly established land rights to address cultural and environmental threats to traditional country that had gone unmanaged for decades (Kerins 2008). As Young *et al.* (1991:160) stated:

“The development of interest in ranger positions for community rangers confirms the strong concern of aborigines for control of resource use both on the land to which they hold title and also on land in which they have a traditional interest.”

Throughout the 1990s community Ranger groups grew in number and capacity, predominantly supported by the Federal Government's Community Development Employment Program (CDEP). However these CDEP schemes, or “Aboriginal work for the dole” as Altman (2012) described them, had their limitations. Young *et al.* (1991:158) pointed out that CDEP paid wages were “only marginally higher than unemployment benefit” which were only available part time, provided “no continuing career structure”. They argued that the schemes should only “be thought of as a temporary way of funding Community ranger positions, in order to assist their establishment” (158). LSMUs supplemented the CDEP wages by continuing to secure partnerships with mainstream NRM agencies, which provided fee-for-service work for Rangers. These fee-for-service contracts, although not directly addressing the concerns of the Traditional Owners, were seen as crucial to building the independence and capacity of LSMUs and Ranger groups (Storrs *et al.* 1999).

The Caring for Country movement

The expanding indigenous estate, combined with the success of community Ranger groups coalesced into a nationwide movement organised under the idiom 'Caring for Country' (Young *et al.* 2001, Kerins 2008, Ens and McDonald 2012).¹⁷

'Country' is a culturally significant Aboriginal English expression commonly used by Aboriginal people and in NCRM discourse, which expresses the intimate connections between Aboriginal people and their land. As Rose (1996:7) explains, Country is a "nourishing terrain", which:

"gives and receives life. Not just imagined or represented, it is lived in and lived with...[Country is] not only a common noun but also a proper noun. People talk about country in the same way that they would talk about a person: they speak to country, sing to country, visit country, worry about country, feel sorry for country, and long for country. People say that country knows, hears, smells, takes notice, takes care, is sorry or happy."

'Caring for Country', is an Aboriginal articulation which represents the holistic nature of people's responsibility for 'country'. Significantly, it asserts alternative meanings for Ranger work outside the structures of top-down NRM and discourses of mainstream environmental management. As Rose (1995:ix) explains:

"Aboriginal people see Caring for Country as an integral part of living on their land. Caring for Country forms part of the relationship individuals have with each other and with the land. It is not seen as a separate activity which can be 'carried out'."

The Caring for Country movement developed as an idea for a bottom-up approach to Aboriginal NCRM, which highlighted the cultural and social aspects of Aboriginal people's connection to their country. It emphasised the cultural significance of Ranger work rather than simply an employment, or an environmental management program (Smyth 2014). Kerins (2012:30) points out that this approach prioritised cultural connection to country "instead of focusing solely on linking employment aspirations with environmental management", which had been a hallmark of previous State-led initiatives. Institutionally, Caring for Country signified a loosening

¹⁷ The term was first used officially by the Northern Land Council who developed the "Caring for Country Unit" in 1995 as a part of their Land and Sea Management Unit in order to "deal with the new land and sea management challenges...and to consider commercial enterprises promising environmentally sustainable development". (NLC 2014)

of the “joint-management straightjacket” that had previously constricted land use negotiations and fee-for-service contracts between Aboriginal groups and governments (Altman 2012).

This grassroots independence, adaptability and bottom-up approach were keys to Caring for Country’s success. Morrison (2007:253) noted that:

“The Caring for Country movement is fluid and adaptive. It is essential to ensure that Indigenous people are the drivers of the development, rather than just passive stakeholders. Testimony to the importance of the Caring for Country movement is its origin in communities, not in institutions or the government.”

While some observers of the movement focused on either the environmental or social outcomes of Caring for Country in isolation, the majority highlighted the synergy created by a program that merged the human and environmental benefits of having Aboriginal people engaging with their country. Altman (2012:6) suggests, the Caring for Country movement provided Native Title groups and Aboriginal people with the possibility to “stay on country...[and] find a space within the existing dominant neo-liberal arrangements and ideologies to underwrite a different notion of development based on conservation”.

Indigenous Protected Areas

In the late 1990s federal funding became available for Aboriginal people and groups to set aside parts of their Native Title land as Indigenous Protected Areas (IPAs). As outlined by the Federal Government, an IPA is:

“an area of land and/or sea over which the Indigenous traditional owners or custodians have entered into a voluntary agreement with the Australia Government for the purposes of promoting biodiversity and cultural resource conservation”.
(DEWHA 2009)

Through this voluntary agreement IPAs are included in Australia’s National Reserve System (NRS) alongside a network of other government and private reserves and protected areas. The NRS underpins Australia’s commitment to the international Convention on Biodiversity by working towards protecting 17 per cent of its bioregions by 2020. As of August 2013, 60 IPAs have been declared, which together constitute more than a third of the area of Australia’s NRS. In 2013 the Australian Government committed to supporting

the ongoing development and management of IPAs by pledging a further \$78million over the next five-year period.



Figure 5.5 The declaration of four Indigenous Protected Areas in the Kimberley within a month culminated in a ceremony at Gambanan on Bardi-Jawi country in April 2013

Aboriginal groups have seen the development and management of IPAs as an opportunity to secure financial assistance to manage their country and protect it against environmental and cultural threats. For an IPA to become declared and integrated into the NRS an IPA Management Plan must be developed by the Aboriginal group and ratified by the Federal Government. The development of IPA Management Plans are directed by Traditional Owners with the assistance of the Federal Government, state and territory agencies and other non-governmental, environmental and conservation organisations. Many groups are developing their IPA Management Plans through the Conservation Action Planning process. This process identifies the major assets of a group of people or landscape, and recognizes their threats. These threats are rated alongside the assets, and management is undertaken in order to mitigate or eliminate these threats. By guiding the planning process Traditional Owners are supposed to direct how the IPA is managed.

Through their IPAs Aboriginal groups are provided with funding, which assists them to enact their management plans. At present, this management is predominantly undertaken by Aboriginal Rangers, usually alongside their Working on Country duties.

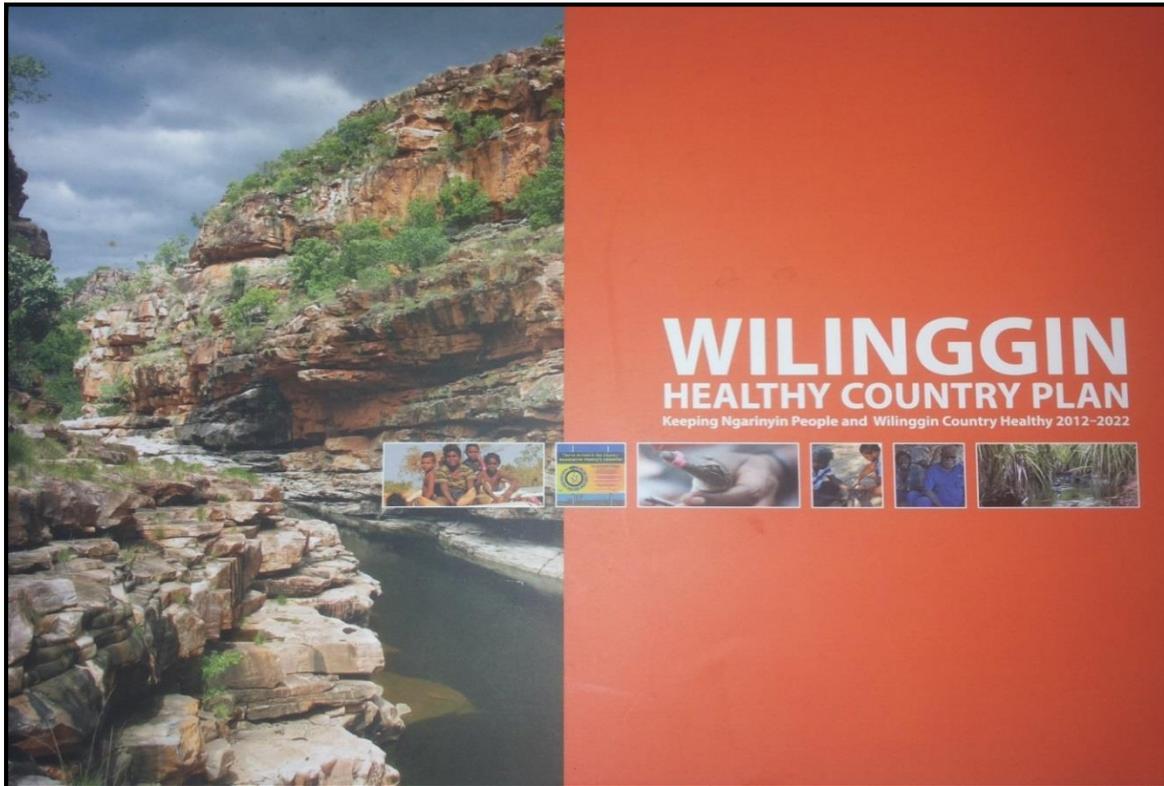


Figure 5.6 Wilinggin IPA Management Plan, developed through the Conservation Action Planning model

Working on Country

In 2007 the Federal Government recognised the success of the Caring for Country movement, CDEP schemes and IPA programs and developed its own centrally-organised and funded pilot Indigenous Ranger program. In 2008, this pilot program became the current 'Working on Country' program. As a part of this transition in 2008, Working on Country was incorporated into the Federal Government's flagship environmental initiative 'Caring for Our Country', which combined a number of previously independent NRM bodies as well as the Indigenous Protected Area program.

The implementation of Working on Country occurred during a turbulent period of Australian Indigenous policy, characterised by the Northern Territory National Emergency Response (popularly known as the 'Intervention').¹⁸ The development of Working on Country by the Federal Government signified an alignment of Aboriginal NCRM alongside increasing

¹⁸ The Northern Territory National Emergency Response (the Intervention) was a package of legal and welfare reforms put in place for Aboriginal communities in response to allegations of widespread child sexual abuse. Although it received bi-partisan support from the Federal Government, the Intervention has been widely criticised for using the allegations of child abuse as a 'Trojan horse' to enact legislation that restricts the liberties and self-determination of remote Aboriginal communities.

'centralisation' of Indigenous policies and programs (Kerins 2012). This federalisation of 'Indigenous' programs meant that Ranger programs became situated within the broader federal Indigenous policy mandate of 'Closing the Gap', which intends to address "Indigenous disadvantage" by providing "a broad range of environmental, cultural, social, education, health, employment and economic development outcomes" (DSEWPaC 2013:1). The change of Federal Government in 2013 caused a further policy and departmental realignment, which saw the responsibility of Indigenous programs, including 'Closing the Gap' and 'Working on Country', transferred to the Department of the Prime Minister and Cabinet.

This trend towards centralisation was in no way the intention of lobbyists and practitioners who had lauded the grassroots Caring for Country movement. Some, such as Kerins (2012:43) criticised this centralisation suggesting that it represented an "attempt to reshape the broad Indigenous vision [of Caring for Country] into a narrow environmental employment program."

The Federal Government promotes Working on Country as "a successful cross-cultural model that is achieving environmental benefits in the national interest and supporting the Australian Government's commitment to Closing the Gap" (DSEWPaC 2013:1). They attribute Working on Country's success its unique position at the nexus of cultural, social, economic and environmental policy. This is reflected in the Working on Country program objectives which are to:

- support Indigenous aspirations in Caring for Country
- provide opportunities for Indigenous people to deliver environmental services that protect and manage Australia's environmental and heritage values
- provide nationally accredited training and career pathways for Indigenous people in land and sea management in partnership with others
- facilitate a partnership approach between Indigenous people and others to deliver environmental outcomes. (DSEWPaC 2013)

Smyth's (2011:2) report compiled for the Federal Government, claimed Working on Country as "one of the best and most effective programs across the whole spectrum of Indigenous environmental, cultural heritage, health, housing or education programs".

The Working on Country program provides the bulk of financial support for Aboriginal NCRM in Australia. The program now employs more than 680 Aboriginal Rangers, working for 95 Ranger groups across the country. The program was initially funded as a five year program

from 2008–2013, with a \$244million investment that predominantly targeted the establishment of Ranger groups and the training of Rangers. From July 1, 2013 the program was extended for a further five years, offering an additional \$320million with the commitment to have 730 Aboriginal Rangers trained and working on country by June 2015 (DSEWPaC 2013).

Funding of the Working on Country program is only secure until 2018. Advocates emphasise that the achievements of the program to date are only the beginning of long-term strategies towards achieving environmental, cultural and social sustainability. As Smyth (2011:8) reports, those involved with the programs on the ground “view the [Working on Country] funded achievements to date as the early stages of long term and sustainable environmental management and community development programs”. Or, as Walter-Turnbull (2010:2) found in its independent report, the “certainty of ongoing funding availability was cited as critical to success of the program in achieving environmental as well as social and cultural objectives”.

Two-way management in Australian NCRM

As Aboriginal NCRM has expanded there has been increasing interaction and collaboration between Aboriginal and non-Aboriginal land managers and scientists. While IPA and Working on Country programs are intended to anchor Ranger work in Aboriginal connections to country, they need to do so alongside (and within) a mainstream NRM system based on scientific and ecological understanding. In practice, finding an epistemological balance that does not simply mirror larger institutional and ideological biases towards Western science is extremely tricky. To democratically and productively integrate two different, sometimes incommensurable, epistemological and ontological approaches to environmental management within the same NRM space is a challenge, recognized both on the ground and in the literature.

Indigenous Protected Areas:

“An IPA brings together traditional Indigenous knowledge and modern science for effective land management.”

Working on Country:

“Through the Working on Country program, Aboriginal Rangers use Western science to build on traditional knowledge of their country.”

Kimberley Land Council LSMU:

“The [KLC] Land and Sea Management Unit...uses a combination of traditional ecological knowledge with modern science and technology to achieve best practice methods and environmental outcomes.”

Box 5.1: Examples of two-way management language in major Aboriginal NCRM programs

Two-way management – sometimes called both-ways management, or the two-toolbox approach – has emerged to provide this institutional and epistemological bridge. Two-way management is intended to provide a cross-cultural management framework to “redress the dominance of non-Indigenous science in natural resource management” (Muller 2012:61). It seeks to achieve this by constructing a framework for management that “contests historical institutional power relationships and attempts to build on commonalities and mutual respect rather than difference” (ibid:62). As Preuss and Dixon (2012:3) highlight in their promotion of two-way management for Ranger work, “at the core of the two-way approach is a focus on recognising, valuing and utilising both Indigenous and non-Indigenous ecological knowledge systems in environmental planning and management”.

Two-way management has been extensively adopted as best practice within Australian Aboriginal NCRM. As the quotes in the text box suggest, this approach is promoted as a guiding principle of the IPA program and the Working on Country program as well as the Kimberley Land Council’s Land and Sea

Management Unit. Despite two-way management being widely adopted in Australian NCRM, the way that this is done is largely left up to the agencies and individuals working in each project. Across the spectrum of Aboriginal NCRM there is a variety of ways in which the model is enacted on the ground (Muller 2012, Preuss and Dixon 2012).

Aboriginal NCRM in the Kimberley

Aboriginal people in the Kimberley experienced much of the same colonial brutality as in other parts of Australia. Initial violent suppression of Aboriginal people, known as the ‘killing time’ by Kimberley Aboriginal people, was followed by over a century of oppressive colonial control

(Griffiths and Kinnane 2010). This control involved the enforcement of colonial law and the extensive dispossession of Aboriginal people and dislocation from their homelands. Even throughout this prolonged struggle, Aboriginal people in the Kimberley maintained their strong cultural identity and connection to country.

Largely due to this strong and proud cultural connection, and alongside the outstation movement in other regions of Australia, Aboriginal people in the Kimberley began to move back to live on their country during the 1980s and 90s. As Griffiths and Kinnane (2010:24) point out:

“The move back to Country in the 1980s and 1990s was associated with a resurgence in Law and custom. Old people chose the hard road of setting up outstations and communities so that they could be closer to Country and to make sure that young people grew up knowing their Country and their obligations to it, and to their family and people.”

These efforts were supported by the formation of Aboriginal regional organisations such as the Kimberley Land Council Aboriginal Corporation (KLC). The KLC was established in 1978 to represent Kimberley Aboriginal Traditional Owners, predominantly during human rights and land rights struggles. Through numerous legal battles, Kimberley Traditional Owners, alongside the KLC, have secured Native Title to around 70% of the Kimberley, which in turn has significantly increased the numbers of Aboriginal people living on country (KLC 2013).¹⁹ Central to its role in re-establishing people’s rights to country, the KLC:

“...was charged with the responsibility to do everything in its power to protect traditional land and waters. To protect, enhance and gain formal status (legal, social and political) for the customs, laws and traditions of Kimberley Traditional Owners.”
(KLC 2014)

Kimberley Caring for Country

Aboriginal NCRM in the Kimberley is chiefly undertaken by Ranger groups operating through their PBCs. Although there are some Ranger groups who remain independent, such as the Bunuba Rangers, the bulk are coordinated by the KLC’s LSMU.

¹⁹ Currently, over half of the Aboriginal population of the Kimberley live outside the major towns of Broome, Derby, Fitzroy Crossing, Halls Creek, Wyndham and Kununurra (Griffiths and Kinnane 2010).

The KLC LSMU was developed during the 1990s as a distinct function of the KLC to capitalise on successful Native Title determinations and to assist Traditional Owners “achieve the cultural and environmental changes they want to see happen on the ground” (KLC 2014). During its first decade the unit primarily facilitated Kimberley-based CDEP community Ranger programs, organised some fee-for-service work with external NRM agencies and assisted in the development and implementation of IPAs in the region.

The KLC LSMU was assisted by other regional Aboriginal organisations, to develop the Kimberley Aboriginal Caring for Country Plan.²⁰ This collaborative plan, produced by the Kimberley Aboriginal Reference Group, was developed from 2004–2010 and highlighted the importance of Aboriginal people caring for country, provided perspectives on how country should be cared for, and reported on the success of Caring for Country work being undertaken.²¹ This plan intended to set the direction for Caring for Country operations into the future. One of the strongest findings of the Kimberley Aboriginal Caring for Country Plan was the need to consolidate and develop Aboriginal Ranger groups as the most effective way of maintaining healthy country and linking the health of Aboriginal country to the health of Aboriginal people.

Although significant time and energy was put into the development of the Kimberley Aboriginal Caring for Country Plan, it has failed to direct any significant action on the ground, and was given no mention by any of the Ranger groups with which I worked.

The Kimberley Ranger Network

In 2008 the KLC LSMU integrated into the Working on Country program and established the Kimberley Ranger Network as a centrally coordinated and organised replacement for the CDEP community Ranger programs. The Kimberley Ranger Network now includes 14 ranger groups, employs 85 full-time Rangers, 40 part-time or casual Rangers, as well as hundreds of elders who work as cultural advisers. These positions are predominantly funded through the Working on Country program, while some receive supplementary support through IPA funding and fee-for-service contracts.

²⁰ These groups included the Kimberley Language Resource Centre, the Kimberley Aboriginal Law and Culture Centre and the Kimberley Aboriginal Pastoralists Incorporated.

²¹ The Kimberley Aboriginal Reference Group was established to provide a unified voice in NRM matters in the Kimberley. The group was made up of one representative of each of the four Aboriginal classifications of country types in the Kimberley (saltwater country, desert country, river country, and rangelands or cattle country). These representatives also represented each of the four peak Aboriginal organisations mentioned above (Griffiths and Kinnane 2010).

Ranger work provides opportunities for culturally meaningful employment in communities where these are usually scarce. The differences that this makes for Aboriginal people and communities in the Kimberley are extremely significant and most noticeable at a personal level. Within their communities Rangers provide strong cultural leadership and are respected as positive role-models who are able to live and succeed in 'both worlds'.²³

A key aspect to achieving these social and cultural aspirations is ensuring that Traditional Owners guide the management that the Rangers undertake. There is therefore a strong focus on linking Traditional Owners' values, knowledge and perspectives to the Rangers' activities. As the KLC (2014) suggests:

"The Kimberley Ranger Network is a grass roots initiative which encourages nation building as elders work with rangers and young people to pass on traditional knowledge about looking after country while enhancing culture, law and language."

The LSMU and Ranger Network are structured to link Traditional Owners' values and knowledge with management action. This is achieved through the formation of Cultural Advisory Committees for each of the Working on Country affiliated Ranger groups. Cultural Advisory Committees are made up of senior Traditional Owners who formulate the work plan for their Ranger group. The development of these work plans is conducted annually through a collaborative process between the Cultural Advisory Committees, Ranger coordinators, senior Rangers, members of the KLC LSMU and federal representatives from the Working on Country program. These work plans itemise what tasks the Rangers will undertake during the following year and how much time will be allocated to each of these tasks. The details of how and when this management occur and are largely left up to the Ranger group to decide.

Ranger groups in the Kimberley Ranger Network are made up of between six and 12 full-time Rangers. Some groups have separate women's Ranger groups which undertake specific tasks, while others combine men and women Rangers who work together.²⁴ Each group has one Ranger coordinator who oversees the implementation of the work plan and is responsible for the bulk of the group's administration. Although Aboriginal Ranger coordinators are sought and preferred by the KLC and by PBCs, there is great difficulty finding appropriate candidates for

²³ 'Both worlds' and 'two worlds' are expressions used by Aboriginal people which describe the need for them to be constantly engaged with two (sometimes competing) cultural realities. For the young Aboriginal people I met this term encapsulates and expresses the difficulty and confusion of negotiating two cultures simultaneously.

²⁴ For example, the Bardi-Jawi Rangers have a separate *Oorany* (women) Ranger group, whereas the Ngurrara Rangers have six men and four women Rangers.

these positions. Some of the reasons are that: during the development stage of these Ranger groups, the administration component of the coordinator's position is too large to attract Aboriginal candidates; Aboriginal candidates are generally underqualified; and intra-group politics mean that it is easier and more politically expedient to appoint someone from outside a given group. Ranger coordinators are assisted by two or three senior Aboriginal Rangers, who are usually selected for their strong cultural leadership and are accredited with the highest level of Conservation Land Management training.

The activities undertaken by Ranger groups include:

- Environmental weed management
- Fire management
- Feral animal management
- Trips back to country with Traditional Owners
- Cultural site management
- Biodiversity monitoring (including marine) surveys
- Water monitoring
- Design and erection of interpretive signage
- Erection and repair of fencing
- Rubbish removal
- Horticulture and revegetation of degraded areas with native plants
- The transfer of knowledge and language
- Education programs with local people and mentoring with local schools
- Engagement with tourists

Among these activities, Ranger groups in the Kimberley focus the bulk of their management on the 'big three'. Working on Country work plans and Ranger coordinators suggest that Ranger groups spend between 50 per cent and 75 per cent of their time managing the 'big three'. When fee-for-service work is included and all Ranger work considered together, the big three can exceed 80 percent of Ranger work. These proportions are substantial considering that these are only three duties among numerous others that the Rangers undertake.

Aboriginal weed management in Australia

In northern Australia, the problem of environmental weeds came together with Aboriginal NCRM during the 1980s and 90s to produce Aboriginal weed management. This accelerated quickly through the 1990s as it became recognised that large tracts of Aboriginal land, particularly in the NT, had been invaded by exotic species. Of particular concern was Mimosa and Gamba Grass (Miller and Schultz 1993, Storrs *et al.* 1996).

Aboriginal people in control of these lands were legislatively required to manage these infestations but lacked the resources to do so. This legislation was predicated on the assumption that pastoral and other industrial landholders should use some of the economic gain derived from land use to manage invasive plants and inhibit their spread.

Aboriginal people contested these responsibilities, claiming that they derived much smaller financial gain from their land and therefore could not be bound by the same legislation (Storrs *et al.* 2002). Despite the increasing push from the Federal Government during the 1990s to enforce landholder responsibilities for weed management, it was recognised by the governments that such management by Aboriginal people on Aboriginal land was not possible without significant external assistance (Storrs *et al.* 1999, Smith 2000). Partnerships developed between local and regional Aboriginal organisations, state and territory government agencies, NRM bodies (including the newly established National Heritage Trust), and research organisations including universities and the CSIRO.²⁵ These partnerships provided knowledge and practical training to Aboriginal workers, who were funded to undertake weed work under the guidance of CDEP projects and large-scale mainstream weed management programs.

Although there were a number of successful programs, difficulties frequently arose (Luckert *et al.* 2007). Lack of success was attributed to a number of factors including insufficient and short-term funding; constantly changing funding structures and priorities; and weak partnerships between government, non-government and Aboriginal groups (Smith 2000). However, by far the most commonly mentioned cause of these difficulties was the lack of Aboriginal commitment to weed management operations (Cook 1993, Miller and Schultz 1993, Storrs *et al.* 1999, Smith 2000, 2013).

²⁵ The CSIRO (Commonwealth Scientific and Industrial Research Organisation) is Australia's national science agency.

Despite the challenges and lack of motivation, the threat that environmental weeds posed provided a strong case for the creation of community Ranger groups and broader NCRM infrastructure. As Smith (2000:7) points out:

“Where there are Community Development Employment Program (CDEP) projects operating within Aboriginal councils or resource centres there is an opportunity to build land management capability as discrete sub-projects within a range of projects...Increasingly serious weed problems provide a focus for development of such arrangements” (Smith 2000:7).

As such, the need to control weeds on Aboriginal lands played a critical role in the establishment of Ranger programs and has significantly influenced the shape of Aboriginal NCRM in northern Australia. As Storrs *et al.* (1999:564) stated in relation to Mimosa management, “Mimosa is therefore being used as a concrete focus or ‘hook’ to initiate weed management works that can then be broadened into land management programs.” They explained that on the back of specific Mimosa management partnerships several Aboriginal community weed management programs were expanded to set up formal land management programs.²⁶

It is clear that these origins are linked to the original justifications for Aboriginal NCRM, namely the importance of having a workforce of environmental managers in remote parts of Australia (Smith 2013). This has produced a legacy of mainstream weed management agencies viewing Aboriginal Rangers as a remotely based labour force for weed control. Such a view is highlighted by Cowie’s (2007) article “*A Case for Indigenous Weed Management*” in Luckert *et al.*’s (2007) publication “*Investing in Indigenous Resource Management*”. *Investing in Indigenous Resource Management* is a compilation of articles attempting to substantiate the importance of Aboriginal contributions to Australian NRM. Instead of Cowie’s “*case for Indigenous weed management*” being about the contribution of Aboriginal voices to weed management discourse, it is about the potential contribution that access to Aboriginal land and labour can make to manage northern

²⁶ A Kimberley Ranger coordinator who took part in Ranger programs in the NT during the early and mid-1990s recalled that at that time, “there was basically nothing” in the way of Aboriginal NCRM organisation, so “weeds, almost entirely Mimosa, provided a means to make something out of that nothing”. The Ranger group’s role as managers of Mimosa led them to be dubbed “Mimosa Boys”. He reminisced that even after having established a fully operational Ranger program, of which weeds and Mimosa were only a part, “it took years and years to shake that name off”. He considers the current state of Aboriginal NCRM to have been largely shaped by the origins of weed (particularly Mimosa) management programs on Aboriginal lands in the NT, saying, “I guess you could still call all of us [Rangers] ‘Mimosa Boys’” (interview: Derby, August 2013).

Australia's current environmental weed "problem". The role of Aboriginal people in this management is left largely unconsidered until the last paragraph, which concludes that:

"...weeds have emerged as a major component of natural resource management in the [Northern Territory]. Management of weeds on Indigenous land is a key component of any weed control strategy for NT and northern Australia. Without the involvement and cooperation of Indigenous people, a management program is likely to be far less effective and more difficult to implement. However more information regarding costs and benefits of alternative control programmes is needed. Moreover, implementing such programmes would require training in control methods, identification of some specific weeds, and in use of equipment. It will also require funding."

This "*case for Indigenous weed management*" relies on an Indigenous contribution that begins and ends with access to land and labour. Framing Aboriginal involvement in weed management as such assumes that Aboriginal people must either perceive weeds in the same way as the mainstream, or else have no knowledge of weeds whatsoever.

This framing is recognised by authors such as Smith (2000, 2013), Duff (2012), and Duff and Weir (2013), who all emphasise that Aboriginal engagement in weed management needs to shift from that of a labour force at the direction of others, towards active participation in weeds discourse so that Rangers are in control of the weed work they undertake. Barbour and Schlesinger (2012) confront this directly in their article "Who's the Boss?" stating that:

"there is usually an assumption that weed management is important before the programme even starts, and this is based on contemporary mainstream views about land management (which are often, but not always, based on ecological research). This assumption is not challenged or even stated upfront. That stage is skipped and the focus, instead, is on how to implement management. Some Indigenous people struggle with the notion of managing and destroying weeds because it does not fit their world view or objectives. We need to be able to turn this approach upside down by allowing people to work it out for themselves."

While fee-for-service contracts still exist between Aboriginal Rangers groups and mainstream environmental management agencies, the Working on Country and IPA initiatives have provided greater space for Aboriginal people to "work it out or themselves" and have their

priorities guide Ranger work (Duff and Weir 2013). How this operates in the Kimberley is the focus of the following chapter.

Conclusion

Environmental weeds have intersected with Aboriginal NCRM to produce Aboriginal weed work. As Tim pointed out, this intersection is embedded within a ‘minefield’ of policy and governance, which overlaps across a number of scales and jurisdictions.

Environmental weed policy and management is complex. Landholders and weed managers are informed by overlapping policies that occur at the local, state and national scale. Common to each of these scales is that environmental weeds are classified and prioritised according to their status as non-native, invasive and harmful to natural ecosystems. This species-led classification and prioritisation has informed a species-led focus to their control.

Australian NCRM originated and expanded to support Aboriginal people to live on and care for their country according to culture. This aligned well with the ambitions of mainstream NRM agencies who saw Rangers as a key to addressing the ‘big three’ environmental threats of environmental weeds, fire and ferals. Although the Caring for Country movement occurred as a trend towards decentralisation of environmental management, Aboriginal NCRM’s current manifestation as Working on Country and IPAs sees it structurally enclosed within centralised Federal environmental and Indigenous policy.

Despite the perceived success of Aboriginal NCRM and the expansion of ‘two-way’ approaches to Ranger work, Aboriginal weed work has predominantly seen Rangers framed as a source of labour, rather than directors of weed management. As Tim suggested, although it seems as though Rangers are in charge of what they are doing, in actual fact they are confined and directed by this ‘minefield’ of policy and governance. They have little chance to do anything but “chase their tails” and “go with the flow” – it is no wonder he feels that they are following and not leading.



ABORIGINAL WEED WORK IN THE KIMBERLEY

I met up with Larry in Broome at the end of my first stint in the field. Our meeting was social and brief because we were really just catching up to say our farewells before I headed back to Melbourne. During our chat we reflected on my research and our times spent together so far. Larry told me that since participating in my project he now thought of me every time they did weed work – he didn't like this. What had stood out from my first round of field-work was that weed work in the Kimberley is laborious, uncomfortable, frustrating and has a habit of yielding minimal results. Now, every time that Larry was doing this laborious, uncomfortable, frustrating and sometimes pointless work, he thought of me. Tongue-in-cheek, I apologised, and was going to joke that at least my project had given us an opportunity to meet and share some fun times. Halfway through, he interrupted me and said:

“Tommy. You should have chosen to study dugongs; we would have had way more fun that way! I could have actually taught you something about them; and be happy when I think of you!”

Aboriginal weed work in the Kimberley has a similar history to other parts of northern Australia in that it originated as employment for Aboriginal people to work on large-scale, species-led weed projects. These weed projects provided employment opportunities for Aboriginal people while Aboriginal people provided a labour force for controlling the spread of aggressive agricultural and environmental weeds.

Unfortunately, in the Kimberley this early weed work is tainted by a legacy of severe health problems and fatalities resulting from chemical herbicide use during weed control operations in the 1970s and 80s. During this time the Kimberley weed spraying program run by the Agricultural Protection Board of Western Australia used two herbicides, 2,4,5-T and 2,4-D to

control agricultural weeds, particularly as a part of the Noogoora Burr weed control program (Expert Medical Panel 2003). Exposure to these chemicals has since been found to have caused severe illness and death among many of those who were employed by the program (Harper 2002). These weed control programs employed a high proportion of Aboriginal workers, particularly from the communities of Derby and Fitzroy Crossing. The stories of people who were adversely affected by herbicide exposure have resonated throughout the Kimberley. Only a small number of Aboriginal people I worked with did not at one point speak of a family member, or a close friend's family member, who had suffered from chemical herbicide poisoning. The legacy of cancer and death from this program continues to influence public sentiment about weed management.

The development of the KLC LSMU during the 1990s saw the organisational capacity of Ranger groups improve. Alongside this, opportunities developed for more regular and better coordinated fee-for-service contracts with mainstream environmental management agencies. Such opportunities also consolidated access to CDEP funding, provided weed management training to Rangers, and were seen to develop the overall capacity of community Ranger programs. Through the establishment of the IPAs and Working on Country programs, Aboriginal Ranger groups are supposed to have gained greater control over how they undertake their weed work and attach it to its local cultural significance.

This chapter provides a thick, multi-cited ethnographic description of the weed work that Aboriginal Rangers undertake in the Kimberley. It begins by outlining the organisational structures of Aboriginal weed work. It then describes the weed work of each of the Ranger groups with which I worked, focusing on the projects that I either participated in or observed. These descriptions involve a discussion of the site and the weeds that were targeted, the methods of weed management that were used, the motivations behind the weed work and an assessment of the results that the work achieved.

Structure of Aboriginal weed work in the Kimberley

Aboriginal weed work in the Kimberley operates through three main funding arrangements: fee-for-service contracts with mainstream environmental agencies; the Working on Country program; and IPA management.

Fee-for-service contracts:

Through the development of partnerships with mainstream NRM and conservation organisations, Kimberley Aboriginal Ranger groups are contracted to undertake fee-for-service weed management. This work is undertaken across a variety of land tenures, including pastoral leases, private conservation estates, national and state parks, local shire council land, and Native Title lands. This is the oldest form of Aboriginal weed work in the Kimberley and is connected to the early weed spraying programs run through the Agricultural Protection Board of Western Australia and Federal Government CDEP schemes.

As one of the 'big three', weeds on Aboriginal country represent a secure source of funding for Ranger groups. Although fee-for-service contracts are not core parts of Working on Country Ranger group activities, they are constantly sought by Ranger groups. This work helps to supplement Ranger groups' Working on Country and/or IPA income, as well as build and maintain partnerships with NRM agencies. Fee-for-service work provides funds that can be used to improve the 'capacity' and 'sustainability' of Ranger groups because it allows them to purchase assets that Working on Country and IPA funding does not. Among the Ranger groups that I worked with, funding attained through fee-for-service partnerships has allowed the Wunggurr Rangers to construct a Ranger base back on country, allowed renovations and extensions to the Bardi-Jawi Ranger base, as well as the purchase of a quad bike which is shared by the Bardi-Jawi and Nyulnyul Ranger groups. In the case of larger projects, the additional work has provided opportunities for the employment and training of extra part-time and casual Rangers for the Bardi-Jawi, Wunggurr, Nyulnyul and Nyikina Mangala Rangers.

Bardi-Jawi, Nyulnyul, Wunggurr, Nyikina Mangala and Bunuba Rangers all have fee-for-service weed management contracts with mainstream environmental management agencies. These projects are outlined in Table 6.1 according to the funding body that controls the contract.

		FUNDING AGENCY			
		DPaW	Environs Kimberley	Rangelands NRM	Other
RANGER GROUP	Bardi-Jawi and Nyulnyul		West Kimberley Nature Project Monsoonal Vine Thicket protection project.		Community weed project with the Shire of Broome, Environs Kimberley and Rangelands NRM
	Wungurr	Taro control at Mt Hart Wilderness Lodge	'Derby declares war on weeds' project		Gamba Grass management on El Questro pastoral station
	Bunuba	Environmental weed management on DPaW estate	In development for the management of Neem Trees in Fitzroy Crossing		Control of WoNS and Calotropis on Bunuba pastoral leases
	Nyikina Mangala			West Kimberley Rubber Vine Eradication Project	

Table 6.1 Aboriginal Ranger groups' fee-for-service projects

The key difference between fee-for-service weed work and Working on Country or IPA weed work is that in these contracts the mainstream funding body set the priorities and have full control over weed work.

Working on Country and IPA weed work

The bulk of Aboriginal weed work in the Kimberley is organised through the KLC LSMU and funded through the Working on Country and IPA programs. The integration of the Kimberley Ranger Network into the Working on Country program in 2008 allowed Ranger groups to have greater control over their weed management and ground it in local Aboriginal priorities, instead of previously restrictive and externally controlled fee-for-service and CDEP contracts. On average,

each Kimberley Ranger group spends between 20 and 45 per cent of its Working on Country and IPA time controlling weeds.

Working on Country weed work is organised and coordinated through the work-planning process. This involves Cultural Advisory Committees meeting with senior Rangers, representatives from the KLC and Federal representatives of the Working on Country program, to develop the annual work plan for all Ranger duties. This process is outlined in Figure 6.1.

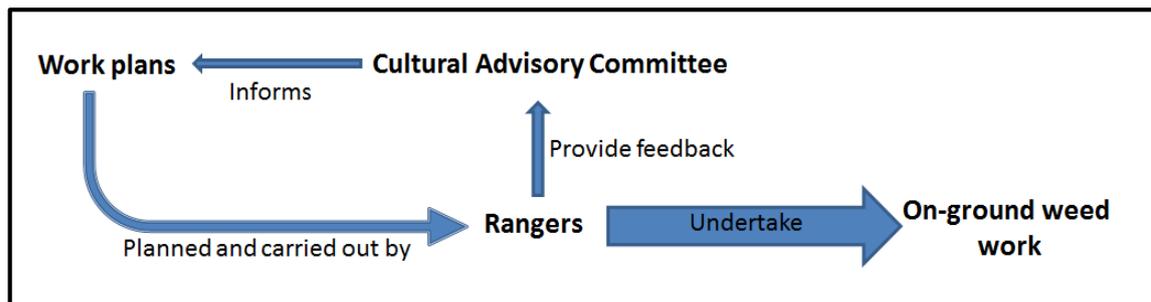


Figure 6.1 Weed work planning process

Work plans are usually non-specific in terms of the weed work that is to be undertaken. The work plans that I saw only specify that a certain amount of time should be designated for weed management. Ranger coordinators and senior Rangers then translate these work plans into on-ground strategy and weed work. For instance, where a work plan calls for “Five weeks of weed work” the Rangers will decide where, when and how the work will be undertaken during those five weeks.

Ranger Groups and their weed work

The following sections provide an overview of each Ranger group’s weed work and detailed descriptions of particular weed projects that I recorded during my time in the field. This provides a picture of where, when, how and why each Ranger group conducts its work.

Bardi-Jawi Rangers

The Bardi-Jawi Rangers work on the northern part of the Dampier Peninsula. The Ranger group is well-established and highly regarded as the most coordinated of the Kimberley Ranger Network. Despite the initial apprehension they showed in our first meeting, the Rangers were enthusiastic to have a ‘weed expert’ (me) conduct research with them. During initial workshops

and time spent together, this enthusiasm focused on the idea of creating an inventory (and a map if time permitted) of all of the weeds on Bardi-Jawi country. There was consensus among the Ranger group that once all of these weeds were identified, the worst of these weeds – as classified by the national weed lists and DPaW rating – could be prioritised and managed. Over the following month this idea became sidelined as the enormity of such an undertaking was realised. Nevertheless, interest remained on species-specific approaches to managing weeds, such as recording the distribution of Buffel Grass, Neem Trees and Coffee Bush around communities. While this project seemed appealing at first it became an exercise in futility, as one Ranger explained during a visit to Lombadina-Djarindjin community “these weeds [Buffel Grass, Neem Trees and Coffee Bush] are everywhere, we don’t need a map to tell us that”.



Figure 6.2 Weed work sites on Bardi-Jawi country

Neem Trees and Buffel Grass in vine thickets

The high level of organisation and capacity of the Bardi-Jawi Rangers has allowed them to engage in a number of productive partnerships with external NRM, conservation and research organisations. Notable in terms of weed work is a partnership with Environs Kimberley and their *Peninsula Vine Thicket Program*. This partnership engages Rangers to undertake weed work in

monsoonal vine thickets, which are significant cultural and ecological sites for Bardi-Jawi people. As such, the partnership is widely promoted as having mutual outcomes for Environs Kimberley and Bardi-Jawi people.

Since the inception of this partnership in 2010, the Bardi-Jawi Rangers have concentrated their Working on Country weed management quota in monsoonal vine thickets.²⁷ The weed management aspect of the collaboration focused on two main vine thicket sites, one behind the waste dump at Kooljaman (an Aboriginal run eco-retreat at Cape Leveque), the other at Millagoon, an outstation on the eastern coast of their country (refer to Figures 6.3 and 6.6).



Figure 6.3 Kooljaman weed work site

At the Kooljaman site, Buffel Grass was prominent in the ground storey of the vine thicket. Buffel Grass has been observed to promote fire in the vine thickets and lead to their ecological decline. The Rangers spent almost three weeks during the wet season manually removing the grass. Weed work on Buffel Grass is undertaken during the wet season firstly because the ground is soft,

²⁷ Recent communications with the Ranger group suggest that as sea-country activities have increased since the declaration of the Bardi-Jawi IPA, almost all the weed work the Rangers now undertake involves managing Neem Trees and Buffel Grass in vine thickets.

which makes plants easier to remove, and secondly because plants are physiologically more receptive to absorbing chemical herbicides after rain. Weed work at this time of year is extremely uncomfortable as temperatures reach 40°C and humidity can reach 90%. To compound the unpleasantness of such work, the Rangers must wear protective plastic coveralls while chemical sprays are being used (refer to Figure 6.4).



Figure 6.4 Bardi-Jawi Ranger in protective weed spraying suit

Despite substantial (and uncomfortable) weed work being undertaken at the Kooljaman site, it only resulted in just over half of the Buffel Grass being removed from the vine thicket. During a visit to the site two months after weed work had been undertaken, one of the younger Rangers observed that much of the Buffel Grass that the Rangers removed had already grown back; commenting that he would have to “keep pulling the same Buffel grass from the same spot...already done it twice, probably do it again next year”. Substantially more work was needed at this site and it was likely that the Rangers would not have an opportunity to carry it out until much later in the year, possibly not even until after the following wet season.



Figure 6.5 Buffel Grass completely comprises ground storey of the Kooljaman vine thicket site

The weed work site at the Millagoon vine thicket was located next to an elder's property, on which there were two mature Neem Trees (refer to Figure 6.6). The transfer of Neem seeds from the nearby mature trees had resulted in the infestation of the vine thicket with Neem Trees. Initially, a weeklong weed work trip was undertaken during the wet season to remove all of the Neem Trees from the thicket.

This involved the removal of approximately 350 Neem Trees by the methods of hand-pulling and the cut and paint method – which involves chainsawing mature trees at their base and then painting herbicide on the cut area of the stump. This initial work was considered successful by the Rangers and by Environs Kimberley. However, since this weed work, every time the Rangers visited this vine thicket they have had to remove numerous juvenile Neem Trees which have re-colonised from the mature trees on the adjacent property (refer to Figure 6.7).



Figure 6.6 Millagoon weed work site

Rangers found this extremely frustrating and pointed out that as long as the mature Neem Trees existed, Neem Trees would continue to colonise and grow in the thicket. As a Ranger pointed out, this spread is bound to continue, “Birds love the Neem [Trees] and birds love the vine thickets, as long as those Neems are around they’ll keep spreading here [to the vine thicket]” (Millagoon, April 2013). The Rangers were adamant that the elder who lived at Millagoon would never remove the mature Neem Trees on her property. As one Ranger explained “We’ve tried [to speak about removing the Neem Trees] and she has threatened to kill us if we do. She loves those trees. You can try to ask her but she might go get her gun.”²⁸ Therefore no one was willing to speak to this elder about removing the trees. As such, the Rangers had begrudgingly accepted that they would need to continue to return and manage the Neem at this site.

²⁸ I raised this at a Ranger meeting later that day and the other Rangers confirmed what this Ranger had said. I mentioned that I would like to interview this elder as it might add an interesting component to my research. None of the Rangers was willing to accompany me for fear that this might provoke her. One Ranger told me after the meeting, that this elder was his aunt and that if I “*really absolutely* wanted” he would take me. At the same time, he expressed concern that this would not be a smart move as it might jeopardise the Rangers’ ability to continue doing work near her property, so I chose not to take the risk.



Figure 6.7 Bardi-Jawi Ranger pulling out juvenile Neem trees at the Millagoon weed work site

Considered together, these sites seemed like strange places to spend time, effort and resources undertaking weed work. The broad reason for focusing on vine thickets was that this project was in partnership with and funded by Environs Kimberley and its Peninsula Vine Thicket Program. However, none of the Rangers understood why these specific sites were chosen. Vine thickets exist extensively on Bardi-Jawi country and vary in ecological and cultural significance. According to the Rangers, the reasons that these sites had been chosen were “because there are weeds there” and because, according to Environs Kimberley, Neem Trees and Buffel Grass are two of worst weeds on Bardi-Jawi country. Even so, the Rangers suggested a number of other sites where there were also weeds and which could have just as easily been selected.

Little attention had been paid to the sites that the Rangers wanted to work at or what the Rangers wanted to achieve at the sites – beyond fulfilling the weed component of their Working on Country work-plan and gaining funding from Environs Kimberley. The Rangers were

frustrated that their work at both of the sites was likely to require intensive and ongoing management because of the proximity of each site to weed-spreading agents (the waste dump at Kooljaman and the mature Neem Trees at Millagoon). Despite this, the Rangers had shown obvious commitment to controlling these weeds, knowing quite well that it would likely be in vain over the long-term. Some Rangers suggested that their time and effort could be much better spent elsewhere. As one told me as he manually removed another juvenile Neem tree at the Millagoon site, “If we’re going to do something, we might as well get something done.”

Coffee Bush at Ardyaloon and Lombadina

The other major weed work for the Bardi-Jawi Rangers involved the removal of Coffee Bush from around Ardyaloon community. A single infestation of Coffee Bush on the outskirts of the community had been managed five times by the Ranger group over a period of four years. At this site, juvenile Coffee Bush trees were either manually pulled out of the ground, or else sprayed with diesel-based chemical herbicide. For mature Coffee Bush, the cut and paint method was used. Again, this work required Rangers to wear protective plastic coveralls whenever chemical sprays were being applied (refer to Figure 6.8).

Work on this infestation had taken up approximately one-quarter of the Rangers’ weed work during the previous four years. However this work has only yielded minimal outcomes, with several mature trees remaining and significant regrowth evident. The site is of no particular significance to local people, being sandwiched between the community, its aircraft runway and an asbestos dump that people are not allowed to enter (refer to Figure 6.9). Although there are vine thickets nearby, there is no evidence that this patch of Coffee Bush had begun to colonise or affect the health of these vine thickets.



Figure 6.8 Ranger flexes his muscles at the persistent infestation of Coffee Bush at Ardyaloon

Coffee Bush is abundant throughout the Ardyaloon community, so work at this site is unlikely to inhibit its spread in any significant way. Rangers agreed that the work they did at this site was useless unless they “attack the whole lot...If we’re going to do one bit we might as well do the whole lot [in the community]” (Ardyaloon, September 2012). However, this was impractical, as Larry mentioned such work “would take a whole month, doing nothing but Coffee Bush...even then it might not get rid of it, plenty of other things become problem in that month”. The Rangers therefore deemed extensive and intensive Coffee Bush control in Ardyaloon to be impractical.



Figure 6.9 Coffee Bush work site at Ardyaloon (Trees denote the location of Coffee Bush throughout the community)

Despite having continually returned to this site to undertake management, Rangers could provide little justification for why this infestation was prioritised and managed. The two most common reasons were that Coffee Bush was a declared weed according to DPaW; and that they had worked at this site before and that initial work should always be ‘followed-up’.²⁹ I discovered from speaking to one of the long-term Rangers that the site was initially selected by the weed management training officer from Kimberley TAFE.³⁰ He had selected the site because Coffee Bush is a declared weed and because this infestation was close to the community in an easily accessible location. Rangers did not question this site selection and returned to continue weed work in the following years without any clear idea of why. Overall, the Rangers felt that management of this infestation had been a waste of time, but recognised that it had helped them to meet their quota for weed management as outlined in their Working on Country work-plan and had provided opportunities to learn how to use chainsaws and handle chemicals.

At the Lombadina community another infestation of Coffee Bush has a very similar weed management story. It had been selected as a training plot during the mid-late 2000s because it was a declared weed in an accessible location. However, following a change in the weed

²⁹ The importance of follow-up work is emphasised as a part of the Rangers weed management training.

³⁰ TAFE stands for Tertiary and Further Education. Kimberley TAFE is the Ranger’s CLM and weed management training.

management trainer and Ranger coordinator, the infestation had been largely forgotten about and had grown back to its original size.

Despite the Rangers spending significant time and effort at each of these sites, neither site had seen any benefits from weed work. The Rangers attributed this to poor work practice, brought about by a lack of motivation and commitment to work at these sites. These sites were most commonly referred to by Rangers when they expressed negative sentiments towards weed work.

Elders, particularly those who are a part of the Bardi-Jawi Cultural Advisory Committee, told me that they did not find Coffee Bush to be a major problem and believed there were many more important sites that should be managed before these two. However they told me that they did not feel that it was their place to tell the Rangers how or where to manage weeds because “weeds are part of ‘Ranger business’” (Bardi-Jawi elder: Ardyaloon, September 2013).

The Bardi-Jawi Rangers’ are a highly regarded, well-organised and well-resourced Ranger group. They hold high expectations of themselves and their work and are very proud of their achievements. However they expressed that weed work is the aspect of their activities that is “on the top of [their] list to improve”. Senior Ranger Lloyd summed this up, saying that unlike their other activities weed work “doesn’t seem to get anywhere” as they “keep going to the same places and killing the same weeds... doesn’t mean much, doesn’t get much done.” (Ardyaloon: September 2013)

[Bunuba Rangers](#)

The Bunuba Rangers are an independent Ranger organisation that is funded primarily by DPaW to work on National Parks and Conservation estates on Bunuba country. The Ranger group was formed in 2009 as an initiative to have Bunuba people working and caring for country despite Bunuba not having been granted Native Title. This means that the Bunuba Rangers were not eligible for Working on Country funding until Native Title was determined in 2013. Despite this determination, Bunuba have not pursued Working on Country funding or an affiliation with the KLC or its LSMU. Instead, the Bunuba Rangers continue to work alongside DPaW and are currently in negotiations to establish a formal joint-management arrangement for lands which have become shared tenure through Native Title. Despite the Bunuba Rangers’ close funding

relationship with DPaW, both the Rangers and DPaW promote the idea that the group manages weeds on behalf of Bunuba culture.

The Bunuba Rangers focus their weed work on weeds that are listed as significant either by national or state weed classifications. As the group's coordinator told me, this is because "the weeds on the lists are the worst weeds; they are the most important ones to manage" (Fitzroy Crossing, August 2012). He substantiated this position by explaining that this is because "they are the most invasive and worst for biodiversity". This was reinforced by the Rangers who also mentioned that listed weeds are the 'worst' weeds and agreed that they should be of highest management priority. I observed several field sites where the Rangers had undertaken or were undertaking management of listed weeds, particularly the WoNS Bellyache Bush and Parkinsonia.

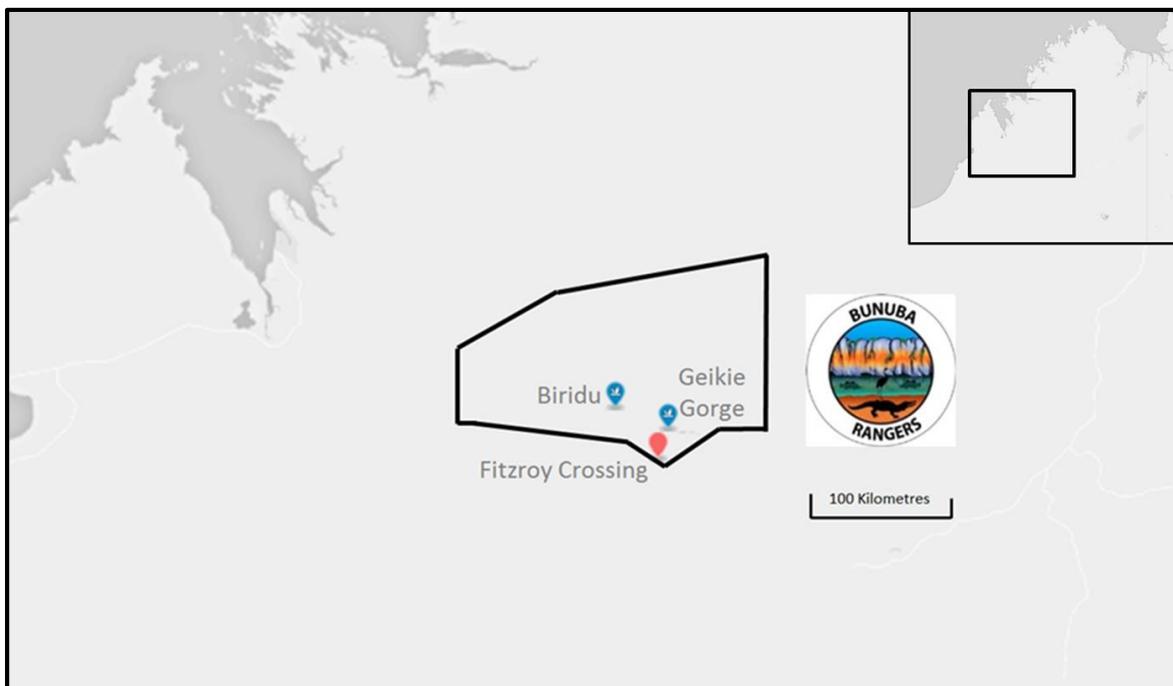


Figure 6.10 Bunuba Rangers weed work sites

Parkinsonia reconnaissance and control at Geikie Gorge

Parkinsonia occurs on the banks of the Fitzroy River and is a management priority for the Rangers, regardless of where it happens to occur. As a part of their weed management, Rangers spend time searching for Parkinsonia on foot; if it is spotted, the Rangers return by boat to kill it as soon as they can. During one of these surveillance trips with the Rangers, I walked through a patch of Gallon's Curse (a particularly nasty burred grass) and spent the next twenty minutes trying to remove its burrs from my socks and boots. One of the Rangers remained behind and empathised with me, explaining that the worst part of walking around looking for Parkinsonia

was that “you get this Gallon’s Curse all over you, you can’t help it. I wish we could just manage this one first” (Geikie Gorge, August 2012). He added that managing Gallon’s Curse at this place would be quite a simple and effective job if it was done at the right time of year. Later, we spotted Parkinsonia growing on a sand bar at a site where the Rangers had done Parkinsonia control two years ago.

The Rangers returned to this site the following day to remove the Parkinsonia. This work involved the manual pulling of juvenile plants and the cut and paint method for larger plants. To ferry the Rangers and all of the equipment to the site, one of DPaW’s boats was needed. This took over an hour to prepare and an extra half hour to secure a DPaW staff member to coxswain the boat. In addition to these time-consuming logistics, the work itself took significantly longer than expected because two of the five Rangers had not turned up to work. According to the Rangers who were present, the other Rangers were absent because they did not like weed work and found it difficult. This was corroborated by the absent Rangers when I ran into them at football training that evening. They explained that they did not like weed work as they found it unrewarding and were frustrated that they needed to return to the same site to carry out the same weed work. They also explained that they did not like using the diesel-based chemical “Access” that they used to kill Parkinsonia.³¹

The Rangers undertaking the Parkinsonia work became increasingly discouraged as it became obvious that the job would not be completed that day. As they had only scheduled this day for weed work, it meant that this job would be left pending and uncertain whether or not it would be completed at all. This annoyed the DPaW staff that were visiting Fitzroy Crossing from Broome. One of these staff explained to me that “everything seems to take longer with the Rangers”, especially because “only half of them ever seem to turn up to work” (Fitzroy Crossing, August 2012). This creates a tension for the Ranger coordinator who feels caught between meeting the requirements of their funding body and remaining sensitive to the feelings of the Rangers:

“[The Rangers] have to do their job, but if I get angry at them too much they’ll stop coming altogether...I need to keep on finding ways to motivate them, that’s the key, can be tough with weeds though.” (Fitzroy Crossing, August 2012)

Debriefing about the Parkinsonia control, I asked the Rangers whether or not the Gallon’s Curse at this site was a priority for them and if it was likely to be managed at all. They told me

³¹ Access Herbicide contains the active ingredients Triclopyr and Picloram and is diluted with diesel at a ratio of between 1:30 and 1:60 for a range of Herbicide treatments

that it was definitely creating a problem, however firstly they had to manage the WoNS, because “WoNS are the worst weeds; they are the most important ones to manage” (Ranger: Geikie Gorge, August 2012). In an ecological sense this seemed plausible; however, it did not accord with what the Rangers had told me. Although the WoNS might pose the greatest threat to this country, they certainly were not causing the greatest harm.

Attacking WoNS at Biridu

The Bunuba Rangers’ focus on listed weeds and WoNS is also evident at a weed work site near the remote Biridu outstation. Bellyache Bush, Parkinsonia and Calotropis are all present at the site and were all targeted by weed work. Biridu sits alongside Pigeon Creek, which is a tributary of the Fitzroy River upstream of Fitzroy Crossing (see Figure 6.11). More than two weeks of weed work were undertaken at this site towards the end of the wet season. The bulk of this work was focused on Bellyache Bush and Parkinsonia. This was for two reasons: firstly and primarily, because Bellyache Bush and Parkinsonia are WoNS which must be managed wherever they are; and secondly, because managing the weeds at this site could stop their spread down Pigeon Creek and into the Fitzroy River. The Rangers also spent two to three days managing Calotropis at the site because it is a declared weed by DPaW. However, the work on Calotropis was ad hoc and non-strategic and was abandoned because it was decided it was accomplishing little and that the nearby WoNS should be prioritised.

Despite focusing their attention on the Bellyache Bush and Parkinsonia, the Rangers were only able to control half of the area of weeds they had planned to. Rangers were quick to point out that this was not satisfactory – as one described it “a bit of a failure, got barely over half way”.

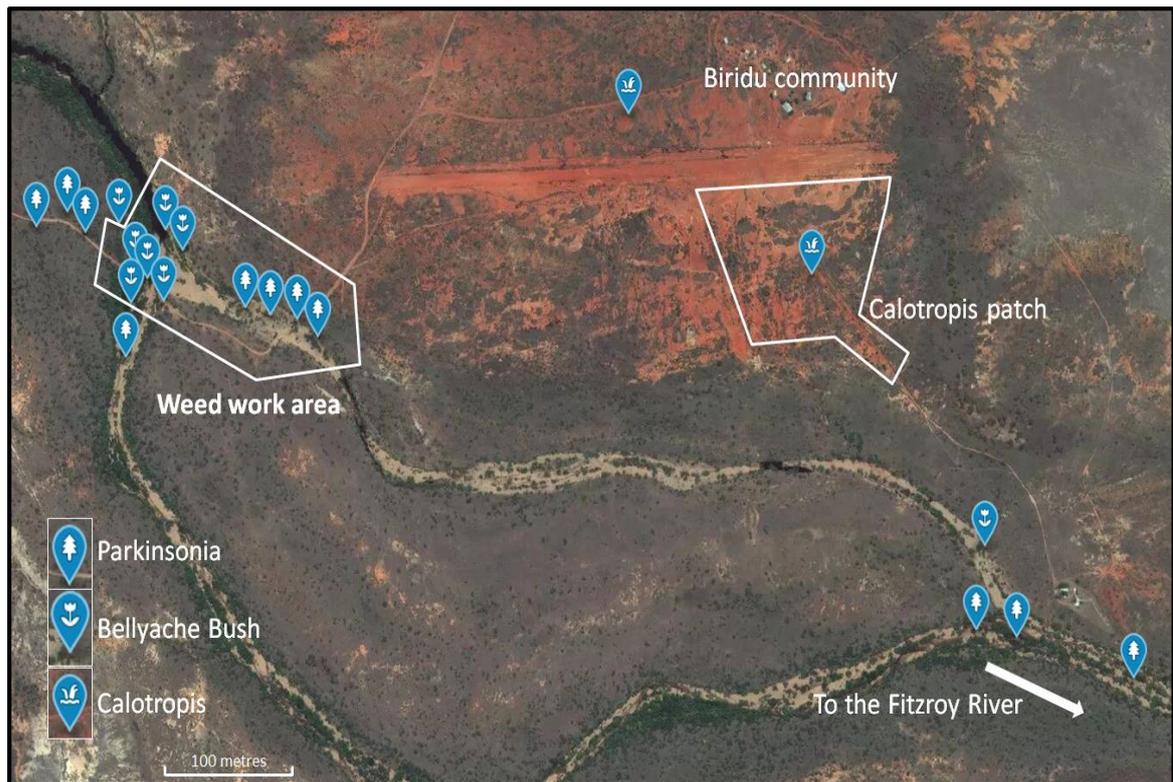


Figure 6.11 Biridu weed work site

Five months after the weed work, significant stands of Bellyache Bush and Calotropis remained, as did a small number of Parkinsonia trees. One Ranger noted that the Bellyache Bush had actually spread since the work was done: “It doesn’t look like we done anything here, strange for us to even bother” (Biridu, September 2013). He explained that undertaking the weed work just after the wet season (although the most effective time to kill weeds) made little sense because the floods of that season would have already transported the seeds downstream. This was compounded by the fact that no weed work was scheduled here until (at least) after the following wet season. This made the Rangers’ efforts ineffective as the Bellyache Bush and Parkinsonia were likely to be spread even further down the creek during the coming wet season.



Figure 6.12 Calotropis and Parkinsonia near the Biridu weed management site



Figure 6.13 Bunuba Ranger with Bellyache Bush in the dry creek bed of Pigeon Creek

Rangers were confused as to why this site had been selected for weed work. The main reason seemed to be that there was an abundance of WoNS at this site. Despite the near impossibility of the Rangers eradicating these WoNS and stopping (or even limiting) their spread in the time that they had for work at this site, the abundance of WoNS at Biridu meant that it should be targeted. Upon reflection, Rangers attribute the lack of success at this site to the lack of a clear and manageable goal. One senior Ranger told me that the effort was therefore “scattered” and “all over the place” and that none of the Rangers ever felt as though the project could be accomplished. Because of the poor results of this initial weed work, the site has not been managed again.³²

Neem Trees around Fitzroy Crossing

The Bunuba Rangers are looking to develop partnerships with external environmental management organisations. The main partnership being pursued at the time of fieldwork was with Environs Kimberley and involved the removal of Neem Trees in and around the township of Fitzroy Crossing. This is despite Neem Trees never being mentioned as a problem by any of the Rangers during interviews or visits to country. Much larger problems were identified by Rangers, including the aforementioned Parkinsonia, Bellyache Bush, Calotropis, Gallon's Curse, Passionfruit Vine as well as a recent emerging threat of Noogoora Burr. The Rangers also mentioned that there are a number of sites which should be prioritised ahead of the township of Fitzroy Crossing.

Rangers frequently commented that there is not enough time to manage these current and important problems. The inconsistencies between the Rangers' priorities and the priorities that would be funded by Environs Kimberley are recognised by the Ranger coordinator. However, he suggested that although Neem Trees around Fitzroy Crossing do not pose a major problem for Bunuba country, “there is a big opportunity to manage Neem...We need to jump at what gives us funding”.

The presence of ‘priority’ weeds on Bunuba country, such as the WoNs mentioned in the cases above, means that the bulk of the Bunuba Rangers' weed work budget concentrates on these weeds regardless of where they occur. Alongside some of the sites at which the Rangers manage

³² During a recent conversation with the Bunuba Ranger coordinator regarding this site, he told me “You wouldn't believe how bad it looks now!”

Parkinsonia on the Fitzroy River, the Rangers identified several other important parts of their country that they want to protect from weeds. However at present they do not have enough time in their work plans to visit and conduct weed work at these places. This species-led weed approach to their weed work makes most of their weed work reactive and set by external mainstream priorities. This worries the Rangers because it inhibits their ability to keep important places healthy and free of weeds. As the Ranger coordinator explained:

“We need to make more trips to these [important] places on country to make sure they stay healthy – weed work is a big part of this. Problems might come up if we don’t get proactive doing weeds...Focus too much on one weed lose sight of important things and important places.”

[Ngurrara Rangers](#)

The Ngurrara Rangers are responsible for managing 77,000km² of the Great Sandy Desert, an area that is only slightly smaller than Tasmania. This is undertaken by a group of 10 Rangers (six men and four women), based out of the remote community of Djugerari. Djugerari is located approximately 80kms south-east of Fitzroy Crossing. Most of the Rangers live in Fitzroy Crossing, which means that every Monday morning the Rangers must be picked up from around town before they are taken to Djugerari. This process usually takes about half a day, and the Rangers arrive at their base after lunch.

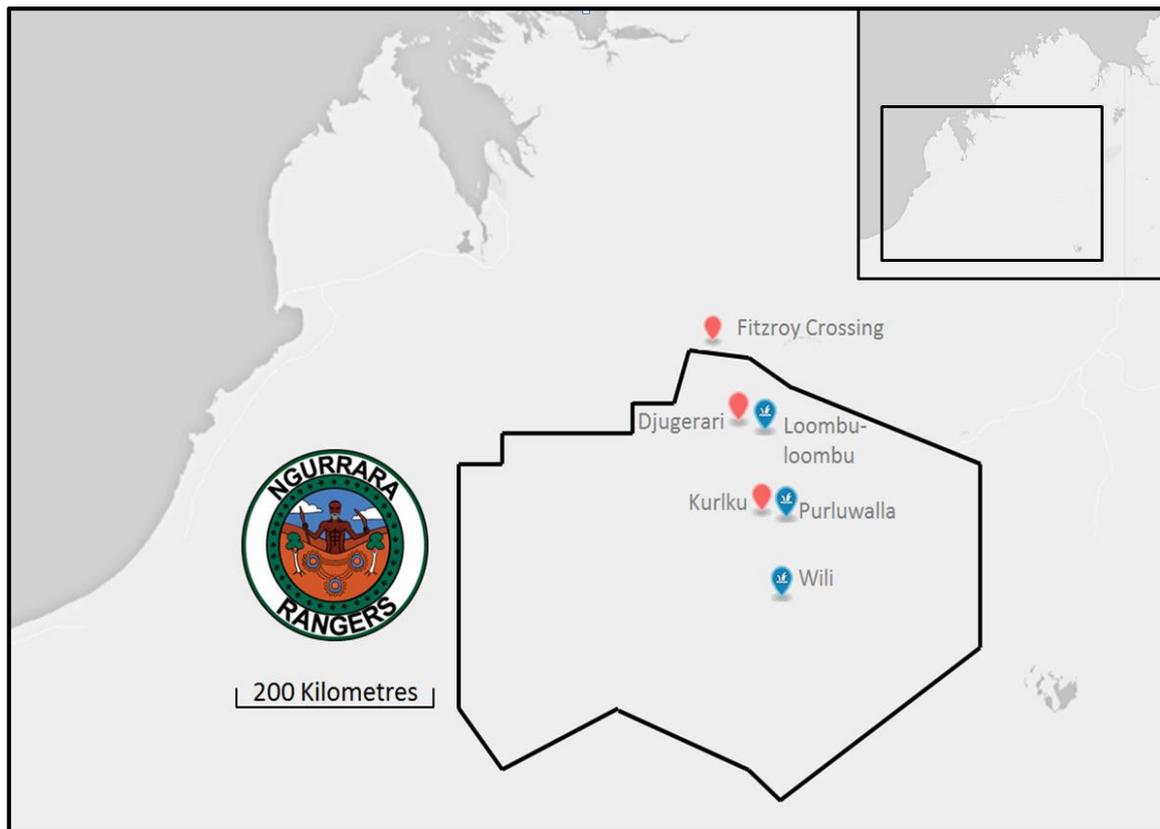


Figure 6.14 Ngurrara Ranger's weed work sites

All but one of the Rangers' weed work sites are more than 50kms from Djugerari. The Rangers spend at least one night at these remote weed work sites to make this travel and work logistically feasible. This means that in addition to their weed work equipment Rangers must bring food, as well as cooking, sleeping and personal items. During weed work trips, a remote outstation is usually used as a base for camping; from this camp an additional trip is required each morning and afternoon to access the work site. The constant packing and unpacking of equipment for each of these trips is laborious and time consuming.



Figure 6.15 Ngurrara Rangers load up equipment at Kurlku at the end of a trip

Gallon's Curse at Wili

Wili is a remote and infrequently visited *jila* (permanent spring), located in the Great Sandy Desert more than 350kms south of the Ngurrara Ranger base at Djugerari. We visited Wili during a week-long trip to Kurlku, an outstation approximately 150kms south of Djugerari. Despite leaving from Kurlku, the difficult terrain and lack of vehicle tracks between there and Wili meant that it took us over nine hours to get to Wili. This trip primarily aimed to collect and record elders' knowledge for the Ngurrara seasonal calendar project, as well as take elders back to their country.

One of the elder ladies who attended the trip was Annie. Wili is part of Annie's *Ngurra* (ancestral country). For many reasons, Annie had been unable to revisit this *jila* for over a decade. Nevertheless, she remembered what a 'healthy' or 'good' *jila* should look like. The first thing that Annie noticed when we arrived at Wili was that that *kurrumpa* (Paperbark, *Melaleuca spp*) and *parta* (Soap Wattle, *Acacia colei*) had become abundant and grown "too close" to the *jila*. On seeing this, and seeing that there was no water in the *jila*, she decided that its current condition was "no good" or "sick". The underlying reason for this was that people had not been there to maintain it:

“No people here...can't be good”. *Jila* (as springs) rely on the local water table being close to the surface. The abundance of Melaleuca and Wattle in the area, especially its proximity to the *jila*, meant that the roots of the Melaleuca and Wattle were taking up this groundwater and lowering the water table. In 'old people' times the Melaleuca and Wattle were always kept well away from the *jila*, both through physical removal and by *warlu* (fire). Annie suggested that the *jila* be “dug” so that water table could be accessed. As is normal during the dry season, the *jila* was dug, however it took much longer than expected to access the water, and only a little water was accessed. Later Annie joked that back in the old people's times, an unhealthy *jila* like this might have meant that people would have died, but now it was just “bad luck” for the people who had to do the digging.

When the Rangers got out of the Troopie at Wili their eyes went straight to two patches of Gallon's Curse that were around where we parked and where we sat to eat lunch. The old ladies noticed the Gallon's Curse, but it did not seem to bother them at all. Even when Annie was pricked by the grass as she sat down to eat lunch all she said was “Cheeky *kirli* (prickle),” and sat down there anyway.

After digging the *jila*, the Rangers spent around an hour manually removing the Gallon's Curse and then burning it. They did not remove or burn the *kurrumpa* or *parta* that Annie had pointed out as affecting the health of the *jila* and the health of the site.

Debriefing with the Rangers the following morning, I asked if weed work would be undertaken at Wili. The Rangers suggested that there was not enough Gallon's Curse to warrant the time that another weed management trip would take. I mentioned the presence of the *kurrumpa* and *parta*, and suggested that they were causing a problem and asked if their removal could constitute 'weed work'. The Rangers considered this, but emphatically decided that it would not fit in with weed work because these were both native plants. As a senior Ranger remarked, the presence of the Melaleuca and Wattle and the problems they were causing were “not weeds,[because] they're natives”. The Wattle and Melaleuca should be removed; however their management would not be weed work but “...something different, something cultural”, formally, this would be classified under the banner of 'cultural site maintenance'. This meant that clearing would not be done that year, because all cultural site maintenance had been exhausted in that year's work plan.

Bulrush at Loombuloombu

Loombuloombu is a significant water site close to the Ranger base at Djugerari. The site consists of a series of small water holes, which stretch for about 500 metres. The main stretch of water holes occurs in a downstream series of pools. In this downstream section the Bulrush has gradually expanded to cover every part of the water holes, resulting in no open or clear water. Where there were previously open pools of water, there are now masses of Bulrush (refer to Figure 6.16).



Figure 6.16 Ngurrara Rangers wondering where to start with the Bulrush at Loombuloombu

The Rangers spent approximately two weeks during 2012 and 2013 manually removing Bulrush by cutting it with machetes. To plan the work, Rangers spoke to elders about what the site should look like and which pools should be worked on first. The Rangers concentrated their efforts on the downstream section and have cleared Bulrush from an area of approximately 10m² in one of the downstream pools (refer to Figure 6.17). The Rangers liked this work because they can see how it is helping the site recover. They are enthusiastic to return there for follow up work, even just to maintain the clear water in the lower pools.



Figure 6.17 Working on the Bulrush at Loombuloombu, clearing an area of open water

Every trip that I attended with the Ngurrara Rangers was accompanied by at least one elder whose country we were visiting and who would teach the Rangers about that country. Having elders with them on country means a lot to the Rangers and has become a priority. As senior Ranger Kevin explained “We’re lucky to have such a good set of elders. We love learning from them, we learn a lot. [It] means so much to know you’re doing the right thing for country” (Djugerari: Spetember 2013). Hearing this I asked Kevin what he had learned about weeds from the elders, he replied “Nothing, really. They don’t know about weeds.”

[Nyikina Mangala Rangers](#)

The Nyikina Mangala Rangers (or Yimardoo Warra Rangers) have been based at different sites to the south of Derby, near to the Fitzroy River (*Mardoowarra*). *Mardoowarra* is extremely significant to the Nyikina and Mangala people and therefore the Rangers focus much of their attention on caring for the river and places nearby.

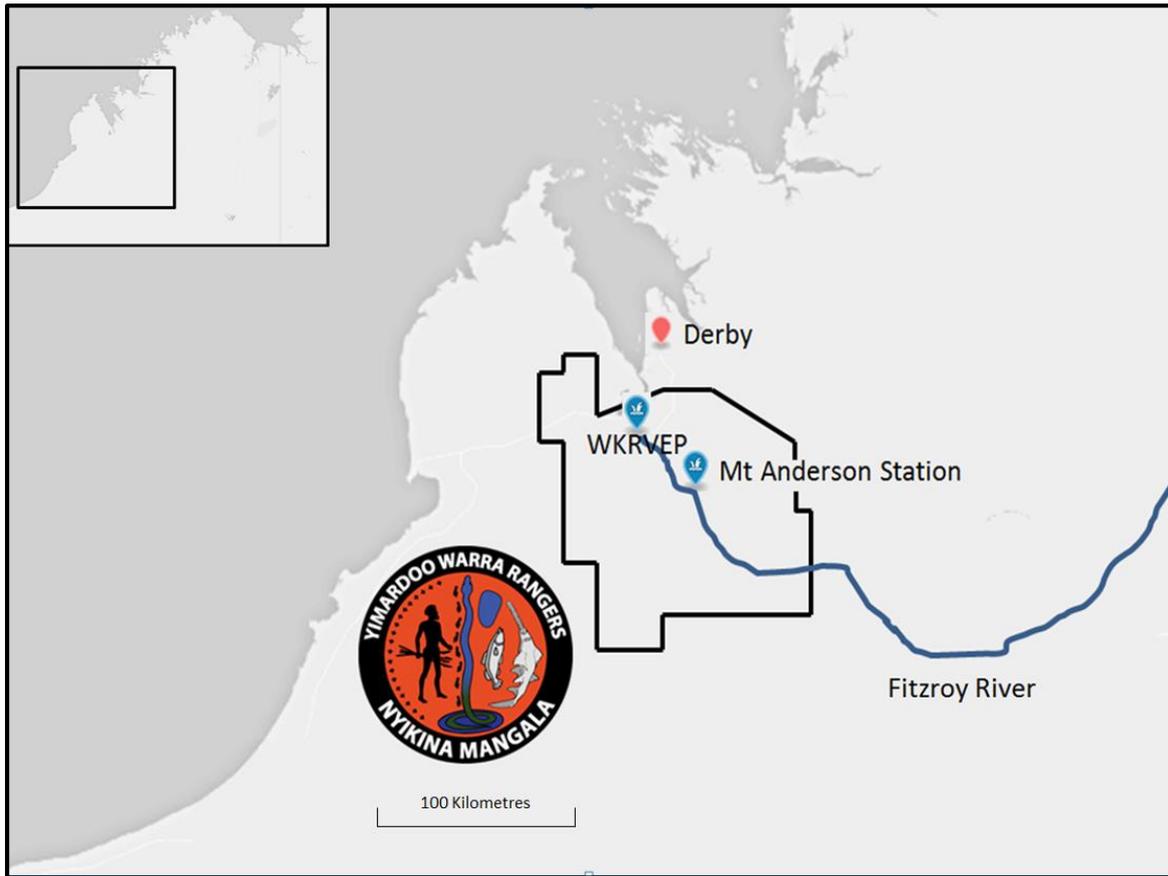


Figure 6.18 Nyikina Mangala Rangers' weed work sites

Rubber Vine and the Fitzroy River

In 2011 the Ranger group was contracted to undertake Rubber Vine management as a part of the West Kimberley Rubber Vine Eradication Project (WKRVEP).³³ Much of the 25,000 hectares targeted by the eradication project is on Nyikina Mangala country and runs alongside the Fitzroy River. The Rangers' involvement in the WKRVEP allowed them to combine their Working on Country weed work with an external fee-for-service funding opportunity.

The WKRVEP, as a species-specific program, meant that 'the rubber vine mob' is, unsurprisingly, mandated to specifically eradicate rubber vine. According to the Rangers, members of the WKRVEP would drive and walk past – and ignore – other noxious weeds, including WoNS such as Parkinsonia, because they were not mandated to kill these 'other weeds'. This was also the directive given to the Rangers, however this made no sense to them. In contrast, senior Ranger Ronnie saw this project, and weed management more generally, as an effort to

³³ Although official figures were never provided, I was advised by both a senior Ranger from this Ranger group and by a senior employee at Rangelands NRM that only a \$20,000 contract of the \$1million grant was offered to the Rangers to undertake work as a part of the project.

“make the place and this country healthy again, not just kill lots of the same plant” (Bedunburru, October 2012). This was supported by a Kendo, a junior Ranger, who added that, “[It] doesn’t make any sense, go past one weed just to get to another” (Bedunburru, October 2012). Although the Rangers understood that it might be against the wishes of the mainstream project organisers, they also cleared Parkinsonia, Calotropis and Gallon's Curse while they worked on the WKRVEP. This extra work delayed their progress on the removal of Rubber Vine, however produced improved outcomes for the overall health of the country.

This approach did not bode well for the Rangers as their contract was terminated well before the conclusion of the WKRVEP. The reason for the Rangers’ contract being cancelled was unclear. Members of the funding body suggested that the contract was terminated because the initial work was not done. The funding body made it clear that the contract would be renewed once the initial work had been completed and ‘sufficiently accounted for’. From the Ranger side, the requirements for this work to be ‘sufficiently accounted for’, were next to impossible. Specifically, requirements included spatial data that the Rangers did not have any way of recording with their existing equipment and lack of expertise. The Rangers believed that such difficult requirements were deliberately specified so that their contract would not be renewed. It had become obvious that the notion of weed work differed between Rangers and the ‘Rubber Vine mob’ and that the funding body did not appreciate this. As Ronnie explained: “We don’t get funding because we don’t know how it works...It seems like you have to manage small things [like single species] to get funding. We manage Country; Country isn’t a small thing” (Bedunburru, October 2012).

This episode had caused frustration for the mainstream funding bodies as well as the Ranger group and made relationships between the two increasingly volatile. I was made aware that from the funding side, this has jeopardised the Ranger group as a potential partner for future fee-for-service contracts.

Calotropis at Mt Anderson station

An ongoing weed project for the Nyikina Mangala Rangers concentrated on removing Calotropis around the abandoned Mount Anderson cattle station. The plan for a four-day weed work trip was to start at the cattle station and work back along its ungraded access track, eliminating the infestation of Calotropis that extended 50-100m on either side of the road. The Calotropis infestation was dense (approximately 30 plants per 10X10m quadrat) and stretched over three kilometres. Mark, the Ranger coordinator, who was riding in my vehicle, showed me a stretch of

the infestation that the Rangers had managed a year earlier. It had clearly grown back, but at a lesser density than in the surrounding patches (refer to Figure 6.19).



Figure 6.19 Calotropis near Mt Anderson Station

When we arrived at the abandoned cattle station, where two previous control efforts had occurred in each of the previous two years, there was still a significant amount of Calotropis present. Some other weeds had grown since the Ranger group's last trip, the most prominent being Kapok, Siratro and Thornapple. The younger Rangers who had travelled ahead of us had noticed these new weeds. However it was the persistent and remaining Calotropis in the place they had managed it the previous year that provoked them. As Kendo as expressed we arrived, "It even seems like there is more here than when we started."

They spoke about this for a while, suggesting that if they really wanted to make any difference to this infestation they would have to return year after year and comprehensively manage the entire infestation. It was suggested that this was absolutely impossible considering the resources that were available to them and the other commitments that they had on their work plan. Nevertheless we undertook some Calotropis control that evening. At dawn the next morning we continued. Having finished at the station around breakfast time, we moved on to the access track. There was little to no shade on the track and the temperature reached 38°C before we stopped for

lunch. Two of the younger Rangers were physically distressed and drove back to the station to seek shade. During lunch, one of the Rangers mentioned that we were never going to get close to clearing the whole patch of Calotropis in the proposed four days and asked whether or not they were planning to return here later in the year to continue the work that this trip “would barely even start”. Mark said that they would not have time among their other Working on Country commitments and that the other time scheduled for weed work would be spent at other places managing WoNS – either Parkinsonia or Rubber Vine. Kendo exclaimed that what we were doing here right now was therefore useless as “it’s all going to grow back, just like the last times”.



Figure 6.20 Early morning Calotropis work around the cattle yards

Mark remarked that they had to do the work because it was on their Working on Country work plan and that Calotropis was a declared weed on their country. However, before we recommenced work, the decision had been made by the Rangers that we would pack up work here, return to the Ranger base, go fishing that afternoon and complete other Ranger duties during the remainder of the week.³⁴ Mark and Ronnie left immediately.

On the way back the younger Rangers and I passed a group of Boab trees that Kendo and a couple of the others remembered visiting when they were younger. They noticed that Buffel

³⁴ I was never fully told how this decision was made, except that a lot of other things needed to be done and that this particular work ‘could wait’.

Grass had grown around the trees, increasing the chances of the trees being harmed by a fire. They also noticed the presence of Gallon's Curse, remarking that people would not be able to sit under the trees without being stuck by the prickly grass. These young Rangers worked for about an hour at this group of trees, manually removing and then burning the Buffel Grass and Gallon's Curse.



Figure 6.21 Ranger sprays Calotropis on the side of the old track

I travelled with Mark and Ronnie on our way to go fishing that afternoon. Mark apologised for not continuing with the weed work but said that he could not motivate the Rangers and it was better to just leave it. He added that he also struggles to get motivated to do weed work. Weed work needed to be done because it was in their work plan but he did not know how it could be done that might motivate the Rangers. During this discussion Ronnie noticed some Calotropis on the side of the track. This track was significant to these Rangers as it was an old walking track used when people walked from bush camps to the cattle station for work. We stopped the vehicle and sprayed the Calotropis. We saw over a dozen more Calotropis plants during the trip, each time we stopped and sprayed.

These cases demonstrate a stark divide in the Rangers' attitudes to weed work. On the one hand, there is a steadfast resistance to the weed work that they feel that they 'must do'; and on the other hand, a genuine enthusiasm to conduct weed work that they choose to. Summed up by Mark, weed work is "important, it's good, you know, [we] just like to have a reason to do it".

Nyulnyul Rangers

Like the Bardi-Jawi Rangers, the Nyulnyul Rangers have a close partnership with Environs Kimberley and are part of the Peninsula Vine Thicket Program and the West Kimberley Nature Project. Through this partnership, the Rangers focus approximately half of their weed work on removing Buffel Grass and Neem Trees from vine thickets. Despite this focus, and the significant amount of time spent working on vine thickets, the Rangers did not mention Buffel Grass, Neem Trees or vine thickets as the most significant or urgent weed problems on their country. Instead, fresh water places such as lakes, springs and creeks were mentioned as the most important places to keep free from weeds.



Figure 6.22 Nyulnyul Rangers' weed work site

Bulrush near Beagle Bay

A weed project undertaken by the Nyulnyul Ranger group involves an infestation of Bulrush (*Typha orientalis*) at a site just to the north of the Beagle Bay community (refer to Figure 6.23). The Bulrush impedes the flow of a creek that previously ran through this site into the tidal estuary and into Beagle Bay. Other plant species including Melaleuca, Bamboo, Sesbania and a number of wetland grasses have also become established in the area since the flow has been reduced. This has resulted in a clogging of the creek system.

Rangers and elders saw this as a culturally and ecologically significant problem. At this site, the Rangers spoke about how the area previously looked; they pointed out that none of the plants had been present and the water had been flowing, connecting the freshwater creek to the tidal estuary. The site had previously been habitat for freshwater eels and a spawning area for barramundi as well as being used as a swimming and fishing hole by the community. Rangers remarked that the Bulrush and other plants had become prominent since the capping of a spring on a private property upstream, which had previously ensured consistent flow throughout the year. This effect had been compounded by the construction of a makeshift causeway across the creek so that vehicles could cross immediately next to the town instead of having to travel all the way out to the main road.

Weed work at this site had solely targeted Bulrush. This involved approximately two weeks' work over the previous three years manually cutting and removing the bulrush with machetes. Although this work had resulted in gains in terms of a reduction in the abundance of Bulrush, it had yielded only minimal gains in terms of an increase in stream flow or improvement of the health of the site. Rangers gave mixed responses as to the success of this weed work; those claiming success cited the removal of bulrush, those claiming lack of success cited the lack of improvement in the health of the site. One Ranger summed this up, saying "We got rid of a fair bit [of Bulrush], [but it] hasn't helped the place much".

Rangers agreed that Melaleuca, Bamboo, Sesbania, and the native wetland grasses also established at the site were also impeding water flow. As one Ranger told me, "None of these plants belong here, too much [of] everything". Another added that "All of [the plants] are stopping the water, clogging it up." When I asked what weed work the Rangers planned to do at this site in the future, the only response was to continue to remove the Bulrush – because this is the only 'weed' that was present.

The overwhelming reason that the bulrush was the only plant designated as a weed was that the bulrush was the only 'non-local' plant that was present. What stood out in this case was that the problem that exists at the site, and the reason for managing the weed, are entirely different. The problem the weed was causing was that it was inhibiting flow and changing the way that animals and humans interact with the site – the reason that the Bulrush was being targeted was that it was not local. Rangers also told me that they had spent time trying to find out whether or not the Bamboo was a local Kimberley species so that a decision could be made on whether or not it should also be managed.



Figure 6.23 The Nyulnyul weed work site in relation to Beagle Bay community



Figure 6.24 Nyulnyul Ranger standing on the causeway surveying the weed infestation

Reflecting on this weed work, Gregory, a new Ranger to the group asked me whether or not it mattered if the Bamboo was native or not, considering it was also responsible for inhibiting flow. I thought his point was valid and asked why he thought that these plants had not received any management attention. Gregory replied, "Because they're not weeds, they're natives." This led to a lengthy discussion between me, Gregory and two other Rangers about the fixation on 'nativeness' in mainstream weed management. They said they had never really thought about this. Gregory expanded the conversation to the Ranger coordinator and the rest of the group to

ask how a weed management plan for this site would look if nativeness, or 'localness', was no longer an important consideration in determining which plants are weeds. The consensus was that the majority of the vegetation would be removed, aside from a few of the Melaleucas. The Rangers would speak to the landowner who had capped the spring and request that it be reopened to allow water through the creek in the dry season. They would also speak to the community about either improving or demolishing the causeway that crosses the creek and inhibits through-flow into the estuary.³⁵

When I returned eight weeks later, no change to the management agenda for that site had been adopted. Instead, the Rangers were still attempting to assess the origins of the Bamboo and had spent time investigating the purchase of an aquatic vegetation grooming machine specifically designed for managing Bulrush.

Wunggurr Rangers

The Wunggurr Rangers are responsible for managing the 63,000km² of Wilinggin country. Similar to the Ngurrara Rangers, the Wunggurr Rangers need to make trips away from their on-country Ranger base at Ngallagunda (Gibb River Station) to conduct weed work.

Weed work represents a smaller component of the Wunggurr Rangers' work than other Kimberley Ranger groups; as one of the senior Rangers told me "we're pretty lucky with weeds, not too many around, sometimes have to work hard to fill our work plan". The Rangers conduct the majority of their weed management under fee-for-service arrangements with external NRM bodies. They estimate that while they dedicate approximately 20 per cent (perhaps even less) of their Working on Country work plan to managing weeds, they spend a similar amount of time conducting weed work through fee-for-service contracts with DPaW, El Questro Pastoral Station, and the Mornington Wildlife Conservancy.

³⁵ Unfortunately this discussion was cut short because the Rangers had to go and manage a fire that was reported to be threatening a nearby property.



Figure 6.25 Wungurr Rangers weed work sites

Taro at Mt Hart

The Rangers have an ongoing contract with DPaW to manage an infestation of Taro (*Colocasia esculenta* var. *aquatilis*) at the Mt Hart Wilderness Lodge in the King Leopold Ranges Conservation Park. The previous manager of a pastoral lease at this site planted Taro adjacent to the homestead from which it spread in to the nearby creek. When DPaW took control of the Lodge the Taro had established and had proliferated 150m down the creek line. Taro was identified by DPaW as a native species in the east Kimberley but not local to the west Kimberley and therefore designated as a weed. It was worried that it would spread further downstream and become a major problem in the Barker and May Rivers which lead all the way to King Sound.

DPaW contracted the Wungurr Rangers to undertake weed work at the site in 2011. Since then the Rangers have undertaken week-long weed control operations at the site once or twice a year depending on their availability. The work is labour intensive; as one Ranger expressed "That Taro, he's hard work! Harder than any other weed." Weed work on Taro is most effective when it is removed manually; however this is extremely arduous, especially on the sides of steep creek beds. Therefore manual removal is supplemented by spraying chemical herbicide where the infestation is extremely dense or difficult to access (refer to Figure 6.26).

Initial weed work at the site decreased the abundance of Taro in the creek bed near to the homestead and was considered successful. However despite the significant time and effort that yielded the initial gains, a six month absence over one wet-season resulted in a significant portion of the Taro regrowing and in some cases even spreading down the creek. As Junior, one of the younger Rangers explained, “we go back and it seems like we haven’t got anywhere” (Derby, October 2012). This was disheartening for the Rangers who have since shifted their attitudes and expectations for weed work at this site. As senior Ranger Jonathon expressed, the Rangers’ weed work is now “mostly about containment...it doesn’t seem to be getting anywhere but we need to keep containment in mind” (Ngallagunda, September 2012). Nevertheless, the Rangers and DPaW are both keen to maintain the partnership for this site.



Figure 6.26 Wungurr Ranger spraying Taro at Mt Hart Wilderness Lodge (Source: Wungurr Rangers)

Gamba Grass at El Questro Station

In 2013 the Wunggurr Rangers accepted a fee-for-service contract to control Gamba Grass at the El Questro Pastoral Station on the eastern fringe of Wilinggin country. Gamba grass is regarded as an emergent weed threat to the Kimberley because of the severe problems it has created for both pastoralists and environmental managers in the Northern Territory. The Wunggurr Ranger coordinator explained to me that the work that the Rangers do at El Questro is extremely significant: “We are at the front of Gamba grass control for the whole Kimberley.” Rangers agreed, saying that El Questro is their most important weed project. The significance of this project was primarily justified by the fact that it is designated as a WoNS. As a Ranger explained “Gamba Grass is important because it is a WoNS, we got to get straight on to the WoNS. That’s why [El Questro] is important work.”

Weed work on Gamba Grass at El Questro involves a complete day of travel to and from the site. For these trips to be feasible the Rangers must spend more than four days at El Questro, in addition to the full day of travel either way. The Gamba Grass at El Questro is currently confined to a number of creek beds and rocky outcrops near the intersection of the Gibb River Road and the access track to the Pastoral Station. The weed work involves the Rangers walking these areas spraying the Gamba Grass with the chemical herbicide glyphosate (refer to Figure 6.27). These trips have been undertaken following the wet season when the new grass is sprouting and the mature grass is susceptible to herbicide treatment.

Rangers have seen a good deal of success at this site and plan to continue to return there. The Rangers speak fondly about their weed work trips to El Questro; partly because of the success, however mostly because it provides an opportunity for them to visit this part of their country. Having been previously based in Derby (a further 4.5 hours to the west of Ngallagunda), the Rangers were unable to visit and work at the sites on the eastern side of their country. As Junior explained “We don’t usually get this far [east], this is still our country though, this is my father’s country and my country so it’s good to work here.”

Even though they consider this work successful they recognise that they cannot stop the westward spread of Gamba Grass by themselves. The Rangers highlighted that they will be able to manage the grass at this site but that they will need significant assistance if their work at this site is to have any impact on significantly impeding its spread.



Figure 6.27 Wungurr Ranger managing Gamba Grass at El Questro Station (Source: Wungurr Rangers)

Chinee Apple at Ngallagunda

As a part of their Working on Country weed management, the Wungurr Rangers removed Chinee Apple (also commonly known as Taylor Fruit) from near their Ranger base at Ngallagunda. This weed work was undertaken because Chinee Apple is identified as a weed by DPaW and the Rangers needed to fill their quota of weed management on their work plan. However, the Rangers involved in this project expressed that they were unhappy that the Chinee Apple trees were no longer present as they liked to eat their fruit. This had also been noted by other Ngallagunda community members, including elders, who wondered why such ‘good tucker’ had been removed by the Rangers. One of the Rangers mentioned that he had noticed that there were some other Chinee Apple trees growing nearby but that he would not tell anyone in case this meant that they would also need to be removed. Following this he mentioned that “Pretty much anything can be a weed – even good tucker – depending on how you look at it.”

Coffee Bush on the Gibb River Road

Also as a part of their Working on Country weed work, the Rangers managed a stand of Coffee Bush on the side of the Gibb River Road in early 2014. Three days of work went into managing the infestation and achieved the removal of most the Coffee Bush at the site. The Ranger who suggested this weed work be done had been aware of the Coffee Bush at this site for at least two years. He noted that it was not rapidly spreading, problematic or in any need of control, however, when the Rangers discussed where they would do their allotment of Working on Country weed work for that year, he mentioned the Coffee Bush as a potential management site.

He justified his decision saying that Coffee Bush was classified as a weed by DPaW and that the Rangers had previously done work on it as a part of the Derby Declares War on Weeds program (which the Rangers carried out on behalf of Environs Kimberley and the Shire of Derby West Kimberley). He finished our discussion of this weed project reflecting that “Knowing [Coffee Bush] it’ll come back for us next year. [We are] going to have to keep coming back to this one”.

Conclusion

Perhaps I should have taken Larry’s advice and chosen to research dugongs instead of weeds. I have no doubt that we would have had more fun that way – and the Rangers might be happy now when they think of me. Larry, like most of the Rangers I worked with, is daunted by the scale and difficulty of weed work. Rangers are responsible for managing weeds over vast tracts of the Kimberley and therefore dedicate a significant part of their time, energy and resources to this work. This occurs alongside, and competes for space in work plans with other culturally significant activities.

Unlike these other culturally significant activities, which Larry feels that he could “actually teach me something about”, Rangers conduct weed work according to mainstream priorities and management techniques. This means that they adopt species-led strategies to kill weeds according to weed classifications and prioritisations that have been produced by mainstream environmental agencies (such as WoNs or DPaW’s ‘priority weed list’).

Weed work is laborious and uncomfortable, particularly in the hot and humid conditions of the Kimberley. Compounding these physical difficulties is that despite significant efforts, weed work yields minimal outcomes. There are some stories of success, but these are in the minority.

The majority of weed work that I witnessed was unsuccessful; either in terms of eradicating, reducing, or containing the spread of weed populations, or in terms of improving the health of a particular site.

Considering the physical difficulties of the work, combined with the feeling that they are rarely in charge of this work, and compounded by its lack of success, it is easy to understand why weed work does not foster positive sentiments in Rangers such as Larry.



7 CHAPTER SEVEN

ABORIGINAL REFLECTIONS ON WEED MANAGEMENT

Jimmy, a Bunuba elder, wanted to know what *kartiya* meant by the term weed. He knew me as ‘Tom, the weeds guy’, but was unsure what the term ‘weed’ actually meant and why the Rangers spent so much time managing them. I remained silent to see if he would attempt to answer his own question. Instead, Roxy, the Ranger who was present interjected to explain that weeds were plants that were “non-native and invasive”. At this, Jimmy glared straight at me and said:

“Just like *kartiya*”

My immediate reaction was to laugh, but it felt awkward. Jimmy didn’t laugh and neither did Roxy. His comment was definitely incisive but I thought he meant it as a joke. Thankfully, a moment later, Jimmy defused my discomfort with a genuine chuckle, telling me “I got you there! Didn’t I? Or what!”

I laughed and admitted that he did get me. I pointed out that the other common characteristic of an environmental weed was that it changed the environment in which it occurred. Jimmy said, again, “just like *kartiya*”. Roxy and Jimmy discussed the mainstream concept of an environmental weed. Jimmy continued to return to the similarities between environmental weeds and *kartiya* and pointed out that a *kartiya* system that demonises and kills plants for behaving like *kartiya* made no sense to him. Such a system is “silliness” and has little merit for understanding or classifying plants and managing country. New plants, like new people were here now and should be judged on “how they fit in” and relate to country.

Jimmy asked Roxy about the weed work she does, whether or not she liked it, and if the *kartiya* way of viewing and managing weeds made sense to her. Roxy replied that, at times, she found weed work “frustrating” and “pointless”, and that the *kartiya* concept of weeds didn’t always make much sense. She followed this by explaining that this had always seemed like “the only way”; it was what the Rangers had been taught, and is just the way that weed work is done.

Jimmy's reflection was symbolic in that it challenged mainstream environmental weeds discourse and presented an alternative way of viewing and classifying weeds. Aboriginal people frequently voiced reflections of mainstream concepts of weeds and weed work, before offering their own understanding of what made a plant wanted or unwanted. Roxy's response to Jimmy's question was also symbolic, in that while this system did not always make sense to the Rangers, it was the way weed work happens. Weed work is not connected to culture like some of the other Ranger activities are.

This chapter explores Rangers' and elders' reactions to weed work, focusing in particular on the factors that disconnect it from its cultural significance. It then discusses their reflections on mainstream environmental weed discourse, according to how they address the 'triad' of mainstream environmental weeds classification.

Reflections on weed work

Rangers commonly cited weed work as the worst part of their job. They freely admitted that they found weed work difficult, but this was not the real problem. They were frustrated by the pointlessness of weed work. Rangers attributed these feelings partly to the poor results that weed work generally achieves; however more significantly they attributed this to the lack of cultural connection to this work.

The frustration of weed work that is produced by poor results is plain to see and is highlighted by many examples in the previous chapter (refer to the quotes in Box 7.1). Rangers explained that the frustration over the poor results of weed work produce a lack of motivation among the group. In turn this lack of motivation leads to more poor results and more frustration. This circularity is demonstrated in Figure 7.1.

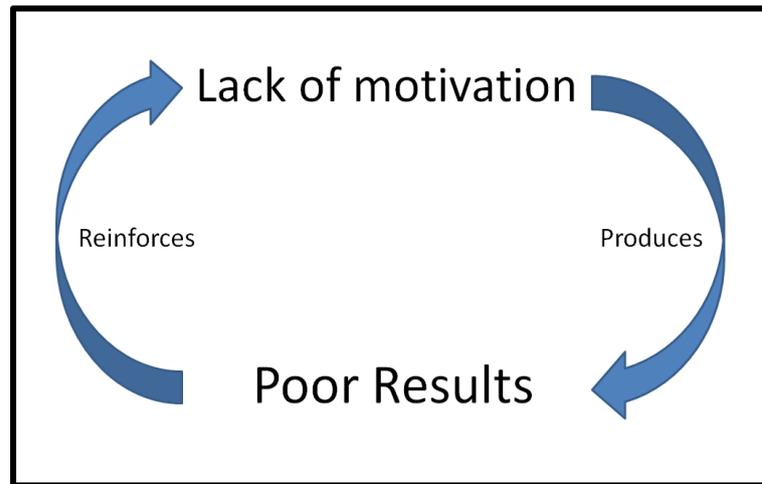


Figure 7.1 The positive feedback between poor results and the lack of motivation

Bardi-Jawi Rangers:

- “Keep pulling the same Buffel grass from the same spot...already done it twice, probably do it again next year”
- “...a whole month, doing nothing but Coffee Bush...even then it might not get rid of it, plenty of other things become problem in that month”
- “If we’re going to do something, we might as well get something done.”
- “keep going to the same places and killing the same weeds... doesn’t mean much, doesn’t get much done”
- “doesn’t seem to get anywhere”

Bunuba Rangers:

- “a bit of a failure, got barely over half way”
- “It doesn’t look like we done anything here, strange for us to even bother”

Nyulnyul Rangers:

- “We got rid of a fair bit [of Bulrush],[but it] hasn’t helped the place much”

Nyikina Mangala Rangers:

- “It even seems like there is more [Calotropis] here than when we started.”
- “it’s all going to grow back, just like the last times”

Wunggurr Rangers:

- “we go back and it seems like we haven’t got anywhere”
- “it doesn’t seem to be getting anywhere...”
- “[We are] going to have to keep coming back to this [Coffee Bush]”

Box 7.1 Quotes from Chapter Six that demonstrate Ranger’s frustration with their weed work

Poor results and lack of motivation are keenly observed by mainstream weed managers and contribute to their irritation with Aboriginal Rangers. Although this is commonly perceived by mainstream weed managers as a sign of apathy towards the problem of weeds, I found that Rangers are not apathetic to weeds at all.

The Rangers' frustration and lack of motivation is in much larger part due to the absence of a cultural connection that is supposed to guide their weed work. Rangers are frustrated because their work is supposed to be culturally informed – but weed work is not. Therefore they do not understand its significance or get the fulfilment out of weed work that they do from other, more 'culturally-based' activities.

When I asked Rangers 'Why do you undertake weed management?' the most common responses were "It's on our work plan", "Because that's our job" and "To remove weeds". Very few actually said that they thought that weed work was a culturally significant part of caring for country. I also asked why other activities were undertaken, such as fire management, cultural site maintenance and taking old people back to country. Usually, Rangers gave cultural reasons for why places must be burnt in particular ways and at particular times; why certain places must be cared for in particular ways; and the importance of having old people on country and the reasons why particular people were needed for particular places. However, with weed work, reasons almost always stopped at 'Because that's our job'. The following section explores Rangers', elders' and Aboriginal NCRM practitioners' perspectives on how this cultural disconnection has developed.

[The strings attached to Aboriginal weed work](#)

Rangers and elders seek to connect all of the work that they do to its significance for culture and country. However, they struggle to do this in weed work. As a Ranger coordinator explained, "I'd love [the Rangers] to manage weeds according to culture and IEK, I just don't see how it can be done, not right here, not right now" (Derby, August 2012).

Ranger groups are pulled in a number of different directions when planning and undertaking weed work. Rangers (Ranger coordinators in particular) are conscious of these tensions and are aware of how they are responsible for disconnecting weed work from its cultural

significance. A Ranger coordinator explained this by using an analogy of his Ranger group as a marionette puppet, which is controlled by 'strings' that are out of their hands. Although not a perfect analogy – because Ranger coordinators and Rangers are ultimately responsible for what actually gets done on the ground – it pointed to a number of external forces, or 'strings', which influence their weed work.

Three main strings were identified that pull Rangers' weed work away from its cultural basis. These are: The need to secure funding and from within a mainstream NRM structure; the dominance of mainstream environmental weeds wisdom; and the assumption that there is no Aboriginal knowledge about weeds.

"Weeds are an opportunity": Securing mainstream funding

I am by no means the first or only one to recognise the lack of connection between Rangers' weed work and its cultural significance. However Ranger groups and KLC LSMU employees feel that they are not in a position, even within the Working on Country and IPA programs, to challenge or diverge from mainstream environmental management wisdom. This attitude has led Ranger groups to control weeds according to mainstream weeds discourse and practice.

The need to secure funding is always foremost in Ranger groups' minds. The financial viability of ranger groups and the employment this provides is frequently prioritised over all else. A Bunuba leader stated this bluntly:

"Ranger work is crucial to the Rangers and the community. Any employment is important, but especially ranger work. They get working out bush, they get out on country...what they do out there is secondary, doesn't matter what it is...You don't see them in town drunk. You don't see them in town killing themselves." (Fitzroy Crossing, September 2012)

While he suggested that grounding Ranger work (and weed work) in cultural connections to country was important, it should always be put into perspective of the larger social benefits that Ranger groups promote. Therefore, it is crucial to play by the mainstream's rules and not, as one Ranger coordinator put it, "bite the hand that funds you".

The tension between Ranger work as a source of employment and ongoing funding on the one hand and an opportunity to care for country based on local Aboriginal priorities on the other, was highlighted during an annual KLC Ranger coordinators' meeting. At the meeting it

was emphasised that Ranger groups must first and foremost be accountable for their work plans, because this was the requirement of the Federal Government's Working on Country and IPA programs.³⁶ As will be discussed, and as the Ranger program coordinator acknowledged at the meeting, while these work plans do not always represent the Ranger groups' or the PBCs' priorities, their funding would be jeopardised if they were not fulfilled.

For funding security, some groups prioritise fee-for-service and weed work projects funded by mainstream environmental agencies. Although these arrangements mean that the Rangers have no control over this work, they provide extra funding which secures and strengthens their financial viability. This relationship is ingrained in Aboriginal weed work and is traceable to its origins in Northern Australia, which used the management of Mimosa and other weeds to instigate LSMUs and Ranger programs. As such, I was frequently told by Ranger coordinators and KLC LSMU staff that weeds constitute an "opportunity" for Aboriginal Ranger groups. As the Bunuba Ranger coordinator explained, although Neem Trees did not represent much of a problem on Bunuba country "there is a big opportunity to manage Neem...We need to jump at what gives us funding". This was also stressed at the annual KLC Ranger coordinators' meeting, at which groups that had sought fee-for-service partnerships were lauded for strengthening their financial position and contributing to the "sustainability of the entire Ranger network" (KLC Ranger coordinator: Broome, July 2012). Although fee-for-service contracts secure funding, Ranger groups are aware that this means they must conform to the requirements of funding agencies.

The Working on Country and IPA programs are supposed to get around this 'fee-for-service straightjacket' by financially supporting Ranger groups to work on behalf of their culture. However Ranger groups and elders see that this funding also comes with conditions. They see these conditions as a result of the centralised structure of Aboriginal NCRM and feel that the system is still effectively top-down, with the power concentrated within the Federal Government's NRM and Indigenous policy. Commenting on the so-called bottom up structure of Aboriginal NCRM and Working on Country, Nyulnyul Ranger Gregory said:

"Yeah, but bottom-up to where? It all goes up and out to government. Always some whitefella above us, [if] we don't like it, we gotta take it up with a whitefella, [if] we want to go above him, we get another whitefella...We're still at the bottom." (Beagle Bay, October 2013)

³⁶ This was emphasised in discussions with members of the Federal Government department (at that time the department of Sustainability, Environment, Water, Population and Communities), who had taken part in the assessment of Ranger groups and Ranger programs participating in the Working on Country program.

This was also raised by a senior Bardi-Jawi Ranger who explained that he feels “caught” and “trapped” in a “big system that doesn’t know us, doesn’t really know Bardi(-Jawi) problems”. This sentiment of enclosure and distance from power is illustrated by looking at the institutional structure within which Ranger groups operate, which is displayed in Figure 7.2.

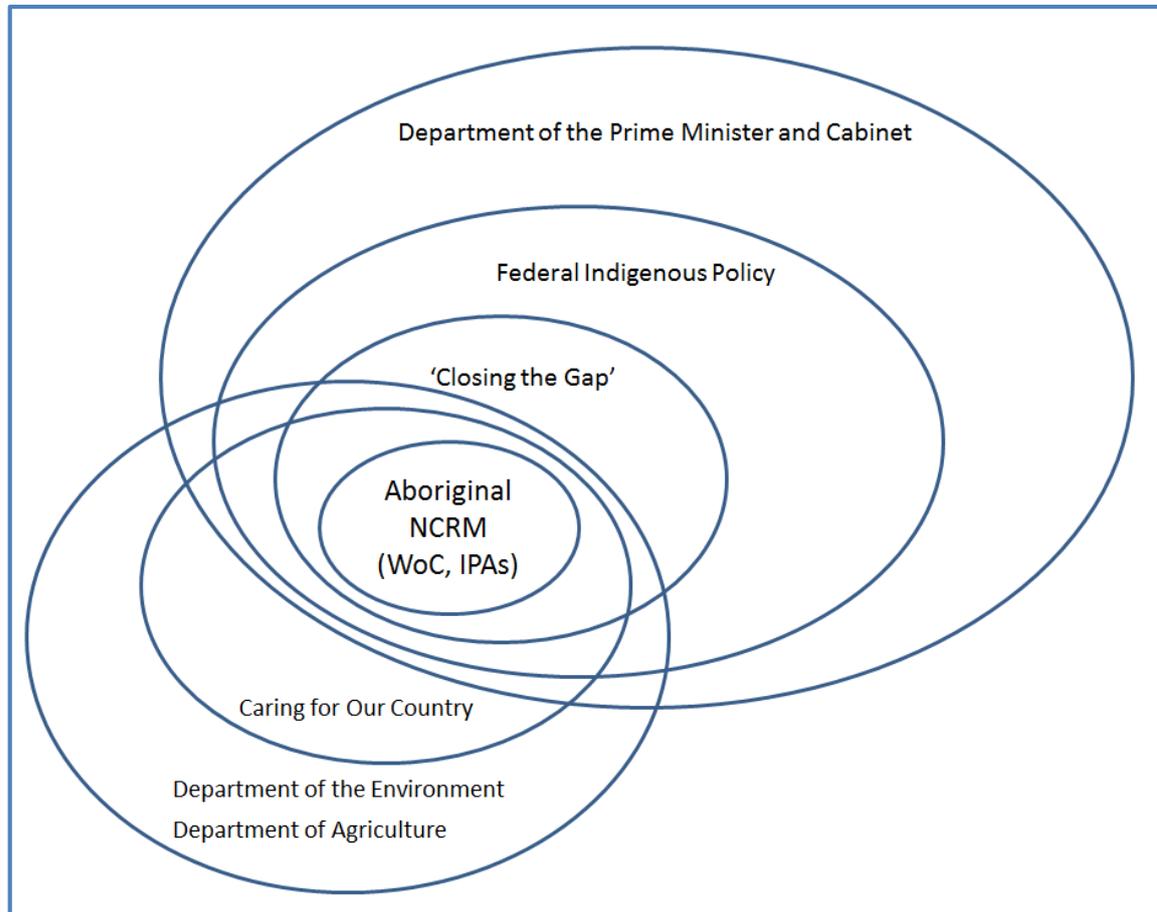


Figure 7.2 Institutional and bureaucratic enclosure of Australian Aboriginal NCRM (Modified from Berkes, 2000)

In Kimberley Aboriginal NCRM, the effect of this ‘enclosure’ is evident in the development of Rangers’ Working on Country work plans and IPA Management Plans. These work plans have a significant influence on Ranger work as they effectively direct what the Rangers need to complete in the following year. Traditional Owners mentioned that although they are present and contribute their guidance during planning meetings they inevitably sign off on what is a mainstream environmental management work plan, dominated by the ‘big three’. As a Nyulnyul Traditional Owner explained of the work planning process:

“We sit in all these meetings. In meetings they [KLC LSMU staff and Working on Country representatives] talk about ‘doing things black-fella way’. But there we are, sitting in meetings in Broome *talking* about doing it blackfella way. Long way from doing it our way” (Beagle Bay: August 2014)

Traditional Owners who spoke about this explained that the *kartiya* from the KLC LSMU do a very good job understanding their perspectives and priorities; however, they feel that the process and outcomes are more or less set prior to the meetings. The following examples highlight the discordance that this creates.

The ‘big three’ that the Rangers end up spending the bulk of their time on does not necessarily reflect the Rangers’ or the elders’ priorities. This was highlighted during a discussion with a pair of Rangers about the work they do, in which I mentioned the phrase ‘the big three’. Upon doing so one of the Rangers immediately asked, “Whose ‘big three’ are you talking about?” I explained that I thought it was a neat expression to describe the emphasis placed on environmental weeds, fire and ferals. The other Ranger remarked, “Yeah, but they’re still not my big three.” I asked what his big three were and he said he did not have one, instead it all came down to “caring for country” – if he had to choose one activity though it would be taking people back on country.

Rangers routinely mentioned taking people back on country as the most important part of their work. I was told numerous times that “country needs people” and that it is crucial to have the right people visiting the right country. Elders know how to keep country healthy; however, first and foremost, they need to be there. Therefore taking the right people to the right country should be the most important part of Ranger work. On average, less than 20 per cent of Rangers’ work plans are dedicated to taking people back to country; for elders in particular, this raised major questions about the agendas that control Ranger work.

A Wilinggin elder was puzzled by the planning and declaration process for his group’s IPA. For an IPA to be declared and funded, a Management Plan for that IPA must be ratified by the Federal Government. This elder mused that it seemed bizarre that Wilinggin’s vision of healthy country and their plan to protect it needed authorisation from the Federal Government. Specifically, he posed the question “What do they [the Federal Government] know about healthy Wilinggin country?”

Together, these examples demonstrate that elders and Rangers feel that larger structures of authority and governance have not really been shifted in any significant way by the current

Aboriginal NCRM system. While they recognise that this pulls the work away from local and cultural priorities, they feel that there is no alternative but to play along.

These accounts are not isolated to the Kimberley. Revisiting the literature, it shows that this is experienced in other NCRM contexts in Australia and across the world.³⁷ Scholars and practitioners have emphasised the restrictions that pre-existing and lingering politics place on 'decentralised' NCRM (Dubois 1999, Howitt 2001, Shackleton *et al.* 2002, Cooke and Kothari 2004). They suggest that these entrenched politics fundamentally restricts the abilities of local or Indigenous communities to guide management, let alone do it on their own terms (Nadasdy 1999, Brosius *et al.* 2005). As Nadasdy (2005) argues, for Indigenous peoples to become 'empowered' through involvement in NCRM, they must first agree to play by the rules of the game, but by doing so, emphasises they "tacitly acknowledge the legitimacy of that game, thus taking for granted the unequal power relations within which they are embedded." This binds Aboriginal engagement in NRM within particular ontological and epistemological bounds making "certain types of behaviour possible and others impossible – and sometimes even unthinkable" (Nadasdy 2004:268).

In Australia, critical attention highlights the institutional and epistemological politics that inhibit Aboriginal people from guiding NCRM. In terms of institutional inhibitors, Altman and Kerins (2012), among others, criticise the current centralised Aboriginal NCRM structure, suggesting that it represents a centralisation of an inherently decentralising movement.³⁸ These critics argue that such a structure contradicts the grassroots strength of the Caring for Country movement, which as Morrison (2007) stated was underpinned by its "origin in communities, not in institutions or the government". This is also highlighted by Palmer (2006:34) who has brought attention to the "political inadequacy of democratic projects that seek to create spaces of inclusion for Indigenous peoples within existing environmental governance arrangements".

Epistemological critiques of Australian NCRM relate to the uncommon and unequal ground upon which issues of natural resources and ecological management are discussed and contested (Strang 1997, Smith 2005, Pickerill 2009). These critiques highlight the lingering colonial and cultural politics that frame how ecological and resource management 'truth' is constructed

³⁷ For more from an international context see: Nadasdy 1999, 2004; Kellert *et al.* 2000; Fortier 2002; Brosius *et al.* 2005; Houde 2007.

³⁸ For more about this enclosure from Australia see: Howitt 2001; Jackson 2006; Baunman and Smith 2007; Palmer 2007; Hemming and Rigney 2008; Bradley 2011; Muller 2012.

and reinforced by what Bradley and Johnson (2015:3) refer to as a “religion of scientism” that runs through Australian institutions and land management agencies.

This returns us to Johnson’s (2011) chess game analogy. Ranger groups and elders feel as though they are always one move behind, always dictated to by the rules of a game that they have no choice but to keep playing. Ranger groups feel that the system in which they are working is in control of what they do. They feel removed from the power that allows them to control how they care for country, especially in terms of weeds. Therefore the weed work that Aboriginal Rangers undertake within the current Working on Country and IPA structure is bound to only partially represent Aboriginal priorities.

In the Kimberley this is never really challenged because securing funding is paramount. Put straightforwardly by a KLC employee, this is because “Surely having eight to twelve full-time Rangers is more important than whether or not those Rangers do weed work on Parkinsonia or Buffel Grass” (Derby, July 2012).

“It’s in the book”: mainstream environmental weeds discourse

Rangers generally believe that there is only one correct way to think about and manage weeds. This is partly a function of the institutional enclosure discussed above, in that this system privileges mainstream environmental discourse and management; however it is also a result of the dominance of the environmental weeds discourse itself. The reification of this discourse within Australian, Western Australian and Kimberley NRM has created the illusion that the environmental weeds and their control are not products of culture, but natural and unquestionable ecological truths. Weeds have therefore become a matter of fact, and nothing to do with culture. As a DPaW employee asked of my research project while we were working with the Bunuba Rangers, “What do weeds have to do with culture?” Perhaps, like Ewan, she also thought that culture might just “be used to subvert the science.”

A conversation with a Ranger stands out that is symbolic of the dominance of mainstream discourse in Ranger’s weed work:

- TB: “Why do you manage this plant?”
Ranger: “Because it’s a weed.”
TB: “Why do you say it is a weed?”
Ranger: “Because it’s in the book.”

The 'in the book', or 'on the list' attitude is manifested in Rangers' weed work by the consistent prioritisation of listed weeds such as WoNS, over weeds that had been identified as problems by elders, local people or even by the Rangers themselves. This means that weed work frequently does not accord with what the Rangers actually want to do. The discord is evident in a number of the weed work cases from the previous chapter. Examples of this include:

- The Bardi-Jawi Rangers conducting weed work in two particular vine thickets for no clear reason and despite their proximity to weed spreading agents.
- The Bunuba Rangers lamenting Gallon's Curse but never managing it because of their focus on WoNS. As one of the Rangers put it "I wish we could just manage [Gallon's Curse] first."
- The Nyikina Mangala Rangers deciding to discontinue a weed work trip because it was not worthwhile, however stopping twice on the way back to base to manage weeds at significant sites.
- The Wunggurr Rangers managing Chinee Apple at Ngallagunda, despite it being a well-liked fruit by the locals and by the Rangers themselves.

The influence of mainstream weed management is also manifested in a strong species-based focus of weed work, which tends to be discordant with Ranger priorities. Examples include:

- The Bardi-Jawi Rangers focusing solely on sites of Coffee Bush with scant attention paid to where or why the work was being undertaken.
- The Bunuba Rangers prioritising weed work at Biridu because of the presence of Bellyache Bush and Parkinsonia with little attention given to the significance of the weed work site.
- The Nyikina Mangala Rangers' reactions to their involvement in the WKRVEP, suggesting that "[It] doesn't make any sense, go past one weed just to get to another". And that "[Weed work should] make the place and this country healthy again, not just kill lots of the same plant."
- The Wunggurr Rangers managing Coffee Bush on the verge of the Gibb River Road because it is identified as a weed by DPaW.

Rangers and Ranger coordinators suggest that the dominance of mainstream environmental weeds discourse in weed work has been heavily influenced by the education that the Rangers receive as a part of their conservation and land management (CLM) training. This training has a strong technical focus and educates Rangers in line with mainstream environmental weeds wisdom. Although Rangers and those involved in weed management

education suggest that training models in the Kimberley have adapted their approach to become more relevant to local requirements, they remain predominantly technical and fundamentally grounded in Western conservation ideology.

Some of those administering training in the Kimberley suggested that Aboriginal Rangers are becoming accredited in CLM; therefore they are taught the skills to undertake this type of land management. Summed up by one of the weed training demonstrators; “[weed management] training is not a cross-cultural forum” (Broome, July 2013).

This assessment of weed management training is supported in cases of Aboriginal weed work from other parts of Australia. From central Australia Barbour and Schlesinger (2012:39) state:

“Within these training programmes, the attention can sometimes be too much on how to control weeds and less on working out why weed control may be important. This is a particularly important point when we consider that the values behind the training are grounded in a Western conservation ethic and are generally not questioned, even though they may no longer make sense in the context of Indigenous land management.”

This is also the case in Cape York and is detailed by Smith (2013:277), who argues that:

“What needs considerable attention for future land management arrangements, including weed management, is training that is essentially ‘Aboriginal’ but still satisfies Western accreditation. Until there are major changes to the way this TAFE style training/capacity building takes place, the types of marginalisation...will continue.”

Rangers understand that their training is grounded in a particular ideology, some openly criticise this. Most directly, a Nyulnyul Ranger challenged the weed management training he had just completed:

“[Working on Country] want us to manage country blackfella way, hard when we have to go through this training and [TAFE] only teach us this one [whitefella] way. Weeds [are included in this] too, you know”. (Beagle Bay, September 2013)

With reference to the weed work on Coffee Bush undertaken at Ardyaloon, a Bardi-Jawi Ranger also spoke about the influence of their education “we don’t know any other way [to

manage weeds], only taught this one way, you see". Rangers sometimes explained that they felt liberated when my project offered them an opportunity to think about alternative ways of understanding and controlling weeds. As Bardi-Jawi senior Ranger Lloyd, explained to his Ranger group during one of our first meetings "he (referring to me) wants to know how we'd do it if we could do it the way we like. There is a different way...our way to do things. How would we do it?"

"There's no Aboriginal knowledge about weeds"

There is a commonly held assumption in the field that *there is no Aboriginal knowledge for weeds*. I encountered this assumption from mainstream environmental managers from the outset of my time in the field. Even more unsettlingly, I encountered these views from Aboriginal Rangers and elders. Elders frequently told me, particularly during initial stages of my fieldwork, that they did not know about weeds and that I should speak to the Rangers instead, because they had been 'educated' and 'knew' about weeds. I found this assumed lack of knowledge to rest on two main factors: Firstly, because environmental weeds are framed as a 'contemporary' issue it negates the relevance of 'traditional' Aboriginal understandings; and secondly, because of the reductionist, species-led and technical focus that dominates weed discourse and management.

The supposition that environmental weeds represent a 'contemporary problem' in NCRM means that they require a 'contemporary solution'. This was explicitly stated by the DPaW employee in Kununurra who told us during our scoping trip that:

"Aboriginal knowledge is important, but they don't know about weeds because these were introduced after colonisation. They need to be educated about how non-native invasive species harm the environment and need to be trained to control them with modern methods."

This was also implied by Larry's assertion at the opening of the thesis, that "Weeds are a kartiya problem". Later, he explained that what he meant by this was that "Weeds have been brought here by kartiya, that means it's a new thing, a new problem."

The vast majority of plants that are considered environmental weeds and are managed by Aboriginal Rangers have arrived and naturalised in their current location since European colonisation; therefore it is supposed that Aboriginal people do not hold 'traditional knowledge'

about these plants. The relative stability of northern Australian ecosystems prior to colonisation is also presumed to indicate that Aboriginal people have not encountered such a rapid rate of vegetation change and disturbance as is now occurring (Miller and Schultz 1993).

These assertions depend on the assumption of Aboriginal knowledge as 'of the past' and 'static' and does not have the capacity to incorporate new concepts or adapt to changing environmental conditions. It also disregards the past 150 years, in which Aboriginal people have been living alongside these plants and changing environments in the Kimberley.

Aboriginal knowledge and IEK are neither of the past nor static (Holt 2005). The construction of such is misleading and marginalising (Simpson 1999, Berkes 2009). In terms of Aboriginal NCRM, Marsden (1994: 47) points out "The danger is that we perceive cultures as discrete, bounded systems in a functional way and, through certain forms of representation, present them as undynamic and unchanging." Berkes (2000:1259-60) reinforces this point in terms of adaptive environmental management, stating that Aboriginal knowledge (or TEK in this case) "can be viewed as a 'library of information' on how to cope with dynamic change in complex systems."

In Australia, a number of scholars have demonstrated Aboriginal knowledges' dynamism and adaptability to changing environments and how this emphasises the agency of Aboriginal people in environmental change and management (Holt 2005, Gammage 2011). Strang (1997:171) points to this agency and adaptability, suggesting that for Aboriginal culture "the human environmental relationship is essentially dynamic...It is thus a creative process of integration and adaptation." Bradley (2011:5) also recognises that in terms of Aboriginal people's relationship and understanding of country that "no landscape is static" and highlights "the importance of acknowledging people's changing interactions with place".

The reductionist, species-based and technical approach to mainstream and Aboriginal weed management in the Kimberley has created the idea that 'knowledge' about weed management is strictly about knowledge of species and their technical control. At an early point in my fieldwork, a Bunuba Ranger told me that it was no use speaking to elders in his community because they did not know anything about 'weeds'. I asked what he meant by this and he explained that they had no idea which plants were "weeds" and which ones were "just plants". As a part of his explanation he mentioned that "none of [the elders] would even know what a WoNS is" let alone identify one of them. Elders touched on this, frequently assuming that their lack of knowledge

about particular weed species was a lack of knowledge. Many also conflated their lack of technical knowledge about weed control with the lack of any knowledge. For example when I asked a Bunuba elder why he had told me that he did not “know anything about weeds”, he told me that he “wouldn’t know where to start with all of those chemicals”.

Rangers’ weed work in the Kimberley usually begins at point of technical control. This technical focus distracts from underlying questions of what is being controlled and why. The action of killing weeds is separated from its purpose and significance, which is left in the background. This was recognised by the *Weeds on Native Title Lands, Broome* workshop, as Duff reported:

“Weeds management requires technical, scientific expertise, such as training in how to stop the spread of particular weeds, and it is here that management priorities may implicitly or explicitly ignore the Indigenous values that are central to weeds management on native title lands.” (Duff 2012:1)

As critical voices in invasive species discourse have suggested, knowledge about weeds is holistic, relational and value-based, despite the reductionist, species-based way they are more commonly dealt with (Sagoff 1999, Rotherham 2005). Aboriginal understandings of land management issues have been demonstrated to be based on holistic relationships, imbued with care and ethics (Rose 1996, Muir *et al.* 2010), in contrast to the current “preoccupation with...itemised lists or inventories [that] is a feature of the dominant entity-and-category orientation of values in conservation discourse” (Jackson 2006:28). Therefore, by emphasising the holistic and relational nature of weeds, it foregrounds the “emotional and sensory engagements” that Aboriginal people use to make decisions about weeds, and dispels the myth that there is no Aboriginal knowledge for weeds (Bradley 2011:3).

The assumed lack of Aboriginal knowledge about weeds marginalises Aboriginal perspectives and allows the dominance of mainstream discourse and management. This reinforces a lack of Aboriginal agency in directing weed management, which in turn, reinforces the assumption that Aboriginal people lack knowledge about weeds. This is displayed in figure 7.3.

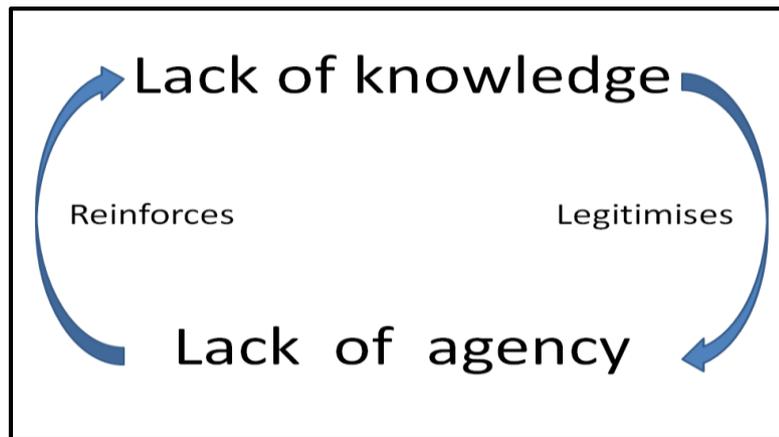


Figure 7.3 Lack of knowledge and a lack of agency in decision making

This lack of agency has implications for weed work because elders do not feel comfortable contributing their perspectives to work plans. As such the development of Ranger groups' work plans is transformed. Figure 7.4 illustrates how weed management work plans are made. It is based on discussions with Rangers, elders and those who have taken part in work plan development through their role in the KLC or the Federal Government.

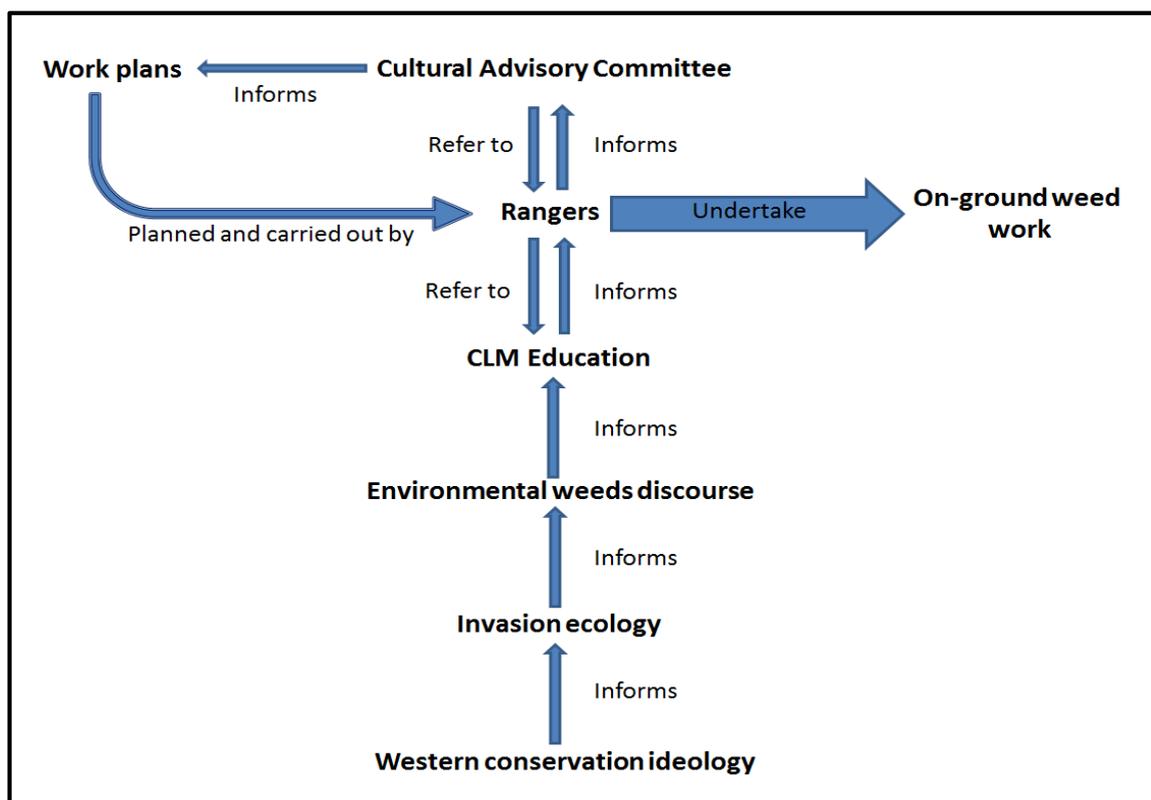


Figure 7.4 The 'actual' weed work planning process

- Along the guidelines of the Working on Country and IPA work planning process, Rangers seek advice on managing weeds from the Cultural Advisory Committee.

- Elders on Cultural Advisory Committees feel they “do not know about weeds”.
- Elders therefore refer weed management decisions to the Ranger coordinators and senior Rangers because the Rangers are ‘educated’ and ‘experts’ on weed management.
- These Rangers refer to their CLM education (underpinned and informed by mainstream environmental weeds discourse) as the basis of their expertise to inform their opinions.
- The Rangers provide these opinions to the elders, who have little choice but to agree with them.
- A work-plan for the Rangers is developed based on these opinions.

Although the assumption of ‘no Aboriginal knowledge about weeds’ seemed pervasive, towards the end of the project a number of elders and Rangers challenged it directly. They argued that regardless of whether or not they understand modern methods of control, or whether they have faced the issue of environmental weeds in the past, this does not mean that they should be excluded from the issue in the present. To quote them:

“We have ideas about how these new plants belong now.”

“We’re here together now, we know [new plants] pretty well.”

“I don’t know how to kill Buffel Grass but I know I don’t like it.”

“Don’t need to know what it’s called to know it’s bad for country.”

As these quotes suggest, although Aboriginal people might not possess knowledge regarding the name or physiology of an introduced or invasive plant, or how to handle and use synthetic herbicides to kill them, they do hold knowledge and values for their country which allow them to guide weed work.

Reflections on environmental weed discourse

Like Jimmy, Aboriginal elders and Rangers reflected on the mainstream concept of weeds, according to the mainstream classification ‘triad’ of *origins, behaviour and impacts*.

[Origins: Non-native plants in place](#)

The relevance of the concept of nativeness is of little categorical significance to Aboriginal elders in the Kimberley. On only three occasions (once from Ngurrara and twice from Bardi-Jawi) did elders express negative attitudes towards plants for the reason that they had arrived from

elsewhere. For both of the Bardi-Jawi elders, instead of a flat-out rejection of the plant based on its origins, their reservations were expressed in terms of not yet “knowing” this plant or how it might affect the health of country. Instead, although elders were frequently curious as to the origins of some of the plants that they recognised as ‘not from here’ or ‘kartiya plants’ (outsider or whitefella plants), this did not play any significant role in forming attitudes to towards these plants.

Non-native plants can be good

Elders frequently commented on non-local plants that were good. Table 7.1 outlines the non-local plants that were considered favourably by Aboriginal participants.

Table 7.1 Aboriginal participants’ positive attitudes towards non-local plants

Species:	Considered favourable by:	Favourable because:
Mimosa Bush (<i>Acacia farnesiana</i>)	Wilinggin, Bunuba	Used as an analgesic for toothaches; used to make boomerangs; resilient, ‘protects’ cattle country where little else will grow
Kapok (<i>Aerva javanica</i>)	Bunuba, Ngurrara, Wilinggin	Cottony heads are used to stuff pillows, mattresses and saddles (particularly by cattle musterers)
Rain Tree (<i>Albizia lebbek</i>)	Bunuba	Good shade; attractive colourful flowers
Neem Tree (<i>Azadirachta indica</i>)	Bardi-Jawi, Bunuba, Wilinggin, Nyulnyul	Provides very good shade; inhibits undergrowth; produces a natural insect repellent that keeps bugs (particularly mosquitos) away
Calotropis (<i>Calotropis procera</i>)	Bunuba, Wilinggin	Feed for cattle at certain times of the year; Resilient, and can grow in heavily grazed areas
Yellow Oleander (<i>Cascabela Thevetica</i>)	Bunuba	Attractive flowers; good ornamental garden plant

Buffel Grass (<i>Cenchrus biflorus</i>)	Bardi-Jawi, Bunuba, Ngurrara, Wilinggin	Very good cattle fodder much higher protein than most local grasses, fattens up 'killer' quickly
Butterfly Pea (<i>Clitoria ternatea</i>)	Bardi-Jawi, Nyulnyul	Attractive flowers; good ornamental garden plant
Mintweed (<i>Hyptis suaveolens</i>)	Bardi-Jawi, Wilinggin	Smells nice (especially after rain); children can make spears from stems
Bellyache Bush (<i>Jatropha gossypifolia</i>)	Bunuba	Keep ticks off dogs; good to plant along fences to create colourful hedges
African mahogany (<i>Khaya senegalensis</i>)	Ngurrara, Wilinggin, Bardi-Jawi	Provides excellent shade (particularly in the desert)
Lantana (<i>Lantana camara</i>)	Nyulnyul, Bunuba	Attractive flowers; seen as a good ornamental garden plant
Passionfruit Vine (<i>Passiflora foetida</i>)	Bardi-Jawi, Bunuba, Nyulnyul, Wilinggin	Ripe fruit consumed, particularly by children and people who are walking country; provides habitat and fruit for animals (particularly birds)
Tamarind (<i>Tamarindus indica</i>)	Bardi-Jawi, Wilinggin,	Tasty fruit; good shade tree
Chinee apple (<i>Ziziphus mauritiana</i>)	Bunuba, Wilinggin	Fruit is consumed, rare but very popular

This demonstrates that since these plants have arrived on country, people have sought out uses for them and adopted ways of making them favourable, rather than disregarding or demonising them. These favourable attitudes also undermine the assumption that Aboriginal people and Aboriginal knowledges are static and unfit to adapt to new (post-colonisation) plants and landscape change.

Native plants can be bad

Elders further undermined the automatic designation of ‘native’ as more favourable than ‘non-native’ by speaking about local plants that had become problems on country. Although the majority of plants that elders and Rangers mentioned as ‘bad for country’ or ‘weeds’ are non-native or non-local, several local plants were also cited as causing problems:

- Pindan Wattle (*Acacia tumida* or *Wongi* in Bardi-Jawi) growing abundantly near the side of vehicle tracks on Bardi-Jawi and Nyulnyul country made visibility around these tracks poor. Although Pindan Wattle is considered a useful plant (particularly for making spears), when it is growing abundantly in these places it was considered dangerous to humans and harmful to country.
- Melaleuca and Soap Wattle growing at Wili on Ngurrara country was cited to be encroaching and taking water from *jila* and making these water places unhealthy. Although these plants are important because they provide protection for *jila* and are used to find the location of *jila*, they need to be controlled (usually burnt) so that they do not get too close and affect the ability of *jila* to provide water.
- Pandanus growing abundantly at Brooking Gorge on Bunuba country was cited by elders as disrupting the correct flow of the water at this place and upsetting the ‘feel’ of the Gorge. While Pandanus is an important local species, its abundance can “upset the balance of water places on country” (Bunuba elder: Geikie Gorge, September 2013).
- The prolific growth of Speargrass following frequent burning can obscure visibility through country and affect access to important sites on Wilinggin, Bunuba, Bardi-Jawi and Nyulnyul country. This was significant because elders and Rangers suggested that it inhibits people’s ability to hunt and also affected the look of country. In response, local people had burned the grass, which in turn promoted its regeneration and increased its abundance.
- ‘Walkabout Weed’ (*Crotalaria crispata*) was spoken about as a weed by elders and Rangers, particularly those who have been involved in the pastoral industry, because it caused serious health problems for cattle and horses.

In each of these cases the categorisation of these plants as ‘native’ or ‘local’ species made no difference in their classification as bad for a particular part of country. As such, some elders who considered native species to be problematic suggested they should be managed by the Rangers like any other species.

Decoupling nativeness from belonging

The generally-held mainstream assertion that a plant's belonging is linked to its biogeographic origins was not shared by elders. Confronting this belief directly, a Bardi-Jawi elder mentioned that nothing will ever be able to come to belong if nativeness is the arbiter of belonging. Using the analogy of environmental weeds and *kartiya*, he suggested that despite being from elsewhere, "*kartiya* belong here now too".

Similarly, many elders spoke about non-native animals (particularly cattle) as belonging to country. Although they recognised that these animals might have originated elsewhere, some animals (namely cattle on Bunuba, Wilinggin and Bardi-Jawi country, and camels and cats on Ngurrara country) have become important additions to country.

Plants also come to belong on country. Examples of this development of belonging include:

- Bunuba, Ngurrara and Wilinggin elders who had been (some still are) involved in the pastoral industry spoke about Mimosa Bush, Calotropis and Buffel Grass as 'belonging' to cattle country.
- Bunuba elders near Fitzroy Crossing, and Bardi-Jawi elders on the Dampier peninsula spoke at length about how, as children, they used to snack on Passionfruit Vine as they explored their country. Most suggested that Passionfruit Vine belongs on country and want children to have the same experiences with the plant as they did.
- Neem Trees reminded Wilinggin elders who grew up around Derby of the times that were shared with family and friends underneath these trees. Some of the people they spoke about had since died and these trees brought back fond memories. The memories attached to these trees suggest that Neem Trees now belong to that place.

Views on how long this belonging takes to develop varied. A number of elders suggested that the belonging of a plant was underpinned by its presence and ability to succeed in its current environment. As a Bunuba elder posed regarding a Neem Tree we were sitting under in Fitzroy Crossing "it's here now, [shouldn't] that mean it belongs?" The majority of elders provided examples which suggested that 'belonging' developed over one or two generations. Elders pointed out that many of the weeds we were talking about and which were 'in the book' had existed on their country "since little kid time" (since they were children). The strong association formed between some of these plants and Aboriginal people and Aboriginal country over these times meant that they are now considered to belong to that country.

Behaviour: Reconsidering invasion

Elders are keenly aware that some plants spread quickly in particular environments. This was definitely something to be watchful of, particularly in important or vulnerable parts of country. However, that a plant might spread quickly (is invasive) does not render it as automatically unfavourable. These plants were commonly referred to as 'cheeky' but this behaviour, in itself, was generally not framed as being negative. Instead, this behaviour was context dependent and interpreted according to how this behaviour was affecting the health of that country.

A standout and direct reflection on the mainstream interpretation of invasive species (and species invasion) was offered by Donnie, a Wilinggin elder and cultural advisor to their Indigenous Protected Area. Donnie directly confronted why he thought invasiveness was so threatening to *kartiya* and why it played such a significant role in informing environmental weed classification. As he put it, "*kartiya* need to control everything, something out of control, it's no good for *kartiya* ... *kartiya* like it their way and usually have it their way". Donnie linked his ideas of control to his ideas of colonialism, suggesting that colonialism was a way to control people, "so *kartiya* have the whole world the way they want it". In relation to environmental weeds and mainstream environmental management, he suggested that, "country is just another thing to be controlled" and that invasive plants threaten this perception of control over country. This means that they are demonised as 'weeds' and must be destroyed to "get back order, get back control". Donnie contrasted this to his own understanding of country and control. He mentioned that country has always changed and people should respect its agency to control itself, therefore people should adapt to country rather than always trying to control it. Donnie highlighted that since colonisation Aboriginal people have needed to adapt to significant cultural and environmental changes, caused by 'invasions' "we're used to it now, it's usually out of our control...We [are] good at adapting, we gotta be" he added with a chuckle.

Invasiveness as a positive

Some elders, particularly those from Ngurrara, Bunuba and Wilinggin, commented on the invasiveness of certain plants as a positive attribute. A plant's invasiveness or its local abundance were sometimes perceived as a sign of health, especially when the plant provided food. Elders and Rangers from Bardi-Jawi, Nyulnyul, Bunuba, Nyikina Mangala and Wilinggin all appreciated the invasiveness and abundance of Passionfruit Vine as a reliable source of 'good tucker'. Bunuba and Wungurr Rangers and elders also expressed wishes that some of the other

'weeds' were more invasive. In particular, they expressed that Rosella and Chinese Apple should become more invasive as these were both sought after sources of tucker, however were scarce on their country. Referring to Rosella, a Ranger asked me "you think it would be really bad if I planted a weed? I know it's a weed but it's so good (tasty)." I suggested that it was up to him but warned him that it might spread – as weeds tend to do. He replied "that's the best thing that could happen!"

Invasiveness was also seen as a positive attribute in that it demonstrated the plant's ability to grow in parts of country which other plants could not. In particular, Calotropis and Mimosa Bush were cited as "good" and "tough" plants because of their ability to prosper in heavily grazed areas where other plants did not or could not grow. As Roger, a Wilinggin elder who had been involved in the pastoral industry for five decades told me, "[Calotropis], he's a tough one, grows out there in cattle country". Similarly, Peter, a Bunuba elder who had also spent his youth as a cattle musterer, told me in terms of Mimosa Bush that "it's tough, pretty good, [there would be] nothing out there on cattle country without it." He continued to suggest that these plants "protect country" from what would otherwise be "nothing, just dirt".

"It's about people, not plants"

Downplaying the invasiveness of the species itself, elders commonly attributed the invasiveness of plants as a symptom of people's engagement with country. A Bardi-Jawi Ranger and cultural advisor suggested, when thinking about the spread of weeds: "It's about people, not plants". This framed the rapid colonisation and spread of certain plants as a result of the absence of people on country, or else people's improper use of country.

Invasive plants were perceived to pose problems around sites that were no longer frequently visited by people. Elders on Wilinggin country recognise that the majority of significant places on their country are remote, and invasive plants might become a problem at these sites. Suzie, a Wilinggin elder, used the example of Kurunjie, an abandoned cattle station homestead where she had grown up and had moved away from in the 1990s. Kurunjie is significant to her clan group, however due to its remoteness, has become infrequently visited. Even though it had only been two years since Suzie had visited the site, when she returned it had changed significantly. As she put it, "I looked away and all of a sudden all this [mintweed] everywhere." Although Suzie did not consider mintweed a problem in this place, she highlighted

the short time period in which plants could establish and become abundant when people were not on country.

Invasiveness was also connected to a lack of people on country by Bardi-Jawi Rangers and elders, who mentioned it in relation to the rapid spread of vines on the islands to the northeast of the Dampier Peninsula. Bardi-Jawi people only rarely visited these islands and had noticed the rapid spread of vines (mainly Passionfruit Vine and Siratro) between visits. The invasive attributes of these vines tended to be tolerated on the mainland because people were present and could monitor them; however the absence of people on the islands meant that they posed a threat to the health of that country.

Buffel Grass was also mentioned as a problematic invader in places that were infrequently visited. Bardi-Jawi people spoke about vine thickets that were difficult to access and how Buffel Grass had become prominent in some of these places over the last five to ten years. Ngurrara elders and Rangers also spoke about Buffel Grass as a problem at remote, infrequently accessed water sites in the desert. As people were no longer around to care for these places, Buffel Grass had begun to encroach upon *jila*, affecting important local vegetation and negatively affecting the health of that country.

In each of these cases the 'problem' was framed as people not being (able to be) present on country rather than the invasiveness of the plant. The absence of people had allowed the plant to spread in a way that might become problematic. Therefore, instead of management focusing on controlling the invasive plants, most elders suggested that management needed to be first and foremost about visiting and re-establishing a human presence on country.

People's improper use or overuse of country was also cited as being responsible for the invasiveness of weeds. This shifted focus towards the human role in the dispersal of these plants – both through direct transfer and through the creation of landscape disturbance.

The human role in plant dispersal/invasion was mentioned directly, in terms of people physically transferring plants to new places. This occurred most commonly in the cases of weeds that attach to people by prickles and burrs. Bunuba elders suggested that Gallon's Curse will continue to spread as long as they kept sticking to people and people kept visiting country. Bardi-Jawi elders mentioned the role that footwear has played in the spread of Caltrop (a ground layer prickle). They spoke about how nobody (especially children) previously needed to wear thongs

or shoes when visiting and walking country. However, recently, the prickles made going barefoot impossible, or at least very uncomfortable. Wearing shoes and thongs allowed people to continue walking after the prickles had stuck to them, which would, in turn, allow the prickles and the plant to spread. To solve this problem, an elder joked that “shoes should be banned, everybody should be barefoot!”

Elders and Rangers from Bunuba, Bardi-Jawi, Nyulnyul and Wilinggin frequently spoke about the habit of weeds to follow tourists. Their country includes some of the main tourist routes in the Kimberley (Geikie Gorge, the Dampier Peninsula and the Gibb River Road) and mentioned the increasing volumes of tourists that they are encountering. Tourists travel enormous distances so can inadvertently transport weeds with them over similarly large distances.

Elders and Rangers also emphasised the link between human-induced landscape disturbance and plant dispersal and spread. Wilinggin elders and the Wungurr Rangers had noticed that ever since a vehicle track to an airstrip near the Mt Barnett community had been graded, Calotropis and Grader Grass had existed on its verge. However as one elder pointed out, while these plants had existed on the verges for at least a decade they had never managed to colonise the undisturbed areas beyond the roadside. Therefore focus should be on preventing further landscape disturbance around this site, rather than killing the plants which had colonised these disturbed areas.

In terms of landscape disturbance, Bardi-Jawi and Nyulnyul Rangers on the Dampier Peninsula are critical of tourists because they can use country irresponsibly and disrespectfully. In cases where they have created landscape disturbance – particularly through the off-road use of four-wheel-drives in ecologically sensitive areas such as sand dunes and vine thickets – tourists are blamed for the spread of weeds. Elders mentioned that this is a major concern, especially considering the plans to pave the Broome to Cape Leveque Road. This is likely to significantly increase the number of tourists on an already popular tourist route, which in turn will increase the amount of landscape disturbance and the number of weeds entering and establishing on Bardi-Jawi and Nyulnyul country. Again, instead of the focus being on the plant/weed as the problem, these observations refocus the problem to the human context of weed ‘invasion’.

Impacts: Change is not harm

During a discussion about the changes that weeds have made to Bardi-Jawi country, Paddy, a traditional owner and the father of one of the Rangers, told a story about the history of the sand dunes that lay between his community and the coast. Linking it to our discussion of change, he told me that “the sand dunes have always moved, the places change, the plants change, so do the people”. These sand dunes have always changed through time and people have adjusted where and how they live accordingly. This was neither good nor bad, it was change – people adjust to change. Paddy stressed that amid these changes it is crucial to maintain Law and the health of country. He used the example of a vine thicket and an *Albay* (a culturally significant tree) which existed between the coastal sand dunes and his community of Djarindjin. These parts of country are important because of the Law, knowledge and values embedded within them. If the shifting dunes threatened the values attached to this country, then this change would be harmful – otherwise, shifting sand dunes is just change. His message was clear, change is change, and harm is harm.

Wilinggin elder Donnie put it more directly:

“Country takes its course and changes, maybe for the better, maybe not. Places are changing, that’s how it is. It is not always obvious whether these places are better off or worse after the change. This will always take time to understand...We need to make sense of change.” (Ngallagunda, September 2013)

The following vignettes outline some examples offered by elders that demonstrate the differentiation between change and harm:

- The stand of Coffee Bush on the side of the Gibb River Road managed by the Wunggurr Rangers at the beginning of 2014 was well-known by the elders in that area. Although they acknowledged that the Coffee Bush had changed the look of that part of country, this was “not a big problem, this place [is] just bush” and not any sort of priority.
- *Calotropis* growing on the verge of a road near Fitzroy Crossing which two DPaW staff considered to be ‘in need of management’, did not bother the elders living nearby. According to these elders, “those [plants] are just there...no problem”. The elders acknowledged that these plants had changed the look of this place. Although this was not ideal, no one worried about it because it “doesn’t look right anyway, it’s a road”.
- Introduced vines (*Passionfruit Vine*, *Siratiro*, *Hairy Merremia*) line the entrance road to a property and a beach on the Dampier Peninsula. Bardi-Jawi elders agree that the presence

of the vines has changed the look of this place; however no one felt that their presence there is causing any harm to people or country.

This attitude to change is also demonstrated by people's positive attitudes to new plants. In these cases, while it was recognised that plants change country, many of these plants caused changes which are beneficial.

Elders are proud of their culture's ability to make use of what is around them and some believe that this should be translated into making the most of new plants and changes to country. Ngurrara elders in particular highlighted the difficult desert conditions in which their ancestors survived. They appreciated the imagination of their old people to have developed such knowledge and adaptive capacity.

Roger, a Bunuba and Ngurrara elder reflected this attitude as we walked along Geikie Gorge. He pointed out a freshwater mangrove and told me how his people used the bark of the mangrove to create a poison to stun fish so that they could be easily collected. He was proud of this knowledge and wondered "how they worked that one out". He mentioned that it must have taken generations to understand and perfect this practice. Shortly after, he pointed out Kapok and told me about how he had used the cottony heads of the flowers to stuff his saddles and pillow cases when he worked as a cattle musterer. I told him that it was considered a weed, which surprised him. He pointed out Passionfruit Vine as a good source of food, which I also told him was also a weed. He asked me to point out the other weeds. I spotted Calotropis and Buffel Grass and he told me that both are eaten by cattle. I spotted Mimosa Bush and he told me that he had used it for toothaches when he was working as a musterer. I pointed out several more weeds, including Gallon's Curse, Mission Grass, Khaki Weed, Mintweed and Parkinsonia. He didn't know these but was certain that if Bunuba and Ngurrara people were given enough time they could find a use for every plant that I told him was a weed. He was proud of all the uses that his people had for the different plants on their country and was puzzled that *kartiya* had been so quick to demonise these new plants and the changes they cause without giving them a chance to become useful. As Roger summed up at the end of our walk, change can be good for country too, "depends on how you look at it".

Conclusion

The starkness of Jimmy's reflection highlights the cultural relativity of mainstream environmental weed classification. To him, the *kartiya* system of classifying weeds that demonises plants for acting "*just like kartiya*" seems like "silliness" and does not match up with his relational and contextual understanding of plants on country.

Even so, Aboriginal Rangers base the majority of their weed work on mainstream wisdom. For Roxy, like many of the Rangers, this has created a sense of frustration and pointlessness around weed work, primarily because it seems disconnected from the cultural priorities that are supposed to underpin it. However, as Roxy suggested Rangers feel that in terms of weed work, "this is the only way".

Rangers and Ranger coordinators are aware of particular 'strings' that are attached to their weed work that make it largely out of their control. These strings pull their weed work towards mainstream weed management wisdom and away from its cultural significance. The constant need to secure funding from within a centralised NRM structure; the dominance of invasion ecology and mainstream environmental weeds wisdom; and the assumption that there is no Aboriginal knowledge about weeds, all undermine Rangers' potential to pursue weed work based on cultural perspectives.

The reactions voiced by Aboriginal people in this chapter emphasise that they are not happy with the current paradigm. There is a desire to conduct weed work differently, in a way that connects it to their perspectives.



WEEDS AND HEALTHY COUNTRY

On a trip to Ardyaloon I was accompanied by Pauline, a member of the Bardi-Jawi Cultural Advisory Committee and the auntie of one of the Rangers. The Ranger had introduced me as “Tom, the weeds guy” who was up from Melbourne researching Aboriginal people’s perspectives about weeds and had suggested that we should speak about my research during our trip.

Pauline told me that it was very nice of me to give her a lift, and she’d be happy to participate in my project, but that she didn’t know anything about weeds. She said that only the Rangers knew about weeds (something I was used to hearing by that stage). The subject of weeds obviously registered very little interest and I didn’t feel like pressing it, so instead I asked about her role on the Cultural Advisory Committee and their newly formed IPA steering committee.

Pauline told me that she considered her role to be a “healthy country adviser” and was proud to have an opportunity to share her knowledge about “healthy country”. She explained that this knowledge would form the backbone of their IPA Management Plan and be used to inform Ranger work. Pauline explained that she had enjoyed contributing to the plan because it involved her making more trips to country and visiting some of the islands that she had not visited since she was much younger. The knowledge about healthy country that Pauline had shared included stories and language names for places on her country, the plants and animals that are there, as well as how these plants and animals interacted with country – which includes how they are used and cared for by people. She asked me if I had taken part in the weed planning section. I told her that I hadn’t and asked whether or not she had contributed to it herself. She told me that she had not and repeated that she did not know anything about weeds.

Just after this conversation, we drove past a track that led away from the main road. Pauline began a story about the beach at the end of that track. She and her family go there a lot. It is a good spot because they can fish there all day and relax in the nearby vine thickets when they want to seek shade or find some bush-food. She was worried about this place because she had seen how some other vine thickets had been affected by new plants such as Buffel Grass. This was

followed by another story about the way that an important cultural site near a community now had Passionfruit Vine all over it and she didn't like this. Another story followed about how an elder at an outstation/homestead wanted the Rangers to come out and control the Mintweed so that access could be maintained to a particular fishing spot. Then there was another story about the spread of Passionfruit Vine on one of the islands that she had visited with the Rangers. Another story followed about Siratro blocking access to Law grounds, then another story, and another, *all* of them about weeds.

Between stories Pauline demonstrated an impressive understanding of the time and resource constraints of Ranger work and the need for strategy and priorities. She explained that the Rangers could "do some of this work but not all of it"; she suggested that the places that the communities use as well as important cultural sites should be prioritised for weed work; and that Rangers should be proactive in making sure that particular sites are kept entirely clear of particular weeds (for example the aforementioned vine thickets and Buffel Grass).

At the end of our journey I mentioned to Pauline that despite her hesitation to speak about weeds, it sounded as if she actually knew a tremendous amount about them and cared a lot about how they affect her country. Modestly, she agreed that this "might be" so. I asked why she had felt that her stories and her ideas had not been important or relevant to the IPA planning and why she had not shared them; she replied that she had been talking about 'healthy country', not weeds. It was only since putting weeds in the context of healthy country that she felt comfortable and confident to speak about them.

This was not the first time that the concept of healthy country had come up. But what stood out in this case was how it had transformed Pauline on the topic of weeds – from uninterested, disengaged know-nothing to interested, engaged, healthy country weed expert. Interest and knowledge had always been present however an appropriate cultural context had been absent. This space had come through the framework of healthy country.

Rangers consider "*caring for country*" alongside other phrases such as "*looking after country*" and "*keeping country healthy*" to be the most accurate descriptions (in English) of what Ranger activities should entail. It therefore makes sense to look at weeds through their relationship to country, particularly their impacts on the concept of 'healthy country'.

Country can be healthy or unhealthy. Elders and Rangers explained that 'Healthy country' encapsulates the proper functioning of an interconnected system of relationships

between humans and their environment, including the spirit world. Through the framework of healthy country, a 'weed' became a *plant that negatively affects the health of country*, more simply, *a plant that is bad for country*.

Some significant differences exist between the framework of healthy country to classify weeds and mainstream classifications. 'Healthy country' breaks down the disciplinary and sector-based divides between Western scientific ways of viewing the concept of 'weeds'. The scientific concept of weeds, although initially associated with agriculture, has expanded to be understood differently within different natural resource sectors such as horticulture, forestry and environmental conservation. Each of these sectors considers a weed differently according to the way that the plant interacts or interferes with that sector's 'desired nature'. For instance, agricultural weeds are not the same as horticultural weeds, both of which are different again from environmental weeds.

Aboriginal people do not draw similar discipline-based or sector-based distinctions (Rose *et al.* 2002, Bradley 2011). Thomas, a senior Bardi-Jawi Ranger, explained his vision for Ranger work, which emphasises the multiple interrelated outcomes that are included in the one goal of healthy country:

"It's all about healthy country...It's all part of it; gotta feed us, gotta look right, gotta do right by old people, gotta be there for our kids, we gotta be there for country...That's what we do as Rangers, and as Bardi-Jawi people." (Ardyaloon, July 2013)

As a target, healthy country highlights the holistic perspective through which Aboriginal people engage with their country, and by extension, the way the Rangers intend to manage weeds. Healthy country is not categorised into an agricultural sector, a horticultural sector and a conservation or sustainability sector. These are all one and the same. As Thomas articulated, Aboriginal people are at once thinking about healthy country as agriculture, (*gotta feed us*), gardening/horticulture (*gotta look right*), as well as conservation and sustainability (*gotta be there for our kids*), all within a cultural matrix which highlights the importance of relationships between people, ancestors, and Law (*gotta do right by old people...we gotta be there for country*).

Using healthy country to explore perspectives about weeds

We have seen that 'healthy country' is the best way to characterise Aboriginal perspectives of Ranger work, therefore what might this framework inform us about perspectives about weeds? That is, how might about Aboriginal perspectives about weeds emerge out of a healthy country framework? The following discussion addresses this question, exploring Aboriginal people's perspectives of weeds according to how they affect healthy country. In order of the frequency that they were mentioned by elders and Rangers, the aspects of healthy country affected by weeds were: having people on country; fresh water places; bush foods; spiritual and sacred sites; 'right-way fire'; passing on culture and keeping Law strong; and the 'look' and 'feel' of country. The way that each aspect of healthy country is affected by weeds is illustrated by stories and experiences from interviews and time spent in the field with elders and Rangers.

Having people on country

Having people on country is the most important aspect of healthy country. As I was frequently told, 'Country needs people and people need country'. Therefore, without people on country, and engaging with country, country cannot be healthy.

People can only be on country if they have access to country. In some cases weeds inhibit this access and therefore inhibit people visiting and engaging with country. This was the most prominent concern that I encountered during fieldwork.

This was evident in the case of vines and scrambling plants, which make it difficult to get through country by physically impeding access. The vines and scramblers that were identified by Rangers and elders included Passionfruit Vine, Siratro, Rubber Vine and Hairy Merremia. Elders noted that other weeds can also create such dense thickets that people cannot or do not want to get through. These other plants identified were Mimosa Bush, Noogoora Burr, Bellyache Bush and Parkinsonia. Long and dense grasses also make it difficult to access particular sites at particular times of year; these included Grader Grass, Mission Grass and Speargrass.

The Fitzroy River offers many sites for fishing, camping, and ceremonies for Bunuba people. However, the accumulation of Passionfruit Vine on the banks of the river between Fitzroy

Crossing and Geikie Gorge has begun to inhibit people from accessing the river and engaging with parts of this country.

One elder, Austin felt that it was important to show me these sites so that I could understand why they were important to the Bunuba people. This was Austin's *muway* (ancestral country) and he had heard from the Rangers that Passionfruit Vine was beginning to affect this place. He had four sites in mind to show me. Even though it had only been three years since he had visited these places, he could not find the access points to the first two sites because of the abundance of Passionfruit Vine. At the third site Austin eventually found the track to the river by using landmarks from the adjacent cattle yard. From there we set off down to the river. However, the Passionfruit Vine was too thick and we were unable to proceed beyond the first embankment. The fourth site was particularly important to Austin. At this site he was able to recognise where the access track should be however it was comprehensively overgrown by Passionfruit Vine.

By this stage, Austin had become determined to access the river. The ranger and I cut a path through the vine for him, but even so he found it difficult. He suffered from a breathing condition, which required us to take frequent rests. It took us 45 minutes to make the 250-metre trek to the embankment where we could see the river. This final embankment was also covered in Passionfruit Vine. The steepness of the embankment, combined with the density of the vine meant that, although we could see the spot that Austin wanted to show us, we were still unable to access it.



Figure 8.1 Looking for the access point to get down to the river

We sat and watched the river as Austin pointed out significant landmarks and told stories about how he remembered this place. Threaded through his stories was a sense of despair that people (especially old people) were no longer able to come here and had obviously stopped doing so. He saw the abundance of Passionfruit Vine as a symptom of this lack of human engagement. He suggested that it had become “all too hard, even just getting here” which meant that “people [will] just go to places closer to town and that are easier”. People could not hunt here, people could not fish here, people could not camp here, people would stop bringing young people here and the Law embedded in this place would become weak.



Figure 8.2 “All too hard”, almost at the river but too much Passionfruit Vine on the final embankment

I related this story to other Bunuba elders. Most were familiar with our experience trying to access the river. I asked if this would change or had changed the way that they used their country, particularly the river. Most told me that they had already changed the places that they go to the river. These other spots are too hard to get to.

A number of islands to the northeast of the Dampier Peninsula face a similar problem with vines. These islands are significant to Bardi-Jawi people but are seldom visited by the Rangers because of the logistical difficulties of doing work there. Elders, including Pauline, who had recently been out to these islands spoke about Passionfruit Vine and Siratro becoming a problem because they restricted access to certain fresh water places. Less frequent visits by people were again said to be the cause of the proliferation of these weeds. The problem was self-perpetuating, as one elder explained, “If people are not there, those plants grow and grow...less people, more plants; more plants, less people.” Absence of people and restricted access to these places meant that they could no longer be healthy.

To deter tourists, the access tracks to some water holes on Wilinggin country are intentionally unmarked and difficult to find. The increased abundance of long grass along the graded areas on the side of roads, particularly near the turn-offs to these places, has meant that they are becoming increasingly difficult for even locals to find. Of particular concern was the recent establishment of Grader Grass. Previously, people had used fire to maintain access to these places, however Grader Grass had been noted to grow back in greater abundance after each fire. As an elder told me “it comes back thicker and thicker. Every time we burn now we get more and more of that [Grader] grass” (Derby, April 2014). People using the water holes, even just for recreation, ensured that people and country would remain healthy. As a part of this discussion Wungurr Ranger Junior mentioned that he had fond memories of these water holes and his experiences there had had a significant influence on him deciding to become a Ranger. He was worried that young people would no longer be able to find and use these parts of country.

Elders expressed the concern that the dense thickets created by some plants might be harbouring dangerous animals, in particular snakes and wild pigs. Bunuba, Bardi-Jawi and Wilinggin people commented that long grasses (Grader Grass and Speargrass) and dense vines (Passionfruit Vine, Siratro and Hairy Merremia) were making places unsafe for people to go because these were perfect spots for dangerous animals. When moving through these thickets, people cannot always see where they are stepping, therefore elders suggested that it is not safe for people, especially children, to use these places while these plants are abundant. Several elders remarked that children need to explore their country and that this exploration is necessary for their physical and cultural development.

Many elders mentioned the nuisance that particular plants can cause people on country. They suggested that such plants can stop people from wanting to go to parts of country where these nuisance plants exist. Prickly weeds such as Gallon’s Curse, Caltrop, Khaki Weed, Noogoora Burr, Goats Head Burr, Spinyhead Sida and Cobbler’s Pegs were frequently blamed for deterring people from visiting country.

Caltrop lines the access paths to the beaches around the Ardyaloon community and are very painful when they are stepped on (Figure 8.3). These beaches are important places for community members and families to meet, fish, have picnics and swim. That people use the beaches is integral to Bardi-Jawi culture and country. Bardi-Jawi people are saltwater people and

their Law, knowledge and culture are embedded in their interactions with their sea country. For Bardi-Jawi culture to remain strong and for people to keep country healthy, they must visit their beaches. Community members and elders alike spoke about the prickles that had started to become more abundant around these beaches. Although the prickles did not inhibit access to the beach, they provided a nuisance that the elders worried would deter people from going there.



Figure 8.3 The prickly weed Caltrop was commonly cited as deterring people from accessing the beach.

The nuisance that Gallon's Curse was causing on walking paths on Bunuba country was mentioned in Chapter Six. During an interview with an elder two days after my tangle with Gallon's Curse, I found another one of the burrs in my sock. I explained to the elder where I had picked it up; the elder was familiar with the spot.

Later in the interview the elder and the Ranger coordinator began to speak about the importance of 'walking country' and taking young people along on these walks. They pointed out that the place where I was 'attacked' by the Gallon's Curse marks the start of a culturally significant walk that takes in sites of spiritual significance and where people share Dreaming stories. The elder mentioned this as an important place that is close to town that can be used to engage young people in walking and learning about country. In recent times, particularly in the past four years, since the last major flood, parts of the walk have become infested by Gallon's Curse. The elder told me that during her previous visit, two of the young people with her refused to continue past the start of the track because they were pricked by the burrs (at exactly the same

spot that I was). Since then she has not tried to take young people out there because she knew that Gallon's Curse was becoming more abundant.

Several other nuisance plants, namely Cobbler's Pegs, Khaki Weed, and Spinyhead Sida, were also mentioned by elders for the same reason. The significance of nuisance plants was summed up by another Bunuba elder: "If you keep getting stuck by these prickles, you have a bad time; you have a bad time you stop going...people stop going, young people stop going, country is no good." (Fitzroy Crossing, September 2013).

Fresh water places

For each of the Aboriginal groups that I worked with, fresh water places are extremely significant parts of country. Elders and Rangers stressed that they are the life of country as they are the basis for the survival of humans and animals. Many water places also carry enormous spiritual significance, usually as the resting place for spirits and creator beings. People also have strong sentimental connections to water places, as many recalled coming together with family and friends to camp and share stories and knowledge.

Freshwater places were almost always mentioned by participants as the most important sites to keep free of weeds because of their cultural and ecological significance. Their importance is highlighted by Bardi-Jawi elders, who despite not identifying any water place as being threatened by weeds, still prioritised these places as the most important to protect from weeds.³⁹

A Ngurrara elder told me that fresh water sites are the life of the desert: "Without *jila* there is no Ngurrara, no desert people, nothing." (Kurlku, May 2013). At Purluwala, a *jila* (relatively) close to the remote outstation Kurlku, the elders noticed that Buffel Grass had 'upset' the *jila*. In particular, *marnkarl*, a ground layer succulent that grows near *jila*, had become significantly less prominent than Buffel Grass. A senior Ranger and cultural advisor explained to me that *marnkarl* was important to have around *jila* because it "keeps the *jila* healthy" by stabilising its sides and inhibiting erosion. He explained that "when the water dries up *marnkarl* protects the *jila*, when Buffel Grass comes it stuffs all this up...no *marnkarl* means there's no more protection for the *jila*"

³⁹ Significantly, the protection of water places was given higher priority than the protection of vine thickets – which are also enormously important to Bardi-Jawi people and becoming increasingly threatened by weeds.

(Purluwala, August 2012). The old ladies who were present also told me that *marnkarl* was an important plant because it was soft and provided a comfortable place to sit around the *jila*.

In former times, to maintain the abundance of *marnkarl*, the areas around the *jila* would be burnt to remove the dry grasses, allowing the succulent to become prominent. With the introduction of Buffel Grass to the *jila* burning no longer worked. Buffel Grass regenerated and spread quickly after fires in contrast to the grasses that had previously been present. Buffel Grass had begun to creep closer and closer to the *jila*, eradicating comfortable places to sit and threatening to reduce the stability of the soil on the sides of the *jila*.

Another major weed problem mentioned by Ngurrara people was at Loombuloombu, a site of permanent and 'living' water (see Figure 8.4). This site is closer to the Ranger base at Djugerari and is more frequently visited by Ngurrara people. As a place of 'living water' Bulrush has made Loombuloombu extremely sick. One Ranger explained to me that "living water should be open and clean, this is the exact opposite". And that he had "never seen a place like this...so sick". Another ranger remarked that seeing it like this was "hard...because it's so choked, makes me feel bad, don't like coming here when it's like this".



Figure 8.4 Bulrush completely covers and chokes a site of living water on Ngurrara country

Loombuloombu was also an important place for fish and other animals. Fish (black bream) used to be present here but since the Bulrush had ‘taken over’ one of the Rangers had seen “nothing, just a couple of minnows”. The Bulrush was also believed to have diminished the number of animals that were using the site. People observed that the desert is a hard place to live, even for animals, and that the animals relied on the people to keep places of living water healthy. As a place of permanent water this site was especially important because “animals can’t dig *jila*”. People were therefore responsible for keeping this water and this place clean, not just for people but also for animals. People could see from the presence of animal tracks that fewer animals had been using these water holes than before the Bulrush had come. This led one of the Rangers to comment that by letting Bulrush overrun this place he felt he was “letting down country”.

A clogged stream on Nyulnyul country was mentioned in Chapter Six. Before the establishment of vegetation at this site and while the stream still flowed, this place was healthy. Barramundi and freshwater eels were abundant. People could easily walk from their community to fish here and would almost unfailingly catch fish. On the other side of the stream several lagoons were used as swimming holes by young people. The Rangers told me stories about running over to

these pools to swim every day after school, loving that they had a freshwater place so close to town. On their way home they would fish in the stream, hoping to catch some barramundi to take home for dinner.



Figure 8.5 Nyulnyul Rangers surveying their previous swimming and fishing hole, now clogged with vegetation

As the water flow reduced and the pools became clogged with vegetation (including Bulrush, Bamboo, Melaleuca, Sesbania and native wetland grasses) it became impossible to fish or swim here (see Figure 8.5). During my discussions with Nyulnyul elders and Rangers from Beagle Bay, this site was always the first weed problem mentioned.

Bush foods

The harvest and consumption of bush foods is important to the health of Aboriginal people, Aboriginal culture and Aboriginal country. As I was told by a Wilinggin elder who is renowned for his hunting ability, “Healthy country means lots of bush food...Lots of food means that people are looking after country” (Derby, August 2013).

Bush foods include plants and meats and usually require traditional methods of harvesting such as the hunting of animals and the manual collection of bush fruits. Hunting,

fishing and bush fruit collection are cultural and communal activities that involve the transfer of knowledge and the living of culture, which in turn keeps it vital. Bush foods eaten at the correct time of year are commonly said to have qualities that make people strong and healthy. Eating bush foods was also mentioned as a way of decreasing people's reliance on fast food and packaged food from local stores and supermarkets, which has both health and economic benefits.

Weeds both directly and indirectly affect bush foods. Weeds that were cited as affecting the availability of bush foods were plants that directly outcompete other plants (namely Neem Trees and Coffee Bush), plants that change the abundance of bush food through fire (namely Buffel Grass and Gamba Grass), plants that make hunting difficult (including Siratro, Hairy Merremia, Passionfruit Vine, Speargrass as well as other long grasses), and plants that smother other plants (including Siratro and Hairy Merremia).

Monsoonal vine thickets on the coastal sand dunes of the Dampier Peninsula provide abundant sources of bush foods for Bardi-Jawi people. The fruits of *Goolay* (*Planchonia careya*), *Joongoon* (*Mimusops elengi*) and *Birimhiri* (*Diospyros ferrea*) among others are frequently harvested from vine thickets and eaten by Bardi-Jawi people. These fruits also have important medicinal qualities and are important for healing. Because of the abundance of bush fruits, vine thickets provide key habitats for foraging animals. Therefore they are also valuable hunting places. However, Bardi-Jawi people have observed that certain plants are becoming established in vine thickets and affecting the bush foods in vine thickets.

Neem trees are said to be particular problems in vine thickets, having been observed to establish and grow rapidly and then dominate the plant communities, pushing out food plants. Buffel Grass has been noted to establish an understorey in the thickets and therefore promote fire. Vine thickets do not have any understorey vegetation and are therefore extremely resilient to fires, which struggle to penetrate beyond their perimeter. However, encroaching Buffel Grass allows fire to enter vine thickets by providing a highly flammable understorey. As vine thickets are not accustomed to fire and do not regenerate quickly after fires (unlike Buffel Grass), such fires damage the vine thickets, decreasing their size and the bush foods they provide.

The same infestation of Buffel Grass that was affecting the health of the *jila* at Purluwala was also responsible for increased fire intensity around two significant *Turtujarti* (Desert Walnut trees) at

the same site. These trees provided fruit and shade for people when they visited this *jila* and are also spiritually significant trees. The increased fire intensity around these trees due to the presence of the Buffel Grass had affected their health. Rangers told me that since a fire three years ago one of the trees had stopped producing fruit. Having healthy *Turtujarti*, near the *jila* were all components of the health of this country – without this *Turtujarti* producing food the health of the whole site was affected. Since this fire, the Rangers have returned each year to do Buffel Grass control work at this site. The first time that I visited this site, one of the *Turtujarti* had started to produce fruit again. One of the old ladies told me that this was a “good sign” and “very important” for the health of Purluwala.

The effects that weeds have on bush foods are sometimes indirect and demonstrate that Aboriginal people understand the complex relationships between weeds and country. Elders and Rangers from Bunuba, Wilinggin and Ngurrara in the central Kimberley have noticed a recent decrease in the abundance of Konkerberry on their country, especially on country that overlaps pastoral leases. Elders and Rangers have blamed the decrease in Konkerberry, at least partly, on increased densities of Mimosa Bush which competes with Konkerberry for habitat.

As grazing intensity has increased, so has the abundance of Mimosa Bush, leading to a decrease in Konkerberry. People commonly mentioned the berries of Konkerberry (*Bunjarul* in Ngarinyin, *Briyali* in Bunuba, *Munyunwiji* in Walmajarri) as a popular bush fruit, eaten both fresh and when dried (see Figure 8.6). Konkerberry is also known colloquially among Aboriginal people in the central Kimberley as ‘Turkey Bush’, because the berries that the plant produces are eaten by the Australian bustard (*Ardeotis australis*, commonly known in the Kimberley as Bush Turkeys). Bush Turkeys are a very popular food for these people and are specifically hunted throughout the year. More recently, they have been difficult to find and hunt. The elders who mentioned the decrease in Bush Turkeys linked this to the decrease in Turkey Bush, ultimately created by the rise in Mimosa Bush. Explained briefly by one of these elders there were “No more turkeys around here now because there is no more Turkey Bush, too much that [mimosa] bush.”



Figure 8.6 Wunggurr Ranger pointing out a Konkerberry bush near Ngallagunda

On Bardi-Jawi, Nyulnyul and Bunuba country, long grasses and vines (of which Speargrass, Passionfruit Vine and Hairy Merremia were mentioned specifically), were said to be making hunting for bush meats difficult. Elders explained that these plants inhibited people’s ability to see through country and provided places for animals to hide. They added that these plants would also make it difficult to walk through country and take children hunting. However, one elder observed that it was unlikely that these plants will ever stop people hunting because “people [will] keep hunting, no matter what”. He suggested that they might have to manage these weeds in important hunting grounds in the future to “clear it up, make it good for hunting again”.

Spiritual and sacred places

Weeds are occurring in Law grounds, and around cultural sites and sacred places. Elders told me that the wrong plants at these sites this can be detrimental to the spirits that live there. When these parts of country becomes unhealthy – perhaps because of weeds – these spirits can take reprisals in the human world, bringing poor health. As a Wilinggin elder explained in relation to

the phrase 'healthy country healthy people', "It means more than just eating well; it's talking about spirits too." This was emphasised across interviews, in that weed management should be seen to have a spiritual component and be attached to the spiritual health of country.

Some frequently used Law grounds, particularly those that are located near communities, have become infested by weeds. Law grounds are culturally and spiritually significant places where certain ceremonies are undertaken and to which access is restricted to particular people at particular times. Most knowledge that relates to Law grounds and Law ceremonies is not spoken about publicly, especially with *kartiya*. Therefore, although most of the details of these cases were kept secret, elders expressed concern that weeds have inhibited people's ability to practice Law and conduct ceremonies at these sites. In some instances people mentioned that sites had been so adversely affected by weeds (usually vines) that they were no longer used.

Bardi-Jawi Rangers mentioned that *Calotropis* had been established at one of their Law sites. The *Calotropis* had existed at this site for a long time and, although it was thought to be increasing a little, was not posing any serious problems to people engaging with this site. Nevertheless, they thought that it should be removed because of the spiritual significance of this place.

One Law site that I was permitted to see, and which was mentioned in Pauline's stories, is located on the outskirts of Ardyaloon community. This site had become infested with vines (mainly Siratro, Hairy Merremia, Passionfruit Vine and Butterfly Pea) (Refer to Figure 8.7). Elders and Rangers commented that unless this site was cleared of these plants it could not be used.



Figure 8.7 Siratro and Passionfruit Vine cover the fringe of a Law site near Ardyaloon community

Bunuba Rangers and elders were worried that Parkinsonia had been spotted near a sacred men's place near the Fitzroy River. This place was a spring surrounded by sandy soil, which Rangers and elders had recognised as an ideal habitat for Parkinsonia. This was of extreme importance to an elder who had seen it near there, who explained,

“That Parkinsonia is trouble. I've seen it other places – it can be nasty, it likes water too. We should do our best to keep it away from [this place]...It can't get there, it would be terrible for [this place]” (Geikie Gorge, July 2012)

Despite these fears, this place remained weed free for the duration of my fieldwork. The elder and the Rangers attributed this to the frequent human presence at this site; as the elder said, “People are always there, they can watch it and know it. It'll be okay as long as people keep going there” (Geikie Gorge, October 2013).

Rock-painting and art sites were mentioned in a number of cases as important to keep clear of weeds. I was told of two sites where an art site had been threatened by weeds. Both sites were on Wilinggin country where it was believed that infrequent and incorrect burning had led to a number of grasses, namely Grader Grass, Buffel Grass and Speargrass, becoming prominent. These incursions had brought fire near to the art sites and it was believed that this would eventually damage it, which would make local spirits unhappy and local country unhealthy.

Spirits and creator beings exist in certain water places, so to neglect or mismanage them is disrespectful and can be dangerous. This spiritual component of unhealthy water places was mentioned as a problem more often than their disturbed ecological functioning or diminished human use. At some of these sites elders remarked that water should be flowing and plants such as Bulrush, Bamboo, Melaleuca, Sesbania and Pandanus were inhibiting flow and choking the spirits. At most water holes, open water, free from any vegetation is important so that the spirits are happy. A Ngurrara elder explained at Loombuloombu, "Plants in the water [at Loombuloombu] are bad, too many plants choke it up – the snake (creator being) – make it unhappy" (Djugerari, October 2013).

Single trees or groups of trees may be significant cultural places. This was highlighted by the Nyikina Mangala Rangers who stopped on their way to go fishing in order to manage the Buffel Grass and Gallon's Curse around the grove of Boab trees.

Another example involves an *Albay* (*Ficus virens*) on Bardi-Jawi country. This tree was mentioned by Bardi-Jawi elders and Rangers in Djarindjin as having 'always' been there and as culturally significant, especially to people in that community. Passionfruit Vine had begun growing around and onto the tree, and Neem Trees had also started growing around its base. Although no elders said they disliked Passionfruit Vine or Neem Trees in isolation (in fact people showed positive attitudes towards each of these plants), these species were perceived to be harmful in this place due to their negative influence on the health of the *Albay* and the site.



Figure 8.8 A significant *Albay* (*Ficus virens*) near Lombadina–Djarindjin is considered sick because of the Passionfruit Vine that covers it and the Neem trees that surround it

Konkerberry is a culturally significant plant for Bunuba, Wilinggin and Ngurrara people as it is used for smoking ceremonies. Elders claimed that besides its ceremonial significance the Konkerberry smoke has important healing qualities. The plant is also sought after by families who are camping on country because its smoke acts as an insect repellent – which I noticed to be particularly effective against mosquitos. However, as has been mentioned, the increased abundance of Mimosa Bush on Bunuba, Wilinggin and Ngurrara country has been blamed for a decrease in Konkerberry and difficulty in continuing these cultural practices.

'Right-way fire'

Fire is an extremely important tool for maintaining and restoring healthy country. 'Right-way fire' means using fire to reduce fuel loads to prevent late season hot fires, using fire to protect important sites, using fire to hunt, and to 'clean up country'. The majority of plants said to be upsetting and inhibiting the practice of maintaining right-way fire were non-native grasses. These grasses dry out earlier than native species and therefore promote hotter early season fires and

disrupt burning routines according to local Aboriginal seasonal calendars. These grasses included Gamba Grass, Buffel Grass, Grader Grass, and Mission Grass.

Some of the effects of ‘wrong-way fire’ caused by grass weeds have already been discussed according to how they affect other aspects of healthy. This has included how Buffel Grass has increased fire around art sites, within vine thickets and near *jila*; and how grader grass’ abundance after fire, and promotion of fire, has affected people’s ability to access sites on Wilinggin country.

The abundant Passionfruit Vine on the banks of the Fitzroy River and around Geikie Gorge was said by Bunuba elders and Rangers to be causing hotter, more intense fires. Passionfruit Vine becomes extremely flammable towards the end of the dry season, and can create intense fires when it begins to dry out (refer to Figure 8.9).



Figure 8.9 Rangers burning off Passionfruit Vine at Geikie Gorge (Source: Brad Scoble)

Bunuba elders and rangers spoke of a recent hot season fire that occurred around Geikie Gorge. Although the fire began as a ground-layer fire, it travelled into an area in which Passionfruit Vine had climbed the trunks of the trees (mainly large Eucalypts) and in some cases become draped between trees (refer to Figure 8.10). This increased fuel load allowed the fire to

spread into the crowns of the trees and through the canopy layer. Even late season 'hot' fires do not normally reach the canopy layer of the large trees; this was a new problem and not 'right-way fire'.

Elders and Rangers expressed concern that trees could be harmed by these intense fires. Some recognised that the trees are resilient and would be able to withstand such fires "once in a while", but the abundance and quick spread of Passionfruit Vine meant that such fires might happen more frequently and begin to damage these trees.



Figure 8.10 Passionfruit Vine climbing trees near Geikie Gorge

Elders living on Wilinggin country are aware of the threat posed by the encroachment of Gamba Grass. Gamba Grass grows quickly and much taller and thicker than other grasses, providing significantly increased fuel loads, which can promote intense fires. These elders have seen Gamba Grass on neighbouring townships and cattle stations to the east around Kununurra and know the risk it poses on Wilinggin country.

[Passing on culture and keeping Law strong](#)

Healthy country relies upon strong adherence to Aboriginal Law, which encompasses knowledge, language and spirituality. Keeping Law strong relies upon the ability of these aspects of Law to be transmitted across generations. This is becoming a key challenge for all Aboriginal groups and is of concern for the majority of the elders that I spoke to.

Law, and with it culture, knowledge, language and spirituality all exist and are embedded in healthy country. Their practice maintains healthy country, and in turn, healthy country maintains them – they become damaged when country is damaged. Therefore, weeds

that affect healthy country affect the potential to transmit Law to future generations. Several examples from previous stories highlight these concerns.

Following our unsuccessful trip to the Fitzroy River, when Austin, the Ranger and I were turned back by Passionfruit Vine, Austin challenged the Ranger to name all of the culturally significant places between Fitzroy Crossing/Bungardi and Geikie Gorge (approximately an 8km stretch of river). Austin commented that this was the Ranger's *muway* (country) and she should be able to name all of them. The Ranger named five – four of which we had just attempted to visit. Austin then listed another five or six. He pointed out that the places the Ranger was able to list were the places that were still used – or had been used in the last five or so years. He had named the places that people had stopped visiting. He suggested that in another generation even the places that the Ranger had named could be lost as a result of the Passionfruit Vine. Each of these sites had important stories attached to them and the damage caused to these places was damaging the potential to transmit these stories and this knowledge to future generations.

This is similar to the Bunuba elder who no longer tried to take young people to walk a particular part of country because of Gallon's Curse. The main reason that Gallon's Curse was a weed at this place was because it stopped young people visiting country, which would in turn inhibit the transmission of Law, culture, knowledge and language.

The practices of hunting, fishing and food gathering *are* Law. To undertake these practices with young people is essential for keeping Law alive and vital. If people's ability to harvest and eat bush-foods is damaged, so is the potential to transfer the knowledge that relates to this aspect of healthy country. Although it is not hard to maintain young people's interest and engagement in bush food collection (particularly hunting), a small number of elders were worried that if weeds did begin to affect the abundance of bush meats, it might make it harder to maintain young people's interest. This deterioration in interest would in turn diminish the elders' ability to pass on their knowledge.

Elders who mentioned that 'right way fire' might be harmed by weeds feared that their knowledge about fire might become less relevant to younger generations. A small number of elders said they were already finding it difficult to generate interest among young people about right-way fire and that if the old people's knowledge was seen to become less relevant, this could jeopardise the transmission of this knowledge even further.

The 'look' and 'feel' of country

Participants often commented on the 'look' and 'feel' of their country and the ways in which certain plants (or their abundance) affected this look and feel. Here are some quotes:

"Country gotta look right, too"

"Too big grass doesn't look right"

"Vines everywhere, looks wrong"

"Can't see through country, no good"

"Too much of that grass looks bad"

"That country looks like it's choked"

"Something at that place doesn't look right"

"Too much of that plant ... Looks out of balance"

People told me that the look and the feel of country are among the most important indicators of healthy country. Often people could not tell me exactly what part of the look or feel of the country was wrong but that they just knew it was. As a Wunggurr head ranger remarked – "if country looks and feels wrong, then something must be wrong".

Sometimes this was said about specific plants. For instance, people referred to *Calotropis* as "that funny looking one", and suggested that it "looks wrong for this country". In this sense it was more frequently designated as a weed because it "looks wrong" for a particular place, than for any other reason. Similarly, the second-most common reason given for Bellyache Bush being unwanted (behind being poisonous for cattle) was because of its appearance at certain sites. A Bunuba elder suggested that "it looks nice in gardens, here in town looks good. Out there [at Biridu] it doesn't look right...looks wrong for that country" (Fitzroy Crossing, September 2013).

Native plants could also make country look and feel wrong. Where Speargrass had been growing and was difficult to see through, elders told me that this looked and felt wrong. As Penny pointed out, the Melaleuca and Soap Wattle looked and felt wrong when they were too close to the *jila* at Wili. As I was told by the Bunuba Ranger coordinator following a trip to an infrequently visited Gorge, Pandanus did not belong there in such abundance because, according to the elders, they looked and felt wrong for that country.

Usually, the look and the feel of a plant in a place had other implications, and if enough time was provided for people to make sense of what 'felt' wrong, the underlying problem would become apparent. For instance, the banks of the Fitzroy River looked and felt wrong because of the abundance of Passionfruit Vine; however underlying this look and feel was the knowledge

that nobody had been around to look after this place and that people would not be able to access the river at these sites. Water places that had been affected by weeds were often described as looking wrong, however with time people explained that this was most significant because it meant that the spirits at this place were unhappy.

People who had worked in the pastoral industry as musterers also saw country from a pastoralist's point of view. Reactions such as "can't see through country" and "looks like country is choked" often referred to the value of that country for cattle or the difficulty that people might have mustering cattle on that country. Specifically, stands of Mimosa Bush, or overgrown and unburnt areas of mixed vegetation, were commonly described as looking 'wrong', 'choked', or 'clogged' because of their potential effects on pastoral productivity.

Healthy country coming together in place

Healthy country encompasses all of these aspects at once, and has to be seen as a whole. What stands out from exploring perspectives of weeds according to this framework is that untangling aspects of healthy country from each other is extremely difficult. The overlapping nature of the discussions above is evidence of this, where one aspect of unhealthy country can, and usually does have an effect on several other aspects.

Each of the aspects of healthy country come together as a whole at particular sites. Therefore a plant's relationship to healthy country can only be evaluated once it has been considered at a particular place. This emphasises that any understanding of a plant through the framework of healthy country is contextually-based and place-specific. Almost every consideration of a weed mentioned above is centred on the relationship between a plant and a place; specifically, a plant's relationship to healthy country at a place. Extremely rarely was a plant ever considered in isolation, or a judgement made about it without justifying this judgement according to how it related to healthy country at a particular site.

The importance of place and context is highlighted by the fact that plants frequently represented one thing in one part of country and something completely different in another. A number of plants that were mentioned as favourable by elders were also mentioned as being harmful to country – albeit in a different context. The importance of this context was keenly understood by elders and Rangers who appreciated that a plant could simultaneously be considered favourable and unfavourable. Table 8.1 outlines different attitudes to the same plant, depending on the context in which the plant is being considered.

Table 8.1 Favourable and unfavourable attitudes to plants depending on context

Common name:	Unfavourable:	Favourable:
Mimosa Bush	When abundant it chokes up country; decreases bush fruits, particularly Konkerberry	Good on heavily grazed cattle country as it “protects the country”
Pindan Wattle	Makes visibility poor and travel dangerous when growing abundantly near vehicle tracks.	Valuable for making spears.
Neem trees	Displaces and competes with bush fruits, particularly in monsoonal vine thickets	Great for sitting under, therefore good in communities, at fishing spots and water holes
Buffel Grass	Increases fire and affects ‘right-way fire’ (which can kill bush fruits, particularly in monsoonal vine thickets and around <i>jila</i>)	Very good cattle fodder, therefore good on cattle country
Mintweed	Impedes access to hunting, fishing and cultural sites	Aromatic plant that is nice to have around homes and the community
Bellyache Bush	Looks and feels wrong; displaces bush fruits; can be harmful when ingested by animals, particularly cattle	Good in the community as it keep ticks off dogs and creates colourful hedges
Passionfruit Vine	Impedes access to country; harbours dangerous animals; increases the intensity and spread of fire	Considered favourable almost everywhere, as long as it is not restricting access or at risk of causing more intense fire.
Melaleuca and Soap Wattle	Take water from <i>jila</i> when they are allowed to grow too close.	Protect <i>jila</i> and provide shelter around <i>jila</i> .
Bamboo	Affects fishing, recreation and spiritual health of water places by inhibiting water flow and availability of open water	Good around water as long as it is not inhibiting flow; useful for making spears

The focus on context represents the major point of difference from mainstream environmental weed classification and management. As the Aboriginal reflections on mainstream environmental weeds discourse highlighted, the species-based classification of an environmental weed as non-native, invasive and impacting ecosystems becomes arbitrary until it has been considered according to healthy country in a particular context.

Conclusion

Despite struggling for legitimacy and agency in current weed management discourse, Aboriginal elders and Rangers in the Kimberley have clear understand the effects that weeds are having on their country. They have their own nuanced perspectives about how and why particular plants are bad for the health of different parts of country.

Like Pauline, elders and Rangers naturally expressed their perspectives about weeds through the framework of healthy country. Healthy country highlights the importance of context in Aboriginal considerations of weeds. Considerations of plants in isolation remain arbitrary until these plants are put in context of their relationship to healthy country at a particular site.

It has become clear that for Aboriginal weed work to reflect Aboriginal perspectives of weeds, it needs to move away from species-led conceptualisations of weeds towards foregrounding an appreciation of healthy country and context. Such a shift refocuses the issue of weeds from plants to place.



SITE-BASED WEED MANAGEMENT: REFOCUSING WEED WORK FROM PLANTS TO PLACE

A planning workshop organised by the Wunggurr Rangers and the Wilinggin IPA coordinator aimed to develop a strategy for Ranger work based on the Management Plan for their recently declared IPA. This strategy would integrate with the group's Working on Country activities and form the basis of Ranger work for the next two years. The workshop was specifically focused on the 'big three' and was so titled the *Wilinggin Healthy Country Workshop to develop strategic plans for the management of fire, weeds and feral animals*. It did so by considering the management of fire, environmental weeds, and feral animals as discrete and separate activities, spending approximately one day on each task. I had been invited to the workshop to coordinate the weed work planning section.

During the second day, Suzie asked me, "When are we going to talk about all of the *other* stuff, *our* stuff?" I asked her what she meant by *our* stuff and she explained that there were numerous other issues that she and the other elders had outlined in their IPA Management Plan (which they had called their Healthy Country Plan) that had not yet been discussed. These included people not being on country, lack of opportunities to pass on knowledge, poor personal health and wellbeing, lack of resources and governance for good land management, and uncontrolled visitor access. Although these had ranked among the most important threats to country during the development of the IPA Management Plan, they had not been considered by this workshop, or by any other to that point.

On the third day of the workshop this elder remarked that it would make more sense to consider the big three management tasks together through the framework of 'healthy country' as this is how the plan was set out. As she explained, "We're talking about [weeds, fire and ferals] all separate, but they are all together, all part of each other, all part of healthy country." She also

noted that weeds, fire and ferals were connected to the “other stuff” outlined as crucial for the IPA but not being addressed by that workshop.

As an alternative, Suzie suggested that weeds, fire and ferals, as well as this “*other stuff*”, could be better managed by focusing on sites rather than individual and separate tasks. She suggested that focusing on sites allows elders’ perspectives of healthy country, which had been formalised through the groups’ IPA Management Plan to guide Ranger work according to culture, rather than according to mainstream tasks. Her message was reinforced by the workshop exercises in which each Wilinggin clan group mapped the places they would like to see burned correctly, have protected from feral animals, and be kept free from weeds. Each day, every session, Suzie’s clan group had mapped the same water place, the same art sites, the same old homestead, the same creek near the homestead and the same walking tracks. It became obvious that a focus on sites would bring the separate tasks together so that they could be seen as interconnected and integral to caring for these significant parts of country.

Weed management that reflects Aboriginal perspectives on weeds should be based on the framework of healthy country. Because healthy country is highly contextual and varies from place to place, weed work will also need to be context-specific and be tailored from place to place.

In this chapter I argue that this can be achieved through a greater emphasis on site-based weed management. The mainstream environmental weed paradigm in Australia is dominated by species-based approaches to weed prioritisation and management. This species-based approach has arrived at Ranger work as common sense and largely incontestable. Despite not aligning with the integrated, country-focused way in which Rangers would like to approach their work, species-based approaches to weed management have been taken up as best practice by Aboriginal Rangers in the Kimberley. This dominant approach has been developed by invasion ecology, grounded in Western conservation ideology, and does not represent Aboriginal perspectives of what makes a plant a weed.

The chapter begins by providing an outline of site-based management and how it contrasts to species-based approaches. It explains how site-based approaches have been marginally incorporated into mainstream national and regional environmental weed management agendas. The chapter then describes the outcomes that a greater emphasis on site-based approaches would have for Aboriginal weed work in the Kimberley. In particular, it shows how site-based approaches foreground Aboriginal perspectives in weed management; integrate

weed management with other Ranger duties to ‘create’ healthy country; and have logistical and pragmatic benefits that make the most effective use of Rangers’ limited time and resources.

Site-based weed management

Site-based (otherwise referred to as place-based, context-based and sometimes asset-based) approaches to weed management entail focusing on a particular part of a landscape, identifying the values attached to this place, understanding how weeds are affecting or might affect the condition of this place, and then designing and undertaking management accordingly. Although this is not a new approach to weed management, it offers an alternative to the dominant species-based weed management framework currently operating in Australia, Western Australia and the Kimberley.

The main contrast between site-based and species-based approaches is that site-based approaches are underpinned by an appreciation of the place-based context in which a weed is occurring. This context is used as the basis upon which management is undertaken, directing which weeds will be targeted, and how they will be targeted (Downey and Sheppard 2006). In short, site-based approaches represent a *refocusing of weed work from plants to place*.

The main differences between site-based and species-based weed management are presented in Table 9.1.

Table 9.1 Characteristics of site- versus species-based weed management

Site-based management	Species-based management
Identify significant sites and the values that should be protected at these sites.	Identify priority environmental weeds according to the triad of mainstream classification.
Identify and manage weeds that threaten the values attached to the selected site.	Eradicate/control existing priority weed populations.
Protect the values of a particular place.	Prevent priority weed species spreading, or manage populations of existing priority species.
Focus on those species to be managed for the protection of the place.	Focus on newly naturalized species in a region, or newly invading species or very confined species.
Scale is that of the defined place.	Scale is usually an area delineated by an institutional boundary. This might be a region,

	state or even a nation.
Work on particular sites where infestations occur within the defined place, as well as buffers and seed sources outside this place.	Work on sites of any quality, any tenure and anywhere
Success is when the environment in the management unit responds in a desired way (e.g. regenerates) to a desired degree.	Success is when the species is eradicated or contained within an area (usually delineated by institutional boundaries).
Non-control activities include place-specific public awareness and weed hygiene, and <i>integrated control with other threat management.</i>	Non-control activities include species-specific public awareness and weed hygiene, controls on sale and distribution and surveillance.

Modified from Williams and West (2000)

The outcomes of site-based approaches are its targeted and strategic nature, concentrating resources within a spatially discrete area (Owen 1998). This allows for more refined scales of management and achieves outcomes tailored to a specific context, which are accountable to a particular set of locally-grounded targets (Downey and Sheppard 2006).

There is a gradual and slight shift towards site-based weed work in Australia. This is taken up by Downey (2011), who argues for a greater emphasis on “context-specific management”. Downey explains that such management has distinct indicators of success, which are connected to a particular context or place. He suggests that this directs more specific, strategic and achievable management targets and could extract the species-led war on weeds from its “unwinnable quagmire” (87).

In Australia, two places where site-based weed management is acknowledged in major weed policy documents include the Australian Weeds Strategy (see NRMMC 2007:15) and Western Australia’s “Invasive Plant Prioritisation Process” (IPPP). The Australian Weeds Strategy acknowledges site-based weed management through its objective to “develop approaches to managing weeds based on the protection of values and assets”. In particular, it directs the strategic actions to “Identify the threats posed by weeds to key cultural, environmental and production assets and values”, and “build community capacity for implementation of site-based plans for weed management”. Similarly, the IPPP for Western Australia (see DPaW 2014:1), includes a site-based aspect through its incorporation of an “asset-protection-based process”. This process identifies potential areas of “high value biodiversity assets” which are “at risk” from environmental weeds and develops weed management strategies to protect them (DPaW 2013:1).

Although both of these major policy documents include recognition of site-based approaches, both do little to disrupt the dominance of species-led management. In terms of Western Australia's IPPP, site-based assessment and management is only invoked after the species prioritisation process has directed the bulk of management strategy. As it states, following the species-led assessments and prioritisation "the next stage of the process is to identify high value biodiversity assets, the weeds that pose a threat to these assets, and the sites where control will have the greatest benefit and cost effectiveness". A prerequisite for the asset-protection-based process commencing is having the priority list of species already established as "this list will assist with prioritising weed control during the asset-protection-based process" (DPaW 2013:3). Despite growing recognition from of its potential, there remain very few documented examples of site-based weed work projects in Australian environmental weed management (Downey and Sheppard 2006).

New Zealand environmental managers have embraced site-based weed management since the early 1990s (Timmins and Owen 2001). As of 1998, New Zealand had 18 species-based management programs aimed at weed eradication and containment, and 307 site-based management programs, predominantly targeting biodiversity protection (Owen 1998). Under New Zealand's environmental weed management framework, both approaches are adopted, each for a distinct purpose. Specifically, programs to prevent, contain and eradicate environmental weed incursions are species-based while programs to protect, maintain and restore natural and cultural values are site-based (Williams and West 2000).

This demonstrates that site and species-based approaches to weed management are not mutually exclusive. Analysts recognise the importance of both site-based and species-based approaches to weed management (Williams and West 2000, Timmins and Owen 2001). As Downey and Sheppard (2007) conclude from their Australia-wide review of species versus site-based weed management, "It appears that both have a significant role in weed management." From here they go on to suggest that the "selection of the most appropriate approach depends on the outcomes sought and the available resources" (264). Based on this assertion, I argue that site-based approaches are the most appropriate for Aboriginal weed work in the Kimberley.

Healthy country and site-based weed work

If we take site-based approach and look at it from the perspective of healthy country there is a striking resonance. Both are grounded in context and connected to values for a particular place.

Both demonstrate that multiple actions are necessary to maintain or restore the health of a site beyond simply killing a particular weed species.

To develop site-based weed management for Aboriginal Ranger groups, Rangers work with elders to identify and select the sites that will be managed. Together, they formulate a healthy country vision for these sites. This vision lays out the significance of the site, the values of the site and how these values should be protected or restored. From this baseline of priorities, the weed work that occurs at these sites flows from this healthy country vision and is therefore grounded in Aboriginal understandings and relationships to specific parts of country.

Exactly how this vision is created varies according to each group and each site. Each Ranger group has a different way of engaging with their elders, and this will be reflected in the way that these healthy country visions are developed. In some Kimberley Aboriginal groups such as Bardi-Jawi and Wilinggin, this process is becoming formalised through the development of Healthy Country Plans, developed through the Conservation Action Planning model and implemented through their IPAs. Although these Plans are providing useful tools for understanding and recording local Aboriginal visions for healthy country, their structure is largely set prior to their development – as I found with the development of work plans and the IPA planning workshops that focused people’s attention on just the ‘big three’.

Each of the Aboriginal groups I worked with currently practises healthy country planning without formally recognising it. Every Ranger group prioritises taking elders on country so that they can learn from them about how country should be managed. Two examples of this stand out. At Brooking Gorge, which has recently become accessible again to Bunuba people, the highest priority of the Rangers was to have elders for this country visit the site and teach them how it should be cared for. Although this was not formalised through the enactment of a Management Plan, Rangers listened to the elders’ stories and learned how to care for this part of country. Another example of this informal creation of healthy country plans relates to the young Nyulnyul Rangers who spoke to me about the wetland near their community. Without having a formal document which described the healthy country vision for this site, they already knew how the place should be managed through the stories they had heard and discussions they had had with elders. However, in both of these cases, Rangers were reluctant to base weed work at these sites on these healthy country visions, because some of the plant species that were causing the problems there were not classified as weeds or ‘high priority’ weeds for Western Australia.

Outcomes of a site-based approach to Aboriginal weed work

I propose that integrated site-based weed management has three main outcomes for Aboriginal weed management: Firstly, it foregrounds Aboriginal perspectives in decision making grounds weed work in Aboriginal connections to country. Secondly, it integrates weed work with other Ranger activities and frames it as promoting healthy country rather than the destruction of plants. And thirdly, it makes weed work pragmatic and achievable given the logistical and resource constraints of Ranger work. The following discussions expand on these proposed outcomes and provide some examples of how site-based approaches have already played out in the field.

Foregrounding Aboriginal perspectives

Site-based management foregrounds the perspectives of Aboriginal elders and Rangers in decision making. Decisions about how plants should be managed are directed by a healthy country vision for that site, which has been developed by elders and Rangers according to their Law. This integrates weed work into an overall picture of healthy country and allows Rangers to connect their work to its cultural significance. From the starting point of healthy country, invasion ecology and mainstream weed management can be invoked by the Rangers to support an established and specific vision.

Linking to two-way management

In many ways this can be understood as ‘two-way’ management. As discussed in Chapter Five, two-way management frameworks are widely adopted as best-practice within Australian Aboriginal NCRM because, in theory, they provide a productive space for different cultural perspectives to contribute to environmental management discourse (Ens *et al.* 2012, Preuss and Dixon 2012). However, it is also widely recognised that existing institutional and epistemological politics between groups and actors tend to influence the way in which different voices are contributed and valued in two-way management (Muller 2012).

In many Aboriginal–non-Aboriginal two-way management partnerships, in which the funding and resources are controlled by non-Aboriginal actors and exist within an mainstream environmental management framework, Western scientific knowledge tends to be privileged (Nadasdy 2004, Barbour and Schlesinger 2012). As has occurred in Aboriginal weed work in the

Kimberley, this leads to the sidelining of certain parts of Aboriginal knowledge that might not necessarily 'fit' into, or agree with, the mainstream environmental management paradigm (Ellen *et al.* 2000, Muller 2012).

To use the metaphor of the two-toolbox approach that is also popular in Australian Aboriginal NCRM discourse, while there might be two toolboxes available – each of which represents a different understanding of environment and how humans should engage with it – the actors who choose which tools are used to fix the problem are still in control of management. For a two-way approach to work properly, Aboriginal people and their connections to country need to guide management – they need to decide which tools are used, as well as where, when and why they are used. Foregrounding Aboriginal perspectives of healthy country through an emphasis on site-based management means that Aboriginal perspectives will remain in control of the tools that are used.

Safeguarding against mainstream recapture

Site-based weed management grounded entirely in Aboriginal connections to country may create blind-spots in weed work that could undermine Aboriginal people's ambitions for healthy country. Therefore, site-based Aboriginal weed management requires assistance from invasion ecology and mainstream weed management. For example, as an Aboriginal NCRM planner and practitioner pointed out, while basing Aboriginal weed management on Aboriginal perspectives is vital, "no one can ignore the march of Gamba Grass down the Gibb River Road" (Broome, June 2013). He emphasised that even though Aboriginal perspectives should guide the direction of weed management, perhaps through a greater emphasis on site-based management, certain mainstream environmental weed wisdom and input is necessary.

Species-based knowledge provided by invasion ecology and mainstream environmental weed management is equipped to fill in blind-spots and provide answers to crucial questions such as: What are the important plants to watch out for? What plants are likely to grow at particular sites? How do/will particular plants affect particular sites? How do particular plants spread? And how should certain plants be managed? These are all important considerations that need to be engaged with by Aboriginal Rangers.

In the field, this interplay with mainstream environmental weed management can quickly and easily lead to the mainstream recapturing and dominating the direction and motivations for weed work. Ensuring that Aboriginal groups remain in charge of the weed

management process is therefore tricky. However, site-based weed work can guard against this by connecting each and every weed work decision to the healthy country vision for that site. To use the Aboriginal NCRM planner's example of gamba Grass, while knowledge about its invasiveness, rapid growth and fire promoting qualities comes from invasion ecology, its potential impacts can be connected to how it will affect the health of country at particular sites. If these impacts are perceived to constitute a significant threat, then management is undertaken. This is the case for the eastern part of Wilinggin country, where elders have identified Gamba Grass as a threat to country and has been controlled by the Wunggurr Rangers. Because this work was directly connected to its significance for healthy country, the Rangers reflected on it positively.

Balancing species-based and site-based approaches in Aboriginal weed management is difficult, yet possible. An example of this comes from the Wilinggin IPA planning workshop in which the question of weeds was approached from an Aboriginal and a *kartiya* perspective. From an Aboriginal perspective, elders and Rangers mapped where weeds were affecting the health of country and the places they thought were important to keep free from weeds. They discussed the values at particular sites that should be protected or restored, and where weed work should be concentrated. The Ranger coordinator then introduced the concept of weeds from what we referred to as the *kartiya* perspective, which is to say with a species-led focus. In this discussion he described the most 'threatening' weeds that are already established or might be expected to become established on Wilinggin country. Through this discussion, elders were made aware of both approaches to weed management, one that focuses on place and one that focuses on plants. A number of elders commented that they did not see any significant divide between the two, as the plants which the *kartiya* focus on are likely to affect the health of the country at the sites they had selected to be managed.

There is a need for both site-based and species-based approaches to contribute to Aboriginal weed work. Whereas the persistent species-based focus has led to a marginalisation of Aboriginal elders' voices in environmental weeds discourse, a refocusing on place foregrounds the knowledge of elders. As local 'healthy country experts', site-based weed management brings elders into the discussion and gives them greater control over the weed work that occurs on their country. From this starting point, Rangers can invoke invasion ecology and mainstream environmental weed expertise as a 'tool' to *support*, rather than *direct* their work.

[An integrated approach to promote healthy country](#)

Not just a “lean, green weeding machine”

Site-based weed work allows an integrated approach to Ranger work, which reflects the interconnected nature of healthy country. Weed work in isolation makes little sense if it is not connected to other components of healthy country and Ranger work. This resounded across Rangers’ and elders’ reactions to current weed work, but is best summed up by the Bunuba Ranger coordinator, who explained “We don’t want to just be this lean green weeding machine”. Rather than conducting weed work, and only weed work, at a site because a particular weed species is present (which is most commonly the case), site-based management encourages Rangers to combine it with other culturally significant activities connected to restoring or protecting the health of that part of country.

An example of this comes from the Ngurrara Rangers, who through the development of their seasonal calendar have collected a body of healthy country knowledge related to particular sites. The sites to be managed were selected by elders who visited these parts of country with Rangers, shared stories and knowledge, and developed a healthy country vision for each site. Based on this site-specific knowledge, the Rangers have adopted a site-based approach to undertake their work. Through this, weed work is increasingly becoming connected to other aspects of their work and healthy country. A number of tasks are performed by the Rangers during each visit to a site; for example, a trip to country that primarily intended to manage Bulrush at Loombuloombu also provided opportunities to take old and young people to country, perform ceremony, conduct right-way burning, monitor a nearby spiritual site and conduct water monitoring. A subsequent trip to Purluwarla primarily intended to take a group of elders back to country and record traditional knowledge, also provided opportunities to maintain the health of a *jila*, check for animals (both native and feral), harvest local bush fruits and bush meats, check a weather research station, **and** manage some Buffel Grass that was at this site. In this case, the weed work was not the sole or even primary reason for the site visit; instead the management was undertaken to maintain the health of the country, particularly the *jila*.

Weed management that focuses on particular sites, rather than just ‘where there are weeds’, allows Rangers to make more trips to significant parts of country. As was repeated over and over in the field, having people on country is the most important aspect of healthy country. The Ngurrara example suggests that site-based management provides Rangers greater opportunities to integrate weed management with taking people back to country, some for the first time, and some for possibly the last time. Rather than just visiting places “because there are

weeds there”, site-based management selectively focuses on important sites that are significant to people so that people can visit and engage with these places while Rangers undertake weed management.

Creating healthy country

Having a healthy country vision to guide weed management according to particular sites transforms the way that weed work is thought about by Rangers, from something destructive to something constructive and creative. There is a strong resonance between this attitude and the mainstream concept of restoration ecology. Although they have different cultural origins, both recognise ecosystem change as inescapable and focus on practices that restore or create a particular vision for a place.⁴⁰

This idea that weed management should be a creative process fits in with how most elders and Rangers chose to speak about the purpose of weed management. As Ronnie the Nyikina Mangala Ranger explained in response to the species-led WKRVEP, weed management should be about “making the place and this country healthy again” rather than what he perceived to be the dominant approach of “just killing lots of the same plant”.

This emphasis on creativity rather than destruction is highlighted by an integrated site-based management plan developed, but unfortunately not yet implemented, by the Bardi-Jawi Rangers. The site selected for this management bordered on a community, two nearby monsoonal vine thickets and coastal sand dunes, and has recently become infested with weeds (mainly Buffel Grass, Caltrop, Siratro and Hairy Merremia). Elders and Rangers were keen to rejuvenate this site and had a particular vision for how to achieve this – a large part of which involved the removal of these weeds. Central to this vision was that it needed to be about creation rather than simply the destruction of the weeds. As Lloyd, a senior Ranger and cultural advisor commented:

“We gotta create country through [weed work], make something. We always seem to be taking something with weeds. We need to make something instead. You know, *create*.” (Ardyaloon, July 2013)

⁴⁰ There is a substantial body of literature relating to the field and practice restoration ecology; however it is beyond the scope of this discussion. For examples that highlight its convergence with Aboriginal perspectives discussed in this chapter, see Hobbs and Harris (2001), Trigger *et al.* (2008) and Gaertner *et al.* (2012).

Underpinning the creative aspect of the work was that this site combined a number of integrated and achievable outcomes beyond weed management. In particular, having a site near the community meant that the local school could become involved in the project. The work could be used to teach young people about the cultural significance of the site, the language associated with it and the importance of harvesting and eating bush foods. It could also foster an appreciation of Bardi-Jawi caring for country. The Bardi-Jawi *Oorany* (women) Rangers could take part in the project and work with the community to revegetate and reinvigorate the site with a number of local bush fruits they have cultivated in a community nursery. Focusing on the site, rather than the destruction of weeds, excited the Rangers as it promoted weed work as a part of a multifaceted approach towards creating healthy country.

Addressing the human dimensions of weeds

Elders commonly foregrounded the human context of weeds. They mentioned that ‘plants go where people go’, and conversely that weeds also grow where people have not been. Therefore greater emphasis should be placed on the human role of the establishment and spread of weeds. This is strongly supported by mainstream weed literature, which highlights the importance of ‘weed hygiene’ and minimising landscape disturbance as proactive ways of controlling weed problems. However this is largely overlooked by species-led approaches to weed work which narrow the focus of weed work to killing a single species in a single location. In contrast, site-based management allows weed work to include an appreciation of how humans are engaging with plants and places and how this is affecting the establishment or spread of weeds. This broadens the perspective of weed work and can include elders’ concerns regarding tourism.

The human dimension of weeds creates a paradox for Aboriginal weed management. Getting more people to important sites is crucial to healthy country; however this is likely to contribute further to the spread of weeds through an increase in what invasion ecologists call ‘propagule pressure’. Such a paradox provokes the question of whether or not it is even feasible to limit weeds at important and popular cultural sites. Elders and Rangers acknowledge this and feel that although increasing people’s access to sites is bound to spread weeds, the increased numbers of people visiting these sites is still beneficial for the health of country, having people on country underpins its health. They argue that the more these sites are visited regularly by Indigenous community members, the more likely they will look after these places. Whether or not this is the case is unclear and is something that the Rangers can monitor.

An example of Ranger work that has addressed the human dimension of weeds is the site-based Peninsula Vine Thicket Project, in which the Bardi-Jawi Rangers in partnership with Environs Kimberley teach local people and tourists about how increased visitation and disturbance in vine thickets can allow the spread of weeds. Relating to this strategy, a Bardi-Jawi Ranger remarked, “that’s the key, if we can stop [the disturbance] we can stop the weeds...gotta think bigger picture than the weeds” (Ardyaloon, October 2013). This is also recognised by a Nyulnyul Rangers who suggested that putting up bollards to stop off-road vehicle use at Middle Lagoon (a popular tourist camping ground on the Dampier Peninsula) should be understood as site-based weed prevention.

Strategic and practical outcomes

Aboriginal Rangers are responsible for managing enormous areas of land and sea country. To manage all of this country with the limited resources (people, time and money) available to them is impossible. To manage even a portion of this country is extremely challenging. Furthermore, weed management is only one of the responsibilities of the Rangers on their country.

Concentrating efforts

Downey and Sheppard (2007) suggest in their discussion of site-based versus species-based weed management, that while both have merits, the most appropriate method should be chosen on a case by case basis. In New Zealand this has meant that species-based management is adopted to control wide-spread single-species incursions whereas site-based approaches are used at the local scale to protect environmental and cultural values.

Aboriginal Rangers are not operating at a scale at which they are able to stop environmental weed incursions through species-based weed management. To stretch their resources under the illusion that this might be possible only detracts from their ability to protect their own significant cultural and environmental places. Previous ad hoc and non-strategic, species-based approaches to weed management “because there are weeds there” have led to minimal gains despite significant effort. Weed work takes concentrated and ongoing attention if it is to be effective. Concentrating weed work and prevention at specific sites will focus this effort, make more efficient use of Rangers’ time and lead to improved results. The integrated nature of site-based management also allows rangers to meet multiple responsibilities and carry out

multiple tasks on single trips, which reduces travel times and increases the efficiency of Ranger work.

The Ngurrara example highlights this. The vast majority of Ngurrara country is remote desert, without vehicle tracks, and is therefore extremely difficult to access. The Rangers have adopted a strategic site-based approach, which concentrates their management on a number of significant sites (mainly water places in the Great Sandy Desert) that were identified by elders as a part of their seasonal calendar project. Because visiting these sites is difficult and can only be done infrequently, Rangers undertake a number of management activities during each visit. Weeds are managed alongside the other Ranger duties associated with caring for these sites. They work on sites rather than activities, despite the prescribed activity-based structure of Working on Country work-plans. As was discussed earlier, this not only allows the Rangers to use their limited time and resources more effectively, but integrates weed work with other parts of Ranger work for healthy country. This shift in emphasis toward site-based management was reflected on favourably by Rangers; as one remarked “We got it better now that we got it concentrated.”

Strategic, site-based prioritisation

The specificity of a site-based approach allows Rangers to identify the weeds that are causing a problem and manage those weeds in that place. Each site is likely to have a number of ‘weeds’ present; however, having a healthy country vision for that site allows Rangers to identify the ‘problem’ or most harmful weeds and manage those specifically.

An example of this targeted site-based approach is the Bardi-Jawi Rangers controlling Caltrop at the beaches near the Ardyaloon community. Caltrop causes a nuisance around these beaches and affects people’s enthusiasm to go there. Although there are other weeds present near the beach that have changed the look of the site (Kapok, Passionfruit Vine, Coffee Bush and some Calotropis), they were not perceived to be causing problems or affecting the health of country. At this site Rangers targeted Caltrop as this is what was harming country – or people’s engagement with country. The Rangers undertook a one-day intensive project to remove the bulk of the Caltrop at the most heavily used sites. As the Rangers visited these beaches regularly for a range of other site-based activities (both formally and informally), they removed Caltrop as they encountered it. Although the task needed consistent follow-up work, it was not considered daunting or unmanageable. Such an approach allowed for a more judicious, directed and efficient approach to management that did not waste time and resources managing weeds “because they

are there". Although this might seem like a species-based management project, it was the values of the site that determined the weeds that were managed. From a species-based perspective, Caltrop is not prioritised ahead of the other weeds that were also present at the site; therefore a species-based approach would not have identified or addressed the problem that the weeds were causing.

Conclusion

Suzie's suggestion that Ranger work should be planned and carried out with a focus on sites has merit – particularly for weed management. The merits of site-based weed work are recognised beyond Suzie's vision for Ranger work. Although site-based weed management only represents a small part of Australian weed management, it has been widely adopted by weed managers in New Zealand and its potential benefits are becoming more widely appreciated. Either way, site-based weed work is not a new or untested concept.

For Aboriginal weed work to reflect Aboriginal perspectives about weeds it needs to be based on the framework of healthy country, which is highly contextual and locally specific. In contrast to the species-led approaches that dominate current mainstream and Ranger weed work, site-based approaches represent the contextual nature of healthy country by refocusing management from plants to place. This allows Aboriginal people to contribute to weed management discourse and guide weed work as 'healthy country experts'.

This connects Aboriginal weed work to local visions for healthy country and allows mainstream environmental weed knowledge to support these aspirations. It reflects the integrated nature of healthy country by integrating weed work with other culturally significant Ranger work. Furthermore, the strategic and focused nature of site-based weed work has practical and logistical benefits that make it achievable within the time and resource constraints.



10

CHAPTER TEN

“ALL ABOUT HEALTHY COUNTRY”: WHY IT MATTERS

I want to return to one of the conversations at the start of my research project, when a government agency weed manager told me that “Aboriginal Rangers are completely apathetic towards weeds...if your project can find out why, we’d love to hear it.” My short response, based on this research, is that Aboriginal Rangers, and the elders on whose behalf they work, do care about weeds and how they affect their country; they just don’t care in the same way that mainstream environment agencies do. Management needs to accept and allow for these differences if it is to improve.

The new chapter in Australian environmental management heralded by Working on Country and the Kimberley Science and Conservation Strategy’s emphasis on Aboriginal Rangers and Aboriginal knowledge suggests that a space has been created within the mainstream environmental management paradigm for Aboriginal people to manage their land according to culture – at least this is their rhetoric. However, this does not occur in the practice of Aboriginal weed work in the Kimberley. Rangers conduct weed work along the lines of mainstream environmental weed management, informed and reinforced by invasion ecology, and grounded in conservation ideology and a particularly scientific way of viewing the environment. There is very little scope within this practice for Rangers to connect weed work to their culture. This has fostered frustration, lack of motivation and poor results in weed control. This frustration and lack of motivation is commonly perceived by government agency weed managers as apathy towards weeds; however this perception is misguided.

My research shows that Aboriginal people in the Kimberley clearly understand how some plants can affect country in negative ways. When elders and Rangers invoke the concept of ‘healthy country’ to speak about these effects they emphasise the importance of context in determining the relationship between plants, place and people. Aboriginal Ranger groups would prefer to use this concept of ‘healthy country’ in an integrated and constructive approach so that they can be effective with their weed work within their time and resource constraints. If the

rhetoric of Aboriginal NCRM is to be put to practice through Working on Country, IPAs, and two-way management, then their contemporary knowledge and concerns for maintaining connections to their country should form the basis of their weed work.

Implications for Aboriginal NCRM

There is no doubt that Ranger programs offer important benefits to Aboriginal people in the Kimberley. These benefits extend beyond the Rangers, into their families and communities and are much more important than just an opportunity for local employment. The possibility to remain on country and foster culture by caring for country is a big step forward from a social and political landscape less than 50 years ago when such opportunities would have been unthinkable.

These programs are based on connecting Ranger work to local Aboriginal priorities and knowledge. However in the context of 'contemporary' land management which is responding to 'novel' and 'dynamic' environmental problems, their 'traditional' priorities and knowledge have come to be considered as only partly relevant.

As this thesis shows, Aboriginal Ranger work in the Kimberley is dominated by the 'big three': *weeds*, *fire* and *ferals*. Of these, mainstream environmental agencies regard weeds and ferals as 'contemporary' and 'dynamic' problems, which have developed in Australia post-colonisation and are therefore beyond the realm of 'traditional' Aboriginal knowledge. The popular representation of Aboriginal knowledge as 'static' and 'of the past' renders it largely irrelevant to almost two-thirds of the work Rangers do. Aboriginal perspectives regarding changing environments are ignored in the NCRM discourse and Ranger work. It should come as no surprise that the disparity between the official NCRM discourse and the actual realities of Ranger work generates widespread apathy towards mainstream agency priorities of managing environmental weeds.

Responding to this, my thesis emphasises a simple, yet fundamental point: that regardless of whether or not Aboriginal people have faced a land management problem in the past, the problem should be discussed and framed in a way that incorporates their values and understanding of how it should be tackled in the present. In terms of environmental weeds, Aboriginal people might not know about an introduced plant's biogeographic origins or its physiology, or be able to offer technical instruction on how to handle and use synthetic herbicides to kill it; but they do have contemporary knowledge and context-based values for their country that should be reflected in how weeds are controlled.

This point has not just been emphasised, time and again, by Aboriginal elders and Rangers as a part of my project, but by other researchers who have looked at Indigenous engagement in NRM and NCRM. They have pointed out that the production of Indigenous knowledge and its integration into NCRM commonly leads to it being transformed and misrepresented.

Despite NCRM's rhetoric of participation, democracy and empowerment, critical scholars have demonstrated that it remains embedded within mainstream institutional, cultural and epistemological politics (Rose 1995, Howitt 2001, Nadasdy 2004, Jackson 2006, Palmer 2007). To contribute to discourse from within these politics, Indigenous knowledge must "conform to positivist methodologies" in order to be made 'legible' or 'palatable' to the culturally dominant scientific framework that encloses environmental management (Christie 2007, Muller 2012, Holmes and Jampijinpa 2013, Bradley and Johnson 2015). This involves abstraction of Indigenous knowledges – by fragmenting, decontextualizing and extracting them from their personal, cultural and place-based contexts (Ellen *et al.* 2000, Johnson 2011). The abstraction of Indigenous knowledges and their separation from context makes them discursively malleable and ripe for appropriation (Stevenson 1998, Hawthorne 2001). Scholars point out that this has usually led to their alignment with environmentalist agendas, which fetishize Indigenous people as "conservationist effigies" and compartmentalise their knowledge as "past oriented curiosities" (Sackett 1991, Hemming and Rigney 2008). Together the processes and politics involved in this "project of integration" mean that although Indigenous people possess Indigenous knowledge they rarely have control of how it affects what happens on the ground (Nadasdy 1999, Fortier 2002). Such cannibalisation of knowledge and values does little to meet the empowerment objectives that NCRM is supposed to have at its core.

The embedded place-based and contextual nature of Indigenous knowledge is epitomised by the concept of healthy country. Using this framework to explore perspectives of weeds does not attempt to abstract and extract Aboriginal values and understandings, but leaves them *in place* and recognises their local embeddedness and specificity. It recognises Aboriginal values and knowledge as 'contemporary' and 'dynamic' as people make judgements based on what they are perceiving here and now, and as they decide how this fits in to their 'desired nature' for that place. Likewise, a site-based approach to weed work based on healthy country avoids this abstraction by keeping attention on the local, and in the present.

Implications for environmental weed discourse

The need to conceptualise and manage environmental weeds differently is not simply a call from an Aboriginal NCRM perspective. Many researchers have pointed out that the current strategies and metaphors to wage ‘war on weeds’ are losing more ground than they are gaining, and that new approaches are needed (Davis *et al.* 2011, Downey 2011). These researchers argue that environmental weed management is grounded in a scientific and conservationist ethic that provides a culturally particular, narrow and restrictive way of understanding plants in place (Sagoff 1999, Chew and Hamilton 2010). This is reinforced by aggressive language and metaphors that have been used to communicate the problem of environmental weeds and their management (Larson 2005, Tassin and Kull 2013).

The product of this discourse is an environmental weed management paradigm that is largely unquestioned on the ground, despite experiencing constant and significant failings (Smith 2013). In Australia, this has led commentators such as Downey (2011:90) to argue that “we need to move to a new weed management system”.

Until now, I have largely presented Aboriginal criticisms of mainstream weed discourse without comparing, justifying or validating them by invoking non-Aboriginal experts or authorities. I did this because I wanted to explore Aboriginal perspectives on their own terms and recognise their legitimacy without requiring substantiation or vindication by scientific researchers and critical social scientists. But now, here in these conclusions, I want to emphasise the marked overlap between the two perspectives to highlight how they present a strong challenge to the dominant discourse on invasive species and weed management. Such cross-cultural overlaps are significant, as Deborah Bird-Rose (1997:74) says:

“...when two traditions think about similar issues through their distinct cultural logic and practice, and independently arrive at similar views, we should conclude that something very important is being grasped here”.

There are two important points of overlap between Aboriginal perspectives and those critical of the dominant invasive species discourse. The first and most resounding overlap is the recognition that invasive species and environmental weeds do not sit outside culture and context. Social scientists and ecologists have also criticised the narrowly defined species-focused approach, pointing out that invasive species and environmental weeds are, in fact, always defined and targeted according to their cultural, social and ecological contexts (Rotherham and Lambert 2011b, Heger *et al.* 2013, Kull and Rangan 2015). These ‘ecological’ problems are culturally interpreted

and moderated, and any assumption that environmental phenomena can be divorced from people's values for the environment is misguided (Robbins 2004a, Larson 2007a). The assumption that weeds are acultural and need to be tackled as a purely 'ecological' problem is one of the main reasons why Aboriginal Rangers appear to government land managers as 'apathetic' towards weed work.

This emphasis on context has led both Aboriginal and academic critics of the dominant invasion ecology discourse to challenge species-led environmental weed classification based on the 'triad' of origin, behaviour, and impact. Instead, they emphasise the relationship and values established between humans, places, and plants in a particular context as the basis upon which a plant can be rendered an environmental weed. As the previous chapter showed, this refocusing from plants to place also refocuses management and suggests a greater emphasis on site-based, rather than species-based weed work.

The second point of overlap is about recognising that new plants and ecological change does not always equate to environmental degradation or harm. Aboriginal Rangers and elders accept that weeds are a reflection of human activity as well as natural processes, and that they need to work with them to find new values and ways of managing these landscapes. When Aboriginal elders talk about keeping country healthy, they say so with the understanding that this does not mean preserving it in some unchanging form. For them, healthy country is one that can keep cultural values alive alongside changing ecologies.

This tradition also exists in non-Aboriginal culture. It is most lyrically captured by poet and nature writer Ralph Waldo Emerson (1878) who suggested that "Time will yet bring an inventor to every plant. There is not a property in nature but a mind is born to seek and find it." This view is echoed by contemporary researchers like Richard Hobbs who refer to changing ecologies as 'novel ecosystems' which need to be recognised, valued and managed accordingly. Other scholars also favour positive interpretations for this change and offer constructive metaphors to describe it, whether this be through "recombinant ecologies" (Peretti 1998, among others), "Rambunctious Gardens" (Marris 2011), or "melting pots of diversity" (Kull *et al.* 2013). As Dwyer (201:85) suggests in response to the metaphor of war which permeates Australian environmental weed management:

"A different approach would be to stop being frightened of weeds, to acknowledge their virtues and their place in the realm of nature, and to seek a more peaceful co-

existence with them. This approach should not be seen as surrender in the War on Weeds, but rather as a way to make peace. It is, in any event, time to declare a truce.”

All of these new terms and metaphors are, in effect, emphasising the need to revalue ecological change within particular contexts and decide how to work effectively to create new values and meanings for ‘plants in place’.

Seizing the synergy

While Aboriginal perspectives of healthy country and weeds are theoretically intriguing, from within Aboriginal NCRM’s current bureaucratic and epistemological bind they are unlikely to generate significant changes to the status quo of Rangers’ weed work. This is because Ranger groups commonly prioritise securing funding over ensuring that all Ranger work is connected to cultural priorities. Some involved in Aboriginal NCRM in the Kimberley therefore suggest that the current state of Aboriginal NCRM and Rangers’ weed work is satisfactory, as the social and economic benefits which accrue from Ranger work take precedence over its adherence to cultural priorities. Finding a balance between the two provides an ever-present tension for Ranger groups.

I propose that by seizing the synergy between Aboriginal and critical perspectives detailed above, and capitalising on the movement towards site-based weed management, it should provide legitimacy for Ranger groups to pursue these innovative and culturally meaningful directions in their weed work. This frames new directions in weed work as an opportunity for innovation, rather than as a challenge to the status quo.

The benefits of pursuing these new directions are twofold. Firstly, at a local scale, it actually satisfies the ambitions and rhetoric of the Working on Country and IPA programs by meaning that Rangers can connect their weed work with their priorities. For Rangers like Larry, who consider their role as “caring for country according to culture” this makes weed work meaningful, more likely to generate enthusiasm and produce better results than it has in the past. Secondly, supporting Rangers to pursue innovative directions in weed work constitutes a type of pilot weed management program. Such a pilot program is guaranteed to offer insights that can be adopted into environmental weed discourse and which might have positive outcomes for mainstream environmental targets such as biodiversity conservation.

This thesis has demonstrated that Working on Country and IPA programs are embedded within layers of bureaucratic governance that prioritise scientific land management and stifle

Rangers' ability to connect weed work to culture. Nevertheless, in contrast to strict fee-for-service contracts, these programs do allow much greater freedom in terms of how weeds are managed. These initiatives are not purely environmental management programs that frame Aboriginal Rangers as a remote labour force. They are also responsible for producing cultural, social and economic empowerment. Ranger groups should capitalise on the space created at the nexus of social and environmental policy to initiate these innovative ways of managing weeds – something that current mainstream weed management agencies are not able to do.

I do not stand alone in suggesting that greater power and legitimacy needs to be given to Aboriginal voices in land management discourse, or that new directions for weed management should be pursued. This thesis does not just absently appeal to these causes, but suggests a way forward for Aboriginal weed management in the Kimberley. This way forward is based on the framework of healthy country and enacted through a greater emphasis on site-based weed work. Site-based weed work that is “All about healthy country” will make weed work meaningful for the Rangers and ensure that they do not lose sight of country for the weeds.

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