SUSTAINING EDEN

Indigenous community wildlife management in Australia

Jocelyn Davies
Faculty of Agricultural and Natural Resource Sciences,
University of Adelaide

Karen Higginbottom
School of Applied Science
Griffith University

Denise Noack
Mawson Graduate Centre for Environmental Studies,
University of Adelaide

Helen Ross
Centre for Resource and Environmental Studies
Australian National University

Elspeth Young
National Centre for Development Studies
Australian National University

Preface

This report is Australia's contribution to the first stage of the International Institute for Environment and Development (IIED) project '*Evaluating Eden*', a three year study of environmental, social and economic factors which contribute to success and failure of community based wildlife management (CWM).

Support for and involvement in CWM is becoming increasingly common in Australia, notably through the Landcare movement . Landcare has focused on addressing degradation on lands used for agriculture but is also increasingly concerned with restoration and management of wildlife habitat. There are also numerous community groups who monitor environmental indicators and a growing involvement by landowners in commercial wildlife harvest of wildlife (Ramsay 1994).

Indigenous CWM is of particular interest because:

- It is a vital component of the world's oldest continuous cultural traditions of resource management.
- Indigenous peoples' values in relation to wildlife contrast markedly with those of dominant non-indigenous cultures in Australia.
- Wildlife has economic importance to indigenous people for subsistence and is also looked to by many indigenous communities as an opportunity for commercial economic development.
- Sustainable management of wildlife on indigenous-owned lands is important to the maintenance of biodiversity in Australia.

This report focuses on Australian indigenous peoples' use and management of terrestrial vertebrates and some marine species (dugongs and turtles). In doing so it examines the extent to which the contemporary involvement of indigenous people in management of these species and their habitats is an effective example of CWM, which provides for sustainable use of wildlife and returns benefit to indigenous communities. It explores key issues and policy considerations for the future of indigenous CWM in Australia.

Our aim in preparing this review is to contribute to the development of effective CWM by encouraging the sharing of information and experience within Australia and with people and organisations in other countries.

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For further information please contact:
Jocelyn Davies
Faculty of Agricultural and Natural Resource Sciences
Roseworthy Campus, University of Adelaide
Roseworthy SA 5371, AUSTRALIA
Phone 08 8303 7889 Fax: 08 8303 7956
Email: jdavies@roseworthy.adelaide.edu.au

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Acronyms and abbreviations

ACF	Australian Conservation Foundation - NGO conservation group
AFMA	Australian Fisheries Management Authority - Commonwealth body managing Commonwealth-owned fisheries
ANCA	Australian Nature Conservation Agency. Former name of Environment Australia Biodiversity Group (EABG)
AP	Anangu Pitjantjatjara - statutory Aboriginal and holding body for north-west South Australia
ARRI	Aboriginal Rural Resources Initiative - a Commonwealth government programme from 1992-1995, managed by BRS
ATSIC	Aboriginal and Torres Strait Islander Commission - Commonwealth agency for management of indigenous affairs policy and programmes. It incorporates an administrative arm, regional councils elected by indigenous people and a board of elected and appointed commissioners.
BAC	Bawinanga Aboriginal Corporation
BRS	Bureau of Resource Sciences in Commonwealth Department of Primary Industries and Energy
CALM	Western Australian Department of Conservation and Land Management - State - government conservation agency
CEPANCRM	Contract Employment Program for Aboriginals in Natural and Cultural Resource Management - a Commonwealth government programme up to 1997. Managed by ANCA/EABG
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLC	Central Land Council - Statutory Aboriginal land council and native title representative body for the southern half of the Northern Territory
CDEP	Community Development Employment Program - a Commonwealth government labour market programme for indigenous people.
Commonwealth	The Commonwealth of Australia Federal government established under the Australian constitution in 1901.
CWM	Community-based wildlife management
CYLC	Cape York Land Council - Non-statutory Aboriginal land council and native title representative body for the far north region of Queensland.
DLMAC	Dhimurru Land Management Aboriginal Corporation
EA	Environment Australia - Commonwealth government environment and conservation agency, formerly called Department of Environment, Sports and Tourism
EABG	Environment Australia Biodiversity Group - Commonwealth government conservation policy agency. Formerly part of ANCA
GBRMP	Great Barrier Reef Marine Park
GBR	Great Barrier Reef
GBRMPA	Great Barrier Reef Marine Park Authority
GBRWHA	Great Barrier Reef World Heritage Area - equivalent to the GBRMP
IPA	Indigenous Protected Area - a Commonwealth government funding programme facilitating indigenous CWM
IUCN	The World Conservation Union

KLANRO	Kowanyama Land and Natural Resources Office (formerly Kowanyama Aboriginal and Natural Resources Management Office)
MaSTERS	Marine Study for Torres Strait Environment Resources Strategy - a Commonwealth government funded project managed by Torres Strait Islander organisations
NGO	Non-governmental organisation
NLC	Northern Land Council - Statutory Aboriginal land council and native title representative body for the northern half of the NT
NSW	New South Wales - Australian State
NT	Northern Territory - Australian Territory
PNG	Papua New Guinea
PRAP	Participatory Rural Appraisal and Planning
Qld	Queensland - Australian State
SA	South Australia - Australian State
SOEAC	State of the Environment Advisory Council - An independent council commissioned by the Commonwealth government to produce the 1996 State of the Environment report for Australia
Tas	Tasmania - Australian State
TAFE	Technical and Further Education - Government tertiary education provider in various States/Territories
TEK	Traditional ecological knowledge
Vic	Victoria - Australian State
WA	Western Australia - Australian State

Introduction

1.1 Reflections on 'Evaluating Eden'

The 'Eden' image used by IIED in the *Whose Eden?* and *Evaluating Eden* projects is a conscious reflection on European attitudes to African wildlife:

> *Apart from their economic interest in Africa, many Europeans have viewed Africa as a 'Garden of Eden', providing the opportunity to experience the 'wild and natural' environment that no longer existed in the domesticated landscapes of Europe*
>
> IIED 1994: 11, citing Anderson and Grove, 1987.

The image derives from Judaeo-Christian tradition, as an expression of the bounty of the land supporting human subsistence. It has curious and conflicting connotations for an Australian analysis of indigenous relationships to wildlife.

In Africa, these views led to a desire to maintain and preserve the continent's 'wildness', leading, after 1900, to the demarcation of national parks and game reserves to protect large animals and their habitats and the banning of traditional hunting. Under the African colonial regime, and its legacy in continuing government and international NGO support for strict preservation of wildlife, "local people found themselves deprived of access to pastures, farming land, fisheries and wildlife resources upon which they depended for their livelihood" (IIED 1994:12). This history has strong parallels in Australia in spite of great geographical, demographic and cultural differences between the Australian and African continents.

As we suspect is the case in much of Africa, applying the image of 'Eden' to Australian wildlife and habitats confronts two different value systems for wildlife and habitat. On the one hand, Australia's indigenous people, even those of the most arid regions, might view their own country as being like a 'Garden of Eden' in the sense that it is abundant in food and all other resources necessary for a culturally rich lifestyle. On the other hand, preservationist values dominate current non-indigenous views of Australian native wildlife and habitat. In these, epitomised most clearly in

the lobby for ‘wilderness’ protection that was extremely prominent in Australia in the 1980s and remains very influential, the ‘Garden of Eden’ is something to be enjoyed only in non-consumptive ways - through contemplation and non-mechanised forms of recreation.

The use of the term ‘evaluate’ in the IIED project title also has connotations that require analysis in order to properly understand the contemporary context of indigenous CWM in Australia. Evaluation is an integral part of the way people manage any system, process or resource, but for most people who have not been formally educated in management it is an informal, even unconscious, process. Indigenous people, like other cultures, use observations over time to detect change and to draw conclusions about whether that change is good or bad and what action is warranted. However, they are unlikely to recognise this process as being ‘evaluation’ because the term is not part of the language they use to describe their own approaches to land and resource management.

Nevertheless, indigenous people in Australia frequently encounter the terms ‘evaluation’ and ‘review’, which in their experience have quite sinister connotations. These tend to be processes carried out by governments in order to check whether grant money has been spent in accordance with government accountability requirements, and is helping to meet government aims. Rather than being a tool which helps indigenous managers decide on appropriate actions, this kind of evaluation is an externally imposed requirement which carries the threat of withdrawal of resources if outcomes are unsatisfactory.

Even though the current policy framework of indigenous affairs in Australia is characterised as promoting self determination, most indigenous people and their community organisations are very reliant on allocations of government funding. Conditions placed by governments on the use of this money subject indigenous organisations to a very high degree of government scrutiny. Self determination, in these circumstances, is reduced at best to self management, where indigenous people have administrative responsibilities, but little real control over how and why money is allocated and spent. At worst, self determination comes to be seen by indigenous people as assimilation under another guise, since government aims and priorities can often be very different to, and even subversive of, their own rights and aspirations. In this context, evaluation can readily be seen by indigenous people as yet another mechanism which governments and non-indigenous people use to limit self determination.

Indigenous people commonly perceive that their use of wildlife is being scapegoated while governments fail to deal effectively with other negative impacts on wildlife, such as the clearing of native vegetation or by-catch kills by the commercial fishing industry. Further, they often feel that undue restrictions are being placed on their use of their land while non-indigenous landowners are free to ignore biodiversity values.

These experiences mean that when evaluation is raised in relation to indigenous management, questions of who is evaluating, why and how, must always be addressed.

This review, initiated as it has been by external researchers, has encountered a healthy degree of scepticism from indigenous people and the staff of indigenous organisations as to our motives, a questioning of who is in control of, and who benefits from, this review, and a resistance to being 'judged' or to becoming someone else's case study. Wildlife use and management, and its evaluation, is clearly not something that is above or apart from the politics of indigenous and non-indigenous power relationships. However non-indigenous people often naively discount the significance of this important premise.

1.2 Aims

Indigenous wildlife use and management can only be effectively understood within a framework of **sustainable development** (see definitions, Box 1.1). Policy and planning for wildlife use and management commonly focuses only on ecological issues. However indigenous aspirations for a satisfying way of life in Australia are premised on the inseparable relationship between people and the physical environments to which they relate spiritually and geographically. These aspirations require that economic development must harmonise with social development and the maintenance of cultural integrity. These elements of sustainable development are synergistic - their whole is greater than the sum of their parts - and none can be considered effectively in isolation.

Within this holistic context, this regional review aims:

- to critically review available information about indigenous wildlife use in Australia, contemporary community wildlife management by indigenous people, and partnership ('co-management') approaches between indigenous people and government;

- to summarise information and gaps in information about the social, economic and ecological impacts (both positive and negative) of indigenous community wildlife management and the nature and extent of monitoring and evaluation that is occurring in relation to indigenous wildlife use and management;

- to contribute to establishing a framework for indigenous community evaluation of wildlife management;

- to identify and critically comment on some key issues which emerge from indigenous peoples' activities and experiences and which are important to the future of wildlife management in Australia.

Box 1.1 Definitions and concepts

Wildlife

We restrict the definition of *wildlife* to non-domesticated vertebrate animal species including both native and feral species. We include information on contemporary management of some marine species - dugong and turtles - because they provide leading Australian examples of the interface between governments and indigenous people in management of wildlife.

Wildlife management

We take *wildlife management* to mean human action which is directed at maintaining or altering populations of wildlife species. This includes policy, planning, day to day actions and the legal and institutional frameworks within which these operate. It includes the regulation of use of wildlife, and also addresses preservation and manipulation of habitat, without which there will be no wildlife. In fact in Australia, wildlife management is most commonly effected through management of habitat.

We are conscious that these definitions are western concepts which do not accord readily with indigenous perspectives. For example, indigenous people tend not to distinguish between use and management of wildlife, because of the close relationship between rights and responsibilities in indigenous people's relationships with the environment.

Sustainable use and sustainable development

Sustainable use of wildlife is use that involves no decline over time in the abundance, range or viability of the wildlife resource. This means that current use will not diminish the potential for wildlife to meet the needs and aspirations of future generations.

Sustainable development is a much broader concept: development that balances ecological and economic goals within a social and cultural context and which takes both intergenerational and intragenerational equity into account. It requires the conservation of biodiversity - of species, natural habitats and ecosystems - and that ecological thinking be integrated into all social and economic planning. Equity in social and economic spheres implies that human rights and social justice are integral to sustainable development. Sustainability of social systems also requires integral attention to maintaining and enriching cultural diversity (Barbier 1987; Young 1995; SOEAC 1996).

Sustainable development is a process. The question of whether a use or a system is sustainable can be judged only by comparing present conditions to past conditions and to future goals (Webb 1997). This means that a commitment to sustainability is a commitment to an adaptive approach to management that includes monitoring, evaluation and, where necessary, changes or corrections to how action is implemented.

Indigenous communities

We consider communities to be groups of people with common spatial, social, cultural or economic interests (IIED 1994; Young and Ross 1993; Davies 1995). All of these forms of community are prevalent in Australia. Any individual is typically part of a number of different communities. We use the term '*indigenous people*' to include both Australian Aborigines and Torres Strait Islanders. Aboriginal peoples and Torres Strait Islanders are culturally quite different as well as each being culturally diverse peoples. Inevitably in a report of this nature it is necessary to generalise about some cultural characteristics, but we have endeavoured to do so in a way that does not

overlook relevant complexities. Where information relates solely to either Aboriginal people or to Torres Strait Islanders, or to a particular cultural grouping of Aboriginal people, we have tried to make this clear.

Traditional indigenous wildlife management

Traditional indigenous wildlife management refers to the systems of rights and responsibilities for the use and management of wildlife and habitat that derive their authority from indigenous customary law, and that have their origins in practices that predate European occupation of Australia. These systems are not static or unchanging. In common with most other features of contemporary indigenous culture, they have adapted to integrate new technologies, such as the use of rifles for hunting and motor cars for transport. However their basis continues to be in the knowledge, rights and concomitant responsibilities that derive from indigenous people's relationships to particular tracts of country and to each other. Where we need to distinguish pre-European systems of indigenous wildlife management, we refer to these as classical systems, following what is becoming an accepted anthropological convention in Australia (Sutton 1997).

Indigenous community wildlife management (CWM)

Indigenous community wildlife management (indigenous CWM) activities are contemporary actions or initiatives in wildlife and related natural resource management which are managed and controlled by indigenous people, and which return benefit to indigenous people. These may include traditional indigenous management systems, overt use by indigenous people of Western scientific methods and technologies, and approaches which combine these knowledge systems. *Indigenous CWM* involves a very high degree of control by indigenous people and their organisations. The planning and execution of wildlife management is driven by indigenous communities and the organisations which directly represent them[1]. Governments are typically involved, indirectly in providing funding support, and in other ways which support (or which may constrain) indigenous management. External researchers or facilitators may also be involved.

Co-management

Co-management refers to forms of environmental management in which indigenous people and other parties share responsibility for management of a species, place or process **in an equitable partnership**. The term stands for *co-operative* management, usually between government and community stakeholders, whether indigenous or non-indigenous. In Australia co-management between government and indigenous people operates in some national parks, where it is referred to as 'joint management'. However we use the term 'co-management' in discussing these examples, to conform with international usage. Unlike Canada and the north-west USA (Osherenko 1988; Pinkerton 1989; McCay and Jentoft 1996) co-management systems have not been developed in Australia for wildlife and fisheries management or in land use planning.

Participatory projects

Participatory projects and participatory management approaches are those in which indigenous people are active stakeholders and are involved in management systems, but neither control the project nor necessarily have an equitable role in decision making.

1 Pimbert and Pretty call such activities 'self mobilisation' or 'active participation', representing the highest level of community control and decision making.

'Top down' and 'bottom-up' approaches

The terms 'top down' and 'bottom up' distinguish activities which are government initiated and controlled, from those initiated and controlled by local communities. However we have found that these terms cannot be applied rigidly. There are many instances where governments have adopted a valuable facilitating approach to indigenous community wildlife and resource management. At first the initiative and direction has come from government, but indigenous communities have progressively moulded this 'top down' impetus to their own circumstances, developing projects which they direct and control. Nevertheless, such partnerships typically develop and operate in a context of markedly unequal power relations since governments typically retain the power to control most of the financial resources and information used in management. In order that this reality is not overlooked or trivialised, we use the terms 'top down' and 'bottom up' in this report when describing and discussing structural relationships between governments and indigenous people.

1.3 Methods

This report is based on a study of 26 projects and initiatives where indigenous people are managing wildlife and habitats on their own lands or participating in scientific research or in government wildlife management programmes (see Box 1.2). These case studies were compiled largely from literature, telephone calls and correspondence during 1996 and 1997. Data collection focused on topics refined from an extensive list of project information.

The case studies detail a wide range of wildlife management activities in contemporary Australia which involve indigenous people. Some of these are wildlife focused, including commercial harvests, collaborative research and management activities for native wildlife species, and feral animal control programmes. Others are broader natural resource management initiatives which have a wildlife component, including regional and local environmental management programmes of indigenous organisations, co-managed national parks and government programmes facilitating indigenous management of natural resources.

These case studies are not an exhaustive inventory of indigenous community wildlife management in Australia although they do cover most of the relevant activity that we have come across. Our selection has been influenced by availability of information and a desire to indicate the range of activity currently underway, illustrate issues of broader relevance and illuminate current trends. A further influence is the extent to which the examples lend themselves to being described as 'projects' or discreet initiatives. Activities that are being undertaken solely by indigenous people, without any specific government funding support, tend not to be included since these are part of the normal fabric of indigenous community life, and not readily isolated as discreet 'projects'.

Time and a small budget have precluded field visits or much personal consultation with community groups, severely limiting direct input from indigenous people. Many indigenous organisations have contributed information and advice but our contact has mostly been with non-indigenous land management officers. A small

Box 1.2 Case studies

Case studies researched for this project can be accessed via the Internet at http://www.waite.adelaide.edu.au/AME/jdavies/studies.html. For each case study information is given on project/activity objectives, funding sources, origin of the initiative, the nature and extent of indigenous involvement, and the positive and negative impacts of the project/activity. Strengths and opportunities, problems and obstacles are also described. The sources of information for the case studies are listed in Appendix 1.

Australian wildlife management projects/activities with involvement by indigenous people

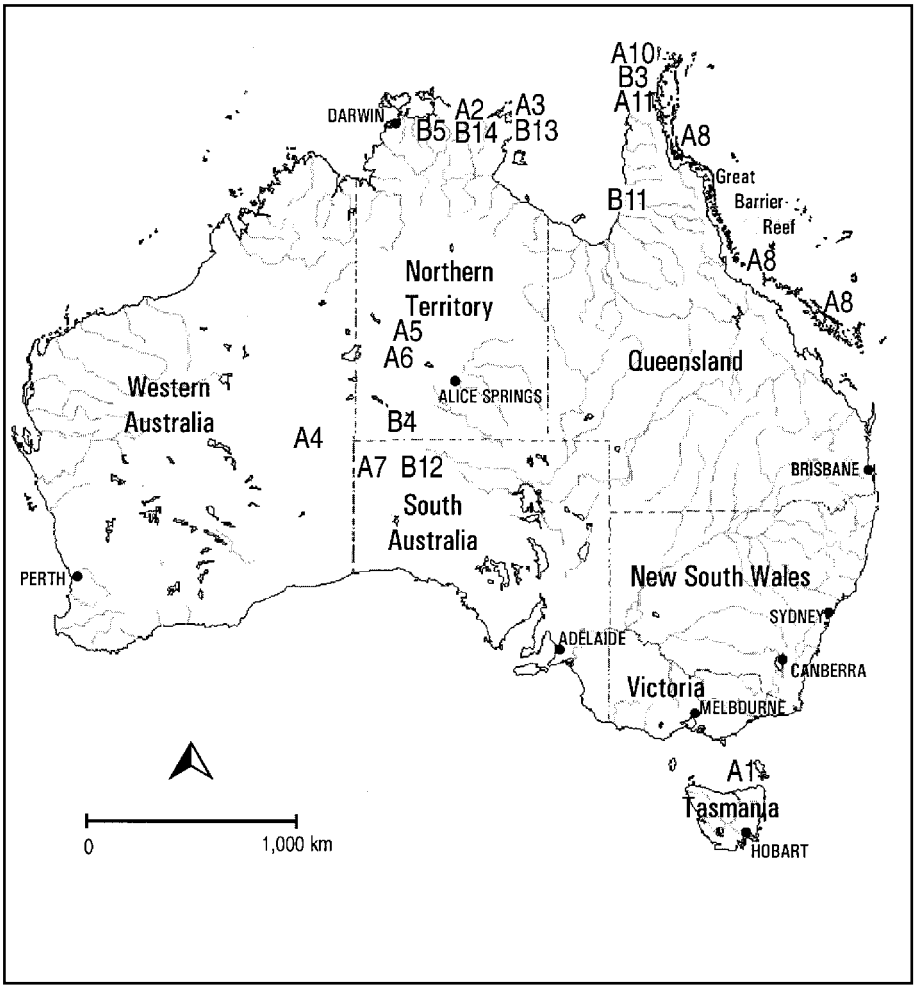
A Wildlife focused

A1 Commercial muttonbird harvesting in Tasmania
A2 Commercial use of crocodiles by Aboriginal people in the Northern Territory
A3 Miyapanu (sea turtle) research project in Arnhem Land
A4 Survey and management of black-footed rock-wallabies in Western Australia
A5 Reintroduction and management of mala in the Northern Territory
A6 Survey and management of the greater bilby in the Northern Territory
A7 Anangu-Pitjantjatjara Lands biological survey
A8 Management of dugong and turtle harvesting in the Great Barrier Reef Marine Park
A9 Australian Fisheries Management Authority Catch Monitoring Programme in the Torres Strait Protected Zone
A10 Community dugong management plan for Boigu Island, Torres Strait
A11 Monitoring subsistence use of wildlife in northern Cape York Peninsula and Moa Island in the Torres Strait
A12 Feral vertebrate control: cooperation between State/Territory governments and indigenous people

B Natural and cultural resource management projects/activities with a wildlife component

B1 Aboriginal Rural Resources Initiative (ARRI)
B2 Contract Employment Programme for Aboriginals in Natural and Cultural Resource Management (CEPANCRM)
B3 MaSTERS: Marine Study for Torres Strait Environmental Resources Strategy
B4 Co-management of Uluru-Kata Tjuta National Park
B5 Co-management of Kakadu National Park
B6 Indigenous Protected Areas
B7 Community Rangers
B8 Central Land Council: land and natural resource management activities
B9 Northern Land Council: Caring for Country Strategy
B10 Cape York Land Council/Balkanu Cape York Development Corporation: land and resource management activities
B11 Kowanyama Land and Natural Resource Office (KLANRO): land and resource management activities
B12 Anangu Pitjantjatjara Land Management Programme
B13 Dhimurru Land Management Aboriginal Corporation (DLMAC): land and resource management activities
B14 Bawinanga Aboriginal Corporation: land and resource management activities

Map 1 Case study locations



workshop of indigenous people held in December 1997 prior to the finalisation of this report provided opportunity for indigenous input. Its advice is reported in Chapter 6.

As well as the case studies we have drawn on published material relevant to indigenous wildlife use and management, and on information from other studies conducted by some of the authors including Sustainable Development Planning by Aboriginal Communities (Young, Ross and Davies, in progress, Davies, 1995) and Caring for Country (Dale 1991; Davies 1991a; Young et al 1991).

Our work has benefited considerably from the recent publication by the Commonwealth government Bureau of Resource Science of *Sustainable Use of Wildlife by Aboriginal Peoples and Torres Strait Islanders* (Bomford and Caughley 1996a). This book was produced to meet the need of government agencies in responding to growing demand from indigenous people for support for projects which involve wildlife.

In order to explain the context for indigenous CWM and draw out lessons and conclusions from the case studies, it has been frequently (and often frustratingly) necessary to generalise. In doing so we have drawn extensively on our combined personal experience: more than 50 years in researching and facilitating action with indigenous groups, and some 25 years in ecological research and conservation management. While our interpretations are inevitably subjective, we are confident that they are not ill-informed.

Our approach to synthesising the material from the case studies and other literature, the opinions we express and the issues we emphasise are premised on a concern for indigenous human rights, social justice and equity. These goals are integral components of sustainable development and are considered by Australian indigenous people to be of prime importance in any approaches to development.

1.4 Structure of this report

In this introduction we describe our aims and methods, and reflect on the some of the issues and constructs that we have grappled with in addressing how the ‘Evaluating Eden’ project applies to Australian indigenous issues.

Chapter 2 provides an introduction to Australian geography, cultural attitudes to wildlife and the institutional context for wildlife use and management by Australian indigenous peoples.

Chapter 3 reviews current activities of indigenous people in wildlife use and management drawing on case study material and other sources.

Chapter 4 focuses on evaluating the impacts and achievements of the projects described in the case studies.

Chapter 5 is a summary of key issues for the future of indigenous CWM identified

from analysis of the case studies and other material. It discusses policy considerations for future involvement of indigenous people in wildlife use and management.

Chapter 6 concludes the report with a summary of the strengths and weaknesses that characterise indigenous CWM and its context in Australia.

The Australian context

2.1 Environment

Australia, the world's largest island and smallest continent, covers 7.68 million square kilometres. Composed largely of ancient geologically stable land masses, it extends from 10 to 45 degrees south. The climate is tropical in northern coastal areas, temperate in the south east of the mainland and in the southern island State of Tasmania, and mediterranean in coastal South Australia and the south west of Western Australia. However Australia is also the world's driest continent (other than Antarctica) and most of the continent has semi-arid or arid rainfall regimes. Vegetation complexes include savanna grassland and scrub in the north; rainforests and temperate eucalypt-dominated forests, woodland, and heathland on the eastern coast and in Tasmania; and grassland and shrubland in arid and semi-arid regions.

Human population density is sparse over most of the continent, and concentrated in the east, south-east and south-west coasts of the mainland. Eighty-eight per cent of the population live in cities and large towns. Only 6 per cent of the land is arable. This is used for dry land cropping, sugar cane and irrigated rice, cotton and horticulture. About 5 per cent of the land is forested - three-quarters of this is used for commercial forestry. Extensive grazing, predominantly cattle and sheep is the main land use on 54 per cent of Australia. (SOEAC 1996; Young 1996) . Mining and petroleum production, which occupies less than 1 per cent of land, contributes about 4.5 per cent of GDP and 45 per cent of total exports of goods and services.

About 14 per cent of the country is indigenous-owned land, predominantly in arid and tropical regions. This has a mixed land use regime. Livestock grazing, subsistence use of plants and animals, tourism, and arts and craft production are the major economic activities of indigenous people. Substantial mineral production also occurs on indigenous-owned land.

Over 5 per cent of Australia is included in protected areas. However these do not effectively represent the various biogeographic regions of Australia or the ecosystems within each biogeographic region. Both protected areas and indigenous-

owned lands tend to be ‘residual’ land tenures, covering lands where agriculture and pastoralism are least viable (SOEAC 1996).

2.1.1 Wildlife resources

As a result of a long period of isolation from other land masses, many of the wildlife species are unique to Australia. This contributes to Australia’s status as one of twelve key regions for maintenance of global biodiversity.

All three major groups of mammals are well represented, including two of the world’s three monotreme species (platypus and the short-beaked echidna). There are 282 species of native mammals, not including whales, and 85 per cent of these species are endemic (DEST 1994). Marsupials radiated into a great diversity of forms in Australia. They are classified into four orders: the carnivorous and insectivorous dasyurids (eg native cat and Tasmanian devil); the diprotodonts (kangaroos, wallabies, possums, wombats and koala); the peramalids (bandicoots and bilbies); and the marsupial mole (Strahan 1995). Placental mammals are represented in the native fauna by rodents, all of which are murids; bats; four species of seal; whales and dolphins; the dugong and the dingo, which was introduced by Aboriginal people.

Several groups of birds have undergone major evolutionary radiations in Australia and 40 per cent of the 720 native birds species are endemic. Australia’s reptiles are a key element of the fauna. There are 750 species, 89 per cent of which are endemic. The lizard fauna of the arid zone is particularly diverse. All the native amphibians are frogs, some of which have adapted to breed in very ephemeral waters. Of 200 species, 93 per cent are endemic (DEST 1994).

In the two centuries since Europeans colonised Australia, environmental change has been dramatic. Habitat modification has been and continues to be the most significant cause of biodiversity loss. This has resulted from clearance of native vegetation for agriculture, impacts on coastal ecosystems from urban development, and forestry operations. Introduced species, including more than 10 medium and large sized mammals which have established abundant feral populations, present further threats to native wildlife through competition and predation (SOEAC 1996).

Australia has the worst record of mammal extinctions of any country, particularly in the arid zone where a third of medium sized mammal species are now extinct (Burbidge et al 1988). Scientists attribute this to a combination of interrelated factors: resource rich habitats, critical as drought refuges for wildlife, are very patchily distributed. Native species were forced to compete with livestock and feral herbivores (especially rabbits) for use of such areas, as well as facing increased predation from other introduced species (especially cats and foxes). From the mid 19th century indigenous people of the arid zone began to be dispossessed of their land. Their practice of regular low intensity patch burning (see section 2.2.2) ceased, and the prevalence of large wildfires increased. As well as the direct impact of these large fires on wildlife populations, the changed fire regime decreased habitat diversity to the detriment of native species. Population declines continue to affect some mammal species, particularly in central Australia (see Chapter 3).

Wildlife of two large islands, Tasmania and Kangaroo Island SA, has not been as heavily impacted as that of the mainland, with absence of introduced foxes being an important contributing factor. A number of smaller off-shore islands which are also relatively predator free are habitat for the only extant colonies of some species which were widespread at the time of European colonisation.

Some native species have benefited from European land uses, at least over parts of their range. These include the larger kangaroos which have been favoured by the development of artificial stock watering points and introduced pasture species in areas used for sheep and cattle grazing. Where sheep grazing is the dominant use, vigorous control of dingos has reduced predation on kangaroos.

2.2 Australia's indigenous peoples

Indigenous people comprise only 2 per cent (350,000 people in the 1996 census) of Australia's population of 18 million but nevertheless have a strong influence on cultural expression, political debate and land and resource management decisions. About 10 per cent are Torres Strait Islanders and the rest belong to various Aboriginal peoples. The total indigenous population now possibly numbers the same as at the time of European colonisation, though some estimates put the pre-European population much higher than this.

Non-Aboriginal usurpation of most Australian land over 210 years has altered indigenous population distributions dramatically and permanently. European expansion across Australia in the 19th and 20th centuries quickly pushed indigenous people off their traditional country in the south, east and south-west of the continent onto reserves and missions and into towns. In the vast arid and semi-arid rangelands and in the tropics, many indigenous people were able to continue living on or close to their traditional land because they provided essential labour for the establishment of the pastoral industry. However, from the 1960s the introduction of equal pay for Aboriginal stockmen led many pastoralists to cease employing Aborigines, and to cease tolerating Aboriginal camps on their leases. As a result Aboriginal populations in the rangelands, as elsewhere in Australia, became concentrated in centralised government or church-run settlements. Access by Aboriginal people to wildlife for subsistence use and for the maintenance of cultural traditions became increasingly difficult. This did not change until land rights began to be granted to Aboriginal people in the 1970s.

Low socio-economic status, reflected in health profiles, education and employment levels and rates of imprisonment (ATSIC 1996), combines with a history of exclusion and marginalisation from processes of government decision making to make it very difficult for indigenous people to gain acceptance as legitimate users and managers of wildlife. However, it would be a great mistake to simply cast indigenous people in the role of victims since, as the projects and issues reviewed in this report illustrate, they competently and confidently assert their rights and interests in many decision making forums and in 'on the ground' wildlife management.

2.3 Wildlife in indigenous and non-indigenous cultures

2.3.1 Wildlife in indigenous cultures

Aborigines of the Australian mainland and the southern island of Tasmania have managed local ecosystems in particular ways to foster the animal and plant species they hunt and gather for at least 40,000 years (Lourandos 1997), maybe for longer. The classical Aboriginal management system was part of a mobile way of life in which Aboriginal people travelled to their sources of food, rather than growing crops or herding animals as in the European custom. However they were not constantly nomadic. Each group had its own tract of country within which they moved periodically, between regular, sometimes semi-permanent, campsites. In regions where resources were abundant, these movements could be on a very small scale (Chase and Sutton 1981; 1987), whereas in arid regions, much larger distances had to be covered. When environmental conditions resulted in abundant food sources, large gatherings of many groups of people were possible.

Torres Strait Islanders are a strongly maritime people who have always grown some crops as well as harvesting much food from the sea. They have built mound and ditch water control systems, both to drain land and maintain moisture in the dry season. Marine resources were conserved through customary tenure systems (Mulrennan 1992: 35). Both Torres Strait Islanders and Aboriginal peoples have long been active traders.

Traditional indigenous wildlife management is underpinned by spiritual affiliations to ‘country’. Country includes land, marine areas and other waters, wildlife and other natural resources. Spiritual affiliations accord both rights and responsibilities, including custodial responsibilities for keeping the land healthy and its species abundant.

Aboriginal people have subtle seasonal regimes of burning patches of grassland and woodland. This manipulates habitat for favoured wildlife species and plants, and makes hunting, visibility and travel easier. It also reduces the likelihood of large wildfires and their impact on habitat diversity (Hallam 1985; Braithwaite 1991; Rose 1994). Some argue that the prevalence of fire-adapted plants and grasslands in Australia is due to ancient Aboriginal manipulation of the environment (Hallam 1985; Kershaw 1989; Braithwaite 1991; Haynes 1991; Rose 1994; Cubit 1996). There are also techniques for the propagation and storage of some plants, and distribution of seeds (Satterthwait 1980; Baker 1993; Latz and Green 1995). These are conscious practices which sustain the ecological health of country and its value for human subsistence.

In traditional indigenous management, rights to use wildlife are not distinguished from responsibilities for management, because hunting and gathering of resources is considered to be an overt part of ‘caring for country’ (Povinelli 1992 illustrates this well in a contemporary setting). Wildlife resources are valued in cultural, ecological and economic terms. Thus, for example, crocodiles might be valued simultaneously for their spiritual significance, as a familiar component of the local landscape whose behaviour indicates seasonal change; as food, and, now, also as a source of cash

income. This points to the value of a holistic sustainable development framework for understanding indigenous wildlife use and management.

Indigenous traditional ecological knowledge (Walsh 1990; Williams and Baines 1993) is highly integrated, in contrast to the reductionist perspectives in much non-indigenous science:

> *For example, Western science has produced incredibly detailed knowledge of the reproductive behaviour of crocodiles along with wonderful technology for measuring time, but there is no way that Western scientists can predict, using their knowledge and technology, exactly when the crocodile eggs will be laid on the swamps. Aboriginal scientists on the other hand know little of Western microscopic detail, but know that the moment in which crocodiles start to lay their eggs is entirely predictable if one pays attention to march flies. There is a certain sort of march fly which will come and tell you the eggs are there. The other type of biting fly tells you that the bush plums are ready.*
>
> (Christie 1990: 61)

Indigenous people needed to develop a sophisticated understanding of their environments in order to survive. In desert areas this involved knowing plant responses to particular combinations of temperature and rainfall which might occur only rarely (Walsh 1990). In northern monsoonal areas elaborate seasonal calenders have been drawn up from local indigenous people's intimate knowledge of the correlation between seasonal events, and the responses of plant and animal species (Altman 1987; Baker 1993). Ecological systems of relationships - between animals and their habitats, or between plants, terrain and soils, climatic patterns and fire - are reflected in Aboriginal people's land classification systems (Walsh 1990, Baker 1993). Traditional ecological knowledge also encompasses detailed understanding of animal behaviour, exemplified by Aborigines' sophisticated tracking skills.

Traditional ecological knowledge is inseparable from indigenous beliefs about the formation of the earth and its species, and from individual people's particular spiritual relationships with land, plants and animals. This body of belief is known in English as 'the Dreaming', or more properly as indigenous (or Aboriginal) customary law, or simply 'the Law'. Knowledge about the Law is highly respected by indigenous people and access to it is determined by gender, age, one's country, and dedication to learning. There are clear protocols for the transfer of knowledge. Women's and men's knowledge and responsibilities are distinct, complementary and equally valued spheres.

Aboriginal people believe that the landscape as we now know it was shaped by the actions of ancient, gigantic ancestors, considered simultaneously as human and animal, and that the spirit of these ancestors continues to be manifest in the landscape. The movements of these ancestors form links between places, and thus between the Aboriginal landowners responsible for those places. The stories of their movements are retained and taught in lengthy and detailed song cycles, often taking some time to perform. These songs encapsulate much of the traditional knowledge of both well-known and less frequently visited places. In the latter case they enable people to find water and food even if they have not been to a place for many years. The sense of time in these beliefs is complex. The activities of the ancestors are both

past and present and people often express this by explicitly linking themselves and visible features of the contemporary landscape to the ancestral beings. Thus a mountain can be simultaneously a mountain and also the contemporary embodiment of an ancestral being. Humans and animals are linked in a similar way:

> *Animals, they're related to us*
> *Animals were human before.*
>
> (Napranumpeople, in Suchet 1996: 211)

In the process of describing the behaviour of the ancestors - meeting, mating, travelling, fighting, gathering food, eating, or making shelters - Aboriginal Law prescribes the mores of Aboriginal behaviour including treatment of the environment and other beings. The Law also codifies knowledge of the relationships between animals and their preferred habitat, as Newsome's (1980) analysis of red kangaroo song cycles of central Australia indicates. This belief system is not centred on the primacy of human beings. Rather each species has its own Law, and this is believed to be the reason why its members behave in ways that are regular, predictable and unique. Human and non-human systems of Law are linked through people's links to animal and plant species, sometimes referred to as totems:

> *For example, (in Yarralin country in the north-west of the NT) people who are flying fox ngulu (totem) are said to be 'countrymen' (close kin) of flying fox...They share a special relationship to flying foxes which is particularly evident when a flying fox person dies. At that time all flying foxes become taboo as food and it is only with the passage of time and the permission of other flying fox people that flying foxes may again be hunted.*
>
> (Rose 1992: 262)

Unusual events, catastrophes and the failure of life-supporting systems are consequences of failure to respect this system of Law.

Although conservation cannot necessarily be considered the conscious aim, these totemic relationships with wildlife species act to regulate hunting pressures. They are noted from many parts of Australia (see for example Newsome 1980; Baker 1993; Tunbridge 1995; Rose 1996).

The Law links Aboriginal people to particular tracts of land, known as their 'country'. The linkages are complex and vary regionally - they are generally inherited through parents and grandparents, and are also often associated with the place of conception or birth. People thus often have more than one country. Countries, and therefore the rights and responsibilities of different individuals and families, may overlap.

Decisions about the use of country are made in accordance with these customary systems. Decision-making follows an ethic of consensus, but not everyone has an equal right to participate. Traditional owners, those with primary spiritual affiliations and responsibilities, have pre-eminence (Ross 1995). Others must consult traditional owners about any use of their country (Myers 1982; Williams 1982). In this way people can negotiate access to the resources of their neighbours' country, a particularly important practice in arid areas where food resources are scarce in times of drought. Traditional owners must in turn consult their kin and neighbours in making important

decisions (Williams 1987; Ross 1995). When non-Aboriginal people wish to make decisions about how land is used, they are expected to consult Aboriginal traditional owners according to the same set of norms.

Ceremony has a central role in traditional indigenous management of country. For example, for Yolgnu people:

> *The ritual in hunting turtle and dugong is part of our management structure.*
> (Lanhpuy 1993)

'Increase', or 'maintenance' (Latz et al 1995; Rose 1996), ceremonies feature in indigenous cultures across Australia. By paying ritual respect to the propagative powers of ancestral beings, indigenous people assure maintenance of the populations of animals associated with that being. Anangu people of the Anangu Pitjantjatjara lands illustrate this process in their video *Manta wirura kanyilpai: keeping the spirit in country* (IAD 1994). Flood (1997) speculates that the origin of much of the rock art prevalent in parts of Australia lies in such increase ceremonies. The rock art record of animal tracks, extending from engravings made at least 25,000 years ago to paintings made in central Australia crevices in the 1960s by hunters waiting for game (Flood 1997), underscores both the antiquity and continuity of indigenous Law for use and management of wildlife.

Since their Law is ancient and is an expression of the landscape and its plants and animals, indigenous people do not view it as easily open to amendment or negotiation. They speak disparagingly of the law-making practices of Australian governments, where laws are just pieces of paper, frequently discarded or changed.

When Europeans arrived in Australia indigenous people probably maintained a sustainable balance with environmental resources through a combination of low population pressure and the complex and interdependent mechanisms outlined above. Flannery argues that this was not always so and that Aboriginal peoples' hunting practices had caused the extinction of Pleistocene megafauna. Archaeological evidence for this is inconclusive and there is on-going debate (Lourandos 1997). Nevertheless it is certain that the rate of environmental change in pre-European Australia was infinitely slower than the continent has experienced since 1788.

2.3.2 Wildlife in colonial history

In contrast to the abundant resources indigenous people enjoyed from their traditional country, European usurpers of indigenous peoples' land in Australia originally considered it anything but a bounteous 'Eden'. Even though some regions in the south and east of the continent presented attractive scenes to their eyes, with open and park-like landscapes (a legacy of indigenous people's use of fire in land management) seemingly awaiting their flocks of sheep, much of the land was seen by them as hostile and barren. Only a few animal species, such as snakes and in northern Australia, crocodiles, are actually dangerous to humans and none other than crocodiles are predators of humans. However the unfamiliar environment, harsh climate and isolation, coupled with fears of attack by indigenous people, dominated European impressions.

In many parts of Australia, native animals were used as survival food by early colonials who sometimes drew on Aboriginal ecological knowledge. In most cases this ceased with establishment of European crops and livestock. Unlike indigenous people, the European colonists people lacked the knowledge and interest to live effectively off native species. The vast majority soon turned their backs on the resources and landscapes of the Australian continent, in favour of imported food resources and imported cultural practices and symbols. Indigenous habitat management practices such as regular, low-intensity burning of vegetation were banned from the early days of colonial rule because of their conflict with imported European farming practices.

Above all, the late 18th and 19th centuries were characterised by attempts to remould the bush into the European image. Efforts to naturalise familiar European species such as rabbits and foxes, sparrows, starlings and trout were devastatingly successful. Many domesticated mammals - cats, goats, donkeys, horses, camels, buffalo, pigs and cattle - also readily established thriving feral populations.

For most of the first two centuries after Europeans colonised Australia, the dominant attitude to native species was summed up in the satirical saying: 'If it moves, shoot it - if it doesn't, chop it down.' Many native species were regarded as pests by rural landowners because they ate pastures and crops and raided food stores. Native predators - such as dingos, thylacine (the marsupial Tasmanian 'tiger', now probably extinct) and wedge tailed eagles - were also targeted by colonists because they sometimes attacked livestock. Where their furs or flesh were a marketable resource, native animals were commercially exploited. By the start of the 19th century hunting pressure had already sent some species of seals and whales into dramatic decline.

Some native birds were hunted for food (with the dwarf emu of Kangaroo Island becoming extinct in the 19th century as a result), while parrots were heavily trapped for the caged bird market (Thomson et al 1987; Callister et al 1995; Martin 1997). Populations of some species, such as koalas, increased after European settlement, with the cessation of Aboriginal hunting thought to be an important cause (Martin 1996). An export skin trade flourished briefly until hunting, disease, wildfire and habitat fragmentation markedly reduced populations. Several other mammal species were hunted on a substantial scale for their fur in the early to mid 20th century. However, declining wildlife populations and increasingly strict regulation of exploitative uses reduced almost all commercial use of Australian wildlife to very low levels by the middle of the 20th century.

Aboriginal people were involved in some of these early commercial wildlife harvests and 'pest eradication' efforts. For example, earlier this century, in central Australia and the Kimberley region of northern Western Australia, Aboriginal people actively traded dingo scalps for a government bounty. On the Nullarbor plain in south-central Australia some of the kangaroo shooting teams active in the late 19th century were dominated by Aboriginal people (Gara and Cane 1989). In south eastern Australia, Aboriginal people worked on shore based whaling crews in the 19th century.

2.3.3 Contemporary attitudes to wildlife

Non-indigenous attitudes and uses

There is a growing interest and advocacy amongst professional wildlife managers for approaches to conservation of wildlife through sustainable consumptive use . Farmers and pastoralists who suffer economic damage from 'pest' wildlife species, native or feral, are also increasingly looking to commercial harvest of wildlife as a way of balancing productivity and conservation. However these attitudes to, and uses of, wildlife are exceptional. Australian wildlife legislation is directed at strict preservation and the vast majority of contemporary non-indigenous Australians make no consumptive use of any wildlife species. Many regard "wild animals as sacrosanct, not to be killed or interfered with in any way" (Wilson 1987: 250). This concern for strict preservation is dominant in the attitudes of the general public and many NGO conservation groups towards native species.

Preservationist attitudes have recently impeded efforts to control wildlife populations which are so large that they have marked impacts on local ecology, such as kangaroos in parklands around Canberra, and koalas on Kangaroo Island, South Australia. Political distaste of management culls has forced government wildlife managers to sterilise animals from these wild populations rather than implementing more cost effective and ecologically sound culling strategies. Opposition to culling stems from people's belief that these animals have a right to live and that humans have no right to destroy them. There are also objections to the economic impact that culling might have, such as by tarnishing Australia's appeal as a destination for overseas tourists. Scientific argument about ecologically sustainable management has little impact on political decision making in such situations (Webb 1995; 1997b; Hugh Possingham pers com). Such attitudes contribute to difficulties in political acceptance of CWM activities which involve killing native animals.

Indigenous attitudes

Contemporary Australian indigenous people's attitudes and priorities for wildlife use and management are diverse, but generally premised on a desire to regain or hold on to control of traditional country and ensure that younger and future generations retain these connections. Subsistence use of wildlife is an integral part of this desire for most indigenous people, while commercial uses are looked to as potential economic opportunities which suit indigenous people's lifestyle and the productive capacity of their land.

The sorry policy and administrative history which has deprived indigenous people of many of their lands and rights has also affected their access to wildlife for subsistence hunting, and the continuity of traditional ecological knowledge and environmental management practice. Inability to visit traditional country, because of lack of rights or transport, has made it difficult for indigenous people to teach their children about their country and about customary environmental management practices. However although there has been attrition of knowledge, it has survived to an impressive degree in many parts of the country, and customary management practices are enjoying some revival as land rights and recognition of native title rights create new opportunities for indigenous people to return to and manage their traditional country.

Meanwhile the environments to which indigenous people have been returning have often been severely degraded, especially from grazing pressure and soil compaction by feral animals and livestock; erosion on water courses and denuded areas; and population declines or extinctions of many native species. Indigenous people are most concerned about the loss of native wildlife because of its spiritual and economic significance to their cultures, not because of the European idea of conservation. In Central Australia, where mammal extinctions have been most dramatic, Aboriginal people's theories about the causes of these extinctions are very different to those of scientists. Some speculate that the 'whitefellas' took the animals away, extrapolating from oral histories of scientific collectors in the early 19th century. Visits by scientists with specimens of rare species confirm Aboriginal people's views that 'whitefellas' must have populations of these animals somewhere. So do Aboriginal peoples' observations that in places where there are lots of non-Aboriginal people, such as the agricultural and coastal regions, there are also lots of kangaroos (Peter Yates, pers com).

Another common explanation is that when the people left the desert country, some 50 years ago, the animals left too. The country became 'sick' because it was not being looked after (Rose 1995). This explanation has some resonance with scientific models of central Australian mammal extinctions in that both recognise the importance that Aboriginal fire management practices had in maintaining suitable habitat. However for Aboriginal people the basis of their explanation is discontinuity in spiritual relationships with country. The songs and stories for some animals have been lost with the passing of some of the old people, so the animals have disappeared too (Rose 1995). For scientists such factors are quite irrelevant to explaining causality. A number of the initiatives described in this report are making important contributions towards better communication between scientists and indigenous people about such issues, for example a survey and management of black-footed rock wallabies in Western Australia, the Anangu-Pitjantjatjara land biological survey, and the Central Land Council's land and natural resource management activities.

Although Aboriginal people's explanations for wildlife declines tend to be spiritually based, some recognise the impact of hunting (eg Nesbitt and Wikilyiri 1994). In the more closely settled regions of Australia many indigenous people are also acutely aware of the impact of loss and degradation of habitat on wildlife populations. They can be very sensitive to suggestions that indigenous hunting may be having adverse effects on wildlife populations because they see their impact as insignificant compared to habitat loss caused by non-indigenous land use.

Feral animals

Some feral animals have acquired economic and cultural value to indigenous people, introducing further complexity into contemporary wildlife management. It cannot be assumed that indigenous people will share the concern of conservationists, government wildlife managers, scientists and non-indigenous landowners to eradicate or reduce feral animal populations. Rose's (1995) survey of indigenous attitudes to resource management in central Australia revealed that people perceived that rabbits, like other animals, 'belong to the country'. Government attempts to conduct donkey culls in Western Australia's Kimberley region in the 1980s were

opposed because some people saw the animal as strongly associated with Christianity. Indigenous people are rarely opposed to killing feral animals but object to the waste they see as occurring in 'kill and let lie' control programmes. For example, they see no logic in being banned from hunting feral animals in national parks when rangers are culling the same animals, and not using them.

Wildlife scientists and conservation NGOs are often concerned about the positive values that indigenous people have towards feral animals, given the enormous negative ecological impact of those animals. However such attitudes are not universal amongst indigenous people - many recognise the damage that feral animals are doing to the habitats of native species, wild plant resources and culturally significant sites, such as by trampling wetland vegetation and muddying water holes (see Baker 1993; Rogers 1993; Nesbitt and Wikilyiri 1994; Cooke and Guivarra 1995; NLC 1996; Breckwoldt et al 1996a). Nevertheless this recognition does not always translate into a capacity to control feral populations. Although some groups are involved in feral animal control, it may not be a priority for others or they may lack the resources to do so effectively.

Protected areas

A further significant difference between indigenous people's attitudes to wildlife management issues and those of many other groups of Australians is in establishment of protected areas. From about 1970 there was a marked growth in general public concern about environmental degradation and in the popularity and sophistication of the non-government conservation movement. By the late 1980s, governments responded with a more than four-fold expansion in the area of land dedicated as national parks and nature reserves. The dominant philosophy for protected area establishment and management was the 'Yellowstone model', in which all forms of plant and animal life are strictly protected with people as temporary visitors engaging only in contemplative activities.

In the 1980s, protection of wilderness was the most popular rallying cry to galvanise public support for conservation and it continues to be very influential. Indigenous people have increasingly taken issue with the emphasis on wilderness and uninhabited national parks, arguing that country that government agencies and conservation NGOs speak of as if it were uninhabited has been home to indigenous peoples for tens of thousands of years (see Brown 1992; Brown 1993; Ketley 1994; Langton 1995/6; Rose 1996; Sultan et al 1996).

Rapid expansion of the protected area system occurred at the same time as indigenous land rights were being recognised in Australia for the first time, and there are numerous examples where the creation of conservation reserves has been at the expense of recognition of indigenous land rights. Co-management of national parks developed in this context, as a compromise between the competing interests of land rights and conservation.

Many national conservation NGOs have revised their policies over the past decade to be supportive of indigenous land rights in protected areas, provided conservation values are protected. Some have been active advocates of co-management and have negotiated mutually satisfactory outcomes to land tenure and conservation management issues with indigenous groups (ACF et al 1993; Horstman and Downey 1995; ACF in prep).

Non-indigenous attitudes to indigenous hunting

Research commissioned by the Council for Aboriginal Reconciliation (1995) shows there is relatively strong acceptance by the general public for recognition of indigenous rights and for reconciliation between indigenous and non-indigenous people. However this support does not seem to extend to rights to hunt wildlife, particularly in the more closely settled regions of Australia, or in national parks. For example, in Queensland, regionally based conservation NGOs have lobbied against legislative reform to extend indigenous hunting rights, helping to raise 14,000 signatures on a protest petition. In NSW parliamentary opposition to recent legislation for co-management of national parks stemmed from concerns about the prospect of Aboriginal people hunting with firearms (Jopson 1996).

Among the scant quantitative data on such issues, Ponte et al's (1994) attitudinal research stands out. He found that 60 per cent of people in north Queensland oppose any indigenous hunting in national parks and 30 per cent thought hunting should occur only if classical weapons, such as spears, were used. This research was conducted in a region where co-management arrangements are being developed for a number of parks, potentially allowing Aboriginal people to hunt, including with firearms. One reason for public opposition is the entrenched view that all protected area management should subscribe to the Yellowstone model of strict preservation from all human impact. More fundamental is the commonly held view that the increasing urbanisation of indigenous people over recent decades and their use of guns, vehicles and motorised boats for hunting means that they are no longer 'real Aborigines'. In this view, most indigenous people have 'lost their culture' and are not entitled to any more rights than other Australians.

These attitudes are part of a far wider set of issues concerning indigenous peoples' place in Australian society and government expenditure on indigenous affairs. As Ponte (1996) has put it, public opposition to indigenous hunting rights has really 'got nothing to do with hunting'. Legislative changes to recognise indigenous hunting rights have not been accompanied by any public educational campaigns about why such change is warranted and how indigenous people and government will manage hunting impacts. As a result public understanding and acceptance of legislative change is limited (Ponte et al 1994; Ponte 1996). Some indigenous people fear that the vocal opposition of some non-indigenous groups to hunting of native fauna may lead to indigenous hunting being further vilified.

2.4 Institutional context

The institutional context for indigenous CWM is complex. It is difficult for anyone to keep abreast of this rapidly changing field. For this reason, it is difficult for indigenous peoples to understand all ramifications of their legal rights and practical opportunities in wildlife management and harvesting. It is perhaps even more difficult for non-indigenous people with interests in wildlife to comprehend indigenous perspectives on wildlife issues.

Australia's indigenous people do not readily accept the authority of governments to regulate their use of wildlife. This resistance stems from oral history and cultural memory of how the process of colonisation imposed British Crown sovereignty and

assumed ownership of land and resources, without the consent of indigenous peoples and with very little attempt at negotiation.

Indigenous users are generally either ignorant of the complexities of the 'top down' wildlife management regime or dismiss that whole system as an unwarranted intrusion on hunting and gathering practices which they consider to be an integral part of their cultural heritage.

> *(Hunting is) what Nyungars have always done, and will keep doing.*
> (Nyungar person commenting about illegal hunting in protected areas: in Department of Conservation and Land Management (WA) 1991:9).

> *But it's not an offence for me (to kill a crocodile), in my area, with my mob. We have certain responsibilities that come first before any Commonwealth or State laws that occupiers have forced upon us.*
> (Murandoo Yanner, quoted in Meade 1997).

Such strongly felt attitudes, coupled with the scant resources of government conservation agencies, mitigate against any attempt by governments to control indigenous use of wildlife by regulation and enforcement. This emphasises the importance of effective indigenous CWM for sustainable wildlife use and management.

Indigenous organisations and the Commonwealth, State and Territory governments are the key players in determining the future of indigenous use and management of wildlife. A large number of other groups and committees also influence use and management of wildlife in Australia, or will potentially do so in future. They include consumers of wildlife products, industry groups concerned with wildlife, conservation NGOs, animal rights groups, scientists and their professional associations, community groups engaged in addressing land degradation and in environmental monitoring, local governments, government advisory committees, Commonwealth parliamentary committees, and politicians (particularly critical are those from the minority parties which often hold the balance of power). With a few exceptions these groups have little involvement by indigenous people and little understanding of contemporary indigenous use and management of wildlife. Further organisations, such as churches, tertiary education institutions and schools, may contribute through their interests in indigenous human rights and social justice, or their contributions to public and professional understanding.

2.4.1 Wildlife management by Australian governments

General features

'Top down' regulatory systems characterise Australian wildlife management. Wildlife is the property of the Crown in Australian statute law, even where it occurs on indigenous owned or other private land (Wilson 1987; Smyth and Sutherland 1996). Native wildlife is a commons in the sense of being a resource managed for the public good. It is alienable as private property only in very restricted circumstances, such as when bred in captivity in a zoo or as part of a ranching operation, or after it has been killed by an authorised commercial harvester.

Australian government wildlife management systems are overtly protectionist, with virtually no unregulated use allowed except in the case of feral animals (Wilson 1987). Most species are protected by statute and there are very few open seasons for recreational hunting. Prevention of illegal trapping is a priority in government management of wildlife conservation, since some species of birds and reptiles fetch high prices from black market sale to wildlife collectors. This is thought to have been the main factor in decline of 13 species (Callister and Williams 1995).

Landowners can apply for permits to cull specified numbers of pest species of native animals, typically kangaroos or wallabies, and commercial use of the culled animals is sanctioned in some parts of Australia. Government agencies tend to be cautious in issuing culling permits, yet have limited capacity to monitor compliance with permit conditions. This leads to illegal culling at unknown rates. However low market demand and low prices for these species means there is little illegal trade in them.

Although little commercial use of wild populations of native animals is sanctioned, there is a trend to increased commercialisation within the framework of sustainable use. This is most apparent in the commercial kangaroo harvesting industry and for some other species in the Northern Territory.

Indigenous uses of, and rights and interests in, fisheries (including traditional dugong and turtle fisheries) have attracted more policy and research attention than similar issues concerning terrestrial wildlife. The latter have rarely been the focus of policy debates or research either in the indigenous affairs sphere or in wildlife management.

The approaches of the various Australian governments to indigenous use and management of wildlife are outlined below. This summary is based on more detailed reviews by the Australian Law Reform Commission (1986), Altman and Allen (1992), Craig (1996); Collins (1996), and Haigh and Coleman (1995).

The Commonwealth role

Australian wildlife, and all other aspects of land and natural resource management, are mainly the constitutional responsibility of State and Territory governments under Australia's federal system of government. The Commonwealth government takes a facilitation and coordinating role in these issues in conjunction with State and Territory governments. However, most of the projects studied in our review have a high degree of direct or indirect Commonwealth government involvement, because of that government's direct policy involvement with indigenous peoples and its capacity to create grant schemes to assist indigenous peoples.

The Commonwealth has ratified most international conventions relevant to indigenous human rights and to wildlife protection[1] but few have been given specific effect under Australian law and not all aspects of these conventions are implemented

[1] Australia has ratified the International Covenant on Civil and Political Rights, the International Covenant on Economic, Social and Cultural Rights, the Convention on the Elimination of all Forms of Racial Discrimination (CERD), the UN Law of the Sea Convention (UNCLOS), the Convention on Wetlands of International Importance (Ramsar Convention), the World Cultural and Natural Heritage Convention, the Convention on International Trade in Endangered Species (CITES), and the Biological Diversity Convention. It has not ratified ILO Convention 169 concerning Indigenous and Tribal Peoples in Independent Countries or the International Convention to Combat Desertification (Craig 1996; Wilson 1987).

effectively (Craig 1996). Where legislation has been developed, such as in the case of the Racial Discrimination Act 1975 and the World Heritage Properties Conservation Act 1983, it has facilitated strategic and far reaching Commonwealth action to override State government powers which impact on indigenous human rights or on conservation values.

The National Strategy for the Conservation of Biological Diversity includes commitments to facilitate conservation of traditional ecological knowledge (TEK), protect indigenous intellectual property through agreements, establish a royalty payment system, and promote understanding amongst all Australians of the importance of TEK. It undertakes to provide accurate information to indigenous people about biodiversity and involve them in research, negotiate cooperative arrangements for biodiversity conservation on indigenous land, and provide resources for recovery of threatened species significant to indigenous people. It also undertakes to provide assistance for ecologically sustainable wildlife harvesting by indigenous people. As later sections of this report indicate, there are few significant actions by governments to address these challenging commitments.
Two substantial Commonwealth inquiries have researched and addressed indigenous rights, interests and concerns for natural resource management: the Resources Assessment Commission Coastal Zone Inquiry and the National Rangelands Strategy. Most of their recommendations for empowerment of indigenous people are still outstanding. The policy issues addressed in these strategies are intractable, requiring substantial intergovernmental and interagency co-ordination.

The Commonwealth level of government has taken the main government role in negotiating statutory arrangements for recognition of indigenous rights and has been active in facilitating indigenous involvement in wildlife conservation and related areas of natural and cultural heritage management. These activities extend the leading role that the Commonwealth government has taken in indigenous affairs over the past three decades.

The Commonwealth wildlife management agency, now known as the Environment Australia Biodiversity Group (EABG) is the government partner in three co-managed national parks, Uluru-Kata Tjuta, Kakadu (both located in the Northern Territory) and Booderee (in Jervis Bay Territory). Aboriginal people own these parks and are allowed to hunt there for subsistence and ceremonial purposes subject to management plans and any regulations imposed to conserve wildlife. EABG also coordinates threatened species recovery planning (see for example Maxwell 1996). Threatened species management programmes which involve indigenous people include mala (rufous hare wallaby, *Lagorchestes hirsutus*), bilbies (rabbit-eared bandicoot, *Macrostis lagotis*) and black-footed rock wallabies.

The Commonwealth government, through the Great Barrier Reef Marine Park Authority (GBRMPA), manages the Great Barrier Reef Marine Park (GBRMP) in conjunction with the Queensland government. Zoning plans provide for traditional hunting of dugong and turtles. The Commonwealth also has a significant role in the Torres Strait, through the Torres Strait Treaty between Australia and Papua New Guinea, which aims to protect traditional lifestyles of Torres Strait Islanders and the marine environment and is implemented by Commonwealth and Queensland legislation.

State and Territory legislation

Government regulation in some States and Territories exempts indigenous people from statutory prohibitions on wildlife use that apply to other people. However there is little consistency in approach between the various States and Territories and some States have no provisions for indigenous use of wildlife.

Statutes regulating access to land and regulating use of firearms complicate the picture. Indigenous hunters' access to privately owned land generally requires the permission of the landowner, except on pastoral leases in some States and Territories. Most indigenous hunters use firearms, for which they require licences. The impact of recent gun control laws on indigenous hunting has not been examined to our knowledge. However it seems likely that this would present some practical barriers to legal gun ownership by many indigenous hunters. Other factors relevant to firearms use are public safety concerns about hunting in areas to which there is public access (such as national parks).

Principles for recognition of indigenous customary law

In 1986 the Australian Law Reform Commission (ALRC) examined issues surrounding the recognition of indigenous customary law. It advocated wider recognition of traditional indigenous hunting rights, for subsistence purposes. It recommended key principles for statute law reform:

- Indigenous traditional hunting for subsistence purposes should take priority over non-traditional activities, including commercial and recreational activities of non-indigenous people.

- Traditional hunting may be limited legitimately where necessary for species conservation goals and similar overriding interests.

- In determining whether an activity is traditional, the focus should be on the purpose of the activity rather than the method. Use of new technologies and hunting of feral species does not mean that hunting is not traditional.

In the decade since the report was released, there has been no attempt to systematically and clearly incorporate these principles in government systems for wildlife management and little effort to educate voters as to why they are important. For the most part, indigenous people have had other priorities than reform of wildlife laws, with restoration of land rights being a prime concern.

2.4.2 Indigenous organisations

Structures and functions

More than 2,000 indigenous NGOs have been established in the last three decades, to allow indigenous people to deliver services such as health, education, housing and welfare in a culturally appropriate way, while meeting government accountability requirements. Their prevalence reflects the development of political impetus for self determination. While managed quite independently of government, almost all depend on government grant funding to carry out their activities. Many have dual accountability requirements, under their grants, and under the accountability and reporting requirements of the legislation under which they are incorporated.

A few corporations have been specifically formed for land, wildlife or other natural resource management, for example Dhimerru Land Management Aboriginal Corporation. In many other cases wildlife management and related functions are undertaken by more broadly constituted indigenous corporations such as indigenous community councils, resource agencies; land councils and land holding organisations; and native title representative bodies. The roles of these different types of organisations in land and wildlife management are described below.

Most Aboriginal communities have their own community councils. While community administration has historically focused on provision of township and social services, many councils are now involved in some aspects of land management such as tree planting and other amenity projects around settlements. A very small number of community councils, such as Kowanyama, have extended their activities more directly into management of wildlife, fisheries and other natural resources in their regions.

'Resource agencies' have been established to achieve economies of scale in management among indigenous people of a region, often including a number of small family settlements, known as homelands or outstations. They have evolved local and regional roles relevant to the people they service, in many cases including environmental management. For example Tangentyere Council and Pitjantjatjara Council, both based in Alice Springs, and Winung Ngari Aboriginal Corporation in Kimberley, have all been active in promoting landcare principles at Aboriginal settlements, such as by planting trees for dust control and as a source of fruit for residents. Bawinanga Aboriginal Corporation, a resource agency which services 800 people on 25 outstations on the northern coastline of the Northern Territory, has developed a strong role in commercial wildlife harvesting.

Aboriginal land councils are established to claim land and to manage land, either directly, or by providing advice and support to indigenous community members. Statutory land councils and Aboriginal land holding organisations exist in the Northern Territory (the largest are the Central and Northern Land Councils), NSW, South Australia and Tasmania. In Queensland and WA, non-statutory land councils, such as Cape York Land Council and Kimberley Land Council, have a significant advocacy role in land rights and environmental management on behalf of local indigenous groups. The wildlife related management initiatives of four land councils and major land holding organisations are described later in this report.

In recent years much of the environmental management activity of the major land councils has been linked to another role they have assumed, as Native Title Representative Bodies. Native Title Representative Bodies are funded to administer native title claims and other processes under the Native Title Act, 1993 on behalf of native title holders. These organisations offer capacity to support negotiations about environmental management and community wildlife management, within the very obvious constraints of their finances and staffing levels.

These various kinds of indigenous organisations have been the driving force in empowerment of indigenous people in Australia on the whole range of social justice and resource rights issues. They play a significant role in promoting community

capacity for wildlife management. The communities they represent vary from individual families, clans and language groups, to groups which have come to share a common residence through historical processes of dispossession or through contemporary migration. In scale their areas of operation vary from large regions to discreet clan territories. All these organisations operate as intermediaries between indigenous customary law and non-indigenous statute law. Thus, as well as complying with statutory requirements for financial accountability and wider community expectations for equity in the distribution of the benefits of government grant funding, they also need to respect the primacy of indigenous customary law in decisions and activities that involve use and management of the land and its resources. This intermediary position gives them a crucial role in facilitating indigenous CWM.

Resources

Indigenous organisations' opportunities to engage in land and wildlife management are restricted by the security and flexibility of their funding bases. Most are highly dependent on short term government grants, which constrains their capacity for self determination. Some community councils (such as Kowanyama and other large communities in Queensland and the Northern Territory) and land holding bodies are funded along a quasi-local government model, and have more discretion in determining their own priorities. Statutory land councils in NT are funded from a statutory trust fund established to provide a return to Aboriginal people of a royalty-equivalent from mining on Aboriginal owned land (see Altman 1996). However even in these cases, funding arrangements have never taken adequate account of land and wildlife management responsibilities and indigenous organisations tend to give these a low priority compared to community services and infrastructure maintenance, in the case of community administrations, and land rights claims, in the case of NT land councils.

A significant source of income to many community councils and resource agencies is an employment scheme which replaces community members' unemployment benefits with a grant (Community Development Employment Program, CDEP). These monies are used by indigenous organisations to provide employment for indigenous community members in projects of their choice. The money is only sufficient to cover part time employment for most participants but, where commercial enterprise opportunities exist many such schemes use commercial income to 'top up' hours of work and wages of participants. This funding is secure and continuous relative to most sources of grant funding to indigenous organisations. It has a role in many of the CWM projects/activities discussed in this report, including community rangers who are usually CDEP participants.

A number of recommendations for 'block funding' to indigenous organisations, to remove the impediments that short term tied grant funding places on indigenous self determination (Coombs et al 1989), have been made to governments over the past decade, with little action. At present the greatest opportunities that indigenous organisations have to establish a more secure economic base are through land use agreements and regional agreements negotiated as a consequence of proposals for mining or other intensive development on Aboriginal owned land and land under native title claim.

2.5 Indigenous land rights

Restoration of land rights has given some indigenous groups a high degree of de facto control over wildlife management and allowed them to restore and develop community based systems for land and resource management. Legal recognition of indigenous customary ownership of land has taken prime place in indigenous people's political campaigns. Hunting and food gathering opportunities are one of the reasons why indigenous people have campaigned for land rights, but this reason is rarely highlighted. Far more prominence is given to the restoration of spiritual and cultural ties and promotion of self-determination, both by indigenous peoples in campaigning for land rights and by governments in sometimes granting them.

Mechanisms for granting land rights

Fourteen per cent of Australia is now recognised by governments as indigenous owned land. As can be seen from Map 2, this land is concentrated in remote arid and northern tropical areas. Much of it was not desired by non-indigenous people for productive purposes. Most of the land that was, in the course of Australia's colonial history, designated as government reserves for indigenous peoples' use or granted to church authorities for the establishment of missions has now been returned to indigenous ownership (though there are significant exceptions, such as in WA). Other avenues for return of land to indigenous people over the past three decades have been:

- **Direct political action by discrete groups:** These have resulted in large land transfers in South Australia (*the Pitjantjatjara Land Rights Act 1981 and the Maralinga Tjarutja Land Rights Act 1984*) and smaller areas in Tasmania and in Victoria. Political action also assisted in establishing legislation enabling Aboriginal land claims, notably in the Northern Territory and NSW.

- **Claims to unalienated land lodged under land rights legislation in the Northern Territory, New South Wales and Queensland:** In NT, large areas of land have been successfully claimed by Aboriginal traditional owners. In NSW little eligible land survived to the 1980s, but the few land rights gains include some economic, cultural and strategically significant areas. Fifty-eight per cent of claims have been refused because the land is required by the government for nature conservation purposes (Ridgeway 1997). The Queensland legislation allows designated conservation reserves as well as designated parcels of unalienated Crown land to be claimed.

- **Government funded land purchases:** About 100 rural and remote area properties have been bought for indigenous people since 1972 (Palmer 1988, ATSIC 1992). Conditions for the purchase and management of such properties formerly emphasised prospects for economic development, particularly through cattle pastoralism. However commercial management of purchased properties has rarely been successful, due to the marginal nature of the land, degraded infrastructure and indigenous people's lack of skills and interest in commercial pastoralism. To indigenous people, return of their land has been far more important than running a cattle station (Young 1995). The current land purchase mechanism, the Indigenous Land Fund (established in 1994) is giving priority to purchase of land which has cultural significance to indigenous people (ILC

1996a; 1996b). Its statutory requirement to give priority to 'sound land and environmental management practices' creates openings for sustainable wildlife management.

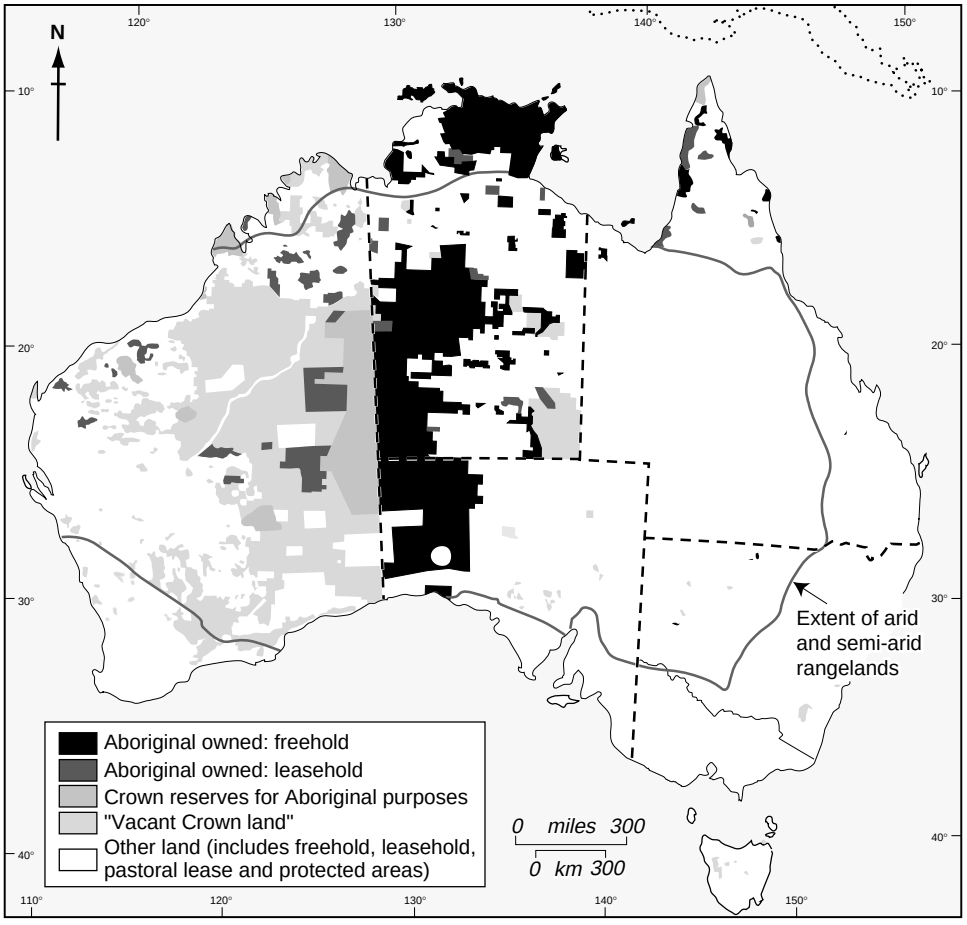
- **Excisions:** In the NT and WA, since the 1970s, some Aboriginal groups whose land rights have not otherwise been recognised have been granted rights to occupy small living areas excised from pastoral leases, national parks or reserved from larger areas of Crown land.

This indigenous land is held under a variety of tenures. Depending on its mode of re-acquisition by indigenous people, it may be held as inalienable freehold by local indigenous groups; as freehold with covenants restricting sale (imposed by statute or by funding agencies); as freehold held in trust by a central body or a group of trustees with a lease to local groups; as a pastoral lease, a form of tenure that grants grazing rights to leaseholders; or as a special purpose lease. While land ownership does not confer recognition of indigenous ownership of wildlife, it does give a very high degree of de facto control over use and management of wildlife resources.

Economic development opportunities are few on most Aboriginal owned land because of factors such as remoteness, arid climates, lack of infrastructure, the skills of indigenous landowners and their lack of financial capital. In spite of some benefit from mining agreements, and royalty equivalents in the NT, land rights have not led to significant overall increases in the monetary income of indigenous people. However subsistence economies add additional income, particularly in remote areas, and have not been well accounted for in valuations (Altman and Taylor 1987). While social and cultural impacts from land rights have not been comprehensively or systematically established, there is ample anecdotal evidence of empowerment and retention and revival of TEK (see eg Young 1995). Ecological impacts of land rights have not been seriously examined anywhere.

The achievement of land rights has been important to indigenous CWM - land rights have enabled people to move back to traditional country and have affirmed customary rights and responsibilities to use and care for country. They provide a basis for benefits from sustainable management of land and resources to be returned to indigenous people. Groups whose land rights (and sea rights) have not been recognised are now using native title claims to secure greater control over use and management of resources.

Map 2 Aboriginal owned freehold and leasehold lands



2.5.1 Native title

The 1992 ‘Mabo’ decision in the High Court, which established indigenous native title as part of the common law of Australia, provides a new framework for the recognition of indigenous rights to land, sea and wildlife. Until 1992, the doctrine of *terra nullius* (that the land was owned by no one) was used to justify the dispossession of Australia’s indigenous peoples from the lands and seas they traditionally occupied. No treaties were made with indigenous peoples during the colonisation of Australia because of this doctrine. Indigenous peoples were assumed to have no system of laws that gave them proprietary rights to land and natural resources, so that it was not necessary for colonial governments to secure their consent before occupying or selling the land.

The ‘Mabo’ High Court decision of 1992 established that native title rights continue to exist where indigenous people have maintained a connection to land and resources and where their common law rights have not been extinguished by a government grant of land to third parties.

Native title rights are analogous to property rights in non-indigenous common law and, depending on the circumstances, may encompass exclusive occupancy, or shared use rights, or ‘profit a’pendre’ - the right someone has to take some profit, such as wildlife, from the soil of another (Meyers 1994). However, the ‘Mabo’ decision established that the content and meaning of native title must be established with reference to indigenous customary law, not any other legal system.

Immediately following the ‘Mabo’ decision, many indigenous groups who had been denied land rights in the past lodged claims to their traditional territories in the High Court. Meanwhile there was considerable confusion, concern and scaremongering from many non-indigenous interests about threats to security of their land tenure. Subsequent negotiations between governments, indigenous representatives and those from resource based industries led to the passing of the *Native Title Act 1993* by the Commonwealth government.

The *Native Title Act* validated past government actions held to have extinguished native title over much of Australia. Over other land, the Act establishes a process for handling indigenous groups’ claims to native title, involving native title claimants and registered native title holders in future government decisions about the use and management of resources in their areas, and payment of compensation where native title has been impaired or extinguished by government actions that occurred since the passing of the *Racial Discrimination Act 1975*.

On vacant Crown land, where no leases have been granted by governments and no protected areas or other reserves established, native title may potentially give indigenous people the sole right to occupy and use the land. Native title may also potentially continue to exist in protected areas and other public reserves, at least to the extent that it is not inconsistent with the purpose of these reserves. Native title rights are always subject to government powers to acquire the land in the public interest or to grant mining tenements. However the ‘Mabo’ case established that governments are required by the *Racial Discrimination Act* not to treat native title rights as any different from other forms of property rights which means that it cannot

be extinguished or overridden without payment of compensation. This has given many indigenous people some bargaining power over the use and management of their traditional lands, for the first time since colonisation.

Native title and wildlife

The *Native Title Act* provides for State/Territory governments to confirm Crown ownership of natural resources, including wildlife. This has subsequently been done by various State/Territories in passing legislation consistent with the Commonwealth Act.

The Act also specifically recognises indigenous peoples' rights to hunt provided that these activities are being undertaken by people 'in the exercise or enjoyment of their native title rights and interests' (s211(2)(b)) and for personal, domestic and non-commercial purposes. It provides that where hunting is prohibited by any other Act, or is permitted only in accordance with a permit or licence, (and the particular law is not one that confers rights, interests or benefits specifically for indigenous people) then the provisions of the other Act do not apply.

These provisions were recently tested in Queensland. Aboriginal political activist, Murandoo Yanner, was arrested and charged with illegal possession of crocodile meat and skins. He successfully defended the charge by presenting extensive anthropological and genealogical evidence of his connections with the country and arguing that in killing and eating crocodile he was exercising his rights as a native title holder:

> *The* **Native Title Act** *simply complemented my personal insistence that I am the traditional owner of the region I kill my animals in .....I have always known I had those rights. Not in whitefella law, but in my law.*
>
> (Murandoo Yanner quoted in Meade 1997)

Previous challenges to the validity of statute law covering indigenous subsistence uses had been lost because indigenous appellants failed to show their use was non-commercial or failed to establish clan affiliations or land customs related to the rights claimed (Atkinson 1997). In the Yanner case these customary rights were established. However the Queensland government appealed the finding, successfully arguing that indigenous native title rights to wildlife were extinguished by the provisions of Queensland statute law which make wildlife in that state the property of the crown.

Resolution of native title claims involves a complex process of negotiation between indigenous groups, governments and other interested parties, to establish the content of native title in the particular circumstances of the claim, and how this relates to the rights and interests of other people. Such negotiations typically involve indigenous rights to use the wildlife on land being claimed as native title. Sometimes they also involve more far reaching questions of indigenous control of natural resources.

For example the Yorta Yorta people's claim includes waters of the Murray River, the largest river system in Australia. Murray water is a vital resource for irrigators and for the city of Adelaide, as well as being crucial to the wildlife, fisheries and

landscapes used and valued by Yorta Yorta people and many others. The claim is a key strategy for gaining increased indigenous control over environmental management, including action to address the degraded state of the river system (ABC 1997a). The Yorta Yorta case is the most prominent example of Australian indigenous people using native title rights to bargain for action by governments and other stakeholders to restore environmental degradation.

Other potentially controversial aspects of the recognition of native title that are yet to be resolved will concern the nature of Aboriginal native title rights to national parks and other protected areas (see Wootten in Woenne-Green et al 1994) and to ownership of wildlife. However at present the focus of controversy is on native title rights on pastoral leases.

Pastoral leases

Pastoral leases are a distinctly Australian tenure system, originally established by colonial governments to regularise occupation of land beyond the limits of survey and settlement. They were designed as a non-exclusive short term tenure which would allow governments to control land use by 'squatters' and their herds of sheep and cattle, receive a return from rent, and yet protect the rights of indigenous people to occupy and use the same land (Reynolds, 1987; 1996a; 1996b). Pastoral leases remain the dominant private tenure in the arid, semi-arid and tropical rangelands of Australia and cover about 40 per cent of Australia. The terms and conditions of the leases vary but generally they only authorise livestock grazing and incidental activities. In some jurisdictions their original purpose of allowing continued use of country by indigenous people had been all but forgotten by the 1990s. However in December 1996 the High Court in the 'Wik' decision ruled that indigenous native title can potentially co-exist with pastoral leases.

For indigenous people, the Wik decision meant that access to pastoral leases for purposes such as subsistence hunting and ceremony might be confirmed as their right, not a privilege or favour to be granted at the whim of individual pastoral lease holders. Although the decision found that pastoralists rights prevail where there is a conflict between native title rights and the valid rights of pastoralists under their leases, pastoral stakeholders launched a campaign for the extinguishment of native title on pastoral leases. This led to recent Commonwealth government legislation to amend the *Native Title Act*. Under these amendments, the final resolution of indigenous rights over pastoral leases, and any strengthening of pastoralists' tenure, has been referred to the States for further legislation.

Discussion of the precise impact of these changes on wildlife management is necessarily speculative at this stage. However one possible effect will be that pastoral leaseholders will be able to be granted State/Territory government permission for commercial harvest of wildlife from their lease areas without any consideration of the impact of that harvest on indigenous subsistence rights, let alone of the possibility that indigenous native title rights themselves encompass commercial harvest of wildlife. Exclusion from this decision making process is likely to limit potential benefit to indigenous people from the trend to commercial use of Australian wildlife and native plants through sustainable wild harvest in the rangelands.

Current uncertainty about future recognition of indigenous peoples' native title rights means that use and management of wildlife by indigenous people is at a watershed, particularly on the 40 per cent of Australia covered by pastoral leases.

Commercial rights

Commercial aspects of indigenous common law native title rights - including the right to indigenous intellectual property in knowledge of, and symbolism derived from, plants and animals - remain unrecognised anywhere by Australian governments or tested in the courts. Comparison with other countries whose legal systems draw on British common law indicates that native title potentially encompasses commercial uses (Sweeney 1993). As Marcia Langton has commented, in the context of mining activity, the *Native Title Act* sees native title as embodying only subsistence rights, whereas:

> *What we are talking about ... are commercial rights.... After all Aboriginal people quarried and mined and traded across the country. All that historical activity for tens of thousands of years has been written out of evidence in the way native title has been defined; native title is defined by those fellas in Canberra as scrabbling around on the ground for roots and possums.*
>
> (quoted in Harris 1995: 29)

While some indigenous people consider their customary rights in wildlife extend to commercial use, as Fourmile (1996: 241) comments, debate about such issues within indigenous communities has hardly begun.

Negotiated agreements

Since the Mabo decision, Australian indigenous organisations have increasingly looked to negotiated agreements with governments and industry groups to achieve the economic base that they need as a starting point for sustainable development. Recognition of native title has provided critical bargaining power. Overseas experiences, particularly Canadian approaches to comprehensive regional agreements but also fisheries settlements from New Zealand and US co-management arrangements, are being studied in Australia to inform negotiations (see for example Jull 1993; Richardson et al 1994a; 1994b; Harris 1995; Wickliffe 1996; Wood 1996).

To date, there have been significant achievements in negotiating land settlements and employment, education and fiscal agreements for indigenous peoples in return for approval for major development projects such as mines (O'Faircheallaigh 1996; NLC and KLC 1997). Such settlements, and the income they provide to indigenous groups, have significant potential to increase communities' resources for the technical support and capital costs associated with CWM projects and activities.

Where the trigger of major project development does not exist, the process of mediating native title claims is slow and outcomes remain quite uncertain. Potentially, future agreements about the nature and content of native title rights in particular regions might encompass increased indigenous control over land and natural resource management, including such matters as recognition of indigenous rights to protection of subsistence wildlife resources from adverse impacts of other peoples' activities; co-management agreements for wildlife and for ecosystems; and

recognition of rights to commercial harvest. Consideration of these issues is likely to give strong impetus to indigenous CWM. Other than the Yorta Yorta claim, it seems likely that these issues will be addressed first in some of the many claims that have been lodged to ‘sea country’.

The resolution of native title claims is still at a very early stage. However much of the bargaining power that native title was beginning to provide for indigenous people to negotiate for government and industry support for indigenous CWM is already being eroded by restrictions to native title rights under recent amendments to the *Native Title Act*.

Indigenous wildlife use and management

3.1 Wildlife harvesting

3.1.1 Subsistence harvest

Australian indigenous people hunt a wide range of wildlife species for subsistence, although none depend exclusively on hunting and gathering for food and many - particularly those living in large towns and cities - do not hunt at all. Collins et al (1996) list 47 native mammals, 37 birds, 15 reptiles and two amphibians commonly harvested by Aboriginal people now and in the past. More than half of these are probably still harvested fairly frequently but the extent of this use has not been quantified, except in some very discrete cases (see below). Hunting of other species has stopped for a variety of reasons - the species may be rare or extinct; access may be poor in the area where the species occurs; or, because alternate foods are readily available, hunting may no longer be seen as worthwhile. Bias in harvesting towards female animals, because of their higher fat content, is common for kangaroos and wallabies (see for example Collins 1995), and is also noted for dugong and green turtles (Roberts et al 1996).

Indigenous men, women and children all harvest wildlife, with hunting for large game generally undertaken only by men. The contribution of large game to subsistence economies (in terms of quantity of produce and energy value) is generally greater than that of plant staples because many of the latter have been replaced by easily available store bought processed foods. Women nevertheless still procure significant amounts of vegetable foods and small game such as goannas (see for example Devitt 1988; Walsh 1990; Povinelli 1992). In coastal and riverine areas women are also highly skilled in fishing and shellfish gathering. During such activities women also teach children, both practically and culturally, about the country and its resources. While modern harvesting implements, such as firearms, nylon fishing lines and nets, are now universally used women still frequently use digging sticks and men often use fishing spears in some regions (see for example Suchet 1996).

Feral animals also make important contributions to subsistence in some areas. In arid Australia rabbits are a dietary replacement for rare and extinct medium sized native mammals and, in a desert community studied by Palmer and Brady (1991) they came second only to kangaroo as the dominant bush food. Other feral species commonly harvested include buffalo (Altman 1982) and, in some places, feral cats. Programmes for eradication of feral buffalo and, more recently, for the introduction of rabbit calicivirus disease with the aim of eradicating wild rabbits, have, not surprisingly, caused concern to indigenous people accustomed to harvesting these resources. In the case of buffalo eradication, aimed at preventing transmission of brucellosis and tuberculosis to disease free domestic cattle herds, establishment of Aboriginal owned buffalo farms has allowed Aboriginal people continued access to buffalo meat.

Most indigenous hunting is for subsistence use of food for immediate consumption. However meat is commonly gifted or traded by hunters, according to their social and spiritual rights and responsibilities. Sometimes it is sold, although this is not sanctioned by governments. Indigenous people from colder southern regions used to use furs or skins of animals for clothing but no longer do so. Other by-products of wildlife harvest formerly used in tool and artefact production - for example kangaroo leg sinews for strong and flexible bindings – have also gone out of common use. But some items, such as echidna quills and turtle shell for making jewellery, are still prized. This intermingling of subsistence and commercial use can present problems because subsistence use may well be authorised by statute law while commercial use may be prohibited. The Aurukun community in Queensland, for example, has reported that technical illegalities have prevented them from selling such artefacts.

Social and economic significance

Subsistence wildlife use is of great social and cultural value to indigenous people – it expresses the vital linkage of people to their country, reinforces their spiritual beliefs governing their existence and responsibility for their land and provides a means for passing on social and cultural knowledge to their children. It also has great economic value. Lack of complete data inhibits quantification of the overall economic significance of indigenous subsistence harvest. However some discrete groups, mostly in monsoonal and arid regions have been intensively studied (Meehan 1982, 1988, 1991; Altman 1987; Devitt 1988; Walsh 1990, 1992; Johannes and MacFarlane 1991a; 1991b; Palmer and Brady 1991; 1992; Asafu-Adjaye 1995). Because of their diversity and the fact that they do not always distinguish the contribution of wildlife from that of other subsistence resources (invertebrates, plants and fish), results can only be extrapolated with caution. However it seems that the dietary contribution of bush foods (plants and animals) can be locally very significant. In the monsoonal north of the Northern Territory Altman (1987) estimated that, at Momega outstation, bush foods provided 46 per cent of energy intake and 81 per cent of protein; and in one community in central Australia Devitt (1988) estimated 31 per cent of energy intake and 74 per cent of protein came from bush foods. In the Torres Strait, where seafood consumption (343g/person/day) is among the highest in the world, dugong represent 28 per cent of the catch by weight and sea turtles 26 per cent. In Boigu Island, with a population of only 240, it has been estimated that the mean daily catch for dugong is 21.9 kg and for turtles is 68.1kg.

Subsistence wildlife harvesting thus contributes to real incomes and also employs people productively. Altman's (1997) detailed study of Momega outstation showed that adults on average worked 18 hours per week in subsistence production and, with the additional time spent in arts and craft production (for sale) the total weekly work effort was about 25 hours per week, exceeding the Australian average of 24 hours paid employment per adult. When converted to dollar values wildlife subsistence use is also economically significant. In Momega, where people have relatively good access to wildlife resources, the market replacement price of subsistence production represented 64 per cent of total income and, based on these results, Altman and Allen (1992) estimated that in 1986 subsistence production on outstations was $25 million. While this excluded subsistence production by indigenous people living in larger remote communities or in rural towns it still amounted to 3 per cent of total indigenous income (Altman et al 1996).

Wildlife consumption also provides indirect social and economic benefits because it enhances levels of nutrition compared to store bought foods (White 1977; Naughton 1986; O'Dea 1988) and encourages physical exercise. Given the high incidence of late onset diabetes amongst indigenous people, partly resulting from processed foods and lack of exercise, this is important.

Ecological issues

Understanding of the ecological dimensions of subsistence wildlife use in Australia, as many (eg Altman and Allen 1992; Collins 1995; Smyth 1995; Altman et al 1996; Bomford and Caughley 1996b) have noted, is very limited. As Altman and Allen (1992) have observed, people know more about legislation concerning indigenous wildlife use than about the characteristics of the use. For example, a study from south west Western Australia concluded:

> *The extent of Nyungar hunting and gathering activities suggests a comprehensive use of wildlife from various areas of nature conservation value. The numbers taken within each species and the effect of this on local wildlife communities are not known. However it is probable that some effect is occurring.*
>
> (WA CALM 1991:2)

In order to determine whether a specified rate of harvesting is likely to be sustainable, data on the demography and social/reproductive structure of the population are required. Further, any selectivity in harvesting, such as sex or age bias, must be known. Alternatively, harvesting must be accompanied by careful monitoring of either population size (and preferably structure), or of indicators of this such as catch per unit effort, which is then linked to adaptive management. As there is always an element of uncertainty in predicting harvesting impacts, wide safety margins need to be employed. Since even under optimal management, sustainable harvesting requires a reduction of the population size below levels it would achieve without harvesting, harvesting of threatened species where local population densities are low should be approached with particular caution. Dugong (*Dugong dugon*) and several species of sea turtle have attracted particular attention from wildlife managers because of their threatened status, coupled with their economic and cultural significance to indigenous hunters. Box 3.1 summarises key issues concerning dugong and turtle status and management.

Box 3.1 Dugong and turtle status and management

Over the last decade scientists, indigenous peoples and government agencies have all reported the decline of dugong populations in the southern sections of the Great Barrier Reef, northern Queensland and the Torres Strait Islands. Factors which explain this include continued hunting by indigenous people, drowning in commercial fishing nets, and loss of habitat through coastal development. Evidence concerning the relative importance of these reasons is inconclusive. Although methodological problems make dugong population surveys imprecise, these surveys do suggest that dugong populations in some areas are declining and thus may not be able to withstand indigenous harvesting. However it is common for indigenous hunters to conclude that declining catch rates are due to changes in dugong behaviour or to lack of skill amongst hunters rather than to declining dugong populations. There is consequently little community support for measures to restrict harvests. In other cases indigenous groups comment that they have taken measures to limit their catches but that government authorities discount the value of their traditional knowledge in species management (Williams, 1996). Government agency staff are also concerned that the harvest of green turtles (for meat) and leatherback turtles (for eggs) may not be sustainable. Some indigenous people are also worried. In the Northern Territory Dhimurru Land Management Aboriginal Corporation and the government conservation agency initiated a collaborative project which has included production of an information video, a catch monitoring programme run through the schools and surveys of nesting activity by community rangers. Community awareness about turtle conservation has reportedly increased. While it is difficult to assess the real impact of indigenous hunting it is clear that controls on hunting will not by themselves arrest population declines. The impact of commercial fishing is undoubtedly significant. Traditional owners in the Gulf of Carpentaria, alarmed at discovering 30 dead dugong on a beach in 1995, discovered that the cause was netting by commercial barramundi and shark fishers. Subsequent negotiations between the Northern Land Council representing traditoral owners and the Northern Territory Fishing Industry Council, representing commercial fishing licencees, resulted in a dugong protection strategy being agreed to by both parties. This is a landmark example of indigenous people successfully negotiating with other stakeholders to address impacts which threaten wildlife resources and indigenous harvests.

Other threatened species hunted by indigenous people include the southern cassowary (*Casuaruis casuaruis*) and the Australian bustard (*Ardeotis australis*). Conservation NGOs and government wildlife managers are concerned about the impact of hunting but once again lack of accurate information makes it difficult to assess this. We consider that indigenous groups differ in their awareness of the dangers of hunting such species. In some cases, even when species numbers are small, active hunting continues; in other cases it is negligible. Probably people who hunt regularly are more aware of the need to conserve locally rare species than those who hunt only occasionally. Increasingly, indigenous people share the concern of scientists to protect and restore populations. For example, in the arid Anangu Pitjantjatjara (AP) lands of northern South Australia, mallee fowl (*Leipoa ocellata)* are no longer harvested even though eggs were once an important food. Those community members who have worked with scientists have learned about the wider conservation significance of this population and have been educating others about the importance of protecting it from hunting and from feral predators.

Common species - localised declines

Around many large indigenous communities, particularly those on Aboriginal owned land in arid central Australia, common species targeted by Aboriginal hunters - for example red kangaroos and emu – have declined (Cane and Stanley 1985; Piper 1985; Latz and Johnson 1986; Ellana et al 1988; Copley et al 1996; Breckwoldt et al 1996a). The scarcity of kangaroos in these regions contrasts with the abundance of the same animals in some other areas of Australia, particularly in the semi arid sheep rangelands where populations are favoured by control of dingos and a relative abundance of watering points maintained for livestock.

Aboriginal hunting pressure is undoubtedly one factor in these population declines. Other species in these areas, particularly the large feral animals (camels, donkeys and horses) and the euro (*Macropus robustus*) are much less favoured by hunters and their populations remain high. While declines are most obvious around larger centralised communities the dispersal of indigenous people to ‘homelands’ on their own traditional country over the past 20 years has also led to increased hunting around these smaller settlements. As well as hunting, competition from feral herbivores, changed fire regimes and predation by feral animals also contribute to the decline of otherwise common native species.

Indigenous people are worried about these declines. Animals such as red kangaroo and emu are of great cultural significance and low populations make hunting a more time consuming and more expensive way of obtaining food - greater distances need to be covered and vehicles are now essential for successful hunting. Little is known about these population declines. However it is clear that traditional landowners have been unable to prevent them occuring. Control of feral animals, difficult on a large scale, would undoubtedly improve habitat for native herbivores. Establishment of new artificial water points fenced from large feral animals, and restrictions on hunting near these places, has been discussed as a measure that may help promote increases in kangaroo densities but, as Bomford and Caughley (1996a) suggest, feral animal control and reduced hunting might be more effective. Increased government and scientific support is required to help indigenous people address these issues.
As these brief summaries show lack of data makes it impossible to establish to what

extent indigenous hunting affects the viability of wildlife populations. Even when wildlife populations are obviously declining we do not generally know whether this is due to indigenous harvest or to other factors, including seasonal conditions and the response of other populations, such as predators or their alternate prey species, to population change. For example, recent reductions in rabbit populations through the impact of rabbit calicivirus disease have increased forage availability for native herbivores and have also required predators - dingos, foxes, raptors and indigenous hunters - to target alternate prey. The current lack of data shows that adaptive wildlife management, including monitoring populations and harvests, is essential. Useful indicators, such as the catch per unit of hunting effort, need to be designed. It may be necessary to alter harvest levels in order to sustain populations and address any adverse impacts that harvesting may be having on other components of the ecological system (Webb 1995; Choquenot 1996; Bomford and Caughley 1996b).

Indigenous wildlife users will need to understand and support monitoring and adjustments to harvesting rates. This requires a high level of mutual understanding, respect and commitment on the part of indigenous people and wildlife scientists or government conservation agencies. This has rarely been achieved. Thus 'top down' regulatory regimes for managing indigenous subsistence use are ineffective. And indigenous management systems may also be ineffective because population trends of harvested species are not fully appreciated. Participatory monitoring, undertaken by government agencies in conjunction with community groups, could help to bridge this gap.

Monitoring indigenous harvests

For wildlife scientists and government wildlife managers, obtaining reliable information on the level of indigenous harvests is no easy task. Indigenous people are unlikely to provide information about their harvests unless they see that it is in their interests to do so, particularly if they think the information is likely to be used unfairly to restrict their hunting activities. If they see a benefit for themselves, such as contributing to a management system that will ensure wildlife resources and indigenous rights to use them are protected, then cooperation is far more likely. Monitoring methods, particularly those which draw on traditional indigenous wildlife management systems are likely to be more meaningful to indigenous people, and should be developed.

Traditional monitoring methods

We do not support the view, put forward by some researchers (eg Johannes and MacFarlane 1991) that indigenous people are rarely aware that wildlife resources are limited. If that were the case how could the widespread and significant role played by 'increase ceremonies' in Aboriginal customary law be explained? Aboriginal people's awareness that wildlife resources are limited is also suggested by their general abhorrence of waste such as they see occurring when non-indigenous landowners cull kangaroos or wombats because of pasture and crop damage, or when feral animal control programmes kill animals without using them. Contemporary hunters speak frequently of consciously rotating their hunting areas to allow populations of sedentary species to recover. Nevertheless, as a few authors have noted, wasteful hunting practices, where several kangaroos are shot and discarded until a suitably fat animal is secured, do occur (Sackett 1991; Scott Cane pers com).

Indigenous customary systems dictate that the wildlife and other resources of someone else's country are not used without their permission. Knowledge of what hunting was taking place within their own country would have given traditional owners a basis for detailed understanding of the sustainability of harvest. This protocol still applies in much of the land that has been returned to Aboriginal ownership, and for coastal people it also applies to waters:

> *I always tell my grandchildren that before you go out to another man's lagoon, you have to ask.....That's our custom.*
>
> (Meriam landowner, in Sharpe 1996:198)

Changes in indigenous population distribution now inhibit the effectiveness of this protocol in many regions. Many people now live in the traditional country of others, where they may not be aware of local customary law for wildlife management. Conservation agency officers in Broome (northern WA), for example, had reached an informal agreement with local Aboriginal people about conservation of the remaining local pod of dugong, but these animals were still being hunted by visiting Torres Strait Islanders, who were ignorant of local conservation issues (Alan Gross, pers com). Similar issues concerning dugong hunting have also arisen in the southern Great Barrier Reef region of Queensland because many Torres Strait Islanders have migrated to this region (Ponte et al 1994; Marsh et al 1995; Ponte 1997). In addition, many elements of traditional knowledge and management have been lost. Nonetheless indigenous ownership protocols are remarkably resilient and non-indigenous people cannot assume that such systems do not exist simply because they are not told about them (Cordell 1993).

Seasonal changes in hunting patterns (eg in Cape York) and the closure of some areas to hunting at certain times, such as with the death of a traditional owner (eg in Arnhemland) are practices which would act to conserve wildlife resources (and see Baker 1993; Bennett 1983; Goodale 1982; Latz and Johnson 1986; Newsome 1980; Rose 1992, 1996; Stevenson 1985; Wurm 1993). Traditional methods possibly associated with monitoring harvests, are the Yolngu customary law of gathering together cooked turtle shells of each species into a pile; and the Torres Strait practice of keeping dugong skulls on the 'Tree of skulls' as a tally of hunting success. It seems likely that classical management systems did incorporate a concept of scarcity and the need to regulate resource use and that this may have included some conscious monitoring of harvests, probably with greatest attention to this in regions where drought is most frequent. Indigenous CWM projects that build on these customary systems are likely to be most meaningful to traditional owners, and thus have greatest chance of being accepted by them and by other indigenous people.

Participatory monitoring

Scientific monitoring of the level of indigenous harvests can provide some basic information to help distinguish the impact of indigenous harvest from other factors affecting wildlife populations. As with species population monitoring, most scientific harvest monitoring so far concerns dugong and turtles. Approaches developed by different management agencies and researchers have all involved some degree of participation by, and empowerment of, indigenous people. Nevertheless these monitoring systems have been designed by and are managed by agency staff.
In the Torres Strait the government controlled Australian Fisheries Management

Authority carries out catch monitoring of fish but Islanders are employed in the programme and in education and awareness activities conducted through local schools. In response to Islanders' calls for greater control over resource management in their region, it has been suggested that this monitoring programme be transferred to communities themselves, without government control. The Great Barrier Reef Marine Park Authority (GBRMPA) has delegated the allocation of permits for traditional hunting of dugong and turtles to indigenous community groups. The block allocation of permits to each authorised group takes into account the ecological sustainability of harvest rates. The group itself then authorises hunting by individuals, according to the cultural appropriateness of the hunt. Harvest rates can be monitored from the numbers of permits issued. This approach has helped to foster mutual trust between the management agency and community groups and the degree of cooperation on hunting restrictions has increased.

In the above examples, indigenous community members have not been fully involved in decisions about what data to collect and why, or in design of data collection methods. However, community rangers at a number of places in Cape York and Torres Strait have had such input (Roberts et al 1996; A. Roberts, pers comm; G. Smith, pers comm.). Here community rangers collected data on subsistence hunting of a number of wildlife species and the interrelationships between use of these species. After an initial establishment period, the harvest monitoring was independently undertaken by community rangers with the researcher collating the data and returning results to the communities. Collaborative harvest monitoring is also an integral aim of the miyanpu (sea turtle) research project in Arnhem land. While this work is in its early stages, increased community awareness of conservation issues has already resulted in some modification to harvest rates.

3.1.2 Commercial harvesting

Very few native Australian wildlife species are harvested commercially for meat or other products and, unlike Africa and North America, there is no substantial Australian tradition of trophy hunting. However some government sectors are beginning to encourage increased commercial harvest of wildlife species where sustainability can also be ensured. Harvesting of feral animals can also generate economic return, although commercial enterprises based on these resources can cause conflict where environmental management objectives aim to eliminate feral species.

Indigenous people are very interested in the opportunities that commercial utilisation of wildlife, both native and feral species, may provide for developing economic activities which fit comfortably with their lifestyle and interests (Williams et al 1995; Vardon et al 1996; Bomford and Caughley 1996b; Vardon and Tidemann under review). All indigenous groups involved in commercial wildlife harvest are working within the framework of the government regulatory system, which aims to limit the risk of over-exploitation and to maintain biodiversity values. The argument that people will be more likely to conserve wildlife and habitats if they can realise an income from doing so is logical. Nevertheless, if people feel that the benefit of immediate monetary gain is greater than the value of preserving sufficient animals to allow future sustainable harvesting, commercial harvest could cause over-exploitation. Mobile species such as kangaroos, where an individual landowner's

opportunity for harvest is only transitory, may be at greatest risk (McCallum 1995). Commercial harvesting may also cause decrease in biodiversity, because the habitat is managed for harvested species, thereby disadvantaging others.

At present markets, rather than populations of commercially harvested species, restrict the size of commercial wildlife industries in Australia. The demand for Australian wildlife products is low. In the case of kangaroos, poor records for product reliability and uninformed concern about the sustainability of harvest contributes significantly to this (Macarthur Consulting 1996). In total wildlife products are reasonably significant to the national economy, with estimates of annual value of domestic and export trade at $A100-$A156 million per annum (Callister and Williams 1995), but the industry is fragmented and uncoordinated and lacks a marketing strategy. Primary producer attitudes that wildlife is a pest, not a resource, and preservationist objections to wild harvest also impede the industry, as does lack of government support and lack of consistency between State/Territory governments in industry regulation (Ramsay 1994). Not surprisingly other countries have been more successful than Australia in developing industries based on Australian native species such as emu and some plant products.

Indigenous involvement in commercial wildlife use has occurred primarily through the Commonwealth government's programmes such as Aboriginal Rural Resources Initiative (ARRI) and through associated research, education and awareness activities (see Wilson et al 1990; Meek and O'Brien 1992; Bomford and Caughley 1996a). From 1988 to 1995 The ARRI programme promoted indigenous economic development through employment and income from wild animal and plant resources. It also aimed to encourage people in remote communities to use local produce instead of importing expensive foods. It had no formally identified environmental goals.

Feral animals

It can be difficult for government agencies and indigenous groups to achieve agreement about management goals for feral animals because many indigenous people see feral animals as a resource to be utilised, not a pest to be controlled.

Feral animals commercially harvested by indigenous people include rabbits, pigs, buffalo, goats, horses, donkeys, cattle and camels (Wilson et al, 1990; Collins et al, 1996). Some of these animals are also often valued for social and cultural reasons and their meat contributes to subsistence economies. Unlike native species, wildlife protection legislation provides no impediments to harvesting of feral species. Local indigenous control of the development of commercial harvesting operations is therefore greater than is the case for native species.

The ARRI programme focused largely on the commercial harvesting of feral species. ARRI projects have included rabbit harvesting in South Australia; feral pig control in Arnhem Land and Cape York; water buffalo domestication for meat production in communities in the 'Top End' of the Northern Territory; and camel domestication for breeding and sale in the Anangu Pitjantjatjara lands in South Australia. Outcomes have varied in different communities. In all cases employment increased, some were able to establish commercially viable industries, and some significant social

outcomes, such as decline in substance abuse among young people, were reported. Development of some enterprises was limited by lack of commercial skills and community interest.

Poor market development for feral animal products also restricts enterprise opportunities (Ramsay 1994). Some species, such as donkeys (Environment Australia 1997), lack a market and the camel market is small. Wild horse (brumby) domestication and harvesting for sale of stock horses and pet meat could offer economic opportunities but, as Wilson et al (1990) stress, would also require substantial capital investment. Transport costs from remote indigenous lands add to marketing problems. Promoting commercial wild harvest of feral animals by indigenous people as an economic development opportunity could also conflict with biodiversity conservation since high populations of ferals make harvest most cost effective but degrade habitats for native species. Buffalo farming projects, however, demonstrate that it is possible to control feral populations and allow Aboriginal goals for ongoing utilisation to be accommodated. Aboriginal groups who aim to control or eradicate feral animals on their land find it very difficult to secure sufficient funding. In central South Australia, for example, the sale price of goats is insufficient to cover costs of capture. Unlike non-indigenous pastoralists in this region, who offset the cost of this control against increases in carrying capacity for domestic livestock, these Aboriginal landowners control goats in order to restore degraded land for cultural purposes, conservation and tourism. At present the only way they can support goat control is through government grants.

Native Species

Crocodiles

Crocodiles are an important subsistence resource and totemic species for many Aboriginal people in coastal northern Australia and both freshwater crocodiles (*Crocodylus johnstoni*) and saltwater crocodiles (*C. porosus*) are harvested. Unregulated commercial harvest, mostly by non-Aboriginal people caused marked population decline which led to species protection in the late 1960s. Populations recovered quickly and limited commercial use, coupled with ongoing population monitoring, was reintroduced by the Northern Territory government in 1984. Commercial crocodile ranches and farms, one of which is Aboriginal owned, have since become important in the Northern Territory industry.

Egg harvesting is the prime commercial enterprise in wild crocodile populations, which, because of their high fecundity, are not threatened by such activity. Some Aboriginal landowners actively participate in the wild harvest of eggs and hatching juveniles for sale to stock commercial ranches and one group is now commencing trial harvest of adult crocodiles for skins. Other Aboriginal groups allow contractors to harvest eggs on their land, receiving a fee per egg. The rate of commercial harvest, at up to 15,000 eggs, 500 hatchlings and 400 adults in 1996, is far greater than the indigenous subsistence harvest (estimated by Grahame Webb as 150 adults and 2000 eggs in 1994). Nevertheless wild crocodile populations appear to be continuing to increase slightly. Economic returns to indigenous people from the harvest can be substantial with Bawinanga community earning $180,000 in 1995/6 from the sale of hatchlings incubated from wild harvested eggs Despite these harvesting activities Aboriginal people take little part in the government programme for management of

Box 3.2 Muttonbirding in the Bass Strait

On the Bass Strait islands about 120 Aboriginal people take part in a seasonal harvest of about 200,000 juvenile birds. This cull is well within the maximum sustainable yield quotas which the Tasmanian government conservation agency sets using a long established monitoring programme. Markets for muttonbirds, and therefore economic benefits, are very limited. Demand is mostly restricted to Tasmania and to Maori communities in New Zealand. Nevertheless:

> *When the season comes, most people go (muttonbirding) because it is probably the only time throughout the year that Aboriginal people can try to make themselves some money.*
>
> (Brown 1993:5)

Economic returns from the harvest are in fact quite limited. In 1985 each catcher earned $1,000 - $1,500 and the total harvest was valued at $328,000. As the industry has since declined, current values are probably even lower. Nevertheless on one island an Aboriginal enterprise established with government assistance seems to have achieved commercial viability. Social and cultural motives also encourage people to catch muttonbirds.

> *It is a very special time for us ... a time to forget our problems and be together as one great big happy family. It is our culture.*
>
> Brown 1993: 5

In 1995 recognition of Aboriginal ownership over commercial muttonbird islands was a crucial element of the Tasmanian government's first recognition of Aboriginal ownership of land in the state. This, and the land rights campaign that preceded it, lead to renewed interest in teaching younger generations about their history and culture. One community member reports that since gaining ownership, the community is reconnecting with its land and that serious commercial harvesting is not currently a priority. At present Aborigines have little involvement in the management of the harvest, quotas and harvest conditions being set by the government, but with the handback of the land they are likely to adopt a greater role in management of the harvest in the future.

the harvest which involves development of management plans, setting of harvest quotas and monitoring of populations.

Muttonbirds

Muttonbirds (short-tailed shearwater, *Puffinus tenuirostris*), traditionally harvested for subsistence by Aboriginal people on Tasmania's Bass Strait islands, are now also harvested for commercial purposes. The enterprise is carried out only by Aboriginal people (Box 3.2).

Kangaroos

Kangaroo harvest, Australia's largest commercial wildlife industry, in dominated by non-indigenous operators. Although Aboriginal involvement in the industry is extremely limited we describe the industry here (Box 3.3) because it is a concern for some groups of Aboriginal people.

Box 3.3 Australia's commercial kangaroo harvest

The overall aim of Australian kangaroo management - conservation of kangaroo populations - conflicts with the wish of many sheep graziers to reduce kangaroo populations so that they can maximise sheep numbers while maintaining range condition. Commercial harvest was for a long time merely an inefficient by-product of this confrontation. In 1992 the Commonwealth government agreed to work towards removing policy impediments to the development of a sustainable commercial kangaroo industry, based on controlled wild harvest of seven macropod species: red kangaroos (*Macropus rufus)*, eastern and western grey kangaroos (*M. giganteus and M. fuliginosus*); euros (*M. robustus*); whiptail and red-necked wallabies (*M. parryi and M. rufogriseus*); and Tasmanian pademelons (*Thylogale billardierii*) (Australia 1992). These species are most abundant in the agricultural areas and the sheep rangelands where they have been favoured by factors such as control of dingos, introduced pastures, and a relatively dense network of stock watering points. The first five species listed are harvested for both domestic and export markets. The other two are harvested only in Tasmania and only domestic sales are possible because the harvesting programme has not been approved by the Commonwealth government and export is therefore impossible. Total commercial harvest for all species in 1993 was close to three million animals (Callister and Wiliams 1995, Ramsay 1994). The industry is dominated by non-indigenous operators.

Market development, both domestically and internationally, is so poor that kangaroo harvest quotas, although set conservatively, are rarely if ever reached. Leather, which is high strength and low weight, and partly processed skins generate most export earnings (Ramsay 1994). All States/Territories now allow sale of kangaroo meat for human consumption but limited market penetration means that meat from most of the kangaroos that are commercially harvested is used for pet food. Although it is of high quality, its image as pet food in Australia undermines its promotion overseas (Ramsay 1994; Macarthur Consulting 1996). A 1992 survey indicated that 50 per cent of Australians disapprove moderately or strongly of production and sale of kangaroo meat (Freeman and Kellert 1992 in Aslin and Norton 1995). While these attitudes remain important a marked increase in the size of domestic markets is unlikely (Ramsay 1994).

Annual harvest quotas for kangaroos are set by State/Territory governments on the basis of population monitoring and forecast of seasonal and regional factors which will affect population trends. These models have not yet fully incorporated the impacts of age- and sex-selective harvesting (Pople and Cairnes 1995). In those parts of Australia where commercial harvest is authorised, specialist commercial operators licensed by governments conduct the harvest. Landowners benefit from reduction of pest populations, but have received no direct financial return from the kangaroos harvested. More than 20 years of scientifically based management experience has shown that kangaroo populations are resilient to controlled harvest and there is a compelling though controversial argument that, if legislative reform allowed landowners to derive profit from harvested kangaroos, they could reduce total grazing pressure on their pastures and maintain or enhance their income without having to maximise sheep numbers. Resulting shifts in land use would be likely to benefit native vegetation in the rangelands and habitat for other wildlife (Grigg 1995; Lunney 1995; Alexander 1997).

South Australia has recently introduced reforms to the management of the industry in order to allow property owners to benefit financially from kangaroos. From 1996, landowners were granted tradeable rights to a 'sustainable use quota', approximating 12-15 per cent of the kangaroos on their property. Payments by commercial shooters to landowners for the rights to harvest these animals are now bringing minor but welcome additional cash income to those pastoralists whose leases are included in this scheme. Like other landowners, Aboriginal groups who own pastoral properties in the commercial kangaroo zones will be able to generate income from tradeable quotas of kangaroos. However at present poor markets for kangaroo products limit economic returns to landowners to only a couple of dollars per kangaroo, quite insufficient to make kangaroos an economically viable alternative to grazing sheep or cattle.

Kangaroos are of very great cultural significance to Aboriginal people and also play a key role in subsistence economies. The Commonwealth government has funded two indigenous groups to establish small commercial kangaroo harvesting enterprises, one of which was proving to be commercially viable in 1995. In Queensland an Aboriginal community representative is a member of the statutory Macropod Management Advisory Committee (Fourmile 1996). Other than this the current role of Aboriginal people in the commercial kangaroo industry appears to be only as consumers. Kangaroo meat, particularly the tail, is so sought after by Aboriginal people that kangaroo processors routinely sell substantial quantities to indigenous community stores. Buying tails substitutes for subsistence harvest in those arid regions where kangaroo populations have declined.

Potential conflict between development of the commercial kangaroo industry and subsistence Aboriginal use has not been examined to our knowledge. Significant conflict seems unlikely because, even though populations fluctuate with seasonal conditions, kangaroos are often abundant in the areas where commercial harvest occurs, quotas are conservative and rarely reached. Nevertheless conflict may be occurring in some regions and for some species or it may well occur in future.

If Aboriginal common law native title rights include commercial use of wildlife, as Sweeney (1993) argues might well be the case, then granting leaseholders tradeable quotas to kangaroos (or other wildlife species), without negotiation with native title holders, may well violate these rights. Certainly, given the very great cultural and subsistence economic significance of kangaroos to Aboriginal people, and the economic potential of commercial harvest, governments would seem to have a moral obligation to facilitate equitable Aboriginal involvement in the development of the kangaroo industry. A national feasibility study into promoting indigenous participation and equity in the kangaroo industry has recently been proposed (ATSIC and DPIE 1997).

Emus

Apart from crocodiles, the emu is the only native wildlife species that is commercially ranched. Commercial farms were initially stocked through hatching eggs harvested from wild populations but farms are now restocked with eggs and young from captive populations. Because there is no longer any link between commercial emu production and wild populations, emu farming is not considered in any detail in this report. Nevertheless, as a wildlife industry that has had relatively high involvement by Aboriginal people, it is potentially important. Emu farming started in Western Australia

in the 1970s with an Aboriginal owned farm at Wiluna as the first in commercial production. In 1990 there were 25 Aboriginal owned emu farms in WA, and one in Queensland. One has since started in SA. However indigenous people remain minor players in this industry which will continue to have limited commercial viability as long as market development is a problem (Byrnes 1988; O'Malley 1992; Ramsay 1994; Williams et al 1995; Caughley and Adamns 1996; Collins et al 1996).

Other native species

Other native species harvested commercially include possums and some birds. In Tasmania brush tailed possums are harvested for export of skins. A commercial harvest of over 200,000 animals under a management programme which started with government regulation of harvests in 1913, is sustained (Ramsay 1994). To our knowledge there is no indigenous involvement in this industry. Possibilities for commercial harvest of Cape Barren Geese in Tasmania have been discussed (Irynej Skira pers com). The NT government is planning to allow landowners to commercially harvest red-tailed black cockatoos (for the aviary trade) and magpie geese (for meat), within an adaptive management framework, as a strategy to encourage landowners to conserve habitat (NLC 1997; Vardon et al 1997). Like the crocodile programme, these strategies are not particularly targeted at indigenous landowners, but the very high proportion of Aboriginal people (23 per cent) and Aboriginal owned land (50 per cent) in the NT means that indigenous people are important stakeholders and potential participants. In the case of red-tailed black cockatoo, some indigenous people are concerned that the animals are too scarce in some areas to withstand commercial harvest. They want to know more about how they can monitor the impact of harvests (NLC 1997) - to be treated as co-managers rather than simply as potential users of a commercial resource.

At least two other species, fruit bats (Vardon and Tidemann 1995; Tidemann and Vardon 1997) and southern hairy nosed wombats (St John 1989) may include populations with potential for sustainable commercial harvest. Both of these are viewed as pests by farmers (and culled under permit), and as subsistence resources by indigenous people. In both cases, existing government management plans fail to address key issues that are significant to landowners and community groups. Cooperation between farmers and indigenous hunters may help to develop more effective community based management systems, and may allow pest populations to be used commercially, while overall population viability is still maintained.

3.2 Threatened species recovery projects

Aboriginal people and wildlife scientists have been collaborating for a long time in recovery programmes for some of arid Australia's threatened mammals and biological surveys have also helped to build strong relationships of mutual respect and support. However outcomes of these projects are always unpredictable, mainly because Aboriginal priorities may differ markedly from those of the scientists. Politics can also play its part.

Conservation of threatened wild populations of the *mala* (Box 3.4) and threatened *bilby*, like that of the *mala*, depends on their management on Aboriginal land in the Northern Territory. Aboriginal people have been working with scientists on

Box 3.4 The Mala Project in Central Australia

Mala (rufous hare wallaby, *Lagorchestes hirsutus)*, once widespread in central Australia, is a key symbolic animal in the customary law of many groups. The species is now endangered. In 1978 the Tanami wildlife sanctuary in the NT, where the only two surviving mainland populations of mala occurred, was handed back to Aboriginal freehold ownership following a land claim. In the same year scientists initiated meetings with Warlpiri traditional owners to share knowledge of mala habitat and to begin planning for the management of the few survivors. Since 1980 more than 100 Walpiri men, women and children have participated with scientists in selecting and fencing an additional site to establish a third population, in patch burning to create favourable mala habitat and in monitoring populations (Johnson 1997). At the start of the project scientists were concerned that Aboriginal people might want to hunt the rare animals:

> *...It was stepping into the unknown because we did not know how (a group of key Aboriginal men) would respond to contact with mala which were traditionally a highly sought food item having strong medicinal powers for old people....one very knowledgeable old man who owned the mala dreaming was able to share his vast knowledge of the species, finding wangku (or squats), and explaining the activity of mala from tracks in the red sand. He and the others proved to be as concerned with the mala as we were, and the possibility of a food hunt was not discussed.*
>
> (Johnson et al 1997:160)

The mala project has taught scientists some important lessons - species recovery projects of this type are very time-consuming , particularly because of the detailed consultation which must be conducted with Aboriginal people (Johnson et al 1997); and the continuing enthusiasm of Aboriginal participants cannot be taken for granted. Although the mala is of widespread spiritual importance and Aboriginal people have valued the attempts to save the animal very highly, their commitment to the work has fluctuated. Events such as the deaths of several community elders have been sufficient to disrupt efforts in the project.

management of these species for about 20 years. While individuals from these two groups seem to have maintained good relationships with each other, the same could not be said for the NT government conservation agency and NT Aboriginal land councils. Negotiations about scientific access to Aboriginal owned land have been protracted and tense. Northern Territory government opposition to Aboriginal land claims and scientific concern over the need to maintain high conservation values has supported government arguments that land should be retained by the government. Scientists have also found that the need to employ traditional owners in their work, a condition imposed on their research by Aboriginal organisations, is hard to meet given their fieldwork budgets.

The establishment of trust between indigenous people and scientists is beneficial to both parties as well as to realising conservation goals. The participation of South Australian indigenous landowners (Anangu) in biological surveys of the Anangu Pitjantjatjara lands in the north west of the state has been very fruitful. Anangu contribution to this study, initiated in 1992, has revealed relict populations of mallee fowl and a number of Anangu have begun to take a much stronger interest in land management. Anangu comments about the decline of large kangaroos in the region have been corroborated by aerial survey and scientists have identified contributing

factors. The respect shown by the scientists to the elders' knowledge is likely to help to encourage them and younger generations in using and transmitting traditional ecological knowledge.

Anangu have also had their understandings of wildlife ecology challenged by this collaborative survey work. Scientists' concern about decline of waru (black footed rock wallaby, *Petrogale lateralis*) were initially met with scepticism by Anangu and prompted visits by a community ranger, a scientist and traditional owners to known rock wallaby sites. Anangu had assumed that waru were still present in places they had not visited for some time. However, with two exceptions, colonies of these animals had disappeared, providing something of a shock and a loss of face for traditional owners:

> *One of the traditional owners...was surprised that waru were no longer in areas he had known them to inhabit during his childhood and early years as an adult ....(He) was aware that waru were no longer as widespread as they once were but he was not aware they had disappeared from so many areas. He is unsure of why this has occurred.*
>
> (Nesbitt and Wikilyiri 1994:4)

As the above comment indicates Aboriginal people cannot readily explain what has happened to waru. Yet they were sceptical about the scientific explanation – fox predation. As many have said, how can scientists, whose learning is based on very short periods of fieldwork, really know the country and its wildlife? (Baker, Woenne-Green and Mutitjulu Community, 1992; Baker and Mutitjulu Community 1992). However Anangu contact with many parts of their traditional country is now very intermittent. Had Anangu been living in close contact with wildlife and habitat over the past 50 years, instead of in centralised settlements, it seems likely that they would have come to the same conclusions as scientists that fox predation is responsible for rock wallaby decline. Baiting around rock wallaby sites has now been undertaken by Anangu working with scientists. However, as with the mala project, maintaining Anangu enthusiasm and ongoing commitment for this work is problematic. It is difficult for scientists to demonstrate short term benefits, such as rapid increases in populations of native species. Without clear proof that their effort in feral predator control makes some difference, Anangu may remain cynical about scientific explanations for wildlife decline.

3.3 Integrated approaches to resource management

For indigenous people wildlife management does not take place in isolation but is interlinked with the holistic management of the natural resources on their lands. Indigenous organisations, including regional bodies whose functions include providing professional support and technical advice to indigenous populations numbering several thousand, and community organisations and land holding bodies representing much smaller numbers of people, are increasingly initiating such integrated approaches.

3.3.1 Initiatives of regional indigenous organisations

In the Northern Territory regional land councils now provide land management support for Aboriginal land owners and have in recent years expanded their land management activities to develop participatory planning and management systems. Non-indigenous stakeholders - petroleum and mineral exploration and mining companies, wildlife research and conservation scientists, and government departments involved in delivering services to remote settlements – have substantial interests in indigenous lands, now about 40 per cent of the Northern Territory. The Central Land Council (CLC) (Alice Springs) and Northern Land Council (NLC) (Darwin), whose areas of operation cover most of the Northern Territory, therefore have to address varied and complex land management issues. Staff expertise in sustainable resource use and management, a feature of their land management support units, provides the vital focus for meeting these challenges.

CLC's land management planning is implemented in full collaboration with traditional owners. Participatory land assessment and enterprise management processes, locally developed but with input from a trainer with experience in Participatory Rural Appraisal and Planning (PRAP) approaches, are the prime tools used. Benefits already identified by the CLC project team include improved information exchange between traditional and scientific stakeholders; greater capacity within CLC to target their technical resources to land management problems; and improved implementation of CLC land management recommendations by local landowners (CLC 1996; Johnston 1996; Mahney et al 1996). NLC's approach has a slightly different focus. Their 'Caring for Country' strategy has a general policy of helping indigenous landowners to achieve their aspirations, whether these are to develop and manage their land within a framework of multiple use or simply to protect the cultural values of the land. NLC has developed employment and training programmes, educational material and land management planning and has catalysed the development of a new degree programme for indigenous environmental managers at Darwin's Northern Territory University.

Wildlife management is an integral part of these general approaches to land and resource management. CLC has been conducting research into Aboriginal attitudes to wildlife and other land management issues (Rose 1995); NLC has participated with commercial fishing interests to develop a dugong conservation strategy and, along with a number of government agencies, has been examining options for sustainable economic development on wetlands, including through commercial use of wildlife (NLC 1997). NLC has also presented submissions to a Commonwealth parliamentary inquiry into commercial utilisation of wildlife (NLC 1997). In addition both land councils have given considerable assistance to Aboriginal communities for the establishment of feral animal harvest and control programmes.

Queensland regional indigenous organisations are also actively involved in resource management, including wildlife. Cape York Land Council (CYLC) and other indigenous organisations in the region have initiated the establishment of the Balkanu Cape York Development Corporation which is conducting a number of projects in land and sea management in conjunction with local indigenous communities such as Kowanyama. Balkanu aims to explore opportunities for sustainable management of local resources and respond to resource development proposals put forward by other

interest groups. It is developing a strong interface with researchers and participates on a number of industry and government committees. The Cape York Heads of Agreement, drawn up between CYLC, the elected regional council of the Aboriginal and Torres Strait Islander Commission (ATSIC), two national conservation NGOs and the regional pastoral industry body also supports innovative action on sustainable resource management at a regional scale. This agreement provides for protection of native title and pastoralists rights on pastoral leases, cooperation in the development of a sustainable pastoral industry; and it establishes a process for governments to identify and acquire lands of high conservation and cultural value and negotiate co-management arrangements with indigenous people (Horstman and Downey 1995; Farley 1996). The agreement, which has been widely acknowledged as an example of how the interests of different stakeholders can be accommodated will provide a sound basis for cooperative approaches to 'on the ground' management of wildlife. Unfortunately securing government commitment to the agreement has been problematic and its future impact is hard to predict.

In 1991 the Torres Strait Island Coordinating Council (ICC), which represents the indigenous community councils of 14 islands, developed a marine strategy (the MaSTERS programme) and has subsequently played a vital role in its implementation. Development of the strategy has involved research on people's perspectives on environmental issues and on the harvesting of wildlife species, the most significant of which are marine turtles and dugong (see Box 3.1). Community 'ownership' is promoted by the ICC's management of the project, with indigenous as well as non-indigenous people in co-ordinating roles; in the training and employment of community members in household survey; and in extensive feedback between communities and the ICC on outcomes and future directions. Participatory action research methods are of key importance and the ICC has emphasised the development of community based plans for environment and resource management, such as a dugong management plan for waters near Boigu Island. Community level planning is linked to the development of the regional strategy. Not surprisingly, government and ICC perspectives on the MaSTERS programme differ. The former tend see it as providing cultural input to government planning for the region, and are frustrated with the slow pace of the project. But the latter see it as a focus for empowerment and sustainable self management of local resources. The active community participation essential to all aspects of the process necessarily slows the pace of change.

Regional indigenous organisations, particularly the large statutory land councils, are well placed to undertake integrated resource management initiatives as they are sufficiently large to employ a diverse range of professional and technical staff. CLC, for example, currently has a staff of over 100 people engaged in land claims, mining negotiations and native title issues as well as land management. This allows them to maintain broad networks and to actively seek funding from innovative sources. Most of these initiatives aim to integrate scientific approaches to environmental management with the priorities, interests and ecological and cultural knowledge of indigenous people. In many cases this is complemented by state of the art technology - GIS and remote sensing. Since all staff of indigenous organisations, including directors and other executive officers, are responsible to their elected representative Councils, community control of these organisations' activities is relatively unproblematic.

3.3.2 Community initiatives

Community initiatives in integrated resource management are even more directly controlled and managed by indigenous community members. Examples summarised here include Kowanyama Land and Natural Resource Office (KLANRO) in Queensland (Box 3.5); and Dhimurru Land Management Aboriginal Corporation (DLMAC) and Bawinanga Aboriginal Corporation (BAC) in the NT, all of which operate in settlements and outstations with total populations of about 1,000 people. A fourth example, the Anangu Pitjantjatjara (AP) Land Management Programme, has a broader scope, operating in the extreme north-west of South Australia in a region with a total population of about 3,000 indigenous people (Box 3.6). Regions of responsibility are extensive - Kowanyama owns more than 4,000 km^2 on western Cape York Peninsula and its resource management activities also extend over other lands and waters in the catchment of the Mitchell River and Gulf of Carpentaria; and Anangu Pitjantjatjara lands cover about 10 per cent of the state of South Australia. Community rangers, local indigenous people employed by their own community organisations, make significant contributions to these and other CWM projects/activities.

As Kowanyama's experience demonstrates, indigenous resource and wildlife management need not be confined to indigenous held lands but can also influence regional resource management strategies. Kowanyama's strong commitment to sustainability and self management, the community's determination not to be distracted by other peoples' agendas, and their understanding that they need to maintain their actions over long time scales make their ultimate success more likely.

Box 3.5 Community integrated resource management at Kowanyama

Kowanyama community is widely recognised as one of the first indigenous groups in Australia to strategically integrate traditional authority structures; scientific and managerial expertise; and cooperation with other stakeholders in approaches to sustainable development. Kowanyama's territory is located in the lower part of the Mitchell River catchment and includes wetlands of international significance and fisheries which are valued highly both by the community for subsistence use and by others for recreational and commercial use. KLANRO, which operates under the direction of traditional owners and the elected community council, is responsible both for local resource management planning and for cooperating with other stakeholders to manage issues that are outside its direct control. These include land use planning for the whole Mitchell River and commercial fishing in the Gulf of Carpentaria. Wildlife management activities have included the prohibition of recreational hunting by non-indigenous visitors. Contacts with native coastal North Americans from Washington state, many of whom face similar circumstances, have provided much guidance and support. Key factors in Kowanyama's success in reducing impacts of non-indigenous users on its subsistence resources have been the training and authorisation of its senior community ranger to enforce statutory fisheries regulations; and buying out and closing down two commercial fishing licences. Initiation of a catchment management strategy, in cooperation with other non-indigenous stakeholders, has also empowered the community (EA 1997; Sinnamon, in press; 1995). Kowanyama's approach demonstrates how cooperative management, 'top down' regulatory authority and innovative strategies can be used effectively by indigenous people without disadvantage to others.

Over more than ten years of debate and constant activity, the community has grown in confidence. Their improved relations with the fishing industry has made access to their subsistence resources more secure. The community's development of its own school environmental education curriculum, combining elders' traditional knowledge with western scientific knowledge, is a particular expression of empowerment. In 1997 an indigenous peoples' workshop on protected area issues identified Kowanyama as a model for how indigenous people might go about addressing issues of sustainable use on their land (Environment Australia 1997).

Dhimurru Land Management Aboriginal Corporation and Bawininga Aboriginal Corporation are both concerned with land and marine management in coastal areas of Arnhem Land, in the Top End of the Northern Territory, Dhimurru is responsible for managing about 80 kms of coastline in the vicinity of the bauxite mining town of Nhulunbuy. While DLMAC was originally established because of the need to manage non-indigenous recreation use of Aboriginal land its activities have broadened and now include sea turtle (miyanpu) research and management; surveillance of illegal fishing, community education about sustainable resource management; and participation in scientific surveys of wildlife, and monitoring and management programmes to address environmental degradation. Funding sources associated with the nearby bauxite mine contribute about 60 per cent of basic operating costs of DLMAC which currently employs five community rangers and two non-Aboriginal staff. DLMAC receives the remainder of its income from government grant funding and has a close working relationship with the NT government conservation agency, BAC, in addition to commercial crocodile harvesting, has been investigating commercial harvesting of trepang (sea cucumbers); planning for a joint venture enterprise in game fishing, and examining ecotourism opportunities in its region. The organisation also collaborates with the NT government conservation agency in data-gathering research for management of endangered species and wildlife harvesting. BAC's goal is to achieve economic independence and self determination for its members, within a framework of sustainable development. Subsistence use of wildlife, which returns high value at outstations within in the region (Altman 1987), is a principal element in this approach. However opportunities for cash income have been limited and, since the community feels that the social and economic costs of high volume tourism, pastoralism or mining are too great, this is unlikely to change in current circumstances.

Box 3.6 Land and resource management in the Pitjatjantjara Lands

Anangu Pitjantjatjara (AP), the statutory landowning body for Aboriginal land in north west SA is managed through an Executive Committee representing the various settlements and outstations on the lands. Its land management programme, established in 1991 and operating under the direction of a subcommittee of traditional owners and the Executive Committee, is currently staffed by a non-Aboriginal coordinator, an Anangu director of land management and part time Anangu community rangers. Unlike previous AP land management support, which primarily emphasised

cattle pastoralism, this programme emphasises traditional Anangu technologies and land management practices. In response to community suggestions activities have focused on cleaning, fencing and maintaining natural rockholes which are important as sources of drinking water for wildlife populations and also have great cultural significance to Anangu. Rockholes are generally associated with the activities of ancestral beings, as well as being places where elders remember living before missions and government-managed settlements were established in the region. Economic activities on the AP lands include subsistence hunting, some small scale cattle operations, art and crafts production, and feral animal harvesting. There are also two small scale tourism operations and limited mining activity. While external tourism and mining operators would like better access to the AP lands, landowners are cautious about this because they want development to occur at a pace and scale that they can control. Community rangers and traditional owners from various parts of the AP lands have also collaborated with scientists on wildlife survey (see section 3.2).

3.4 Co-management of national parks

In Australia co-managed national parks, which Aboriginal people manage with conservation agencies as equal partners, are almost always referred to under the term 'joint management'. Here we adopt the internationally accepted term of co-management. In general, although co-management has been widely discussed and negotiations have been in place, it has only been practically implemented in a few places. Uluru-Kata Tjuta and Kakadu National Parks, both in the Northern Territory, are the most widely cited Australian 'models'. In these parks Aboriginal people own the land in freehold title and have leased the land to the Commonwealth government conservation agency for 99 years for management as a national park. The Aboriginal landowners are in a majority on the Board of Management that is responsible for care, control and management of the park. In both parks, policy and planning are the responsibility of the Board of Management while day-to-day management is undertaken by conservation agency staff and contractors who include some local indigenous people.

Co-management arrangements have been agreed or are said to be under negotiation in approximately 30 other protected areas (see Box 3.7 for summary) (De Lacy 1994). However, outside the Northern Territory, progress in concluding agreements has been very limited. Aboriginal freehold ownership of national parks, a key element in the agreements in Uluru and Kakadu, is not provided for in the legislation of most other States/Territories. This absence of enabling legislation, both for recognition of indigenous land ownership and also for co-management, shows a lack of commitment on the part of State/Territory governments. This barrier can, with goodwill on both sides, be at least partially overcome. Witjira National Park, South Australia, for example, lacks enabling legislation but is pursing co-management through an arrangement which leases the park to an indigenous organisation representing traditional owners. Traditional owners aim to undertake day to day management of the park themselves under the terms of the lease and from bases at homelands that are being established in the park. While this contrasts with Uluru and Kakadu, where day-to-day management is undertaken by the government conservation agency, overall management is still under the direction of a Board of Management on which traditional owners have majority representation. These arrangements show how lateral thinking and negotiation can lead to co-management

structures which are potentially strong for Aboriginal people without specific enabling legislation (Davies and Young 1996; Woenne Green et al 1994). In the future it is possible that recognition of native title over some national parks will provide a new basis for co-management negotiations elsewhere.

Co-management, with Aboriginal and government laws running side by side, represents a reconciliation of indigenous and mainstream conservation aspirations for sustainable management of country. It can forge a new and distinctive type of land use – a cultural national park that is appropriate to the spiritual connections of indigenous people to the land and to the development of a distinctively Australian conservation ethic (De Lacy 1992a). It can also, as in Uluṟu and Kakadu, return significant benefits to Aboriginal traditional owners. In these parks people have gained economically, through lease payments, employment and enterprise development; socially, in terms of empowerment through active participation in decision making; and culturally, through the education of park visitors in traditional cultural meanings and precepts. Indigenous people and scientists have also begun to collaborate effectively in wildlife research and management and in the re-establishment of traditional fire management practices (ANPWS 1991; Reid et al 1993).

On the other hand, while co-management has been beneficial, it is not necessarily, in indigenous eyes, the preferred approach. It essentially represents the imposition of a 'top-down' preservationist framework for natural resource management on the rights and aspirations of indigenous people. There should be 'no illusion that Aboriginal people sought co-management or had any alternative'. For indigenous people it is invariably a political relationship adopted as a necessary strategy to increase their control over those parts of their traditional country where unencumbered ownership, and the opportunity to implement community based management, cannot now be realised because of the existence of national parks. Under co-management, indigenous people's rights and aspirations for future management of their country is constrained by the existence of established uses and management practices which can be contrary to their interests. For example, while heavy tourist use of both Uluṟu and Kakadu, and mining in the Kakadu region, return an income to indigenous people, they also inhibit privacy and the protection of significant places. The existence of Aboriginal land and communities in the parks can also inhibit conservation agencies from carrying out effective programmes such as feral animal control. Thus, far from being a natural alliance of stakeholders based on common goals, co-management is far better characterised as an arena of 'competing interests' (Ketley 1994; Woenne-Green et al 1994).

Indigenous people's hunting practices and the protection of wildlife in a park exemplify one of these 'competing interests'. Even if government regulation condones indigenous hunting, the activity may have to be conducted in secrecy because of fears of adverse reactions from park visitors and public safety concerns. This detracts from the openly expressed enjoyment which indigenous people gain from hunting in their own country. Similar constraints apply to indigenous people's living areas in parks, ownership of livestock and domestic animals, and other aspects of everyday resource use, such as collection of firewood and materials for arts and crafts production. In practice co-management requires continual attention to maintaining and enhancing cross cultural communication, and patience and time for

shared decision making on these kinds of contentious issues. These requirements can be difficult to achieve where political pressures or ecologically threatening processes require quick decisions to be made. In areas such as fire management, indigenous practices may be adopted by conservation agencies in ways that differ from their cultural basis, risking both inappropriate application and the disempowerment of traditional knowledge holders. Similarly in the area of visitor interpretation, appropriation of cultural knowledge to satisfy the curiosity of tourists is a real risk unless conservation agencies are fully committed to this approach. Further grounds for conflict include competition between conservation agencies and indigenous landowners for income from tourists; and the high proportion of management budgets that are commonly allocated to management of park visitors compared to those available for wildlife research and management, or indigenous community development.

Imbalance in power relations between conservation agencies and indigenous traditional owners means that achieving an equal co-management partnership is very difficult. It relies on an on-going process of consultation and negotiation between Aboriginal people and conservation agency senior staff (Lawrence 1996). Committed, sensitive and culturally aware players in the conservation agencies (Weaver 1984; De Lacy 1994) are needed if the institutions, goals and assumptions imposed by the top-down preservationist framework for park management are to be reshaped. Dispute resolution mechanisms and realistic and imaginative budgetary strategies are also normally required.

In some countries, where protected areas have relatively large resident populations who depend solely on these resources for their livelihood, it has been suggested that co-management can save the government money (see for example Kothari et al 1997). This argument has also been put forward by Australian government agencies who assume that employing local people will save costs for travel and relocation of agency staff and hence help to stretch tight conservation budgets (Davies 1991b). This view is somewhat naive. In reality co-managed parks are expensive, even simply for the routine processes of consultation and negotiation between the co-managers. Indigenous community development costs, although rarely funded from government conservation budgets, can add considerably to this because indigenous people may have to be resettled in country where they have not lived for some time. Indigenous co-managers have high wage employment expectations but, in contrast to government conservation managers, their capacity for and/or interest in working alone and unsupervised in remote locations may be limited. Even before co-management is established, ‘substantial investments of time, financial resources and human resources’ are always needed to develop co-management agreements (Borrini-Feyerabend 1996). Since the current budgets of most State/Territory government managed parks are considerably less than those of Uluṟu and Kakadu, these factors mean that the prospects for successful establishment of further joint managed parks in Australia are unceratin. For example, the total budget for Witjira National Park is approximately equal to that available for running Uluṟu Board of Management meetings alone (Woenne-Green et al 1994; Davies 1995). Not surprisingly these budgetary constraints undermine the effectiveness of putting equitable decision making into practice.

Wildlife conservation could be achieved far more cheaply without co-management. However co-management also overtly supports indigenous empowerment, equity and social justice (Lawrence 1996), goals which are essential to sustainable development. Unfortunately government conservation agencies engaged in co-management negotiations rarely see these goals as part of their responsibility and hence consign them to the margins of the process.

3.5 Indigenous protected areas

The newly established Indigenous Protected Areas (IPA) programme (Box 3.7), an initiative of the Commonwealth government, provides further support for indigenous

Box 3.7 The Indigenous Protected Areas programme

The Indigenous Protected Areas (IPA) programme has two aims:

1. To encourage indigenous people to designate portions of their land that have significant conservation values as protected areas and manage those areas in accordance with IUCN guidelines. Potential protected areas on indigenous land are generally expected to match IUCN criteria for Category IV protected areas - Managed Resource Protection Area (Smyth and Sutherland 1996). As indigenous people have recognised, this linkage to international standards strengthens their position compared to State/Territory national park legislation which has previously often been a mechanism of their dispossession from land.
2. To encourage State/Territory governments to give better consideration to indigenous rights and interests in existing national parks and nature reserves. This objective, included at the request of indigenous people involved in the programme's development, raises the issue of reciprocity – indigenous people who lack recognised land rights should still have the right to use the IPA programme to help them to plan and negotiate co-management of existing national parks. Indigenous people's priorities for the IPA programme primarily stress self determination in decisions about conservation management on their country. A national workshop in April 1997 defined an IPA as follows:

An Indigenous Protected Area is governed by the continuing responsibilities of Aboriginal and Torres Strait Islander peoples to care for and protect lands and waters for present and future generations.

(Environment Australia 1997: 47)

According to this definition IPAs should be managed for 'cultural biodiversity and conservation', permitting customary sustainable use and sharing of benefits; and they may include existing government managed protected areas for which co-management arrangements are concluded.

This draft definition, which stresses indigenous control and the importance of cultural relationships with country, shows how indigenous input to government policy has begun to reshape the original 'top down' approach. Instead of assuming that indigenous owned lands should be managed for conservation it implies that land that has conservation value and cultural significance should be managed in accordance with indigenous customary rights and responsibilities. Indigenous people see IPAs as being community based and community controlled, as described earlier for Kowanyama (Box 3.4).

CWM and co-management of national parks. This programme stemmed from recognition that if Australia were to implement its *National Strategy for the Conservation of Australia's Biological Diversity* (Australia 1996), through establishing a national reserve system that comprehensively and adequately represents Australia's biodiversity, indigenous landowners would have to be fully involved. Because of the extent of indigenous land holdings, protected areas in some biogeographical regions of Australia will have to be on indigenous owned land (Smyth et al 1996; Thackway et al 1996; Thackway and Brunckhurst 1998).

The IPA programme marks a breakthrough in Australian indigenous affairs policy. For the first time government funding targets participatory processes of conservation planning managed by indigenous organisations. Some indigenous organisations have previously used their imagination in marking funds from other government programmes for these purposes. But they have faced problems in matching programme guidelines and their own objectives. Indigenous people find the IPA programme attractive because, by formally designating their land as a protected area, they may be able to attract secure on-going budgets for sustainable land management (Smyth and Sutherland 1996).

In 1996 the IPA programme funded 12 pilot projects promoted by indigenous organisations. These assessed IPA feasibility in different regions of Australia. Although people involved in the pilot projects report very positive outcomes, few indigenous groups fully accepted that establishment of an IPA would be appropriate for environmental management of their country. However, in several projects the IPA concept was enthusiastically accepted by local people because they felt it would help to protect culturally significant places (Environment Australia 1997). This shows the prime importance of cultural values in indigenous perspectives on the environment. Indigenous empowerment through participation in negotiations about co-management for national parks was another positive outcome. The first IPA, in semi-arid South Australia, was formally added to the national register of Australia's protected areas in 1998 following agreement by indigenous landowners and goverments about an initial five-year management programme. These initial achievements need to be built upon and granted, as Gillespie et al (1998) have recently stressed, more secure long term funding.

Through the IPA programme indigenous people are being encouraged to contribute to conservation at a national and international scale. IPA consultations have drawn together indigenous people who have had land returned to them (and are thus in a position to manage some land for conservation) and landless people (who must necessarily negotiate with government about co-management of national parks) in an atmosphere of solidarity. However these broad objectives of the IPA programme are hard to realise given that indigenous people's interests in country are focused at local and regional scales. Initial consultations on applying the IPA concept to dugong conservation in the Torres Strait, for example, suggest that people who do not see that their activities pose any local threat to sustainability are unlikely to agree to restrict those activities in the interests of regional, national or international conservation goals. This attitude would almost certainly be paralleled by non-indigenous private landowners.

3.6 Tourism

Indigenous use and management of wildlife is closely linked to the development of enterprises based on ecotourism, indigenous cultural tourism, and environmental and cross cultural education. Indigenous people are today showing greater interest in the tourism industry because they feel it can provide opportunities for people to make a living on or close to their traditional country. The transmission of traditional knowledge, both cultural and environmental, is an important element of this. Cultural tourism often includes introducing tourists to 'bush tucker', such as kangaroo or emu and invertebrates or plant foods. Harvesting for tourists can put additional hunting pressure on local wildlife leading to unsustainable use of some resources, particularly, as has been reported for north-west Melville Island, NT, if tourist itineraries or the location of facilities make it difficult to rotate hunting areas (Burchett 1991). On the other hand, if indigenous people are aware that ecotourism operations stress that their activities should have minimal environmental impact they may deliberately make special efforts to conserve wildlife.

Safari or trophy hunting, a form of tourism aimed primarily at overseas tourists and which can be quite lucrative for landowners, currently operates on a small scale in northern Australia. Indigenous people in Gurig National Park, NT, which is Aboriginal owned, are involved in this activity. The Gurig Board of Management tenders for trophy hunting of feral banteng cattle, with quotas set to maintain the herd size. Trophy fees (over $3,000 per animal) and guiding fees provide income for traditonal owners and additional income comes from lease payments by an up-market ecotourism operation . It has been suggested that government funding should be granted for the establishment of indigenous trophy hunting enterprises where these form part of a land management plan (ATSIC and DPIE 1997). This could include culling feral animals and possibly, as NLC (1997) have suggested, crocodiles. While crocodile trophy hunting is currently prohibited by wildlife protection laws, it is an activity which could return considerable income with little impact on populations.

Indigenous involvement in tourism comes at a cost. It can make heavy demands on people's time and privacy and requires extensive effort in marketing and other aspects of business management (Kesteven 1987; Altman 1988; CLC et al 1991; Finlayson 1991). However some indigenous landowners have found their returns from simply providing tourists with regulated access to their country for sightseeing, fishing or camping can help them to pay for other land management costs without unduly impacting on community lifestyles. For example, in Cape York, Kowanyama community and Injinoo on Cape York (Roberts et al 1996) have introduced a permit system for camping on their land. Income from permits helps to pay for other land management activities. At Yalata in western South Australia, the community is generating income from charging fees to tourists wanting access for shore-based whale watching. This money is also used for the land management programme. However in all these cases tourist use has long been established and the community managed permit systems have followed. It is doubtful that most Aboriginal landowners would, on their own initiative, choose to trade their privacy for cash earned from permit fees paid by tourists.

3.7 Education and training

Like many other rural landowners indigenous people learn best through practical experience (Coombs et al 1983; Liddle 1996), as this allows them to understand how useful new ideas are for solving immediate problems. Community development approaches, such as the Central Land Council's land assessment programme, are most appropriate. However it is hard for indigenous people to obtain funding for such programmes through government departments which support indigenous community management or wildlife and environmental management. This is partly because indigenous education and training policy focuses strongly on accredited individual courses rather than community based efforts, a result of indigenous demand for skills training to be formally recognised and therefore more useful for obtaining employment.

Curriculum development for accredited training courses can face problems. Because it is linked to national competency standards the significance of local knowledge and custom can be overlooked. As De Lacy (1992b) points out, questions such as 'Who teaches traditional indigenous knowledge?' and 'Is the same course appropriate for men and women, young people and mature age students?' are vital for indigenous peoples' education about country and its management. Such questions can only be properly answered at the local scale. Further issues confronting curriculum developers are protection of intellectual property rights in indigenous knowledge; and recognition of the prior learning of indigenous people through the teachings of their elders.

The focus on accredited training has nevertheless succeeded in making formal tertiary courses in wildlife and resource management more accessible to indigenous people. Important examples include, at a community level, training courses for people employed as 'community rangers' and, at more formal tertiary level, the development of new courses targeted to the needs of indigenous land and resource managers.

Kowanyama's model for self-management of land and natural resources led to the first community ranger course developed through Cairns College of Technical and Further Education (TAFE) in north Queensland. This course aims to develop skills both in traditional Aboriginal cultural and natural resource management and in scientifically based management processes (Hill 1992). Similar courses have subsequently been developed elsewhere (eg Batchelor College and South Australia TAFE) and planning to develop nationally accredited curriculum began in 1995. Community rangers play a major role in many of the wildlife management activities described in this report. State government agencies have also supported indigenous training in specific wildlife management techniques, such as feral animal control.

Few indigenous students attend conventional university courses in scientific approaches to wildlife management. This reflects the low numbers of indigenous people completing secondary school, and consequent lack of grounding in maths and science. Universities are responding to this situation by offering foundation courses in science for indigenous students (eg University of Adelaide) and by offering new courses targeted to Aboriginal needs for understanding both traditional and scientific approaches. For example both Charles Sturt University in rural New South Wales

(De Lacy 1992b) and Northern Territory University (NTU) offer courses in environmental management which provide several entry and exit points depending on students' prior learning and individual needs. The new NTU Resource Management Programme focuses particularly on the requirements of indigenous resource managers in northern Australia. The course aims to equip indigenous people to play a leadership role in sustainable long term management of land and sea resources, at both community and regional scales (Langton 1997).

Non-indigenous lack of understanding of the significance of wildlife and wildlife management to indigenous people hinders public support for indigenous CWM. The process of reconciliation between non-indigenous and indigenous Australians, which commenced in 1991 as a bipartisan initiative of the Commonwealth government, has made non-indigenous people more aware of and sensitive to indigenous cultural issues, including relationships to country. However issues concerning wildlife use and management have had no specific attention in the reconciliation process.

3.8 Government roles

Governments play a significant role, either directly or indirectly, in all the activities described in this report. However government funding for wildlife and related natural resource management has always been in very short supply and, as was identified in a 1991 Commonwealth government review (Young et al 1991) indigenous people experience difficulties in gaining access to mainstream sources of land management support. This is partly because of communication barriers and also because their needs do not fit the guidelines of the programmes. Subsequently some efforts have been made to improve indigenous equity in this area but, as Gillespie et al's recent (1998) summary shows, results still indicate that access problems remain.

For example in 1996/97 grants to indigenous organisations accounted for less than 3 per cent of expenditure under the suite of Commonwealth programmes that supported environmental management by private landowners. At that time the Contract Employment Programme for Aborigines in Natural and Cultural Resource Management (CEPANCRM) provided significant additional funding solely for indigenous projects such that the indigenous share of overall Commonwealth grant funding for environmental management was 22.9 per cent (Gillespie et al 1998). However CEPANCRM like its 'sister' programme ARRI, has now been discontinued. The IPA programme, with a 1997/8 national allocation of $A1.5 m, is now the sole source of Commonwealth government support targeted at promoting indigenous environmental management. In 1997 the Commonwealth government restructured its environmental management programmes under the umbrella of the Natural Heritage Trust (NHT) which has a five year budget of $1.25 billion. Although indigenous organisations are accessing those NHT programmes which provide grant funding for community based environmental management, indications are that the proportion of funding allocated to them from 'mainstream' programmes will continue to be inequitable. There are ongoing problems with the appropriateness of NHT guidelines and approval processes for indigenous groups. For example, the NHT priority to 'on the ground' works to redress land degradation can make it difficult for indigenous groups to access resources for facilitation and capacity building in environmental management.

Estimates and predictions of government roles and support for indigenous natural resource management are hampered by different policies implemented by different political parties. Prior to the change of Commonwealth government in 1996 overt recognition of the importance of indigenous natural resource management and the potential for empowerment stemming from these activities was recommended as part of a Social Justice Package promised by the previous Labour government as an element of its response to the High Court decision on native title. A Social Justice Package is not on the agenda of the current Liberal/National Party Commonwealth government.

Other government agencies involved in direct financial support for indigenous activities include the Aboriginal and Torres Strait Islander Commission (ATSIC) and the Indigenous Land Corporation (ILC). Although ATSIC's environment policy (1994) is committed to sustainable resource management and the incorporation of both traditional management practices and conservation principles in indigenous wildlife use, it has had little involvement in wildlife management. ATSIC's land management programme was, from 1991 to 1996, dominated by economic development objectives and most of the funding, ($6m in 1994/5) was committed to supporting indigenous pastoral operations. As far as we are aware, no wildlife management activities have been supported by this programme.

The indigenous Rural Industry Strategy (ATSIC and DPIE 1997) includes some elements aimed at promoting equity for indigenous people in wildlife based industries and protection of indigenous intellectual property rights in wild species. However there is as yet no indication of any 'top down' action to implement this strategy.

The ILC assumed responsibility for ATSIC's land management funding in 1997. Its strategy for supporting indigenous landowners is to collaborate with them to develop planned approaches to land management on land use problems to be implemented by landowners in cooperation with appropriate government agencies. While the ILC's activities have no particular focus on wildlife management, it is required to give priority to sound environmental management practices and to ensuring that indigenous people derive social or cultural benefits from its actions. These requirements provide a far better basis for sustainable development on indigenous land than the narrow focus on commercial viability of land base enterprises that previously dominated.

Apart from funding, governments can help indigenous CWM by providing people with advice; by encouraging public awareness of the value of wildlife to indigenous people; and by legislating to give greater recognition to indigenous rights and responsibilities in wildlife management. While some efforts are being made, Australian governments have no outstanding record of achievement on these issues.

Box 3.7 Status of co-management for protected areas

Co-managed areas	Management structures for indigenous involvement in protected areas
Commonwealth (Cwlth) • Kakadu NP • Uluru-Kata Tjuta NP • Booderee NP and BG	• Kakadu NP (part) and Uluru-Kata Tjuta NP granted to Aboriginal land trusts under the *Aboriginal Land Rights (NT) Act 1976* (Cwlth). Booderee NP and BG (in Jervis Bay Territory) granted to Wreck Bay community under the *Aboriginal Land Grant (Jervis Bay Territory) Act 1986* (Cwlth), as amended, in 1995. • Ownership of Kakadu, Uluru-Kata Tjuta and Booderee conditional on leaseback to Commonwealth government for 99 years; Boards of Management with Aboriginal majority established under the *National Parks and Wildlife Act 1975* (Cwlth); terms of leaseback reviewable; government makes annual lease payments.
Northern Territory (NT) • Gurig NP • Nitmiluk NP • Barranyi NP • Tnorala (Gosse Bluff)	• Gurig NP and Nitmiluk NP are Aboriginal owned and jointly managed with government conservation agency under specific legislation. • Title has also been issued to the traditional owners of Barranyi NP and Tnorala (Gosse Bluff) with leaseback to the Conservation Land Corporation for management as parks with government conservation agency. • Flora River CP; Kuyunba CR; Native Gap CR; Elsey NP; Keep River NP and Watarrka NP are NT government owned parks which have some involvement of Aboriginal people in their management. Designated living areas are present within Watarrka NP and Keep River NP. Watarrka NP also has a zone specifically for Aboriginal hunting and foraging.
Australian Capital Territory (ACT)	• No land rights legislation. • *Nature Conservation Act 1980* (ACT) does not provide for Aboriginal ownership of parks. • Native title dam to Namadgi NP has precipitated negotiations about Aboriginal involvement in management.
Queensland	• National parks can be claimed if gazetted by the government under the *Aboriginal Land Act 1991* (Qld) and the *Torres Strait Land Act 1991* (Qld). Twelve of the 317 national parks in Queensland have been gazetted for claim: Simpson Desert NP; Archer Bend NP; Alice Mitchell Rivers NP; Rokeby Croll NP; Cape Melville NP; Flinders Group NP; Forbes Island NP; Jardine River NP; Iron Range NP; Cliff Island NP; Lakefield NP; and Cedar Bay NP. • Land claims are determined by the Aboriginal or Torres Strait Islander Land Tribunal. Any parks granted are conditional on perpetual, free leaseback to the Government; the terms of the leaseback are not reviewable; land is not granted until a plan of management is

	completed; there is no guarantee of Aboriginal majority on Boards of Management. • Co-management arrangements have not been finalised for any of the parks. • Traditional Aboriginal owners are also seeking further involvement in Mossman Gorge NP; Carnarvon Gorge NP; Great Sandy NP; Jellural NP; Currawinya NP; Great Barrier Reef MP and the Wet Tropics World Heritage Area.
New South Wales (NSW)	• The *Aboriginal Land Rights Act 1983* (NSW) specifically excluded national parks as claimable land. In 1996 amendments to this act and the *National Parks and Wildlife Act 1974* (NSW) provided for Aboriginal ownership of protected areas and the development of co-management. • Five parks have been listed for the development of co-management: Mootwingee NP; Lake Mungo NP; Mt Grenfell HS; and Mt Yarrowyck NR, Jervis Bay NP. To-date no agreements have been finalised. Co-management at Jervis Bay requires Aboriginal people to forgo long standing land claims. • Parks available for co-management are decided by the government; 'ownership' is conditional on leaseback to the NPWS; Boards of Management will have an Aboriginal majority.
South Australia (SA) • Witjira NP	• No generic land rights legislation. • *National Parks and Wildlife Act 1972* (SA) does not provide for Aboriginal ownership of parks. • Witjira NP leased for 99-years from October 1995 to Irrwanyere Aboriginal Corporation (IAC) on the condition that it be managed jointly as a national park. Board of management with Aboriginal majority. Aboriginal homelands are being established in the park. • Co-management has been proposed for Unnamed CP, Ngautngaut CP and Gammon Ranges NP. Traditional Aboriginal owners have sought more active participation in many other parks including: Coorong NP; Flinders Ranges NP; Yumburra CP; Yellabinna RR; and Nullarbor NP and RR.
Tasmania	• No generic land rights legislation. • *National Parks and Wildlife Act 1970* (Tas) does not provide for Aboriginal ownership of parks.
Victoria	• No generic land rights legislation. • *National Parks Act 1975* (Vic) and *National Parks (Wilderness) Act 1992* (Vic) do not provide for Aboriginal ownership of parks • Traditional Aboriginal owners having been seeking title or further involvement in the management of Gariwed (Grampians) NP and Wilsons Promontory NP since early 1990s.

Western Australia (WA)	• No land rights legislation. • National parks and nature reserves in Western Australia are reserved under the Land Act 1933 (WA), vested in the National Parks and Nature Conservation Authority (NPNCA) and managed by WA Department of Conservation and Land Management (CALM). There is no provision for Aboriginal ownership of parks. • There are agreements between local Aboriginal groups and CALM for Purnululu (Bungle Bungle) NP, Karijini (Hamersley Range) NP, and Karlamilyi (Rudall River) NP. Management plans for Purnululu and Karijini propose Aboriginal input to park management through the establishment of Park Councils, which are ministerial committees comprised of Aboriginal and CALM representatives. • Co-management was proposed for the Buccaneer Archipelago Marine NP but no agreement has been formalised.

Abbreviations: BG - Botanical Gardens; CP - Conservation Park; CR- Conservation reserve; HS- Historic Site; MP - Marine Park; NP - National Park; NR- Nature Reserve; RR - Regional Reserve

What has indigenous CWM achieved? An evaluative overview

4.1 Issues affecting evaluation

Evaluation, an explicit element of the IIED's Evaluating Eden project, is crucial to this overview of indigenous CWM in Australia. We consider that indigenous people and their organisations should have prime responsibility for evaluating the achievements and impacts of their wildlife use and management. Indigenous evaluation may well be less formal than that applied by governments and other funding donors. But it is more likely to be accepted as valid by indigenous wildlife users and managers than any outside assessment. Larger indigenous organisations increasingly operate on a programme basis and are likely to be formally scrutinised by government funding bodies. Formal processes of evaluation are important to them because of this, but they can still make very effective use of means of assessment that are designed by indigenous community members.

Evaluation by 'outsiders' risks being misdirected. Non-indigenous Australians, as Ponte (1994; 1996) has pointed out, rarely understand the social and cultural values that indigenous people place on wildlife and the way that these are expressed in contemporary lifestyles. Their assessments therefore tend to express more general relationships between non-indigenous and indigenous people and as such may be clouded by racist attitudes, negative stereotypes, fear and intolerance. Government evaluation of indigenous programmes may be less prejudiced, but because they largely concentrate on monetary economic costs and benefits they underestimate the vital contribution of indigenous wildlife use to subsistence and maintaining cultural tradition. All of these benefits must be counted if the use and management of wildlife is to be a viable path for the socio-economic development outcomes.

Nevertheless, many other people are interested in questions of whether indigenous CWM is sustainable and is promoting indigenous empowerment. Lessons from Australian indigenous peoples' experiences are important to other people who have the same goals or who are facing similar problems. Thus, while we cannot

definitively evaluate the activities described in this report, it is useful to review the lessons that they offer. This report considers a wide variety of activities - government programmes; initiatives of indigenous organisations; collaborative initiatives of indigenous organisations with researchers or government agencies; and, particularly in the case of subsistence use of wildlife, activities that are the contemporary expression of tens of thousands of years of indigenous culture and tradition. The extent of participation by indigenous people and indigenous organisations in these activities also varies. Some projects are initiated and controlled by indigenous people and their organisations. In other cases indigenous people participate more passively - for employment, or because the project is culturally significant to them - with little role in project development and design. Three perspectives on evaluation of these various activities are relevant to this review, as discussed below.

4.1.1 Effectiveness of projects/activities in promoting indigenous control and management of wildlife

Projects or activities which are managed and controlled by indigenous people and their organisations and which return benefit to indigenous people accord with important aspects of IIED's (1994) model for CWM. Other projects, though not fully controlled and managed by indigenous people may nonetheless benefit them and assist them to advance their interests in CWM. These distinctions cannot be effectively quantified so our categorisation of projects involves a high degree of judgement. We here distinguish five categories of project. Four of these - indigenous CWM; co-management; participatory and 'top-down' activities, reflect our perception of the degree of indigenous community control. A final category groups government projects that facilitate indigenous CWM (see Table 4.1).

4.1.2 Effectiveness of projects/activities in achieving their original stated (or implied) objectives

Project managers, in particular, make most use of this form of evaluation. Project planning should involve decisions about goals, and should select indicators which are expected to reflect changes that occur as a result of the planned actions. Monitoring involves the periodic examination or measurement of these indicators. Evaluation then compares how indicators have actually changed with the changes that would be expected if goals were reached. Such evaluation can not only indicate whether actions are having their desired effect but may also suggest other factors that are having an impact. This allows an action to be altered to maximise desirable outcomes.

In indigenous CWM, this kind of evaluation can help to underline factors responsible for success or failure. Lessons for more effective policy or action in future may then be clear. But this type of evaluation also faces constraints because the objectives of indigenous wildlife management activities are not always stated or apparent (at least to outsiders); and they may change as a project develops. Quantitative measures of outcomes may also be inappropriate. With these qualifications, Table 4.1 summarises the main objectives of projects, noting whether or not any formal evaluation has been undertaken and summarising outcomes. Because of data limitations these outcomes rarely reflect those identified by indigenous CWM. Most are based on our own interpretations, the comments of government agency staff or assessments made by non-indigenous researchers into these issues. And they do not provide a comprehensive list.

4.1.3 Effectiveness of projects/activities in promoting sustainable development, including sustainable use of wildlife

IIED's interest in indigenous CWM is explicitly linked to 'striving' for sustainable development, including the sustainable use of wildlife. Such an approach, which considers development as an holistic system which incorporates its ecological, social and economic dimensions, is likely to be more effective than 'top down' development systems in which a single dimension, often the economic dimension, takes first priority. It is also an approach which accords closely with indigenous perceptions of the management of their communities and natural resources (Young, 1996). We thus feel that sustainability, while difficult to assess, must be an overt goal of evaluation.

Evaluation of sustainability must focus both on the ecological system and also the human system which is embedded in it. While, as Prescott-Allen and Prescott-Allen (1996) point out, this is obvious, it is an approach which is often overlooked. Assessment of the well-being of the ecological system means considering the population levels of species harvested, the resilience of other ecosystem components and also of the air, water and soil resources which maintain biodiversity. Understanding the well-being of the human system means assessing material elements (eg housing, cash and subsistence incomes); and non-material elements (eg health, education, social cohesion, cultural vitality, equality of opportunity, political power and influence). Evaluation should also examine whether these components and indicators are improving or declining over time. Prescott-Allen and Prescott-Allen (1996) and the IUCN Species Survival Commission Specialist Group on Sustainable Use of Wild Species (1996) present a process for evaluating sustainability. They advocate systematically examining indicators of the current condition and trend of the ecosystem and of the human system and then examining what impacts wildlife use is having on the resource, the rest of the ecosystem and the human system. However, as they note, even such a detailed process can at best only hope to assess sustainability approximately (IUCN 1996). Lack of essential data on the current condition and trends in the human system and the ecosystem, a problem affecting this study, is a major reason for this problem. Thus, if we attempted such an assessment, important factors affecting sustainability might well be overlooked. For example, Prescott-Allen and Prescott-Allen (1996), based on Grigg (1996), assesses the sustainability of commercial kangaroo use in the Australian sheep rangelands as 'good' but this analysis overlooks issues relating to Aboriginal peoples' interaction with kangaroos and the kangaroo industry. Consequently important points about social justice and equity are excluded from the assessment.

Evaluating an individual activity may also mean that the impacts of other related activities receive inadequate attention. For example, our review suggests that the answer to the question of whether indigenous harvest of dugong is sustainable is probably a qualified 'no'. However, if indigenous harvests are restricted, the sustainability of the human system, with the detriment to the maintenance of indigenous cultural traditions and subsistence economies, will be undermined. Unless other sources of impact, such as by-catch kills in fishing nets, are also evaluated and vigorously addressed any restriction of indigenous harvesting may have little effect on dugong sustainability. Thus the sustainability evaluation process used by Prescott-

Allen and Prescott-Allen (1996) and suggested by IUCN (1996) needs to be extended to look at all activities which impact on the resource. Lack of data will make this a difficult task.

Finally, even if our data were adequate, it would still be difficult to evaluate sustainability because of the synergistic relationship between economic, social and ecological factors that is inherent in the concept. Data may allow a detailed examination of each of these factors but the trade-offs and balances between them also need to be assessed if trends in sustainable development are to be identified. Faced with these complex questions we have restricted our evaluation to simple qualitative outcomes of the various projects/activities, in terms of their ecological, social/cultural and economic components (see Table 4.1).

4.2 Indigenous CWM: High indigenous control

This review examined 12 projects/activities which approximate IIED's model of CWM (see Table 4.1). However only two of these - the development of a community dugong management plan for Boigu Island and sea turtle (miya panu) research and management in Arnhem land - have a specific focus on wildlife. All these projects are managed by indigenous organisations. Through the management structures of these organisations and the less formalised power of elders, indigenous people exercise a high degree of control. But many staff and researchers in these organisations are non-indigenous and, because they act as catalysts for community action, they often play a key role in empowerment.

We also identify subsistence harvest in general as an example of indigenous CWM. Despite limited legal recognition of indigenous ownership and/or rights to use wildlife, indigenous people in many cases remain the de facto managers of their own resources. Indigenous people from all parts of Australia and from both rural and urban communities clearly recognise the socio-economic and cultural benefits of subsistence harvesting and all types of wildlife – common terrestrial species (eg kangaroo, wallaby and emu); rare and endangered species (eg bilby); and estuarine and marine species such as crocodiles, dugong and turtles – are highly significant. As yet government policy takes little practical account of these benefits. Altman et al (1996) argue that governments should consider an income support programme for subsistence hunters and gatherers because, as they are already productively engaged, they may not meet the criteria for government unemployment benefits but still require some cash income. In some places indigenous Community Development Employment Program (CDEP) schemes undoubtedly provide income support for subsistence, because people hunt for the community during their paid work hours, with the use of community owned vehicles.

Evidence about whether subsistence use is adversely affecting wildlife populations is inconclusive because of lack of complete data on levels of indigenous harvest and wildlife mortality from other causes. Populations of some species (including mala, bilby, dugong, rock wallaby and - in some regions – kangaroos) are declining for a variety of reasons. These losses limit the extent to which people can take advantage

of the socio-cultural and economic benefits of subsistence. Demographic changes and loss of indigenous rights to and association with country have, in some areas, eroded traditional indigenous authority structures for managing subsistence use and as a consequence effective systems for monitoring and regulating wildlife use are lacking. Community development focused on supporting traditional knowledge and authority structures would be essential in filling this gap. Scientific knowledge of wildlife management is also needed because of the dramatic ecosystem changes that have occurred over the past 200 years.

All the indigenous CWM projects/activities examined for this report are working towards integrating scientific expertise, participatory approaches to community development and traditional management systems. However, only one of the CWM projects examined for this report, the Annangu Pitjantjatjara Land Management Programme (APLMP) has been formally evaluated by its managers. In spite of some positive outcomes (Table 4.1) the review also raised many problems - see Box 4.1. Since none of the other indigenous CWM projects reviewed in this report have been formally evaluated by their managers, it is difficult to account confidently for their impacts and achievements. Table 4.1 shows that indigenous people have experienced clear social and cultural benefits especially through enhanced self esteem, empowerment and reinforcement of traditional authority structures and environmental management practices. Ecological benefits, including benefits for wildlife conservation, stated from these activities are mostly indirect (eg some increased community awareness of conservation issues). However where environmental management has been vigorously and persistently addressed, such as at Kowanyama, improvements in the ecological condition of subsistence resources are also being reported. Very few projects report negative impacts or unmet expectations. But, considering that our review has not involved a survey of, or direct consultation with, all stakeholders, this is hardly surprising.

The question of formal regulation of indigenous wildlife use emerges in a number of cases. On the Queensland coast some indigenous communities are calling for regulations to prevent other indigenous groups using their local fishing grounds (Roberts et al 1996). The Kowanyama community has developed its own regulations covering community members' use of gill nets for fishing, and is frustrated by slow progress in getting the Queensland government to accept these so that they can be enforced by community rangers. Paradoxically, Kowanyama's senior ranger is a qualified fisheries inspector and can thus enforce government regulations relating to non-indigenous commercial fishing in the region; yet he has no formal powers to enforce the community's regulations for application to community members (Sinnamon 1996). Boigu Island people, who have recently accepted in principle that quotas might be needed for dugong hunting, also want community rangers to have formal powers to enforce these (Ponte 1997). Altogether these and other expectations present significant challenge given the current insecurity and funding deficiencies for community rangers in most places.

Indigenous CWM activities alone cannot assure the future availability of wildlife. These actions have to extend beyond indigenous lands if they are to be effective in empowering people and promoting sustainable development. Apart from Kowanyama's activities, the dugong protection agreement between the Northern

Box 4.1 Anangu Pitjantjatjara Land Management Program

After the first 5 years of its operation the Anangu Pitjantjatjara Land Management Program commissioned a consultancy to evaluate its progress (Breckwoldt et al. 1996a). The evaluation provides a rare insight into some of the problems, shortfalls and unmet expectations from indigenous CWM. Not surprisingly the consultants found that, because of a lack of objective criteria and of appropriate monitoring and evaluation systems, they could not properly address the outcomes and impact of many projects. Qualitative evaluation suggested that some Anangu felt that APLMP offered too little support for their ideas for land based enterprise activities such as cattle pastoralism, while others felt that, because these activities only benefited a few individuals, the money should have been spent elsewhere instead. Agencies identified a deficiency in land capability analysis, contingency planning for drought and enterprise management skills. Some Anangu suggested that the APLMP should develop regulations and guidelines for conserving country, as it is empowered to do under the by-laws provisions of the *Pitjantjatjara Land Rights Act*. Here they seem to be acknowledging that Aboriginal customary law, the basis of the APLMP, is not independently capable of managing degrading processes, such as the soil erosion and vegetation degradation arising from overstocking in commercial pastoralism. Although APLMP has invested enormous effort on traditional land management practices, such as patch burning and rock-hole maintenance, Anangu considered that the condition of the land and its wildlife had declined; and agencies felt that the benefit of traditional land management activities to the maintenance of native wildlife species was questionable and inadequately assessed.

Although evaluation shows that APLMP community rangers have made critical contributions to scientific survey and the promotion of cross-cultural communication, their employment has had some costs. In particular community perceptions of who is responsible for conservation management have become more centralised (Peter Yates pers com). In the early days, before community rangers were appointed, APLMP projects often operated as periodic community events with as many people as possible, women and men, young and old, taking part in activities such as rock-hole cleaning. This gave people both the transport and the opportunity to visit country where they may not have been for a long time, if at all. Cross-generational learning about traditional knowledge and wildlife management responsibilities was supported. When community rangers were designated, other community members began to see this land of work as their sole responsibility as they were supplied with vehicles and paid to do it. Community participation became more limited and women in particular missed out because all community rangers and other staff of the land management office were men. Such factors inhibit everyone in the community from taking part in activities which promote sustainable use of wildlife resources. Without representative community participation TEK and new knowledge gained from collaboration with scientists is unlikely to be effectively integrated to achieve sustainable development in the AP lands. One of APLMP's responses to its review has been to employ female land management staff to develop a programme with Anangu women.

Land Council and commercial fishing interests and the Cape York Heads of Agreement both show how this is being pursued through negotiation with other stakeholders. Early outcomes are positive. But the inadequacy of government funding for indigenous CWM remains an almost universal problem. The only commercially profitable indigenous CWM project examined here is the Bawininga crocodile harvesting enterprise. Community ranger employment and training, professional input to participatory projects, and vehicle running costs need financial support. People's cash incomes are generally low and their organisations usually rely on discontinuous short term grants.

Funding from sources other than government is occasionally available. Dhimurru, for example, receives significant contributions to its operating costs from associated bauxite mining activities. But many of Dhimurru's activities are associated with managing the indirect impacts of mining, such as recreational use, so the net economic benefit to CWM from these contributions is questionable. Costs for addressing issues which affect ecological sustainability and biodiversity, such as land degradation from weeds and feral animals and recovery of endangered species, are high and organisations involved in this need to be well-resourced.

4.3 Co-management: Partial indigenous control

Co-management, where governments and indigenous communities manage natural resources in an equal partnership, can potentially advance sustainable development for indigenous people in situations where indigenous CWM is not feasible because of the rights, interests and impacts of non-indigenous stakeholders. Successive plans of management for Uluṟu and Kakadu place increasingly greater emphasis on indigenous values and priorities for management of the parks, and community control over wildlife and other resource management has been supported. But, while co-management has returned economic, social and cultural benefits to indigenous traditional owners, tensions are still evident in these parks. These concern not only natural resource management issues but also the adequacy of community infrastructure and lease payments to traditional owners. Breakdowns in communication and trust can also impair the active participation of indigenous people in management. Such difficulties are rarely discussed in public because, with the present grudging acceptance of co-management, the positive benefits rather than the limitations have to be stressed.

In spite of such problems, co-management in Uluṟu and Kakadu do appear to contribute significantly to indigenous empowerment and control over wildlife management. Management budgets and scientific interest allow a high level of wildlife research and management to be undertaken and prospects for ecological sustainability are generally good in spite of ongoing impacts from threatening processes. However it must be remembered that the widespread establishment of equally effective co-management arrangements elsewhere is highly constrained. The IPA programme will not overcome these hurdles easily.

4.4 Participatory projects: Partial indigenous control

Participatory activities considered in this report range from shared decision making in joint managed national parks and in some wildlife survey projects to more passive forms of indigenous participation in government managed projects. The contribution of these projects to promoting indigenous capacity for CWM and indigenous sustainable development varies accordingly. In three Queensland marine management projects, for example, active indigenous participation in monitoring dugong and/or turtle populations and harvest rates varies depending on their institutional settings. All of these projects place greatest stress on meeting ecological objectives but also explicitly state some social and economic priorities. All are concerned, to varying degrees, with empowering

indigenous people for sustainable wildlife management and indigenous community support for wildlife conservation measures has in all cases risen as a result of the project. Social benefits noted from the projects include a growth in mutual trust between indigenous people and conservation agencies, and reinforcement of the knowledge and authority of indigenous elders and community rangers. Economic benefits include some short term employment. Even the most 'top-down' of the projects, the GBRMP dugong and turtle management project, is assessed as making a strong contribution to indigenous CWM. However critics of this project have said that it only pays lip service to indigenous knowledge, let alone empowerment (see Williams 1996). Marsh et al's (1995) concern that "the nature and extent of indigenous hunting of dugong in the southern GBR is unknown" suggests that scientists are also somewhat frustrated with existing ecological outcomes.

Funding and project management agencies typically evaluate wildlife survey and species recovery projects in terms of their effectiveness in meeting ecological objectives. Even where government agencies, scientists and indigenous organisations have collaborated in the project design and management social, cultural or economic objectives for wildlife survey and species recovery projects are rarely identified. Yet all the collaborative research projects summarised here (Table 4.1) seem to have had positive social outcomes and many have also provided minor economic benefits through short term indigenous employment. Social outcomes noted by wildlife scientists include the pride and cultural affirmation for traditional owners from sharing knowledge and collaborative action to protect species of cultural significance. Of particular importance is increased indigenous awareness of contemporary threats to wildlife. This develops from their long term and supportive interaction with scientists and explains why people continue to be willing to be involved. While enthusiasm inevitably wanes with lack of overt success this hazard reflects the fact that threatened species recovery is always a long term process. In the case of the mala project, for example, people might well have maintained their interest if they had managed to solve the problem of feral animal predation and been able to maintain and expand wild populations of mala.

Wildlife survey and species recovery projects can potentially contribute significantly to indigenous CWM if there is long term collaboration and if scientists negotiate arrangements with indigenous representative organisations for design and implementation of the overall project. This has occurred in the Anangu Pitjantjatjara lands biological survey and in the Western Australian rock wallaby management programme. While scientists can become frustrated because traditional owners rarely share their feelings about the urgency for regular feral predator control they can not simply step in and take charge.

4.5 Top down activities: Limited indigenous control

Commercial wildlife harvesting activities, e.g. crocodile egg and muttonbird harvesting (Table 4.1) provide the prime examples of 'top-down' regulation and control. Government conservation agencies require these projects to undergo formal monitoring of populations and harvests and the data are used to set harvest quotas. Neither harvest has so far provided evidence of a detrimental impact on wildlife

populations, probably because the species involved are resilient. In addition, markets for both harvests are limited - in the case of muttonbirds, by lack of consumer demand; and in the case of crocodile eggs, by the limited capacity of established ranching operations to grow hatchlings to maturity. With these constraints, risks of overharvesting are probably low, even without government regulation. Markets are less restricted for the skins of adult crocodiles harvested from the wild, an activity which has recently been trialled in the NT. If the trials prove to be commercially successful it will be interesting to see whether indigenous people use traditional management systems to regulate their commercial harvest, or whether they will accept government quotas and monitoring to minimise the risk of overharvesting.
While social and economic factors are not being formally monitored in either the crocodile or muttonbird programme, positive benefits have been noted. However, as long as the current top-down centralised management system persists, such commercial harvesting can only make a limited contribution to the development and strengthening of indigenous CWM.

State/Territory government feral animal control programmes also largely operate in 'top down' mode and, not surprisingly may have received little support from indigenous people. NT government agencies have found that many of these problems can be overcome through careful negotiation by sympathetic and experienced staff. This supports the idea that more participatory styles of management will be more effective in achieving agency goals.

4.6 Government programmes facilitating indigenous CWM

Both of the Commonwealth programmes which facilitated indigenous involvement in wildlife use and management in the decade up to 1996/7, the Aboriginal Rural Resources Initiative (ARRI) and the Contract Employment Program for Aborigines in Natural and Cultural Resource Management (CEPANCRM) have been formally evaluated by government appointed expert panels (ie Breckwoldt et al, 1996b; Williams et al, 1995). While neither began with clear commitment to indigenous CWM, this developed markedly as the programmes continued. This reflected increasing emphasis on consultation with indigenous people about the programmes' directions, and the relatively high proportion of indigenous staff employed in programme administration.

The ARRI programme aimed to enhance social and economic benefits through commercial use of wild animals, especially feral vertebrates. Although there is little overt evidence, it appears that the programme made indigenous people more aware of opportunities for sustainable development. In its funding of individual community based projects, the ARRI programme helped indigenous people to motivate themselves. During the four years of ARRI's existence 434 people were employed at least on a part-time basis and hence its economic impact, in the communities concerned, must have been significant. Significant social benefits in self esteem, empowerment and, in some cases, reduced substance abuse within communities have occurred. The programme did not seek any specific environmental outcomes, although funded projects were designed with environmental aims in mind.

The CEPANCRM programme substantially increased indigenous participation in formal natural and cultural resource management projects, and in education and also succeeded in providing indigenous people with employment. Empowerment and strengthening of cultural knowledge has been widely reported.

Both ARRI and CEPANCRM programmes acted as catalysts in reinforcing indigenous people's interests in country. They also had a marked effect on expanding the networks of indigenous people interested in wildlife use and management, not only putting indigenous groups in touch with each other but also with wildlife scientists. Staff of the programmes, many of them indigenous people, often acting as 'cultural midwives', played a critical role in this (Lynette Liddle, pers com) and did much to enhance cross-cultural communication about wildlife use and management. Unfortunately, while formal evaluation found that both programmes had met their objectives most effectively, neither has attracted the continuing support of the current Commonwealth government. The ARRI and CEPANCRM evaluations also highlighted the need for future programmes of this nature, to develop more effective methods for evaluating intangible social and cultural outcomes. This would entail the use of indicators which were meaningful both to programme management staff and to indigenous people. Similar monitoring processes in the environmental sphere would also help to show how any future programmes of this nature could encourage wildlife conservation. Effective monitoring and evaluation of the current IPA programme is necessary to assist in developing the political support that indigenous people need in order to attract secure and adequate long term funding for protected area management.

Table 4.1 Impacts and achievements of indigenous community wildlife management

Project	Impacts/Achievements
INDIGENOUS CWM PROJECTS/ACTIVITIES	
Subsistence wildlife use *Objective*: Maintain culture and care for country; access preferred foods	• *Ecological*: Declines of some otherwise common species in some areas • *Social/Cultural*: Maintains links with tradition; health benefits from bush food and from harvesting activity • *Economic*: Contribution to (non-monetary) income can be significant
Miyapanu (sea turtle), Arnhem land, NT (*Collaborative research at community initiative*) *Objective*: Integrate scientific and government conservation concerns with Aboriginal perspectives.	• *Ecological*: Community awareness of issues raised; increased hatchling emergence reported • *Social/Cultural*: High community interest and participation; pride and self esteem.

Dugong management plan, Boigu Island *Objective*: Develop dugong management plan for sustainable use and management by community	• *Ecological*: Increased community awareness of dugongs as threatened species; recording of TEK • *Social/Cultural*: A parallel project has indicated potential of model for protection of culturally significant areas.
MaSTERS *Objective*: Develop regional and community plan for sustainable management of Torres Strait region to benefit of local community	• *Social/cultural*: Empowerment; supports community authority structures; reinforces cultural significance of the environment • *Economic*: Short term employment
Community rangers *Objective*: Long term employment of community members as authorised rangers	• *Social/cultural*: Support and revival of cultural practices and traditional authority structures; enforcement of unauthorised access to indigenous owned land • *Economic*: Employment, training
CLC land and resource management initiatives *Objective*: Support Aboriginal land owners with advice and other resources for land management	• *Ecological*: Better acceptance of scientific advice by Aboriginal land owners; incorporation of TEK in planning • *Social/cultural*: Incorporation of indigenous cultural perspectives into land assessment and planning; empowerment of land owners. • *Economic*: Better targeting of available resources
NLC Caring for country strategy *Objective*: Improve environmental and economic sustainability of Aboriginal owned land	• *Ecological*: Land management planning initiated; better understandings of ecological issues. • *Economic*: Improved access for indigenous people to government labour market programmes; support to landowners for developing other economic activities, including commercial wildlife use
Cape York Land Council/ Balkanu Cape York Development Corporation *Objective*: Sustainable development of Cape York natural resources to benefit indigenous people	• *Ecological*: Various projects underway aim to address issues of ecological sustainability and land management research needs • *Social/cultural*: Improved access by indigenous landowners to scientific information and professional advice; strong emphasis on capacity building; improved indigenous participation in industry and regional planning • *Economic*: Employment and training;
Kowanyama *Objective*: Maximise indigenous management of indigenous lands and children's learning about land management	• *Ecological*: Regulation of non-indigenous resource users; increased protection of resources in catchment • *Social/cultural*: Self esteem and empowerment; expanded networks; support for traditional authority structures • *Economic*: Income from tourist camping permits
Anangu Pitjantjatjara land management *Objective*: Culturally	• *Ecological*: Restoration of traditional habitat management practices; some feral animal control; contribution of TEK to scientific survey

appropriate land management centred on customary law	• *Social/cultural*: Maintenance and revival of traditional cultural practices. • *Economic*: Some employment; development of feral animal harvesting enterprises
Dhimerru *Objective*: Management of land and sea using TEK and scientific knowledge	• *Ecological*: Contribution of TEK to scientific research • *Social/cultural*: Reinforce traditional authority of elders; expanded networks. • *Economic*: Small scale employment
Bawinanga *Objective*: Achieve economic independence and self determination through sustainable development of land and sea resources	• *Ecological*: Contribution of TEK to wildlife survey • *Social/cultural*: Self determination and empowerment; • *Economic*: Employment via labour market training program; Involvement in commercial wildlife use
CO-MANAGEMENT PROJECTS	
Uluru National Park and Kakadu National Park *Objective*: Integration of Anangu customary law into national park management	• *Ecological*: Incorporation of TEK in management; collaborative research and management of threatened species • *Social/cultural*: Empowerment; missed awareness of cultural issues; social pressures from heavy tourist use. • *Economic*: Income from lease agreement and Anangu owned tourism enterprises; employment in park management.
PARTICIPATORY PROJECTS	
GBRMP dugong and turtle management *Objective*: establish cooperative management systems for indigenous wildlife use	• *Ecological*: Increased indigenous community support for conservation measures; reduction in illegal hunting • *Social/cultural*: Growth in mutual trust between conservation agency and indigenous communities • *Economic*: Reduction in subsistence harvest in some places.
AFMA catch monitoring, Torres Strait *Objective*: Promote conservation of dugong and turtle fisheries and protect traditional harvest	• *Ecological*: reliable catch monitoring; increased community awareness of conservation issues • *Social/cultural*: Growth in mutual trust between islanders and agency staff • *Economic*: Employment of islanders in catch monitoring
Monitoring subsistence wildlife use, far north Queensland. *Objective*: Collaborative research on subsistence hunting	• *Ecological*: Information base about indigenous wildlife use obtained; ecological modelling of impacts • *Social/cultural*: Empowerment of community from involvement in all stages of project design and implementation; • *Economic*: Part time employment of community rangers
Black-footed rock wallaby, WA (*Collaborative research)* *Objective*: Management to avert local extinction	• *Ecological*: Community awareness of population decline increased; feral predator control commenced • *Social/cultural*: Aboriginal interest in the project because of cultural value of the animals • *Economic*: Some short term employment

Mala management (*Collaborative research*) *Objective*: Prevent extinction of mainland population	• *Ecological*: Extinction prevented via captive breeding but maintenance of wild population not successful • *Social/cultural*: Initial enthusiasm and high participation by Aboriginal people because of cultural value of the animals • *Economic*: Some short term employment
Bilby survey and management (*Collaborative research*)	• *Social/cultural*: Self esteem from recognition of Aboriginal skills and knowledge • *Economic*: Some short term employment
Anangu Pitjantjatjara Lands biological survey (*Collaborative research*) *Objective*: Systematic survey and identification of conservation/land management issues	• *Ecological*: Identification of threatened populations and initiation of some protective action; increased Aboriginal awareness of threatening processes. • *Social/cultural*: Self esteem from recognition of Aboriginal skills and knowledge; renewed interest in land management • *Economic*: Some short term employment
'TOP DOWN' PROJECTS	
Management of mutton-bird harvest, Tasmania (*Government managed commercial harvest*)	• *Ecological*: Harvest is well below maximum sustainable yield; harvesting has helped ensure habitat protection • *Social/cultural*: Maintains links with history and tradition; keeps indigenous culture alive and community together • *Economic*: Minimal - $1,000-$1,500 per catcher per season
Management of crocodile harvest, NT (*Government managed commercial harvest*)	• *Ecological*: Slight population increase in spite of commercial harvest. • *Social/cultural*: Makes use of traditional skills and empowers people for management of resources on their lands. • *Economic*: Can be substantial, especially where communities manage egg hatching facilities.
Feral vertebrate control (*Government programmes*)	• *Social/cultural*: Greater awareness by government of indigenous attitudes to feral animals • *Economic*: Some commercial harvesting of feral species
ARRI *Objective*: Enhance indigenous socio-economic development through commercial use of wild animals (now discontinued)	• *Social/cultural*: Self esteem and pride; expanded networks • *Economic*: Indigenous employment; and establishment of wildlife utilisation enterprises
CEPANCRM *Objective*: Empowerment and socio-economic development through conservation and heritage (now discontinued)	• *Social/cultural*: enhanced self esteem and empowerment; expanded networks; increased interest in and access to education opportunities; revival of cultural practices • *Economic*: Indigenous employment and establishment of contracting and tourism enterprises
Indigenous Protected Areas *Objective*: Support and expand indigenous management of protected areas	• *Social/cultural*: Increased cooperation between indigenous organisations and conservation agencies

4.7 Why evaluate?

If indigenous CWM is to be properly supported it is essential that its contribution to sustainability be assessed. Thus, although evaluation is, for all the reasons outlined earlier, difficult it is still essential that indigenous organisations involved in CWM attempt to follow such a process. Evaluation currently undertaken by indigenous organisations is generally informal, for example through feedback from elders. The views of elders and other community members certainly provides some measure of success or of short comings of CWM. However indigenous organisations also need to adopt a more systematic approach to documenting these opinions than appears to be happening at present. These indicators also need to be combined with others, for example observations of wildlife numbers, the contributions that wildlife makes to diet and both cash and non-cash incomes, and people's state of health. Systematic approaches will provide people with good tools to convince governments and other stakeholders of their successes, or of what action needs to be taken to change factors that are outside their control and that inhibit success. Economic indicators, given government preoccupation with commercial viability of indigenous enterprises, are particularly important. Indigenous CWM projects which can demonstrate that community members' health standards are improving (thus indirectly saving government money) and that communities are becoming more economically self-sufficient will provide the most convincing cases. But it must be remembered that, with the focus on CWM and sustainability, ecological and social indicators are also needed. Indicators need to be practical and repeatable and may best commence with asking a simple question at the start of any new project/activity: How will we know if we are successful?

Community participation is an essential part of the evaluation of most indigenous CWM projects. Community members should be, as far as possible, involved in design and implementation and, as far as possible, in analysis. This principle should be applied across the entire range of CWM projects – assessing wildlife populations and harvest rates; developing co-management structures; or establishing a business enterprise. Projects initiated by an indigenous organisation, or by a government agency, or by a wildlife researcher should all use this approach. While participatory evaluation can add to the workload of project managers, its substantial benefits make it essential. The following summary provides a tentative recipe for successful indigenous CWM.

4.8 Ingredients for effective CWM

All projects/activities reviewed for this report have demonstrated some success but most also have their problems. Lack of money, or lack of budget security are recurring themes which inhibit long term planning and thus undermine the potential for greater sustainability. Apart from substantial non-cash contributions from subsistence production very few projects are generating any significant economic return to the community. Consequently they rely heavily on government funding support. Our assessment suggests that three of the projects examined here – Kowanyama, Dhimurru and Bawinanga – have had considerable success in establishing effective community control over use and management of their natural resources and wildlife; are managing those resources sustainably; and are generating

benefits from these resources for community members. These groups have some advantages. Their land rights have been recognised, over large parts if not all of their country. Their country is comparatively intact and is rich in wildlife resources; and they have retained much of their traditional knowledge. All have articulated a strong vision for sustainable development. They perceive that 'caring for country' links culture and the natural environment and uses both traditional knowledge systems and technologies and scientific knowledge and tools. While some of their activities focus specifically on wildlife, these do not operate separately. Both elders and young people are involved and elders and clan leaders play a key role in accountability. People are becoming more capable of enforcing good management practices, through building strong networks and tapping into technical and professional support available from larger indigenous organisations within their regions. Key features of these groups' activities are summarised in Box 4.2.

We consider that these ingredients are likely to be important in the success of any indigenous CWM activities. There are some other important factors. Individuals are very influential. Key people have made long term commitments to many of the projects described here and successful outcomes are undoubtedly due in a large part to their efforts. They include indigenous elders and other community leaders, community rangers, non-indigenous staff of indigenous organisations, research scientists, educators and staff of government conservation agencies. It must also be acknowledged that the 'successful' projects used to generate the ingredient list are fortunate. Other groups with different experiences of dispossession and degradation of their country are likely require much more external assistance over longer time periods if they are to effective in indigenous CWM.

Box 4.2 Ingredients for effective indigenous CWM

Factors common to successful Australian CWM projects/activities.

Context	
Environment	Relatively rich in wildlife resources and comparatively little degraded.
Group cohesion	Group members have traditional cultural relationships to the country, though a number of clan/language groups may be involved. Relationships to country comparatively little disturbed
Tenure	Community has secure tenure over country; (marine estates are integral, though community tenure is not recognised).
Human scale	Community size is about 1,000 people.
Features of projects/activities	
Initiative	The projects/activities started at the community's initiative.
Time scale	Activities have been established and developed over 5-10 years.
Vision	A vision for sustainable development and self determination is strongly articulated.
Making choices for sustainability	People have chosen not to pursue (or cooperate with) economic development opportunities which they consider will damage the country.
Structures	Culturally appropriate people (clan group representatives, elders) exercise direction over activities.
Knowledge and technologies	Traditional Aboriginal and scientific technologies and knowledge systems are being combined.
Strengthening culture	Activities include support for outstation/homelands groups, who are occupying/resettling remote parts of the land, in order to care for country in culturally appropriate ways; young people involved in activities through schools programmes and training/employment schemes.
Networks	Strong, diverse and expanding networks with other indigenous groups; non-government stakeholders (eg neighbouring landowners, researchers, industry groups); and government agencies.
Functions	Functions focus on management of country; other (associated) organisations in the community have main responsibilities for community services.
Income	A number of sources of government funding are accessed, limited reliance on a single source; some earned income.
Activities	Diverse range of planning, training and management activities, including management of wildlife, habitat, fisheries, low volume tourism, outstations; community rangers are employed and trained in these diverse activities. Wildlife management is part of overall management of country, but some activities focus on particular species.
Enforcement	Enforcement capacity is developing for community activities and those of outsiders; authority for enforcement involves rangers, elders and government regulation.
Regional support	Regional indigenous organisations concerned with land and resources are available; this allows access to professional advice and support.
Evaluation	No formal process, but there is informal evaluation via feedback from elders and community members

Indigenous CWM: Key issues and lessons from the Australian experience

5.1 Background factors

As implied earlier, the relative 'success' of indigenous CWM projects must be based on an understanding of important background factors, all of which vary geographically, demographically, institutionally and politically. Some Australian indigenous groups live in extremely remote locations, in climatically harsh environments; others live in towns and cities. People have differing access to land and resources and differing degrees of control over the use of these. Socio-demographic elements, particularly age and gender, influence what people can achieve. And political awareness, a key factor in empowering people to adopt resource management practices which accord with their own rather than external priorities, ranges across many extremes. Our brief exploration of some of these factors provides a setting for discussion of key issues and lessons concerning indigenous CWM in Australia.

5.1.1 Spatial unevenness

The projects/activities reviewed in this report are distributed very unevenly across Australia, with most concentrated in the northern monsoonal regions of Queensland and the Northern Territory, and in the arid deserts of central Australia. This spatial unevenness is not simply an artefact of our sample. It reflects real constraints on indigenous people's involvement in CWM elsewhere, particularly in southern Australia and in much of Western Australia. In these regions people's land and resource rights have received little recognition and hence it is very difficult for them to be involved in wildlife management or in the development of initiatives in this area. Rural indigenous people living in towns or on small areas of land excised from pastoral leases are restricted in their legal access to areas suitable for hunting. Wildlife protection laws add further legal restrictions. Such people therefore tend to pursue their activities in some secrecy. Government wildlife managers in these areas understand little about the extent of hunting and its impacts. And indigenous hunters have little control over the way that wildlife is managed on their customary land and

often have no guarantees that there will be wildlife there for them to hunt in the future. Such groups are likely to continue to see gaining land rights through native title and land purchase as their number one priority. Negotiations associated with indigenous land ownership increasingly focus on land management issues because agencies want to be assured that land and its wildlife resources will be managed sustainably, that biodiversity conservation values will be protected and that any commercial operations will be economically viable. Thus many of the features of successful CWM projects/activities need to be taken into account in land management planning conducted by such indigenous groups. Co-management structures could also be explored more imaginatively as a way of promoting indigenous CWM on land that is not in indigenous ownership.

5.1.2 Culture and country

Country, including wildlife, is supremely important to indigenous people in cultural terms and hence CWM has vital cultural implications. Concepts such as 'sustainable use of wildlife' and 'biodiversity' have no relevance to indigenous approaches to management of country unless they incorporate cultural dimensions. Thus, as indigenous participants at a workshop on Indigenous Protected Areas (IPA), explained, the words 'culture' and biodiversity must be 'joined and interchangeable' when used in protection of the environment (Environment Australia 1997). Managing for 'cultural biodiversity', a focus of the IPA programme, will present a considerable challenge for government conservation agencies involved in such projects. The Uluṟu-Kata Tjuta National Park experience, in particular, is demonstrating how this can be achieved through a focus on indigenous readings of landscape in park interpretation, and on indigenous skills and knowledge in designing wildlife and land management programmes.

5.1.3 Gender and other equity issues

According to IIED's African experience (IIED 1994) projects managed by community organisations may lack equity in the benefit returned to community members because the needs of less vocal or powerful members of the community may be overlooked. Similar caveats must be applied in Australia. Indigenous organisations, for example, are ostensibly established to represent all residents in an area. However they can, like most organisations, be dominated by sectional groups who receive a disproportionate amount of benefit from employment or service provision. This problem should not, however, be over-stated. Antagonistic governments and resource developers often claim that 'indigenous community interests' are not being represented by 'indigenous community organisations'. These claims are deliberately designed to undermine solidarity of indigenous people in relation to land rights and management issues. Thus we consider that, despite these difficulties, indigenous organisations must be supported if indigenous people are to have the necessary power to carry out CWM effectively. These organisations must be doubly accountable - through indigenous customary law, and through the audit requirements that governments place on grant funding. Together these mechanisms are most likely to encourage equitable distribution of benefits within the community.

This may not be the case with gender. This review did not focus specifically on gender issues and hence we cannot provide a detailed assessment of men's and women's current roles in CWM. But we can, from other evidence, make some

important statements. In Australian indigenous cultures, women have a sphere of knowledge, ceremony and subsistence activity which is separate to and no less significant than that of men. But, particularly in the public arena, women are often marginalised. Thus, while women are powerful leaders in local level management of indigenous communities and organisations, they are poorly represented at regional and national levels (Davis 1991). Women are also marginalised in decision making on issues concerning land and wildlife management. This marginalisation reflects the dominance of men in public positions of power and influence in non-indigenous society. Most early ethnographers and anthropologists were men and they constructed Aboriginal societies as male dominated. Aboriginal women's significant role in decision making and cultural authority was for long unexplored (Gale 1978; Bell 1983). In more recent times the myth of Aboriginal male cultural dominance over women has persisted because land claims tend to be heard by male judges and argued by male lawyers. Although land claim research involves male and female researchers working with male and female claimants, women may still find that it is culturally inappropriate for them to take a leading role in presenting oral evidence for the claim, because this would involve talking about women's knowledge to a male judge and allowing him to make decisions about the importance of this knowledge. If men's evidence for the claim is strong the women may not be asked to speak because the claim hearings can then proceed faster. Thus while people's ownership of their country is ultimately recognised the process has undermined the authority of the women, for it is the men who can (and do) boast that the judge granted the land back because of their strong stories (Rose 1996).

Some of the most significant collaborations between scientific wildlife managers and indigenous people have occurred primarily in women's projects (Walsh 1990; Baker et al 1993). But because few women are employed as community rangers their involvement in many community land and wildlife management activities is limited. In some cases male community members have insisted that projects must be coordinated by men, because of the importance of the male sphere in land management. Women rarely have the power to argue for a similar veto. Having a male coordinator then makes it culturally difficult for women to get support for their priorities.

> *Women want to help care for rockholes .... but men and male staff don't listen to women.*
>
> (Anangu woman in Breckwoldt et al 1996a: 50)

Indigenous CWM activities need to operate under gender equity because spheres of knowledge, rights and responsibilities in indigenous culture are equal and complementary. Affirmative action by indigenous organisations and by funding agencies, such as special funding incentives for women's programmes, will be necessary to achieve this in many places.

5.1.4 Leadership and coordination

As a number of recent inquiries (eg SOEAC 1996, RAC 1993) have established, sustainable management of Australia's natural and cultural resources is inhibited by legislative and policy inconsistencies between States/Territories and lack of coordination between agencies. The same applies to indigenous CWM. National

leadership must provide effective support for indigenous CWM. Addressing the implementation of relevant commitments in the National Strategy for the Conservation of Biological Diversity would provide a start. Although these commitments will not cover all CWM issues of significance to indigenous people, such action would open up arenas for negotiation. At present neither government nor nationally prominent indigenous leaders are providing the necessary leadership for indigenous CWM. The former appear to have little interest in sustainable development; and the latter are preoccupied in fighting government action to curtail indigenous native title rights.

Indigenous people are also concerned about interagency coordination. As emphasised earlier, indigenous communities effectively integrate social, economic and ecological spheres in their approaches to use and management of wildlife but government agencies have a more specialised approach, with economic and social issues being the prime concern of most. Ecological issues are seen as the specific concern of conservation agencies. Effective support for indigenous CWM must break down these sectoral boundaries. At present communities take sole responsibility for coordinating agency activity (Johnston 1991) because agencies make little effort to understand the role that other agencies could potentially play in supporting community projects. Agencies need to develop protocols for cooperation in relation to various types of community needs. The Indigenous Land Corporation (ILC) and the Aboriginal and Torres Strait Islander Commission (ATSIC) have recently developed a protocol that allows for ATSIC funding support for economic development projects on land purchased for community groups by the ILC. Similar protocols dealing with the resources for community infrastructure and outstation/homeland development, and for ecologically sustainable land and wildlife management need to be negotiated between relevant State/Territory and Commonwealth agencies. This would undoubtedly help to promote sustainable development.

5.2 The role and contribution of government

Governments, at Commonwealth and State/Territory levels, are important players in indigenous CWM in Australia. They directly influence such activities through Australia-wide natural resource use policies and programmes and regulatory structures which support these; and through support programmes offered specifically for indigenous people. Indirectly, in its role as community service provider, government affects the way in which communities approach CWM and hence has an impact on its effectiveness. Our overview of indigenous CWM activities highlights a number of important issues that need to be recognised if government is to contribute effectively to these endeavours.

5.2.1 Why should government support indigenous CWM?

First, it is clear that the ‘top down’ regulatory regimes adopted by many government agencies are ineffective in managing indigenous wildlife use. Reasons include:

- government authority to regulate wildlife use is not respected by many indigenous users;

- many indigenous users do not understand government regulations or their basis;
- governments do not have the resources to police regulations.

This suggests that governments should question their approach and pay more than lip service to more participatory, community-based CWM efforts to which people will be strongly committed. Because of governments' overall commitment to biodiversity conservation, on indigenous as well as on non-indigenous owned lands, more effective support for CWM should be attractive to them.

It is likely that significant areas of indigenous-owned lands have high conservation value. But, because there has been comparatively little scientific inventory and research, these values are still only partly understood by non-indigenous people. Governments are increasingly looking to TEK as a valuable part of this research, and hence are committed to supporting not only the conservation of biodiversity but also the conservation of traditional knowledge. This is a complex process. Land rights have given indigenous people a high degree of control over natural resources, including wildlife, allowing them to implement their own strategies for wildlife use and management. Indigenous emphasis on the subsistence and cultural value of the harvest give people strong motives to sustain wildlife populations on the land they own. But, because of modern pressures arising from population concentration and the fragmentation of traditional systems for managing wildlife, contemporary indigenous wildlife management does not always succeed in promoting sustainability. Combining traditional systems with scientific knowledge and skills, and negotiating with other stakeholders are both essential ingredients that can help to deal with this problem. This means that governments need to cooperate with indigenous people in scientific research.

Cooperation is by no means assured. Indigenous people know that government authorities commonly assume that, because their land is not cropped or grazed as intensively as neighbouring land, it is not being used productively. They also know that governments see conservation as a prime use of their lands. But they also suspect that this preoccupation with biodiversity conservation might be used to undermine self- determination. Governments need to confront this issue openly. They may also need to provide indigenous people with financial and other incentives to cooperate, such as through employment arrangements during scientific surveys, or by assuring people that they will have control over the intellectual property inherent in their traditional knowledge.

> *In the real world, State governments demand the right to override Aboriginal concerns in the development of Aboriginal resources. While this situation continues Aboriginal people could be excused for being reticent in giving away the only thing that they can have full control of - their knowledge.*
>
> (Clements and Rose 1996: 67)

Deliberate government efforts to inform indigenous people about the whole range of restrictions placed on activities by all landowners, non-indigenous as well as indigenous, are also part of this equation. Otherwise indigenous people may feel that they are being asked to carry a responsibility for conservation management which is not required of other landowners. Regulation is however, a different thing to incentive and, as Clements and Rose (1996:61), bluntly conclude:

In the Northern Territory Aboriginal landowners have been given no incentive whatsoever to volunteer their land for conservation management purposes.

The situation is little different in other states.

The biodiversity conservation incentives that now exist for private landowners also have limited applicability to the land tenure and uses on most indigenous-owned lands. These incentives include Commonwealth government tax concessions for addressing land degradation and voluntary conservation covenants and agreements (Smyth and Sutherland 1996). The latter mechanisms have not been well patronised by any landowners and a recent policy study has recommended that the Commonwealth government augment them with a range of new incentives for biodiversity conservation (Young et al 1996). As that study did not consider CWM approaches in detail a more recent review has specifically focused on how indigenous people can be encouraged to pursue biodiversity conservation (Gillespie et al 1998).

This review points to the importance of indigenous empowerment starting with recognition of land rights and native title rights and to coordinated government action including development of a set of principles to underlie interactions of governments and indigenous peoples.

5.2.2 Relationships between government conservation agencies and indigenous people

Government conservation agencies obviously play a key role in supporting the development of indigenous CWM. However conservation agencies and indigenous organisations rarely trust each other and hence this function is disrupted. It is important, however, to distinguish between interpersonal trust, such as is often achieved between individual government scientists and the indigenous people they work with; and organisational trust (Walsh 1996). At the organisational level conflict is common, often because of discrepancies between indigenous political leader and government views about the nature of indigenous peoples' rights. This conflict is often alluded to by conservation agency staff as a case of 'politics' preventing 'progress on the ground'. But relations between indigenous people and government staff are frequently positive and constructive at lower levels. Such relationships have helped to promote indigenous people's understanding of government approaches to conservation, and have also allowed conservation agency staff to learn a great deal about the country and wildlife they are responsible for managing. Nevertheless indigenous people still often perceive conservation agency rangers as akin to police. Experience of police harassment, arrest and imprisonment, either personal or affecting family members, is a common part of the lives of a great many indigenous people. Thus if they provide information about their wildlife use, they have no guarantees that this information will not be used to restrict hunting. The 'wildlife police' image presents conservation agencies with a difficult challenge for building trust.

Government and indigenous cooperation on wildlife conservation goals is most likely to be assured first, if indigenous people's rights to use and manage their lands and wildlife are widely recognised; and, secondly if governments then support

indigenous organisations to conduct their own research and management programmes for monitoring impacts from that use. State/Territory conservation agencies need to accept the principles of indigenous self determination and put far more emphasis than previously on education, collaborative research and acceptance of indigenous resource management priorities. This is essential if they are to gain the trust of indigenous people.

5.2.3 Direct government support for indigenous CWM

The greatest direct source of bargaining power that indigenous people have for advancing indigenous CWM is the existence, on the lands they already own and those under native title claim, of significant resources of conservation value. It is most unlikely that indigenous people will give up this bargaining power without tangible gain. The most tangible gain they may hope to achieve from bargaining in the arena of wildlife conservation is the provision of assured funding for management of the resources. But, while indigenous organisations are well practised in 'foraging in the bureaucracy' (Young 1994), (seeking out resources which they can use to meet their needs), foraging areas are quite restricted in the case of wildlife management. As our earlier discussions of CEPANCRM and ARRI suggest, providing government funding targeted to indigenous groups is the most assured way of building indigenous commitment and capacity to managing wildlife sustainably.

This commitment is now required for new programmes, particularly IPA. IPA grants alone are not sufficient to do more than consult with communities and prepare preliminary management plans for selected areas. The programme will only start to provide real incentives when IPA designation carries a realistic chance of adequate and secure funding being available to the indigenous groups concerned. This prospect has given indigenous organisations a strong motive to explore the IPA concept (Smyth and Sutherland 1996).The suite of environmental programmes which comprise the Commonwealth government's Natural Heritage Trust (NHT) will need to be monitored to see what opportunities they provide and problems they cause for supporting indigenous CWM. Indigenous landowner needs are likely to differ from the funding criteria or priorities set in the regional and state decision making processes and it is important that indigenous organisations are supported to assert their priorities in NHT strategic planning.

In addition to money, governments need to offer appropriate scientific expertise and help indigenous people to establish good networks which link them with others working in this area. Both ARRI and CEPANCRM helped participants to broaden their networks with other communities and with wildlife professionals. This was achieved through workshops, conferences and inter-community visits. Exchanges of information between communities on land and wildlife management are otherwise limited, partly because indigenous people identify primarily with their own clan, language or locality based community.

Collaborative learning on how to address wildlife management problems would help people to understand and deal with threats to species, such as bilby and mala in central Australia. In the case of dugong and marine turtles, where a number of government agencies, indigenous communities and industry groups across northern

Australia are involved in action to protect dugong and manage indigenous harvests, such collaborative learning would be strengthened by regular meetings and inter-community visits. Recommendations on how State/Territory governments might resolve inconsistencies in legislation and policy approaches to indigenous use and management of wildlife might also flow from such interactions.

Governments could also help to promote networking between indigenous Australian wildlife managers and their overseas counterparts. The Kowanyama community has laid great stress on the positive benefits of their interaction with indigenous north American natural resource users (Sinnamon in press). Aboriginal groups have also gained much from discussing other problems, such as substance abuse, with indigenous north Americans and others, and the expansion of indigenous peoples' international congresses and working groups is a very positive development. As yet there has been comparatively little exchange between Australian indigenous wildlife managers and community based groups from Asia, Africa and South America.

More general forums for information exchange are also needed. Walsh commented that 'there are no specific newspapers, circulars, societies or associations that connect people in Aboriginal land management programmes' (Walsh 1996: 101). This continues to be the case. It means that dispersed Aboriginal organisations currently provide the only foci for a community of interest in indigenous CWM in Australia. This hinders people most familiar with and experienced in indigenous CWM from playing an active part in developing broader public awareness and support.

5.3 Western scientists and indigenous managers

Wildlife species, in many regions of Australia, have declined dramatically over the two centuries since European colonisation. While indigenous people may be reluctant to accept the disappearance of once common species (Rose 1995), they also often seem to feel that the continuation of wildlife loss or decline is inevitable. This may reflect the fact that they commonly attribute these losses to spiritual agency, loss of cultural knowledge, cessation of particular ceremonial practices, or the inexplicable actions of non-indigenous people. Changing these factors is, they feel, beyond their power. Disturbingly, TEK and traditional indigenous management systems here appear to undermine action. In contrast, scientists often have ideas about what could be done to try to increase the population of any species that still exists.

As this report shows, scientists are heavily involved in indigenous wildlife management activities and it is clear that indigenous people recognise that scientific and technical information can help them to deal with contemporary resource management issues. They often expect science to solve the problems that non-indigenous people have brought with them. Collaboration with scientists in wildlife survey and species recovery projects has helped to make indigenous people involved in CWM projects much more aware of wildlife conservation issues. Even where communities currently see no need to restrict their harvests of threatened species, as

with dugong, improved awareness about such issues may make people question their customary practices more closely (Bomford and Caughley 1996b; Dews in Environment Australia 1997; Ponte 1997). Collaborative monitoring and evaluation of wildlife management programmes helps this process. Regulation may also be required. Bomford and Caughley (1996c) suggest that if there is a risk that unregulated harvesting of rare species is unsustainable, limits on hunting would need to be negotiated under a co-management agreement which meets the goals of both hunters and the wider community. For example if indigenous customary law, requiring the approval of senior traditional owners for harvesting, underpins regulation, and if enforcement is by authorised community members, then the regulatory process would tend to support rather than inhibit CWM. But if the community does not feel that its wildlife resources are under threat, such negotiation would clearly be very difficult. Although Australia currently provides no models to use in this process it is likely that the cultural values of wildlife and natural resources will provide the best foundation. In this regard it is interesting that, in at least three of the IPA pilot projects, communities have seen the protection of culturally significant areas, rather than biodiversity, as the main priority.

5.3.1 Scientific and indigenous collaboration: barriers from science

The examples of collaborations between scientists and indigenous people in promoting wildlife conservation that we discuss in this report are exceptional. Few non-indigenous wildlife scientists and managers are educated in, or later absorb, the understanding needed to work effectively alongside indigenous people. And few want to learn these skills. Many consider that their scientific knowledge of wildlife issues provides the objective, 'right' answers, regardless of community views. They see conservation as the main goal and both community wildlife use and people's cultural, social and economic concerns are perceived to be secondary or in competition.

In comparison to the United States and Canada, where the sub-field of wildlife management dealing with 'human dimensions' (Decker et al 1992; Jones in prep) is widely recognised, Australia lags behind. Only a few institutions have begun to educate new generations of wildlife scientists to be aware of the potential benefits of collaboration with indigenous people in wildlife management. Negotiation processes also need to be included. Unfortunately indigenous people are still markedly under-represented amongst wildlife science students and their participation in this field needs a great deal of encouragement.

Even when wildlife scientists want to collaborate effectively with indigenous communities they may have problems in achieving a good relationship. Scientific methods do not emphasise the need to establish personal relationships of trust and respect when dealing with issues that are important to people. The language of science undermines communication – it becomes a 'secret' language which excludes indigenous people (Christie and Perrett 1996). Scientific processes for research, publication of results and communication in venues such as conventional conferences do not fit with indigenous community requests for continuing participation or for timely feedback. Scientists lack training in participatory approaches. This to a large extent reflects the emphasis on a top-down scientifically-

based approach to natural resource management, in which community participation is not seen as legitimate (Liddle 1996; McCay and Jentoft 1996; Walsh, 1996). Thus funding for indigenous involvement in government controlled wildlife survey and research programmes is commonly seen as an 'extra', rather than as a fundamental part of the research process. This occurs even where wildlife surveys are proposed on indigenous-owned land.

5.3.2 Priorities for collaboration and communication

Until recently, little was known about indigenous priorities for wildlife management and research. However, as current projects are beginning to suggest, these priorities will commonly differ from those of scientists. For example, indigenous people in central Australia would like to increase populations of commonly hunted species, but scientists are more interested in locating and protecting threatened species in this region. While bilby and mala are culturally important to indigenous people, they have less immediate value than the kangaroos and emus that are sought by subsistence hunters. In this case, however, action on both issues may readily be combined since management of threatened species, by predator control and spatial restrictions on hunting, is also likely to promote populations of other native animals.

Collaborative wildlife management projects, using adaptive approaches, offer the best chance of addressing the data deficiencies that prevent wildlife scientists from being able to reliably assess the positive and negative impacts of subsistence wildlife use. Improved design of data collection, incorporating indicators and measures that are meaningful to indigenous people, can help people to understand the ‘secret language’ of science and may encourage them to accept regulatory measures. Australia needs to share international experience in developing appropriate indicators and types of data collection, in order to establish a useful local model.

Scientists need to be able to provide practical demonstration that the management practices they recommend will help sustainable wildlife management by indigenous people. Indigenous people may be very sceptical. As Liddle (1996) points out, the formal meetings, field days and demonstrations that are commonly used to pass on scientific information to rural landowners are not useful for indigenous groups because they rarely attend. Graphs and spreadsheets are of very little use when people have limited understanding of English, let alone of mathematical modelling. More effective extension tools are desperately needed. For example, graphical interactive user-friendly wildlife harvesting models could be used in indigenous organisations and in schools to make people aware of factors affecting sustainable harvest. Through ‘hunting’ kangaroos on a computer screen, with colour coding for different genders, hunters would easily see the impact of sex biased harvests on overall populations (Peter Yates pers com). Such learning tools are likely to have considerable appeal to younger Aboriginal people who are increasingly exposed to computer and video games, even in remote locations.

5.3.3 Protecting intellectual property

Although many scientists are sceptical about the value of indigenous ecological knowledge there is now a tendency, especially at a policy level, to see this approach

as the answer to the environmental ills of the contemporary world (Clements and Rose 1996). But scientists often ignore the fact that, when indigenous knowledge is separated from its localised social and cultural context, its value for informing sustainable management is substantially lost. Indigenous people face real risks that their indigenous customary law systems will be violated and their intellectual property rights ignored in the communication and use of their knowledge:

> *One of the major concerns to Anangu is the proper management of knowledge ... Scientists generally believe that information collected is essentially neutral and available to be communicated, challenged, interpreted and for public use. This is not always so with Aboriginal people. .... In any ecological work undertaken involving Aboriginal people the issue of ownership, control and future use of [Aboriginal ecological information] should be clearly determined at the beginning.*
>
> (Baker et al 1992a: 69)

At a 1982 ANZAAS conference the Central Australian Aboriginal Congress drew up protocols for research on Aboriginal matters. Today these remain as relevant to wildlife research on indigenous-owned lands and to research into indigenous wildlife use and management as they are to any other type of investigation. They call for research to be conducted substantially 'for' and 'by' Aboriginal people, rather than 'on' them; for research to be approved and conducted by relevant Aboriginal organisations; for research to aim at immediate short and long term benefits for Aboriginal people; and for indigenous authorisation to be essential before any cultural knowledge is published or distributed (CAAC 1982; Howitt et al 1990). Similar principles are endorsed in the Council for Aboriginal Reconciliation's advocacy for community-based research approaches (CAR 1994). However, compared to social scientists, wildlife scientists and government wildlife managers appear to be largely ignorant of these principles.

Australia's *National Strategy for Conservation of Biological Diversity* (Australia 1996) aims to ensure that indigenous ownership of TEK is protected and a royalty regime established. This suggests that the issue of intellectual property is more widely recognised than in the past. Australia's 1992 strategy on Ecologically Sustainable Development, for example, makes no reference to intellectual property issues or Aboriginal cultural protocols for transmission of ecological knowledge (Australia 1992). But government mechanisms for effective action on this issue have yet to be formulated. Public knowledge on intellectual property agreements currently in place is quite restricted, and therefore information about effective approaches cannot easily be shared. Model codes of conduct need to be developed urgently (Craig 1996).

5.4 Commercial use of wildlife

Government support of indigenous people's development plans is strongest when these focus on money-making activities. This is perceived to reduce their dependence on government transfer payments and at the same time potentially increase their socio-economic status. Commercial use of wildlife may provide money-making opportunities on indigenous-owned land - but its success is not

assured. Relatively few species of native animals are likely to be resilient enough to bear commercial harvesting at rates high enough to cover costs, including the development of markets. Exceptions are, however, important because they may, as with crocodiles in some NT communities, provide substantial income. Neither does commercial wildlife use assure biodiversity conservation. Viable populations of the species that are commercially harvested may be maintained because of their commercial value, but components of biodiversity which are not critical to commercial use will not necessarily be conserved.

For most indigenous people subsistence use of wildlife is more important than commercial use. This perception is unlikely to change quickly. Subsistence use could, however, return greater benefit to indigenous cash economies if State/Territory and Commonwealth prohibitions on selling artefacts and jewellery which incorporate by-products of the harvest were removed. The Aurukun community, for example, is currently frustrated by legal restrictions on commercial sale of by-products from their subsistence harvest (N. Hedgecock pers com). On the other hand, if restrictions did not exist, increased demand for these by-products might lead to increased harvesting. To reduce this risk adaptive management approaches need to be introduced at the same time as restrictions are revised.

Even if commercially-focused indigenous enterprises are established, their benefits will not necessarily be equitably distributed to all members of a community. This could cause conflict with subsistence use rights, which are shared by all. As a matter of principle the maintenance of indigenous subsistence use rights should always have precedence over commercial uses (ALRC 1986). Indigenous people are unlikely to cooperate in collecting information on wildlife unless they see that it will be useful to them, and subsistence sustainability will be a major priority.

While, as we have mentioned earlier, native title rights may include commercial uses of wildlife, government recognition of that prospect seems remote at present. However it is worth considering whether there would be a risk of overharvesting if government controls on indigenous commercial use of native wildlife were not present. We consider that, particularly around larger centralised communities, local overharvesting would be a real threat for some species. However, if appropriate co-management arrangements are negotiated, it should be possible to recognise indigenous rights to wildlife and also enforce quotas based on population and harvest monitoring.

Spatial unevenness has a marked effect on opportunities for sustainable commercial wildlife harvesting. Opportunities are always likely to be greatest in northern Australia (particularly because of the presence there of crocodiles), in the sheep rangelands (in the case of kangaroos) and in Tasmania (where native wildlife are relatively abundant due to lack of feral predators). In arid central Australia and in agricultural regions, feral animals and patchily distributed ‘pest’ populations of native species, such as some kangaroos, will probably provide the only available resources. A royalty equivalent regime, similar to that which exists for mining on Aboriginal owned land in the NT, could be used to spread benefits from commercial harvesting of wildlife more evenly. The mining royalty regime returns some income to landowning groups whose country is being mined, some money is allocated to a fund for wider benefit of indigenous people and some provides financial support for

the operations of Aboriginal land councils. In the case of wildlife such a fund, perhaps derived from a levy on export sales, could help to support indigenous CWM. However it must be stressed that, in the present state of the industry, commercial use of wildlife is unlikely to significantly increase the limited funding available for indigenous CWM except in very few discrete cases.

Unless the Australian commercial wildlife industry becomes more strongly established none of these benefits will flow through to indigenous people. Do indigenous people have any bargaining power to alter this situation? In the economically valuable crocodile industry they are probably powerful enough to influence management and this could occur with other commercial wildlife use in northern Australia. Their involvement in the industry may well appeal to potential markets in Europe, North America and Australia which are otherwise opposed to commercial use of native Australian wildlife on animal rights grounds. To realise these kinds of opportunities, governments need to start now to make concerted efforts to promote indigenous participation in the management of commercial use of wildlife - its planning, monitoring and evaluation. Education of indigenous people in population and harvest monitoring techniques, designing new techniques which accord with indigenous values, delegation of monitoring responsibilities to indigenous organisations and the development of co-management structures for decision making would all be essential elements in this process. If indigenous common law rights to commercial use of wildlife are ever recognised these efforts will bear fruit. They will generate mutual understanding and respect for the priorities and values of both indigenous people and government wildlife managers.

5.5 Co-management

Formal co-management agreements in Australia have, as summarised above, so far been restricted to national parks. However extension of co-management approaches to wildlife management issues could benefit both government and indigenous people. Indigenous people could use such agreements to establish mutually acceptable standards to regulate other people's impacts on the wildlife resources they use, and for securing the commitment of government resources to support indigenous CWM. Governments might use them for monitoring indigenous peoples' actions to ensure their harvests are sustainable. Co-management agreements would thus provide an overall framework for monitoring and evaluation of the wildlife resource.

Co-management of wildlife, in contrast to national parks, would not be restricted to an individual parcel of land but would allow for species management across a region, covering a range of land tenures. This is a particularly appropriate approach to management of highly mobile and migratory species, commercially harvested species and sparsely distributed species which are threatened across their range. In none of these cases are indigenous people able to fully control the use of wildlife or protection of habitat. In Australia, co-management arrangements for dugong and marine turtles would provide a forum for more consistent legislation and management between the various State/Territory and Commonwealth government jurisdictions. They would also help to build awareness about sustainable wildlife management in neighbouring countries such as Papua New Guinea This is critical

for dugong and marine turtles because harvesting outside Australian waters affects local populations.

Canadian wildlife co-management agreements have, as Usher (1996) comments, succeeded in bringing mutual interests together and solving problems across all lands and resources. This has included, to some extent, land that is privately owned by non-indigenous people. In most North American co-management agreements, the central management structure focuses on boards or committees. These provide a forum for setting goals and designing and reviewing management operations. These boards may be supported by other arrangements, such as species or performance monitoring agreements and subcommittees devoted to specific tasks. Equitable power sharing is the key feature (Oshershenko 1988). Usher (1996) emphasises that, while executive levels of government rarely challenge a board's decisions, management boards are in fact there to advise the Minister. Thus government always has ultimate authority over indigenous customary law. In Australia too, given that indigenous sovereignty remains unrecognised, ultimate ministerial authority over co-management arrangements is inevitable and co-management structures need to account for this in their dispute resolution mechanisms.

One of the greatest strengths of the co-management concept is its capacity to be adapted to local circumstances. For example, co-management arrangements being developed by Kowanyama for fisheries management and for catchment management are somewhat different from board of management models. For Kowanyama co-management combines local expertise and government regulatory authority (delegated to local rangers) to give indigenous people the authority to manage the impacts of their own and other peoples' activities on their land and natural resources.

Scope, scale and composition are vital issues to be addressed in negotiating co-management structures for Australian wildlife. Scope concerns whether co-management agreements are restricted to management of wildlife harvests or if their jurisdiction extends to management of other activities which affect wildlife populations. Indigenous people in Pacific north-west US, for example, found that agreements which were restricted to the allocation of harvesting rights between indigenous and non-indigenous users were not effective because habitat destruction and other environmental factors were also causing wildlife species to decline. Co-management is now being extended to cover habitat protection and restoration (Wood 1996). In Australia too, any co-management arrangement that focused purely on wildlife use without addressing habitat management, would not assure sustainability. In terms of scale, it must be recognised that indigenous people are primarily concerned with the local situation. Yet processes that threaten wildlife populations generally operate outside the local area, at far broader scales. Co-management structures will need to operate at different scales - at state-wide or national levels as well as local level. A nested set of structures is therefore often likely to be necessary. The composition of co-management arrangements - the question of who should be involved - will depend on the purpose of the arrangements. Sometimes non-indigenous non-government stakeholders may have to take part in decision making. However indigenous people may then be relegated to having only a single voice in decisions. This currently often happens where government advisory bodies have a single indigenous representative. This would not

provide equity in decision making, the principle of co-management.
Indigenous groups could use a number of different bargaining approaches for negotiating co-management arrangements. In some situations, government interest in protection of biodiversity values on indigenous-owned land might persuade governments to agree to co-management structures which cover non-indigenous-owned land, in return for indigenous people managing some of their land as a protected area. In other cases, co-management arrangements might emerge as part of the settlement of native title claims or of negotiations about major development projects. Indigenous people who own little land and whose native title rights have been extinguished are in a difficult situation. Here government concern about possible impacts from indigenous hunting, and the lack of effective ways for governments to regulate these impacts, may nevertheless provide a trigger for negotiation of co-management arrangements. Indigenous involvement in wildlife management on such land might give governments greater understanding of trends in wildlife populations and assistance in regulating other processes which threaten wildlife. At present Australia lacks examples from which to determine whether such benefits might occur. This further emphasises the importance of evaluating existing indigenous CWM projects and of comparatively assessing overseas experiences.

5.6 Community development and country

For indigenous CWM a crucial question is whether land, resource rights and management of country are as vital for community development as employment and services such as health care, education and housing. Government funded community development programmes and most indigenous organisations focus strongly on the latter; but the former have typically been marginalised. Unless country is recognised as a central factor, rather than being seen as the backdrop for action to improve human well being, indigenous CWM will continue to struggle for support.

We agree that many indigenous communities urgently need improved services. However we argue that management of country, including wildlife, provides a more logical basis for building community capacity than mere settlement administration (Young et al 1991; Young and Ross 1993; Ross et al 1994; Young 1995). Planning approaches which link community development and ‘caring for country’ generate and transmit knowledge and skills which are more likely to be meaningful to indigenous people and which reinforce their commitment to their community and to the land and wildlife resources for which they are responsible. In contrast, indigenous people often judge the type of administrative work they carry out in settlement management as dispensable, because these jobs can readily be done by non-indigenous people. Those indigenous people who do become interested and skilled in settlement administration are often offered better paid and less stressful work opportunities elsewhere and then leave the community. As has been noted in many other places, this creates ‘a constant need to re-empower (communities) in a cyclical process’ (Barr 1995). In indigenous communities where community development is grounded in ‘caring for country’ this is much less likely to happen, because community development strengthens ties to traditional land.

Effective approaches to community development based on management of country are likely to:

- be supported and directed by elders, to ensure that they are culturally appropriate;
- involve young people through education programmes in local schools and through youth employment and training schemes;
- incorporate both men's and women's spheres of activity;
- be supported by long term personal relationships with scientists and other professionals from a variety of disciplines;
- be networked by a variety of mechanisms to similar community based projects in other areas;
- have secure long term support from governments and indigenous organisations.

Empowerment of indigenous people through such approaches will probably have direct health benefits, as well as making people more capable in other spheres of management. Without this, younger generations of indigenous people will become increasingly disinterested in their country and its wildlife. This spectre presents the greatest tragedy for sustainability of indigenous peoples and indigenous CWM.

Conclusions

6.1 Strengths and weaknesses in indigenous CWM in Australia

Australia has been active in international leadership on biodiversity conservation and human rights issues - both of which are very relevant to indigenous CWM. However implementation of international covenants and recommendations from related domestic inquiries has often been less than effective. In the case of indigenous CWM, this is demonstrated by continuing lack of national leadership to effectively overcome inconsistencies between the approaches of State/Territory governments to land rights and indigenous wildlife use; and by the priority that continues to be given by governments to addressing the symptoms, rather than the root causes of indigenous poverty and social dysfunction. Lack of effective government support for indigenous CWM is but one element of this overall problem. This situation is particularly unlikely to change in the near future because of the current political climate, which is characterised by a 'retreat from tolerance' (Adams 1997) and a trend to 'mainstreaming'. Under 'mainstreaming' government services are increasingly delivered to indigenous groups using the same mechanisms that apply to other sectors of the Australian population, rather than in a manner which recognises the cultural and social context of indigenous needs.

Other weaknesses and strengths that affect the future of indigenous CWM in Australia are summarised below.

6.1.1 Ecological

Strengths

- High biodiversity values - although there has been a pronounced impact on wildlife over the past 200 years, biodiversity remains high.
- Existing protected areas - large areas are secured from substantial impact on wildlife populations; resources available for management are good, compared to many other countries; resident populations in protected areas are small and have little impact on wildlife and habitats compared to many other countries.

Weaknesses

- Large number of endemic wildlife species that are prone to extinction.
- Ongoing ecological imbalance from vegetation clearance, introduction of feral animals and changes to fire regimes during colonisation.
- Relative lack of large bodies of wildlife species amenable to commercial use (as opposed to the large ungulates found in other continents).

6.1.2 Economic

Strengths

- Strong economy, with decreasing dependence on rural production which reduces risk to biodiversity from further clearing of native vegetation.

Weaknesses

- Poverty of indigenous people, entrenched by declining rural economy.
- Lack of commercial opportunities on indigenous-owned land.
- Lack of markets for wildlife products.

6.1.3 Social justice

Strengths

- Extent of land returned to indigenous ownership and control - although many indigenous groups have been dispossessed, some have a high degree of autonomy in management of all or most of their traditional lands.
- Recognition of native title - providing a basis for co-existence and for development of land use agreements and regional agreements; potentially addressing indigenous use and management of wildlife and indigenous needs for management resources.
- Strong support for indigenous rights amongst some sectors of the non-indigenous population.

Weaknesses

- Uneven spatial distribution of indigenous-owned lands - most indigenous people have very limited or no statutory land rights and their native title has been extinguished.
- Very limited participation by indigenous people in wildlife management outside indigenous-owned lands, even though they are substantial stakeholders.
- Threats to indigenous native title rights - particularly on pastoral leases (40 per cent of Australia).
- Lack of mechanisms for indigenous equity in development of commercial wildlife industries.

6.1.4 Socio-political

Strengths

- Political stability means it ought to be possible to set long time horizons.
- Cultural diversity provides a basis for tolerance and respect towards indigenous values and uses of wildlife.
- Changes in non-indigenous community attitudes to wildlife with increasing influence of approaches to conservation through sustainable use.

Weaknesses

- Opposition of the current Commonwealth government and some sectors of resource industry, particularly pastoralists, to recognition of indigenous native title rights.
- Separation between culture and natural environment in management systems, whereas conservation management for indigenous people derives from cultural values.
- Poor understanding by non-indigenous people of indigenous cultures and rights; lack of general acceptance of dynamic nature of indigenous traditions related to wildlife use.
- Sentimental and animal welfare objections (often uninformed) to consumptive use of native species are prevalent amongst non-indigenous people.
- On-going fear and insecurity from non-indigenous people in relation to indigenous history and indigenous peoples' relationships to country.
- Lack of interest in 'country' and its resources from indigenous youth - risk of disjunctions in knowledge and management.
- Premature death of many indigenous adults resulting in disruption to transmission of cultural knowledge.

6.1.5 Institutional

Strengths

- Strong regional indigenous organisations (land councils and similar bodies) - able to provide professional advice and other resources to local indigenous communities; and able to facilitate long term support.
- Co-management in Uluru and Kakadu has achieved international recognition for its integration of indigenous and non-indigenous natural resource management objectives through basing management in culture.
- Well developed processes for environmental assessment - including addressing impacts on wildlife and habitat from development projects.
- Well developed scientific expertise in wildlife management.
- Strong trend to CWM in non-indigenous community through Landcare movement.

Weaknesses

- Inconsistent approaches to wildlife management between States/Territories. Jurisdictional separations between land and sea, fisheries and terrestrial vertebrates.
- Lack of policy recognition of subsistence use of wildlife as a valid economic activity.
- Very slow progress in negotiating co-management agreements for existing protected areas and lack of legislative frameworks in some States.
- Under-resourcing of indigenous organisations engaged in conservation oriented approaches to land and natural resource management.
- Under-resourcing of protected area management - more money from government budgets goes to tourist management in protected areas than goes to wildlife.
- Lack of networks and mutual understanding between indigenous wildlife users and managers and scientists. Lack of forums for regular information sharing and broader information dissemination.
- Lack of dedicated government resources to provide incentives for and support to indigenous CWM.

- Lack of capacity for self management in many indigenous groups and lack of attention to evaluation in management.
- Lack of experience in participatory monitoring and evaluation in the field of wildlife management.
- Lack of data on indigenous wildlife use and other factors affecting wildlife population dynamics.
- Distrust between indigenous groups and conservation agencies.
- Lack of networks between indigenous groups, particularly across state borders.
- No local models for co-management other than joint managed parks.
- Poor industry development in commercial wildlife industries.

6.2 Issues affecting the future of CWM in Australia

Philosophical and cultural issues

- Degradation of the Australian natural environment, which was managed in a balanced way by non-indigenous people, is largely due to the activities of non-indigenous people.
- Culture and environment are intertwined - if you look after culture you look after wildlife. The cultural value of wildlife must be recognised.
- Indigenous people want to see the country looked after and respected.
- There is a need for a holistic approach to wildlife management, including recognition of their socio-cultural and economic values as well as ecological factors; this contrasts with the narrow scientific approach.
- Indigenous people recognise that wildlife resources should not be used up at rates which threaten their survival.
- There is a need to reconcile indigenous and non-indigenous philosophies relating to wildlife management.

Indigenous peoples' participation in wildlife management

- People who live on the land, not outsiders, should look after the natural resources on that land.
- Indigenous people should have more say in environmental management.
- Scientists should provide information in ways that indigenous people can make use of; they should not, as most often happens, merely absorb and use the information indigenous people give them.
- International experiences, from countries such as Canada and the United States where indigenous people have an equitable role in resource management across whole regions, provide useful models for indigenous wildlife management processes in Australia.
- Federal and State governments expend insufficient resources on addressing resource management problems which relate mainly to indigenous people, e.g. rubbish on the coast and sand dune erosion on Aboriginal lands, because they are seen as 'indigenous issues' only.
- Native title rights should include rights to manage the wildlife. Negotiations with indigenous groups over land use need to consider what happens to wildlife.
- Under the current native title legislation, there is potential for more recognition of indigenous rights to wildlife than currently exists.

- Native title/sea rights are vital to give Aboriginal groups strength to deal with conflicts over use of wildlife.
- Changes to native title legislation will erode native title rights and will restrict access to wildlife resources.

Cross-cultural awareness, collaboration and effective support for wildlife management

- Both indigenous and non-indigenous people need to be educated about each other's perspectives.
- Governments need to develop skills in working appropriately with indigenous people.
- There is insufficient funding for research which genuinely shares information with indigenous people.
- The value of Traditional Ecological Knowledge and of true collaborative research with indigenous communities should be promoted.
- There should be more training in, and use of Participatory Rural Appraisal and Planning methods.
- Indigenous wildlife management initiatives should be monitored and evaluated to demonstrate that indigenous people can manage wildlife effectively.
- Indigenous groups engaged in wildlife management should communicate what they are doing to a wider audience.
- Indigenous people should educate non-indigenous people about how they see the country and its wildlife through the dreaming stories.
- Blaming indigenous hunting for animal kills is unfair when other factors are usually more important.
- There is a need for an approach which gets indigenous communities participating in the mainstream, at the same time adapting the process (if possible) to make the programmes more applicable - indigenous people can push government funding agencies to change their guidelines.
- Government programmes for support of wildlife management must be framed holistically, rather than restricted to specific management aspects.

Commercial use of wildlife

- For most indigenous communities, subsistence use of wildlife is more important than commercial use.
- Indigenous experience and aspirations for using wildlife commercially varies widely both between and within communities, and according to geographical characteristics of territory.
- There is limited potential for commercial harvesting of wildlife in Australia.
- Commercial use of wildlife may be an opportunity worth exploring as a potential source of income for indigenous communities living in areas where there are few other economic opportunities.
- If inadequately managed, commercial use of wildlife could lead to overexploitation and undermine subsistence use.
- The commercial use of wildlife may have to be restricted in order to sustain wildlife populations.

6.3 Recommendations

1. Australian governments must embrace a holistic concept of wildlife management, incorporating it as part of general environmental management and at the same time linking it closely with indigenous culture.
2. Governments should facilitate greater indigenous participation in wildlife management, especially on indigenous-owned lands.
3. International models involving indigenous people having an equitable role in resource management across whole regions should be applied in Australia.
4. Government agencies must allocate more resources and research funding to collaborating with indigenous people to address resource management problems on indigenous-owned lands.
5. Indigenous rights to use and manage wildlife must be recognised as an element of native title rights.
6. Government wildlife managers working with indigenous people should be trained appropriately in cross-cultural awareness.
7. Scientists working on wildlife management issues on indigenous land should respect the knowledge and authority of the traditional land owners regarding wildlife management issues. All research should be carried out on a basis of partnership which is seen as beneficial by the indigenous partners.
8. Indigenous people and researchers should promote the value of Traditional Ecological Knowledge and of true collaborative research with indigenous communities.
9. Indigenous organisations must receive appropriate support and training to use Participatory Rural Appraisal and Planning methods.
10. Indigenous wildlife management initiatives should be monitored and evaluated by indigenous people in collaboration with researchers to demonstrate that indigenous people can manage wildlife effectively.
11. Indigenous groups engaged in wildlife management must communicate what they are doing to a wider audience, and governments should provide resources to facilitate this.
12. Indigenous people should take the initiative in educating non-indigenous people about their perceptions of the country and its wildlife, and the linkages of these to socio-cultural beliefs.
13. Government programmes need to recognize that for indigenous people, subsistence use of wildlife is more important than commercial use.
14. Commercial wildlife enterprises for indigenous groups must be based on the concept of sustainability.
15. In developing commercial wildlife enterprises, the different views of people in indigenous communities must be taken into account.

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Please also consult Appendix 1 for a list of sources for each case study.

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Alan Gross, Department of Conservation and Land Management, WA
Nigel Hedgecock, Department of Environment and Heritage, Queensland
Lynette Liddle, Centre for Aboriginal Economic Policy Research, Australian National University
Terry Piper, Department of Environment and Heritage, Queensland
Hugh Possingham, Department of Environmental Science and Management, University of Adelaide
Andrew Roberts, Cairns TAFE
Irynej Skira, Department of Environment and Land Management, Tasmania
Greg Smith, Great Barrier Reef Marine Park Authority
Peter Yates, Anangu Pitjantjatjara Land Management

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Appendix 1: Sources of information for case studies

A1. Commercial muttonbird harvesting in Tasmania
Skira 1990; Skira 1995; Skira 1996; Skira 1996; Breckwoldt et al. 1997. Pers. comm.: J. Everett, R. Gibbons, I. Skira, S. Stanton.

A2. Commercial use of crocodiles by Aboriginal people in the Northern Territory
Wilson et al. 1990; Parks and Wildlife Commission of the Northern Territory 1995; Parks and Wildlife Commission of the Northern Territory 1995; Webb et al. 1996; Northern Land Council 1997; Webb 1997; Vardon et al. submitted. Pers. comm.: A. Kenyon, C. Manolis, M. Vardon, G. Webb, S. Stirrat, D. Yibarbuk, P. Bayliss

A3. Miyapanu (sea turtle) research project in Arnhem Land
Kennett 1996; Kennett et al. in press. Pers. comm.: R. Kennett, K. Leitch, D. Yunupingu to K. Leitch.

A4. Survey and management of black-footed rock-wallabies in Western Australia
Pearson 1992; Pearson 1995; Pearson et al. In press

A5. Reintroduction and management of mala in the Northern Territory
Loorham 1985; Johnson 1988; Gibson 1991; Hyman 1993; Gibson et al. 1994; Tilden 1994; Johnson 1997. Pers. comm.: Gibson 1997

A6. Survey and management of the greater bilby in the Northern Territory
Parks and Wildlife Commission of the Northern Territory 1996. Pers. comm.: Southgate 1997

A7. Anangu-Pitjantjatjara Lands biological survey
Nesbitt et al. 1994; Baker et al. 1995; Benshemesh 1995; Breckwoldt et al. 1996; Copley et al. 1996 Australian Broadcasting Commission 1997. Pers. comm.: Peter Copley 1997

A8. Management of dugong and turtle harvesting in the Great Barrier Reef Marine Park (GBRMP)
Briggs et al. 1992; Bergin 1993; Cook 1994; Great Barrier Reef Marine Park Authority 1994; Limpus 1995; Marsh et al. 1995; Fourmile 1996; Marsh 1996; Williams 1996; Breckwoldt et al. 1997; Collins in prep; Benzaken et al. in prep.; Marsh et al. in prep. Pers. comm.: L. Craig, N. Hedgecock, D. Perkins, T. Piper, F. Ponte, G. Smith, R. Williams

A9. Australian Fisheries Management Authority (AFMA) Catch Monitoring Program in the Torres Strait Protected Zone
Johannes et al. 1991; Dews et al. 1993; Dews et al. 1995; Marsh 1995; Torres Strait Protected Zone Joint Authority 1995; Marsh 1996; Harris in prep. Pers. comm.: D. Kwan, M. Bishop, H. Marsh.

A10. Community dugong management plan for Boigu Island, Torres Strait
Raven 1990; Environment Australia 1997; Ponte 1997. Pers. comm.: D. Kwan, F. Ponte

A11. Monitoring subsistence use of wildlife in northern Cape York Peninsula and Moa Island in the Torres Strait
Roberts et al. 1996. Pers. comm.: A. Roberts, G. Smith.

A12. Feral vertebrate control: cooperation between State/Territory governments and indigenous people
Pers. comm.: M. Williams, C. McGaw, D. Wurst.

B1. Aboriginal Rural Resources Initiative (ARRI)
Wilson et al. 1990; Meek et al. 1992; Williams et al. 1995. Pers. comm.: V. Bordas, A. McNee, R. Turner, M. Brady

B2. Contract Employment Program for Aboriginals in Natural and Cultural Resource Management (CEPANCRM)
Young et al. 1991; Breckwoldt et al. 1996; Environment Australia 1997. Pers. comm.: S. Szabo
B3. MaSTERS: Marine Study for Torres Strait Environmental Resources Strategy
Harris et al. 1993; Mulrennan 1993; Mulrennan et al. 1994; Dews et al. 1996; Breckwoldt et al. 1997; Ponte 1997. Pers. comm.: G. Dews, K. Seebohm
B4. Uluru-Kata Tjuta National Park
Allan et al. 1990; Baker et al. 1990; Central Land Council et al. 1991; Tjamiwa 1991; Uluru-Kata Tjuta Board of Management and Australian National Parks and Wildlife Service 1991; Alanen 1992; Baker et al. 1992; Baker et al. 1992; Creagh 1992; Reid et al. 1992; Rowse 1992; Tjamiwa 1992; Willis 1992; Baker et al. 1993; Reid et al. 1993; Barry et al. 1994; De Lacy 1994; Bagnall 1995; Barry 1995; Baker 1996.
B5. Kakadu National Park
Weaver 1984; Butler et al. 1986; Press 1988; Lewis 1989; Yapp 1989; Cook 1990; Kakadu Board of Management and Australian National Parks and Wildlife Service 1991; Blyth et al. 1992; Lewis 1992; Hill et al. 1993; De Lacy 1994; Hill et al. 1994; Hill et al. 1994; Cubit 1995; Press et al. 1995; Press et al. 1995; Kakadu Board of Management and Australian Nature Conservation Agency 1996 Margetts et al. 1997. Pers. comm.: Dan Gillespie, David Lawrence, Mel Shepherd
B6. Indigenous Protected Areas

Cordell 1996; Smyth et al. 1996; Thackway et al. 1996; Environment Australia 1997.
B7.Community Rangers
Young et al. 1991; Briggs et al. 1992; Fletcher 1992; Hill 1992; Resource Assessment Commission 1993; Birckhead and Wallis 1994; Cordell 1995; Fourmile 1996; Marsh 1996; Ponte 1997; Benzaken et al. in prep. Pers. comm.: A. Roberts, G. Smith
B8. Central Land Council (CLC): land and resource management activities
Rose 1995; Central Land Council 1996; Johnston 1996; Mahney et al. 1996. Pers. comm.: B. Rose; F. Walsh
B9. Northern Land Council (NLC): Caring for Country Strategy
Taylor 1995; NLC 1996; NLC 1997. Pers. comm.: A. Kenyon, P. Bayliss
B10. Cape York Land Council/Balkanu Cape York Development Corporation: land and resource management activities
Horstman et al. 1995; Farley 1996. Pers. comm.: C. Roberts
B11. Kowanyama Land and Natural Resource Office's (KLANRO) land and resource management activities
Dale 1991; Young et al. 1991; Daphney et al. 1992; Kowanyama Aboriginal and Natural Resources Management Office 1994; Sinnamon 1995; Fourmile 1996; Kowanyama Land and Natural Resource Office in prep.; Sinnamon in press. Pers. comm.: G. Drewien
B12. Anangu Pitjantjatjara Land Management Program
Breckwoldt et al. 1996; Breckwoldt et al. 1997; Institute for Aboriginal Development 1994. Pers. comm.: Peter Yates, Ginger Wikilyiri, Peter Copley
B13. Dhimurru Land Management Aboriginal Corporation (DLMAC): land and natural resource management activities
Resource Assessment Commission 1993; Dhimurru Land Management Aboriginal Corporation 1996; Indigenous Land Corporation 1996; Breckwoldt et al. 1997; Kennett et al. in press. Pers. comm.: R. Kennett, K. Leitch, C. Robinson
B14. Bawinanga Aboriginal Corporation (BAC): land and natural resource management activities
Collins 1995; Carter et al. 1996; Northern Land Council 1996; Northern Land Council 1997; BAC's World Wide Web Site. Pers. comm.: J. Carter, D. Yibarbuk.