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Seeing through others' eyes : towards a hybrid ecology of marine turtle and dugong in Australia

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Declaration

I certify that this thesis does not, to the best of my knowledge and belief:

(i) Incorporate without acknowledgment any material previously submitted for a degree or diploma in any institution of higher degree or diploma in any institution of higher education;

(ii) Contain any material previously published or written by another person except where due reference is made in the text of this thesis; or

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For my kids, cheeky buggers all.

Abstract

This thesis explores the conflict between conservationists and Indigenous communities over the hunting of marine turtles and dugong in Australia, with a view to finding a way to overcome the barriers that prevent the resolution of this issue. I approached this exploration as an ecologist, using the framework of Berkes (2004) who proposed three shifts for the field of ecology. This meant taking a systems approach and investigating the intertwining threads of the issue as possible, with a specific focus on integrating the human aspects of the problem in a participatory manner. By doing so my work entered into a third space where multiple possibilities for investigation opened up. Through listening to others with expertise on the matter (from both Indigenous and non-Indigenous cultures) I have created a hybrid account of the ecology of marine turtles and dugong in Australia.

The methodology used in undertaking this research was reflexive in nature, with a focus upon both my own and Bardi and Jawi culture, utilising interviews and participant observation as my primary methods of data collection. Wherever possible, a collaborative and participatory approach to the research was undertaken, with many people assisting me in my growing understandings of this issue. I have made use of various text-based resources, including the current scientific literature, historical accounts and records and my own field diaries to support the interview data that I collected.

This account traces the origins of the conflict over marine turtle and dugong in Australia and focuses on a few key moments where attempts to resolve the issue have occurred over the past twenty years. By viewing these moments through the lens of the ecological discourses described by Manuel-Naverrete et al. (2008), it can be seen that progress towards the resolution of the conflict is unlikely to occur when participants retain a strongly normative worldview, and that movement towards an ecosystemic-pluralistic framework allows for a more flexible and adaptive response to this problem. Furthermore I argue that many of the underlying causes of the conflict are based on non-Indigenous cultures' painful grappling with our current disassociation from the other-than-human world and that the adoption of a transformative-collaborative approach to our relationship with country may provide an opportunity to heal this rift.

Acknowledgements

Nidja Noongar Boodja Noonook Nyininy

Nidja Boodja Ngulak Ngarnk [1]

This thesis has been a work of epic proportions, as they all must be I suppose. If someone had told me at the beginning that it would take me almost eleven years and that I would birth and mother four children while attempting to complete this project, I doubt I would have even started. However, we are (mostly) blessed not to have foreknowledge of our future paths and looking back I am profoundly grateful that I had sufficient time to mature as I wrote – the writing that is here today is like a finer vintage wine in comparison to the raw and unfinished product that would have existed had I taken the recommended path of three to four years. That it has been at all possible for me to complete and submit this thesis is entirely due to the patience, hard work and support of the following key individuals.

Firstly I would like to thank my principal supervisor Pierre Horwitz for never losing faith in my ability to reach this point. Thank you Pierre, you are amazing. Somehow you always knew exactly how to encourage, stimulate, provoke and prod me along in my journey.

The exhausting behind the scenes work of childcare provided by my partner Jeff and my mother Rinske has been integral to my work. Thank you both for the sacrifices made in your careers and spare time in order to fulfil the challenge of allowing me to continue my studies despite having a strong aversion to institutional childcare. It's finally over – and I think we all agree that despite the hardships, the rewards in terms of our children's happiness and emotional wellbeing were worth it. No more babies, I promise!

Huge hugs and thanks are also due to my associate supervisor Sherry Saggers, who kept me in line and managed to always be suitably congratulatory when I announced yet another interruption to my studies, despite her sure knowledge that the hormones and trials of motherhood are often detrimental to clear thinking.

[1] This is Noongar country you are sitting on, our mother, this Land

I could not have conducted my fieldwork without the financial support bequeathed by my initial supervisor Dr Jackie Alder when she had to leave for another country. Thank you Jackie.

Many, many, many people contributed their time and wisdom to teach me what I know now. Firstly I wish to acknowledge all of the elders, hunters and other participants from the Bardi Jawi and Mayala communities who took time to answer my many questions about their relationship with Odorrgoordimil. You were all incredibly patient and generous with me despite the steep learning curve I was on at the time. In particular I would like to thank those who made an effort to befriend me when I was so obviously at a loss: Vincent Angus, Brendan Chaquebor, Irene Davey, Kevin George, Peter Hunter, Eddie James, Brian Lee, Paul Sampi, Bruce Wiggan, Roy Wiggan, and others who have sadly passed away.

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Diana Davies stepped in at the eleventh hour (or later even?) and volunteered to read this voluminous document and check for grammatical errors. Thank you very much Di, your patience and editing skills are fabulous!

Finally I would like to thank my children for bringing so much joy and yes, learning opportunities into my life. Now that this is finished I look forward to our continuing adventures with a clear heart, and no longer a nagging sense of uncompleted business.

Bardi people lived their environment. They were part of the environment and they did things according to their environment. You went somewhere because the tide was like that, you went somewhere else because that was the season for that, they would have seen themselves as immersed in their environment, where I probably saw myself as somebody who looked at the environment from the outside...I think as time had gone on, I probably have gone away to their way of thinking a lot more, as seeing myself as part of the environment. [2]

Ecological science is an interesting field for disruption because scientists themselves are confronting ideas that are totally destabilizing, ideas that completely undermine their own rejection of the awesome, ideas that have the potential to un-make modernity. (Rose 2008: 158)

[2] non-Indigenous participant interviewed 5/5/2004

List of Tables

List of Figures

List of Photos

Table of Contents

Figure 1: Map of Australia

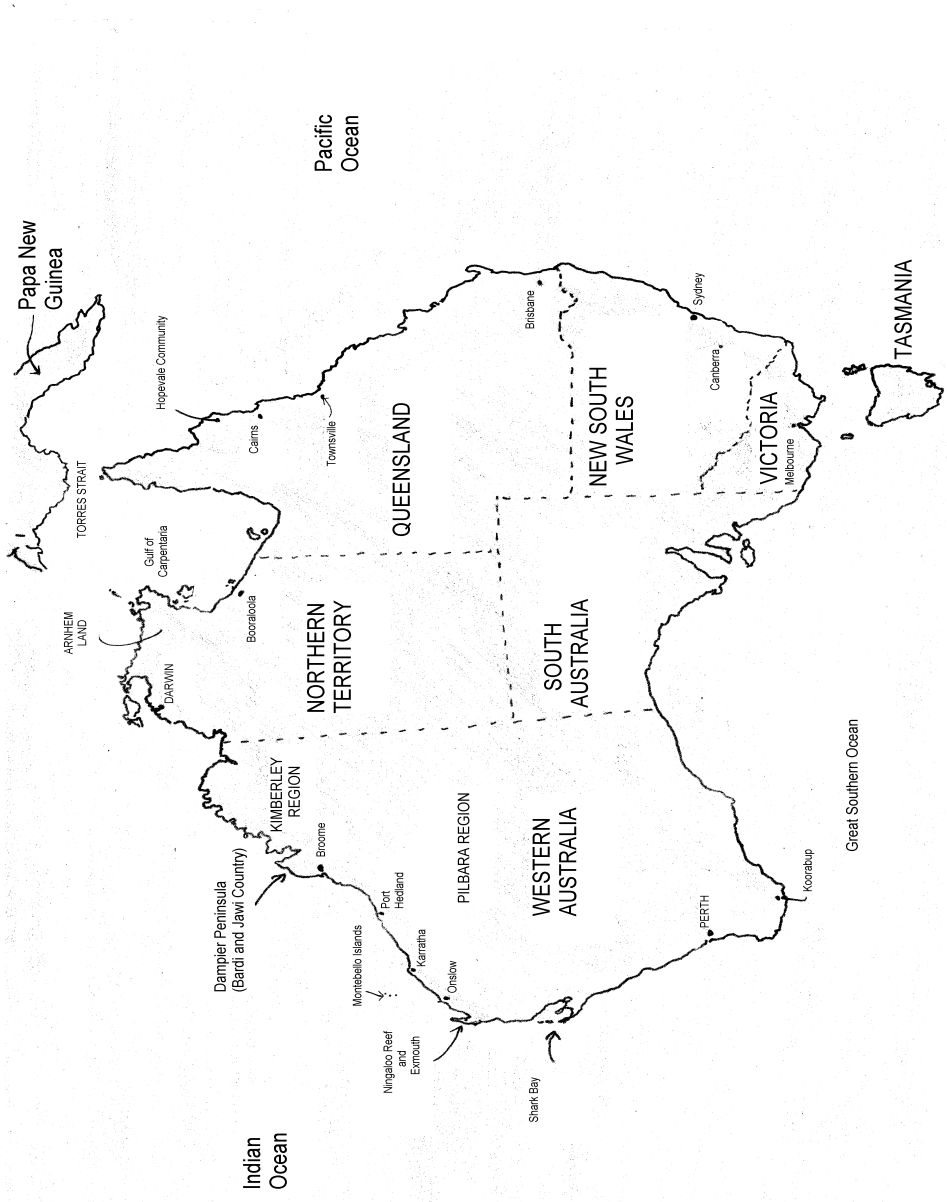


Figure 2: Map of the Dampier Peninsula, Western Australia

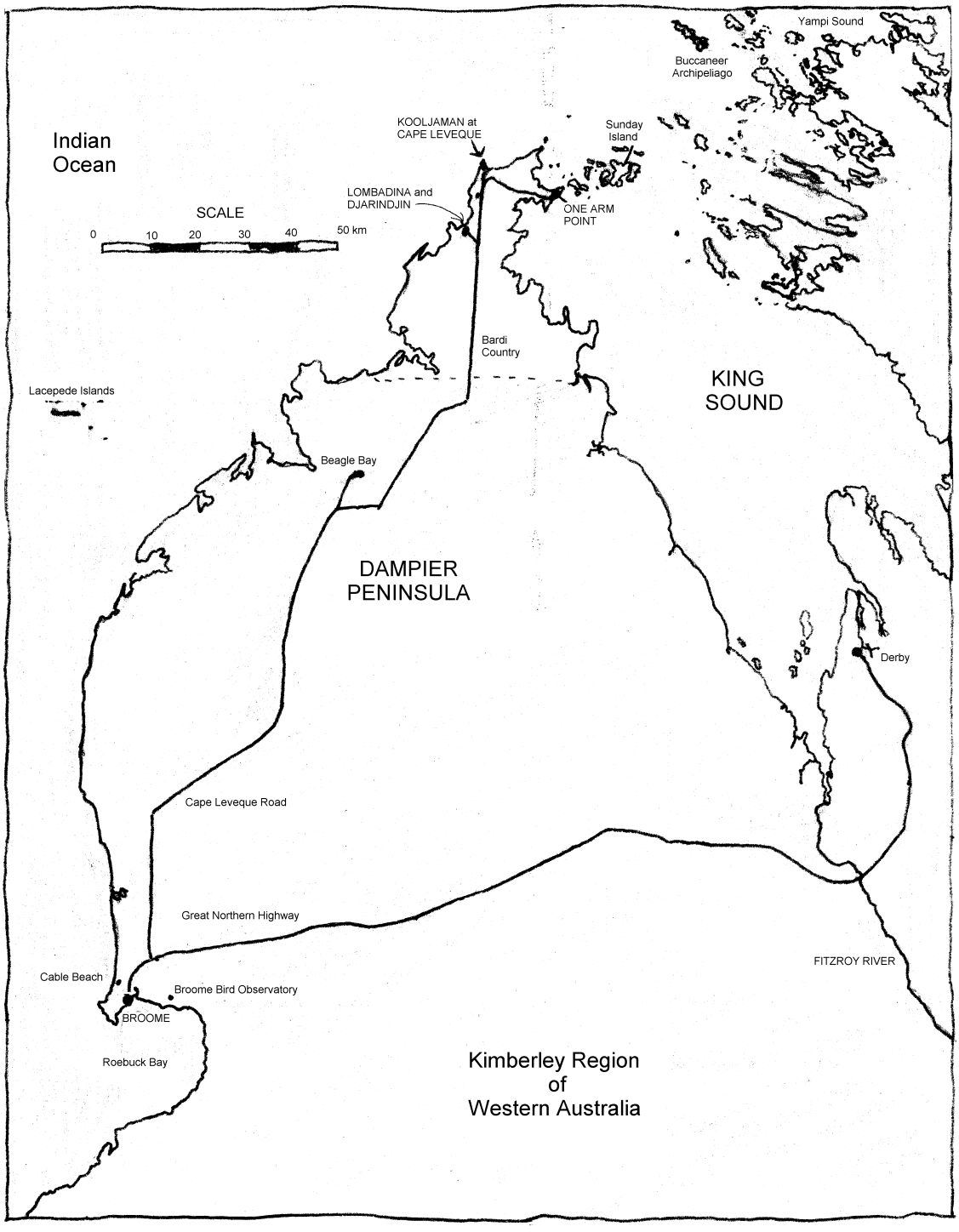
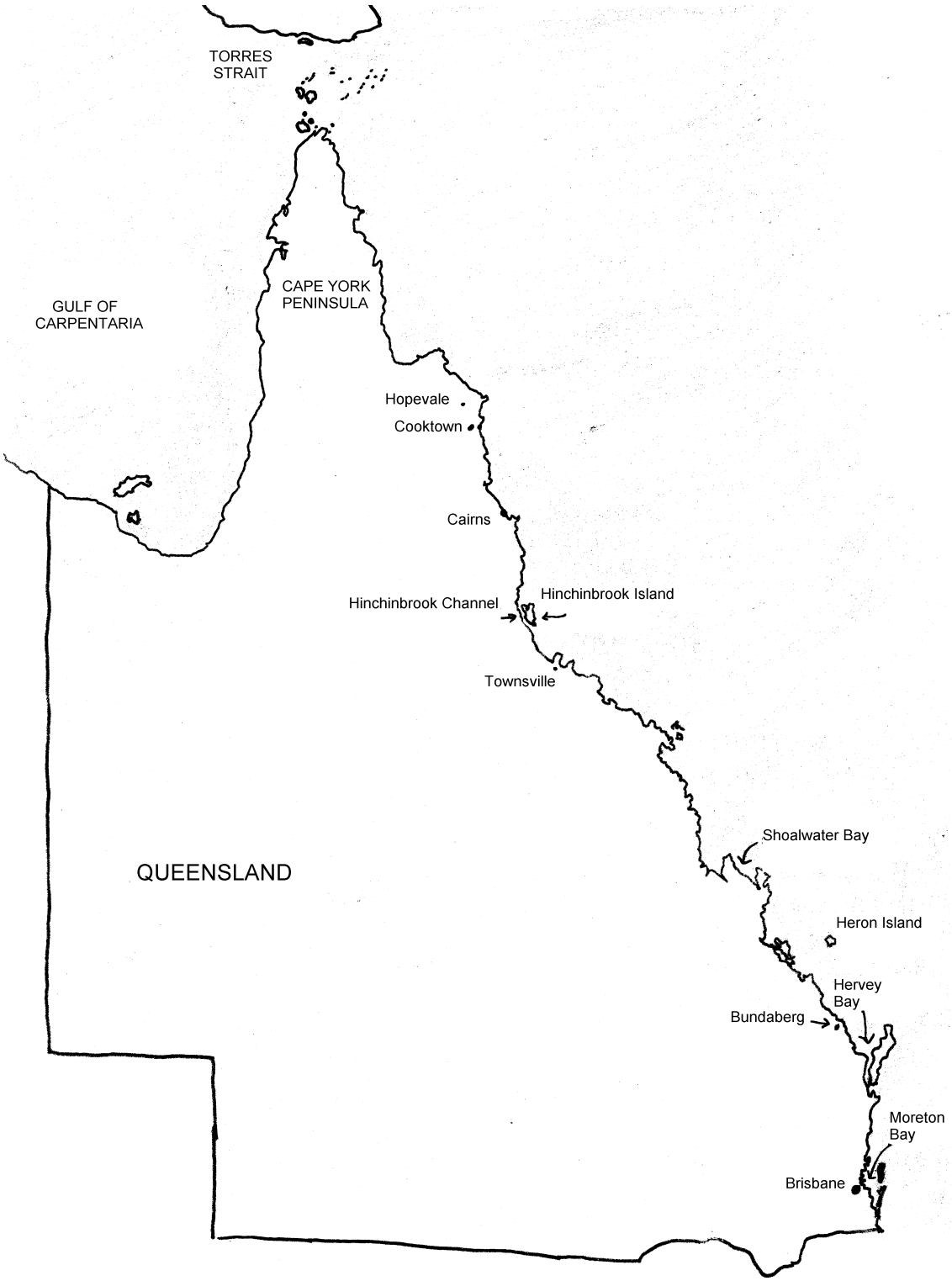


Figure 3: Map of Queensland showing places of interest



Prologue: Conversation

I am travelling on a rich red pindan track in Broome, the dust rising up around the noisy four-wheel drive, and the amazingly opaque agate coloured waters of Roebuck Bay on my left. My travelling companion, the driver, is Joe - a PhD candidate in geology and staunch conservationist. We are both staying at the Broome Bird Observatory, some 25 kms out of town. He is undertaking his fieldwork, I am an 'Assistant Warden' or semi voluntary dogsbody at the Obs. I cannot recall why, but the conversation turns to marine turtles. Joe is strongly opposed to the hunting of these creatures by the local Aboriginal communities. I am nonplussed by his vehemence. Why? From what I could gather the numbers of animals being killed was not large, and probably sustainable given the size of their populations that inhabited the warm tropical waters. As a non-Indigenous woman from an urban background I do not really understand why these animals are so important to the local Indigenous culture, yet I realise that this particular relationship between people and animals must predate European concerns over their welfare.

I have a science degree in Zoology and this training gave me some knowledge as to why these might be animals of importance to the environmental consciousness, but also a degree of scepticism towards overly passionate arguments. I half-heartedly countered some of Joe's points, but the question strikes a resonance that will not be still. Why?

I follow up this conversation with my fellow wardens – all environmentalists, many with degrees in the natural sciences. I find myself alone in my defence of the Indigenous right to sustainably harvest marine megafauna. This issue seems to be representative of a block in the communication between my colleagues and the local Aboriginal communities - despite much rhetoric about involving the Traditional Owners in our projects of land care and ecological research, there is a deep unease and reluctance to acknowledge their rights to access and use the country. When we conduct bird surveys on the beach or along inland lakes there are often remnants of bush tucker feasts to be found – charred coals,

the remains of fish, crabs and once - memorably - a bush turkey[3]. The ornithologists were less than impressed. I have difficulty with the negative reactions of the people around me. Surely conservationists and Indigenous peoples have far more in common in their goals than differences?

I decide that this is to be the focus of my doctoral research. I am spending a 'gap year' travelling around the continent in search of the perfect topic. Broome is an idyllic location, and I am drawn by the complexities that surround the conflict between turtle hunters and turtle savers.

I began contacting experts in the fields of turtle and dugong biology, as well as anthropologists and others who had experience working with Indigenous communities on cross cultural environmental projects. I wanted to find people who could shed light on the conflict I had observed, and who could advise me on the best way to proceed in investigating this issue.

Excerpt from emails between zoecar and selected turtle and dugong scientists dated August 2000

My initial email jumped right into the deep end, with what in retrospect seems a huge amount of naïve confidence. What right did I have to express such certainty about the subject?

> I have decided to do a PhD working with Aboriginal people on conservation issues...I have noticed that there seems to be a lot of ill feeling between these two groups on the matter of turtle and dugong hunting, and after discussion with both these groups and the local [land management agency] I decided this was an issue I would like to follow up with some further study. I am most interested in working

[3] Also known as the Australian Bustard *Ardeotis australis*, this large bird has a reputation for being very tasty which is thought to be why it is now 'mostly extinct in settled districts' (Pizzey and Knight 1997:158)

closely with Aboriginal communities to work out a cooperative and inclusive system of management. I feel that cross-cultural education in both directions is urgently needed up here to allay the fears felt by both parties on the issue.

The replies I received were cautious at first, perhaps they were also taken aback by my brazen assurance in a deeply complex field.

Reply from scientist 1:

I have to say that having supervised several PhDs in the area of Indigenous marine wildlife hunting, I think it is likely to prove a difficult topic, particularly for a person with a Zoology rather than Social Science background. Can you please give me more of an idea about what you are aiming to do?

From others I gained some indication of the socio-political implications of the work I wished to undertake, as the experts tried to gauge what level of knowledge I had on the subject, and what my personal stance on hunting was.

Reply from scientist 2:

Have you been speaking to Aboriginal people?[4]

Reply from scientist 3:

You have picked a very worthwhile but oftimes contentious topic. I have some knowledge of the WA situation and was aware of some tension. I am happy to talk to you more sometime. Let me ask just one question "Do you think Aboriginal people should be allowed to hunt dugong and turtle?"[5]

As I explained my own position further, the experts began to open up and provided me with their opinions on how difficult the issue was.

Reply from scientist 4:

[4] Email dated 7/8/2000

[5] Email dated 14/8/2000

> You are certainly correct in saying that the issue of dugong hunting (and to a lesser extent perhaps, turtle hunting), is both significant and complex. The way forward with the issue is to acquire some understanding of the nature and extent of the hunting, and, through careful and patient liaison, empower the relevant coastal Aboriginal communities to establish a management program to ensure sustainability of the hunting practices...If this is at any way a contrived, or forced procedure from Government, or any non-Indigenous organisations it will obviously not work. Nor will it work if there is a management scheme contrived by others and presented to the communities as a fait accompli. So it is an unpredictable and difficult process that might take many directions [6]

Undaunted by the ambivalent responses of the experts I pressed on with my research plans, assuming that all would be well, that the difficulties I had been warned of would not apply to my project, as I felt sure that I would approach things in a way that would lead to a successful resolution of this strangely intractable problem. If I had known at that time this dissertation would take a further eleven years of deep thought and many intellectual dead ends before I reached a point of equanimity on the subject, I would probably have given up right then and there. But I am very glad that I did not!

Scientist 3 (later):

Welcome to the world of turtles and Indigenous hunting![7]

[6] Email dated 10/8/2000

[7] Email dated 12/03/2001

Chapter One: Introduction

The issue of Indigenous hunting of marine turtles and dugong in Australia is indeed both problematic and complex. It is a topic on which many people are divided, and about which many questions still remain. For example, along most of the northern Australian coastline the exact numbers of marine turtles and dugong are unknown (Marsh et al. 2012, Limpus 2009). For some well-researched areas and species, population trends can be extrapolated, but the migratory habits of these well-travelled marine animals make final conclusions on these trends precarious for the prudent scientist[8]. Much is still unknown about the life histories of marine turtles in particular, as for many years they are for all human intents 'lost at sea', and only really accessible during their brief breeding season on our coastal beaches (Limpus 2009).

Added to these difficulties are the unknown factors on the human side of the relationship, where the numbers of marine turtles and dugong hunted by Indigenous communities has until recently[9] been almost entirely undocumented. The lack of comprehensive research in this area may in part be attributed to the ongoing legacy of colonisation and the resulting dysfunctional relationship between Indigenous people and administrative power structures.

This thesis explores the remaining barriers that prevent a clear resolution of the conflict between Indigenous groups and conservationists over the hunting of marine turtle and dugong, and presents some potential avenues for these barriers to be overcome through

[8] An in depth exploration of this issue can be found in Chapter 8.

[9] Attempts have been made in the past to calculate the numbers of animals hunted by Indigenous communities, but for the majority these attempts have not been particularly successful, due to the conflict of interests between Indigenous hunters and non-Indigenous conservationists, which has made collaborative research difficult. Some of these attempts are discussed in Chapter 7. The NAILSMA turtle and dugong project (run by an Indigenous organisation), which commenced in 2005, has begun to rectify this situation. My role in this project and its outcomes are discussed in Chapter 9.

the co-production of a hybrid ecology that reflects the evolving relationship between Australians and the country[10] they inhabit.

By locating itself within the larger discipline of ecology, this thesis seeks to inform other ecologists of alternative ways of approaching the management of the environment, particularly when this management intersects with the interests of Indigenous and other community groups.

1. Research focus: Contemplating a hybrid ecology

Within the field of ecology, there have been recent calls for a shift in the way that ecologists approach their research. Berkes (2004) identifies three changes necessary to strengthen the field in a move towards 'systems ecology' or an ecology that encompasses the entire ecosystem. Firstly, he calls for a movement away from the traditional reductionistic approach which focuses attention on specific entities or relationships within the ecosystem (such as numbers of nesting turtles, or the impact of human predation upon their numbers), to one that attempts to encompass all of the interrelationships that impact upon that relationship (such as habitat degradation, past commercial hunting, cultural norms and their dynamic movement over time, increasing human populations, climate shifts, migration of populations in response to changing seagrass availability, the impact of conservation initiatives and much more). Secondly, in order to encompass such a holistic goal Berkes identifies the need to reintegrate humans into the concept of the ecosystem as held by ecologists, which requires a renewed focus on the relationships between humans and other elements of the ecosystem; and finally as a result of this renewed focus on human beings there is also an ethical challenge for the work of scientists to become more participatory (recognising ourselves as one of the many human agents interacting within the ecosystem), and include the divergent views of other humans in our investigations (Berkes 2004).

> These three conceptual shifts in ecology – toward a systems view, inclusion of humans in the ecosystem, and management by participatory approaches – are

[10] Country is used here in the Aboriginal English sense, which refers to both land and sea, and conveys the added meaning of a place of deep significance to the people who live there.

related. They all pertain to an emerging understanding of ecosystems as complex adaptive systems in which human societies are necessarily an integral part (Berkes 2004: 624).

2. A complex systems view

The need to integrate an increasing number of factors into the consideration of an ecological problem has been increasingly recognised as scientists (and others) have become aware of the interconnectedness, not only between the other-than-human[11] entities within an ecosystem, but of the complex role that human societies and cultures have in relationship to the ecosystems we inhabit (Waltner-Toews and Kay 2005).

Bradshaw and Bekoff (2001: 462) argue that these new concepts have fundamentally changed the way ecologists must view the world:

> Now, in contrast to Newtonian models, the world is characterized by nonlinear behaviour, deep uncertainties and multiscalar elements that interact over space and time. In short, the world is complex. Predicting the behavior of the natural world has become more complicated; uncertainty has become endogenous to the system of study – something to describe rather than something to eliminate in the course of analysis.

When this approach is taken, the focus is no longer on the *objects* to be studied (such as a particular species, landscape or social phenomenon) but on the *relationships* found within the area of interest, and specifically on the ways in which the above aspects of the observed system interact with one another (Manson 2001). In particular, 'complexity theory' is seen as a conceptual bridge that allows relationships to become emphasized in ecological thought. Kay (2008: 3) describes complexity as "a concept that covers problematic situations that have eluded traditional scientific solutions. Complex situations involve uncertainty and surprise. They give the impression that there is no right way of looking at them and no right answer to the problems they raise."

[11] I use this term in preference to the more conventional 'non-human' to disrupt the often unconscious dualism inherent in modern societies concept of our place in this world.

An acceptance of uncertainty and the potential for multiple solutions brings new opportunities for moving forward out of a problematic situation (Brugnach et al. 2008). This becomes particularly true when the problem involves conflict between different human groups over the best way to manage or interact with other parts of the ecosystem. By recognizing the complexity and uncertainties present in any given situation, it becomes possible to consider other points of view – alternatively, if one remains wedded to one 'correct' opinion to the exclusion of all others, conflict and a controversial outcome are almost inevitable (Manuel-Naverrete et al. 2008)

Russell (2010) proposes a series of principles for open inquiry in order to deal with the consequences of complexity and uncertainty found in 'wicked problems'. These start from an acknowledgement of the innate partiality, plurality and provisionality of all knowledge, and then set out a framework which provides the basis for assessing the reliability and validity of knowledge using an open approach across three philosophical commitments and three rationalities[12] and including ecological conditions in human interests and knowledge (Russell 2010).

This kind of approach requires extensive information gathering in order to map out as much of the known factors around a problem as possible – which also helps to identify the knowledge gaps that still exist. In order to create a comprehensive (though not necessarily coherent) picture of the problem ecologists taking this approach may consult widely with others who hold an interest in the issue at hand (Gonzalez et al. 2008; Olsson et al. 2004). By doing so there is an acknowledgement that the knowledge held by any one person or group is subject to partiality – that it is impossible to ever 'know everything' about a subject or situation. This is turn results in the acceptance that there will be a plurality of knowledges formed about the issue at hand, due to the situated values, experiences and perspectives that shape each persons partial knowledge of a subject.

[12] The three philosophical commitments of knowledge are defined as the ontological, the epistemological and the ethical – Russell (2010) posits that in order to solve intractable socio-ecological problems there is a need to attend to each of these dimensions of inquiry (and particularly to the ethical component which has often been forgotten in standard practice). The three rationalities referred to are the 'three worlds' proposed by Habermas (1972) which represent separate areas of human interest: the external physical world (investigated by the domain of analytical/physical science), the inner subjective world (investigated by the social and historical sciences), and the normative social world (investigated by critical social science and critical systems thinking) (Russell 2010).

Provisionality, or the recognition that all knowledge is fallible and subject to review and improvement, is seen as a consequence of both partiality and plurality (Russell 2010).

The integration of these factors into ecological thought leads us to the second shift proposed by Berkes (2004), which is concerned with reintegrating the human sphere into the scope of ecology.

3. Reintegrating the human

The sphere of human culture and activity is critical to successful ecological problem solving not only because most if not all ecological 'problems' are seen to be caused by human beings, but also because the solutions to these problems can only be carried out successfully with the support of those people who have a sense of responsibility to the country or creatures under threat (Armitage et al. 2009).

Most cultures hold a concept of custodianship of the environment – that humans have a special right or responsibility to land and the creatures and plants that cohabit this planet. In modern western culture this has been expressed as 'a land ethic', espoused by Aldo Leopold, who argued that human kind need to extend their community to include 'soils, water, plants and animals, or collectively: the land.' (Leopold 1949: 258).

> A land ethic, then, reflects the existence of an ecological conscience, and this in turn reflects a conviction of individual responsibility for the health of the land (Leopold 1949: 258).

There is embedded in this ethic a sense that we as humans have agency over land, or country - we can impact on its health and wellbeing; and that the health and wellbeing of country is related to our own health and wellbeing. The responsibility of humans towards the other-than-human world is reaffirmed by voices from a variety of different cultures. Take for example, this translation of the Islamic Qur'an:

> No other creature is able to perform the task of protecting the environment. God entrusted humans with the duty of viceregency, a duty so onerous and

> burdensome that no other creature would accept it: 'Lo! We offered the trust unto the heavens and the earth and the hills, but they shrank from bearing it and were afraid of it. And man assumed it' (Surah 33:72) (Izzi Dean 1993: 528)

On a more local level, Indigenous Australian ideas about country echo this idea of personal duty:

> Every Aboriginal person has a part of the essence of one of the original creative spirits who formed the Australian landscape. Therefore each person has a charter of custodianship empowering them and making them responsible for renewing that part of the flora and its fauna (Graham 2004: 183).

One key characteristic of the Aboriginal worldview as espoused by Mary Graham is the primacy of the human-country relationship - where other cultures often place the intra-human relationships first. Graham (2004: 181) claims that:

> The two most important kinds of relationship in life are, firstly, those between land and people and, secondly, those amongst people themselves, the second being always contingent upon the first. The land, and how we treat it, is what determines our human-ness. Because land is sacred and must be looked after, the relation between people and land becomes the template for society and social relations. Therefore all meaning comes from land.

This emphasis on the relationship with the environment as central to the meaning of being human is one that is echoed by some of the sub-cultures that have emerged in western culture over the past few decades. An example may be the deep ecology movement as envisaged by Arne Naess (1973, 1989), which arose as a response to the environmental crisis that the author had observed over his lifetime.

> We feel our world in crisis. We walk around and sense an emptiness in our way of living and the course we follow. Immediate spontaneous experience tells us this: intuition. And not only intuition, but information, speaking of the dangers, comes to us daily in staggering quantities...Naess offers in this book the basis of a new ontology which posits humanity as inseparable from nature. If this ontology is

> fully understood, it will no longer be possible for us to injure nature wantonly, as this would mean injuring an integral part of ourselves. From this ontological beginning, ethics and practical action are to fall into place (Naess and Rothenberg 1989: 2).

Other areas of convergence with this concept come from animistic ecosophical movements as described by David Abram (1996; 2011) and Graham Harvey (2006), who explore the idea that that humans are primarily animals and that the perceived mechanistic split between mind and matter (as conceived by Descartes) is not only artificial but is also the cause of much of the cultural dissonance and environmental destruction that characterizes modern civilization:

> We have forgotten the poise that comes from living in storied relation and reciprocity with the myriad things, the myriad *beings*, that perceptually surround us...Only if we can renew that reciprocity – grounding our newfound capacity for literate abstraction in these older, oral forms of experience – only then will the abstract intellect find its real value. It is surely not a matter of 'going back', but rather of coming full circle, uniting our capacity for cool reason with this more sensorial and mimetic ways of knowing, letting the vision of a common world root itself in our direct, participatory engagement with the local and the particular (Abram 1996: 270).

Recent contributions to environmental philosophy by Australian authors such as Val Plumwood, Deborah Bird Rose and Freya Mathews among others, integrate the human and the other-than-human worlds and call for human beings to reinhabit reality, or to be re-situated in ecological terms (Plumwood 2002; Rose 2005; Mathews 2005). In doing so these authors explicitly draw upon understandings they have gathered from the philosophy of Indigenous Australians and their relationship to country.

> In order to begin truly to respect the world as it is given to us...we can simply honour and cherish the place in which we find ourselves, whether that place happens to fall in the degraded heartlands of the inner city or the pristine expanses of the outback (Mathews 2005: 200).

Plumwood (1990) specifically identifies a dialogue with Aboriginal worldviews as an opportunity to open new perspectives on human relationships with nature. Other researchers have pointed out the potential benefits for Indigenous culture as well as non-Indigenous culture in working within this hybrid space, seeing opportunities for economic gain and cultural renewal through the process of regaining control over the management of country.

> The interplay between Indigenous and state systems of knowledge and resource governance produce distinctive and dynamic forms of Indigenous community-based wildlife management. These hybrid systems strongly influence how natural, financial, physical, social and human resources are combined and transformed to build sustainable Indigenous livelihoods (Buchanan et al. 2009: 4).

The possibilities of new hybrid spaces between cultures where knowledge can be shared in an equitable manner, leading to benefits to both humans and the other-than-human environment is further explored by Rose (2005) in an article which presents an Indigenous framework for conceptualizing the place of humans in our environment.

> The ecological system is not activated solely by human agency, but rather calls humans into relationship and into activity...rather than humans deciding autonomously to act in the world, humans are called into action by the world. The result is that country, or nature, far from being an object to be acted upon, is a self- organising system that brings people and other living things into being, into action, into sentience itself. The connections between and amongst living things are the basis for how ecosystems are understood to work, and thus constitute Law in the metaphysical sense of the given conditions of the created world (Rose 2005: 303).

Similarly, Anthony Weston (2009) in *The Incompleat Ecophilospher* emphasises the relationship between humans and the other-than-human world (and following on from this, between and amongst all beings) as being critical to the way in which we should be looking to reorient ourselves and our concept of being alive:

> The argument is not the usual suggestion that the West has misunderstood the world, got it wrong, and that we now need to "go back" to the Indians to get it right...understanding the world is not really the point in the first place. We are not playing a truth game at all. What matters is how we relate to things, not what things are in themselves. Front, center, and always, the world responds. The great task is not knowledge but relationship (Weston 2009: 11).

It is not only scholars from the humanities that are reaching across the cultural divide to grapple with the issue of human relationship to country in Australia. Head (2007) describes how the relationships between humans and the environment and culture are becoming an increasing focus of geographers in Australia, commenting that this is mostly due to "the politically contested and intellectually fertile collision of a unique continental ecology, longstanding Indigenous traditions of environmental engagement, and the diverse influences of later settler cultures" (Head 2007: 838).

If ecologists seek to engage with the human dimension, and particularly if they must also reach over cultural divides to do so, it becomes critical to engage with the third shift proposed by Berkes (2004), that is, towards a participatory approach to management and information sharing.

4. Participatory management

The particular focus of this work is participatory research, and management that involves Indigenous Australians. This cross-cultural approach adds another layer of complexity to the integration of the human sphere into ecological problem solving. Despite the added difficulty of working in an unfamiliar culture, much of the processes and issues raised will also be applicable to ecologists working with people who have similar cultural backgrounds to themselves. Overall, the outcomes of this research support the greater involvement of local people in decision-making, regardless of their cultural background.

Arguments that support the alliance of Indigenous and conservation agendas include the idea that Indigenous people are often the best candidates for managing conservation risk.

The benefit for managers in this approach is the opportunity for engaging local communities on conservation issues, which is seen as a more sustainable option in the long run than constant regulation from above (Agrawal and Gibson 1999). Additionally, the growing recognition of Indigenous ownership of large areas of country that is often underpopulated and hard for government agencies to properly care for has led to the recognition that local communities are often repositories of useful environmental knowledge and are concerned about the future of their ancestral lands and seas (Baker et al. 2001). Supporting this, Indigenous people, such as Peter Yu (2007) have claimed responsibility for the maintenance of the integrity of ecosystems on Aboriginal land on behalf of global humanity.

In order for collaborations between Indigenous people and conservation agencies to be successful in caring for natural resources, support from institutions and government in terms of financial assistance and training is crucial (Berkes 2006). It has been suggested that the process of community-based management should be seen not as communities conserving in isolation but 'conservation from the bottom up' (Berkes 2006:2). In this way communities are perceived as having the primary input into how and what is conserved with the support of, interaction and discussion with other layers of the broader community.

> A focus on institutions rather than "community" is likely to be more fruitful for those interested in community-based natural resource management (Agrawal and Gibson 1999: 629).

The process of sharing power and responsibility between governments (and other institutions and local resource users) is known as co-management (Berkes 2009). This form of management implies a shared responsibility and, importantly, an equitable relationship between government and resource users (Davies et al. 1999; Campbell et al. 2009).

There are significant barriers to such collaborations, and projects that seek to integrate Indigenous and conservationist worldviews are often plagued by misunderstandings over the purpose, discourse and outcomes – terms that are too often set and enforced by the

conservationist partners. Anthropologists who have worked with Indigenous people on environmental issues have commented that the concept of 'managing' the land is one that does not translate easily between cultural groups. John Bradley (2001) suggests that it would be better to say 'negotiation' to align the concept in Yanyuwa terms, while Walsh (2009) comments that:

> Land 'negotiation' could be misunderstood particularly in relation to cross-cultural tenure negotiations. Thus, western perspectives on Indigenous management – as a one-way process where people apply practices to the land to make it productive so that they can extract resources – need to be expanded to included the notion of 'negotiation' with an animated landscape (Walsh 2009: 9).

Another example of this is the concept of 'wilderness' which has often been a major sticking point in the dialogue between conservationists and Indigenous people, as in many cases the unpeopled wilderness envisioned by conservation groups is the ancestral homeland of Indigenous people, and the 'natural' landscape of these areas is seen as one cultivated and shaped by humans rather than left to deteriorate into 'wild country' that is alienated from its people:

> For the Yanyuwa the wilderness is better found in a place like inner Brisbane, which I can see from my office window. This is the country without Law, without song, Dreamings and resonating meaning, and beyond negotiation as they know it (Bradley 2001: 305).

This is one of the reasons that long-term success in such projects is rare. The importance of clarifying the terminology and expectations of both parties cannot be overemphasised, as in Australia the interaction between government agencies and Indigenous groups is often fraught with misunderstandings and many projects may ultimately be deemed as failures by both parties (Nursey-Bray 2006).

These preconceptions may be based in a shared history of misunderstandings and exploitation, or in a lack of awareness of the cultural norms practiced by the other group:

> 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 (Davies et al. 1999: 93).

Evaluations of community-based management have often commented on the negative impact of inequitable power relations upon the success of projects. Many different relationships, from truly shared authority to token participation, may take place under the aegis of community based projects, and there is an unfortunate tendency for government departments to co-opt the terminology of participation in order to regulate unruly communities (Campbell et al. 2009; for a specific Australian example see Nursey-Bray 2006).

Fiona Walsh (2009) also critiques the short-term nature of the priorities emphasised by outside agencies, that are often tied to funding cycles of a few years in length, whereas the priorities and problems faced by Indigenous communities require much longer-term commitment to produce sustainable engagement and change.

The long history of violent and oppressive relationships between Indigenous and non-Indigenous Australians also impacts on relationships between cultures. This past, though often ignored or swept under the metaphorical carpet, still shadows our present and future as the repercussions of injustice are carried through the generations in the form of inequalities in the basic provision of education, health and employment opportunities to name but a few. The challenge is to find new ways of relating to each other and to our country in order to overcome the reach of the past.

> The last two hundred years of racial interaction in Australia is a tragic story of violence and suffering. The energy which has sustained this intense encounter must be redirected. But how? What positive projects of cultural interaction can we now structure? Mutual appreciation occurs in sport and more recently in art.

> What other areas of constructive cultural encounter might be imagined? Most particularly, are there means by which the two cultures might collaborate to save some of the remnants of the continent's great and unique ecosystems? (Watson and the Yirrkala community[13]).

5. Research Objectives

This thesis is positioned as forming a part of the new approach to ecology, integrating the three emergent issues as described by Berkes (2004) into a story that revolves around the relationships held with marine turtles and dugong in Australia in the past, present and future. Specifically I seek to assess the potential of the move towards ecological hybridity as a strategy to resolve intractable conflicts such as that found between conservationists and Indigenous people over the hunting of marine turtle and dugong.

This potential is explored by:

1. describing the political and historical factors surrounding the non-Indigenous relationship with and management of marine turtles and dugong in Australia;

2. foregrounding the Indigenous relationships with marine turtles and dugong in this country and the value these perspectives have for the ways in which we can manage the environment;

3. reflecting upon the points in which these relationships intersect with one another in moments of ambivalence, where the creation of a hybrid space becomes possible[14];

4. evaluating the outcomes of case studies where attempts to resolve the conflict between cultures have taken place, and relating these outcomes to the approaches[15] taken by the parties involved in the conflict; and

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[13] http://singing.indigenousknowledge.org/exhibit-1/3 last accessed 22/12/2011

[14] The concepts of ambivalence and hybridity, their usage in the literature and how I define these in relation to my research are introduced and developed in Chapter 2: Challenges to Ecological Hybridity, and Chapter 5: Ambivalence and the Benefit of Hindsight.

5. reviewing the three shifts proposed by Berkes (2004) in the context of the above and assessing what further steps need to be taken by ecologists in order to collectively resituate the relationships between humans and the other-than-human[16].

This thesis details the relationship between marine turtle, dugong and non-Indigenous Australian culture as well as the relationships held by the Bardi Jawi and Mayala peoples and odorrgoordimil[17], with a shifting temporal and geographical focus, spiralling out from a centre located in Bardi Jawi country, north of Broome, Western Australia in the year 2001, where my research journey commenced.

By undertaking an analysis of the relationships between different groups of people concerned with the conservation and hunting of marine turtles and dugong, this analysis leads to the exploration of the wider repercussions of the power differentials between Indigenous and non-Indigenous Australians on this issue, and on a broader scale the interplay between international conservation action and local communities.

I argue that a detailed understanding of the varied relationships between humans and marine turtles and dugong is paramount in any attempt to manage the interactions between people and these animals. If ecologists are concerned about the impact of human actions upon the environment there must be a clear conception of the ways in which these actions are played out in different settings, and the influences of politics and cultural norms on our perceptions of the environment.

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[15] When describing the relationship between ecologists and marine turtle and dugong I have used the concept of competing conservation discourses as described by Manuel–Naverrete et al. (2008) to unpick the complexity of responses to these animals. An in-depth description of the characteristics of each of these discourses can be found in Chapter 2: Challenges to Ecological Hybridity.

[16] According to Graham Harvey (2005): '"Other-than' has at least three references: it reminds us that we are persons in relationship with others. It reminds us that many of our closest kin are human, while the closest kin of oaks are oaks, so we talk most easily with humans while rocks talk most easily with other rocks...It reminds us to speak first of what we know best (those closest to us)...It reminds us to celebrate difference as an opportunity to expand our relationships rather than seeing it as a cause of conflict or conquest. All life is relational and we should not collapse our intimate alterities into identities. Others and otherness keep us open to change, open to becoming, never finally fixed in being"

[17] A Bardi word used as a specific reference to dugong and Green turtle. Another possible word would be 'goorlil' which is the most common way to refer to turtles in the communities, which has a direct translation of 'sea meat'. This term can also be applied to dugong, but after some discussion with senior Bardi men it was apparent that 'odorrgoordimil' is the more appropriate term in a formal setting.

By documenting my own travails between cultures and disciplines this thesis provides a description of how human relationships with marine turtle and dugong can be re-imagined. The entire thesis is structured as a research journey, beginning with my early conceptions and field trips and progressively exploring the research topic in greater depth - reflecting a gradual sophistication of my understanding of the relationship between marine turtle and dugong and human cultures, and the interrelationship of the competing conceptions of marine turtle and dugong within human cultures.

The following chapter also provides an exploration of the theoretical basis of what I am calling 'ecological hybridity' and some of the hurdles faced in the attempt to follow this shift towards a more holistic, integrated and participatory ecology.

Interlude: Welcome to Country

Photo 1: Main entrance to Djarindjin and Lombadina communities in 2003

In order to reach the Bardi Jawi and Mayala communities on the Dampier Peninsula from Broome, we must first brave a journey on what I always thought of as 'The Road': 130kms of red dust, corrugations, high speed, huge pits, mud, and hours and hours of bone shaking travel[18] *(see Figure 2 for map). This road has changed now, with long stretches being bituminised, but at the beginning of my research it was a river of red pindan*[19]*. It is a notorious stretch for accidents, and more than once I was a passenger or driver when a vehicle slid across the treacherous surface, thankfully in my case without impacting or rolling. Others have been less lucky, as I discovered first hand on one of my early trips.*

[18] This road was significant enough to local culture to have a musical named after it: 'Corrugation Road' by Jimmy Chi which first opened in Melbourne in 1996, after the success of his previous work 'Bran Nue Dae'.

[19] 'Pindan' is a colloquial term in the Broome lingo that describes the vibrant red dirt found in the region. Originally it was an Indigenous term, 'Bindan', found in many of the Dampierland languages including Bardi, translated as 'dry woodland', which is the typical ecosystem found on the pindan soil (Kenneally et al. 1996).

The road seemed okay, but only after about 30km we had to stop. There was a girl on the road, waving something around. She was obviously upset. I saw a white 4wd just off the road, it looked like it was bogged or something. I thought it was strange, that they had gone off the road and into such dense bush. We stopped and it became clear that there had been an accident. The girl had been driving and the car had blown a tyre and flipped off the road. Luckily they had landed right way up (though facing in the opposite direction). There were 3 passengers, an older white woman, a young Bardi woman and her baby. The two women were both injured. The older woman had broken her shoulder with the impact, she had been sitting in the passenger seat in front of the younger woman, and this had collapsed back - crushing the younger woman's pelvis. I looked after the baby for about two hours, before I was picked up. By this stage a whole bunch of people had turned up, and an ambulance from Beagle Bay was in the process of moving the injured back to the community where they were going to be picked up by the flying doctors. Field trip diary dated 17/1/2002

As you travel up the road, the landscape changes from the arid, mainly burnt out pindan wattles (Acacia tumida) and cattle stations that are typical of the plains east of Broome, to gradually incorporate taller trees until you reach the edge of Bardi country - here you are suddenly within a forest of tall eucalypts (Eucalyptus miniata), their pale white branches contrasting vividly with the reds and yellows of the earth and grass.

The first community that you come to after entering this country is the dual presence of Djarindjin and Lombadina, located close to a calm beach on an open plain behind the sand dunes. As you continue northward the next major turnoff is to the community owned tourist resort of Kooljaman at Cape Leveque – a magical place to stay where I was fortunate enough to base most of my field studies. This is where the road turns now, towards the eastern most point of the peninsula and the largest community of Ardiyooloon at One Arm Point, a community surrounded on both sides by the sea, the turbulent waters that surge out of King Sound.

There are many unmarked tracks leading from the main road, and as a newcomer to this country I always wondered what lay beyond the ubiquitous 'No entry' signs that are at the

beginning of each. As my research progressed I was invited or directed to visit people at their outstations or blocks, and I gradually became familiar with the places and camps located at the end of these roads. Each place, community or outstation is located at a significant coastal site – the Bardi and Jawi people are saltwater people and the 'burus' or named areas of family responsibility are inevitably linked to the ocean. Glaskin (2002) comments that the interior of the peninsula, like the deep open ocean, is considered a shared resource, and an area to travel through, rather than somewhere to permanently settle.

The culture is very different up here, people are less 'busy' to my citified eyes. Things happen without schedules and deadlines, meetings emerge rather than being planned. Time is related to the tides rather than the clock or the calendar. Once you are up there, you are in another realm, where things happen when they happen and not when you schedule them to occur. There is not much point pushing things – the dominant culture is Indigenous, though aspects of western structure do exist (the shop opening hours, the health clinic, the school, the office all technically run on predetermined times and outside structures/institutions) The truck with supplies arrives once a week – this is the day everyone does their shopping. People are active early in the morning in summer, later in the day during winter. Lunch-time is a dead time, when everyone sleeps, unless the tides dictate a fishing expedition. When the tides indicate night-time hunting, then everyone becomes nocturnal. School and jobs will be let go of in favour of expeditions to catch turtle, dugong, fish.

> *The favourite night fishing times of course were sacred, everybody would go out those nights, you could guarantee it... you would end up with a boy in the class who couldn't stay awake because he spent all night out with his uncles and father or someone, after dugong.* [20]

The communities and outstations are invariably located on the coast. Although no-one lives permanently on the archipelago of islands that are adjacent to the peninsula any more, they are dotted with camps and sites of significance and people will often visit for periods of time.

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[20] Interview with non-Indigenous participant dated 5/5/2004

I was very lucky on Sunday Island as quite a lot of the old folk took an interest in me and what I was doing and again I guess the empathy was a common interest in the sea, that sort of thing. Old Tigan gave me one of my best ever lessons on the tide and how to use it...well he didn't mean to, he just invited me to go to the other side of the island. And we were going round to the other side of the island in a dinghy with one oar. And being fairly young and fit in those days, and this old frail bloke, my first thoughts were, ah the clever old bugger, he's going to use my muscles to get around. I didn't touch the oar - we rode currents all the way around it, his intense activity may have lasted three or four beats of the oar as he changed streams in the water, we went around the other side of the island and came back with very little effort. [21]

The Bardi and Jawi people are strong both in culture and political nous, with many of the elders participating in national and international forums for the advancement of Indigenous interests. At the beginning of my research I was often tripped up by my own preconceptions when I felt surprised at the juxtaposition between the simplicity of people's everyday lives and their broad life experiences.

The isolation caused by the road condition works in favour of the cultural norms, whitefellas and their bureaucracy struggle to control what goes on up here. This may lead to dysfunction on some scales – health outcomes are poor (though better than many in the region), income levels are extremely low, social problems are rife (suicide and substance abuse are prevalent – though not as high as other more remote communities). There is a general sense that people just wish to be left alone – though many of the politically active personalities are calling for more programs and funding to improve the social ills in the community.

They would see that every sand dune, every rock, every stand of trees, every feature of the landscape is imbued with the actions of the ancestral beings. And that's huge. That also means then that the behavior of everything in the landscape was also an expression of their culture. So that's a radical difference right up front.

[21] ibid

> *So if you're fishing you're not just fishing as a practical thing, they'd be standing there, they'd be singing to ...singing to the fish, singing to the country, singing to the ancestral beings who are part of everything, this is all part and parcel of what everyone did.*[22]

Historically the Bardi people lived on the mainland and on closely adjacent islands located at the northernmost tip of the Dampier peninsula (see Figure 2 for map). The Jawi peoples were based on the islands of the Buccaneer Archipelago that spread from the eastern half of the peninsula into King Sound. The Mayala peoples were based further east again, on the islands clustered on the far side of the sound, near what is now called Yampi Sound. The settlement of Australia by Europeans brought change, particularly due to the arrival of the pearling luggers which roamed the coast in the 1800's raiding for both oysters and slaves in a violent manner similar to the whaling and sealing crews of the southern coast of Australia. The violence of this invasion both on a human and environmental scale disrupted the normal cultural practices of the Indigenous peoples and sparked a movement towards the relative safety of the mainland as opposed to the islands.

The response of the European settlers to the impact of the pearling industry on Indigenous peoples was to set up missions along the coast in order to 'protect' and control the Indigenous presence. Within Bardi and Jawi country there were two missions created, which divided the people into northern and southern groupings. Lombadina Mission was set up in 1910 as an outpost of the more southerly Beagle Bay Mission (not in Bardi – Jawi country, and established in 1890). Although the last of the missionaries left in 1968, the community of Lombadina still exists today on land vested in the Catholic Church and shares a Catholic primary school with the adjacent community of Djarindjin (which is separated only by a fence but run by an independent corporation with its own council and community store).

The old Sunday Island Mission was a main settlement for the Bardi and Jawi people from 1899 until 1962 when it closed and people were shifted to the town of Derby. This was a

[22] non-Indigenous participant interviewed 27/8/2004.

bad time for those families, removed from their country, and it was a positive step when the community of Ardiyooloon at One Arm Point was re-established in 1972.

The movement to resettle the outstations and family blocks that occurred in the 1990s is seen as a return to the traditional custodianship of areas of land and sea, with each family group taking responsibility for their own 'buru' or significant area. One result of the continuing connection to country and culture exemplified by Bardi and Jawi peoples has been the recent determination of their Native Title rights to the land and some of the waters that form part of their traditional Country. There are still problems in negotiating the extent of their rights over the seas and shores as this is an area where European Law (which defines the oceans and coasts as common property) does not mesh well with Indigenous Law, which names and attributes ownership to currents, areas of sea bed and associated fishing and hunting grounds (Glaskin 2002).

Chapter Two: Challenges to Ecological Hybridity

In this chapter I wish to explore the challenges that face a reimagining of environmental management and the movement towards a more holistic, hybrid ecology. I argue that in order to accommodate the three conceptual shifts in ecology as envisaged by Berkes (2004), ecologists and managers need to continue to engage with the knowledge held by other academic disciplines, such as the social sciences, where many of the issues now faced by ecology have been discussed for some time.

I argue that such a reimagining is necessary in the face of complex socio-ecological issues such as the continued legal Indigenous harvest of marine turtles and dugong in Australia. In this way I characterise the conflict between conservationists and Indigenous peoples on this point as a 'wicked problem' as defined by Brown et al. (2010) in their book of the same title. In defining a 'wicked' as opposed to a 'tame' problem Brown et al. (2010) describe a situation where conventional problem solving has been unable to resolve the issue, and which involves multiple ethical positions, worldviews and ways of constructing knowledge. This definition fits the territory explored by my research, and many other ecological problems, which are often caused by conflicts within the human social realm. This has been recognised by many ecologists in the past, and forms the basis of the three shifts proposed by Berkes (2004):

> Many of our environmental problems, including those related to conservation, do not lend themselves to analysis by the conventional, rational approach of defining the problem, collecting data, analysing data and making decisions based on the results. There is too much uncertainty; targets keep shifting and the issues must often be redefined (Berkes 2004: 623-4).

In order to be successful in attaining the skills required to tackle these challenges a new kind of ecology needs to be created, one that is holistic in its scope, and draws upon concepts from other knowledge systems. All of the shifts described by Berkes (2004)

require a bridging of the gap between the life and social sciences, often represented by an uneasy partnership and the difficult translation of ideas and concepts (Bradshaw and Bekoff 2001; Forsyth 2003; Grafton et al. 2005; Miller et al. 2008). The challenges involved in these shifts include the ability of scientists and institutions within ecology to recognise that focusing on the other-than-human aspects of the environment alone will not provide sufficient information to solve the thorny problems faced by environmental managers (Bradshaw and Bekoff 2001).

Lawrence (2010:16) posits that the incapacity to deal with complex and 'wicked' problems is partially due to 'the compartmentalization of scientific and professional knowledge'. In particular, effective collaboration between professionals in different disciplines can be highly challenging due to the narrow focus of many specialist areas that do not reflect the complexity of real-life problems (Lawrence 2010).

While exploring the various aspects of the relationships between marine turtle and dugong and both Indigenous and non-Indigenous Australians, I needed to gain access to knowledges held in many diverse fields, disciplines and cultures, a process that was often difficult due to the different modes of communication employed by scientists, Indigenous experts, other professionals and policy makers. In order to resolve the fragmentation of knowledge about marine turtle and dugong and Indigenous interests I found a need to collaborate with many others to bring together the disparate areas of expertise, in a process that I conceive of as creating 'ecological hybridity'.

1. Defining hybridity

Hybridity as a general term means the mixing of two different substances. In a biological context hybridity refers to the offspring of two different organisms, and is often seen as a positive attribute due to the concept of hybrid vigour: the tendency for a hybrid to display the best characteristics of both its parents. On the other hand, hybrid mixes between organisms that are too different (usually classified as separate species) are almost always sterile and unproductive. Thus hybridity as a concept stemming from biological understanding can be one of great strength and promise, or one that becomes an evolutionary dead end.

In post-colonial cultural theory, hybridity as a concept refers to a 'third space' in which new transcultural forms can be created in an attempt to eliminate essentialist thinking and practices. The idea of a third space was first explored by Homi K. Bhabha (1990) who proposed that hybridity could be viewed as the third space between two original moments where new positions are able to emerge, displacing the histories that constitute it and setting up new structures of authority and new political initiatives, thus allowing for the subversion of political and cultural domination (Bhabha 1990;1994).

> It is in this space that we will find those words with which we can speak of Ourselves and Others. And by exploring this 'Third Space', we may elude the politics of polarity and emerge as the others of ourselves (Bhabha 1995: 209).

The usage of hybridity has spread, directing scholars away from the problematic binaries that often form our understandings of the world. Geography as a discipline has drawn widely upon the notion of hybridity in reference to the relationship between nature and culture, and particularly the ways in which geographers deal with the boundaries (or lack thereof) between these two concepts (Whatmore 2002, Sui and DeLyser 2011).

Following on from this, by *ecological* hybridity I am describing the potential for a new type of ecology which draws upon the knowledge that resides in different cultures, and fully recognises the differential power flows between these cultures as dynamic and ever present. My personal move towards hybridity is part of a process that is taking place across the field of ecology as described in Chapter 1: the human component of these ecosystems which for so long has been conceptually excised from ecologists considerations is now being reconsidered (Berkes 2004; Pretty et al. 2008). This in turn mirrors a broader movement towards 'transdiciplinarity' that is occurring across many different areas of inquiry as professionals, policy makers and local communities come together to collaborate on 'wicked problems' that challenge conventional notions of linear problem-solving (Brown et al. 2010).

2. Strategies for a more holistic ecology

Recognition of the problems of respectfully engaging with other forms of knowledge, and the growing sense of urgency related to the ecological changes occurring around the world has led to a changing focus from within the discipline of ecology - with an increasing emphasis on complexity and uncertainty and the need to cooperate with 'other' ways of knowing.

> Most of the ecosystems for which critical and urgent decisions need to be made are best seen as complex ecosocial systems, with people firmly embedded as an integral element. We can no longer manage ecosystems per se, but rather we must learn to manage our interactions within our ecological context (Waltner-Toews et al. 2003: 23).

For ecologists and managers to deal effectively with ecosocial systems as described by Waltner-Toews et al. (2003) requires moving beyond traditional responses to environmental change (often based on historical data or notions of pristine environments found elsewhere) to more flexible and adaptive forms of management that can incorporate multiple scales, both temporal and spatial, radical uncertainty and the intersecting of many different political interests (Waltner-Toews et al. 2003).

One concept that has gained ascendancy within the area of environmental management is 'adaptive management', where scientists and managers engage in a cyclical pattern of investigation, implementation of policy and further investigation leading to an evolving understanding of the best way to respond to changes in ecosystems (Berkes et al. 2000; Abel and Step 2003). This concept assumes that there will always be a level of uncertainty over the way ecosystems react to change, and attempts to build a reflexive approach to this uncertainty into management practice.

When this adaptive management practice is informed by localised knowledges it transforms into 'adaptive co-management', described by Olsson et al. (2004) as

> A process by which institutional arrangements and ecological knowledge are tested and revised in a dynamic, ongoing, self-organized process of learning-by-doing.

> Adaptive comanagement combines the *dynamic learning* characteristic of adaptive management...with the *linkage* characteristic of cooperative management (Olsson et al. 2004: 75).

In order to successfully implement the idea of adaptive co-management, ecologists need information from as many sources as possible in order to form the basis for policy recommendations. Long term studies of the response of an environment or a species to change are often unavailable, which has led to the search for alternative knowledge systems that may provide additional information (Waltner Toews et al. 2003). These are seen as a potential source of the information required to produce adaptive comanagement systems which 'are flexible community- based systems of resource management tailored to specific places and situations and supported by, and working with, various organizations at different levels' (Olsson et al. 2004: 75).

Ecologists may see local, lay or Indigenous knowledge systems as having the potential to provide rich data about specific environments and their history of change. However, as discussed above, there are thorny issues involved in the incorporation of non-validated knowledge into alternative management systems, especially in determining which forms of knowledge to accept, and how to recognise who within a community holds expert knowledge (Davis and Wagner 2003).

One approach for dealing with this difficulty has been the idea of 'post normal science' - a concept first proposed by Functowicz and Ravetz (1994) as the form of science required when society needs to deal with social-ecological problems. By expanding the 'peer group' of science to involve the major stakeholders – including the local community - scientists can draw upon a larger number of perspectives in order to make decisions that will represent the community as a whole (Ravetz 2004). This approach does not necessarily deal with the power inequalities often present between different stakeholders, such as government agencies and business, or the differentials found within community groups where one group or opinion may be marginalised.

Another approach to this problem has been the development of 'ecosystems science', which may be conceptualised as comprising a part of 'post normal science' and involves

the intersection of the social and ecological realms (Kay and Schneider 1994). This approach is based in systems theory, providing scientists with a conceptual tool to come to grips with the complexity of reality when the stakes are high and the system uncertain.

> Systems can only be understood from a hierarchical perspective. Neither a reductionist nor a holistic approach is sufficient. One must look at the system ... as a whole and as something composed of subsystems and their components. One must also look at the system in the context of its being a subsystem of a bigger system, which in turn is part of a wider environment...This is not to say that population ecology is useless, but on its own, it cannot explain ecological phenomena (Kay and Schneider 1994: 37).

The reality of investigating all the interacting levels and subsystems means that if all the available knowledge on a particular overarching system is collated, the amount of information quickly becomes overwhelming and impractical to work with. In order to make sense of what is happening, the analyst must make decisions on which pieces of data to include. This of course leads to a subjective account of the system, and one that is unique to the perspective of the particular analyst in question (Kay and Scheider 1994).

Areas such as ecosystems science do not confine themselves solely to the study of the biophysical environment, but include forays into the social sphere, particularly in the areas of management and policy decision-making, but also in local lived interpretations of reality (see Wynne 1996).

This is seen as necessary because although biophysical science may provide ecologists with insights into the multiple possibilities of what may occur as a result of human induced changes in an ecosystem, the evaluation of which of these potential outcomes will be preferable for a particular society must take place in the policy arena. This usually occurs through the interaction of political institutions and the public, with the ecologist as facilitator providing multiple narratives of what may occur (Kay and Scheider 1994).

A link between adaptive management, ecosystems approach and participatory research has been made by Waltner-Toews and Kay (2005) in their description of the evolution of

an 'adaptive ecosystem approach'. Following this perspective the authors describe their ever-adapting approaches towards integrating the ecological and social in order to achieve sustainable and healthy ecosystems, where humans are considered as part of the ecosystem. The described research journey is one that slowly became more 'participatory' and inclusive of the views and knowledge systems of the local people that were part of the ecosystems studied. Eventually the researchers themselves were explicitly situated within the process and viewed as 'stakeholders' along with the other participants. Refreshingly, the authors recognise that this research journey is far from over:

> Within the dynamics of eco-social complexity and the uncertainty this generates, we are faced with finding our way through a foggily perceived landscape rather than charting a scientifically determined course to a known end point (Waltner-Toews and Kay 2005: 39).

3. Bridging the human and the other-than-human

The division between the study of humans and the study of the rest of existence has been seen as problematic by ecologists for a long time; indeed, the well-known ecologist Aldo Leopold famously commented upon this issue as far back as 1935:

> One of the anomalies of modern ecology is that it is the creation of two groups, each of which seems barely aware of the existence of the other. The one studies the human community, almost as if it were a separate entity, and calls its findings sociology, economics, and history. The other studies the plant and animal community and comfortably relegates the hodgepodge of politics to "the liberal arts". The inevitable fusion of these two lines of thought will, perhaps, constitute the outstanding advance of the present century (Leopold 1935, quoted in Meine 1988: 359).

Despite the early recognition of the dysfunction caused by the divisions between the human and the other-than-human, the synthesis of the study of these two fields is still seen as an emergent issue for ecology and one that is not necessarily supported by all ecologists

(Berkes 2004; Pretty et al. 2008) or social scientists, as there is an unfortunate tendency for each side of the divide to privilege a single perspective that limits the potential for new knowledge to be accepted by existing disciplines (Miller et al. 2008).

Pilgrim and Pretty (2010) call for a dissolution of the perceived divide between nature and culture, arguing that this is an artificial construct of modern industrialised thought created by our desire to control the otherwise chaotic world around us.

By far the most persuasive arguments for such bridging come from those who point out that the ecological problems that many are currently facing are ones with social or political root causes, and as such require these aspects to be addressed as part of any workable solution (Fazey et al. 2006; Gonzales et al. 2008; Pretty et al. 2008). Brown et al. (2010) argue that open transdiciplinary inquiry is needed to resolve the 'wicked' socio-ecological problems of the 21st century. In the same volume Lawrence (2010) conceives of transdiciplinarity as a challenge to knowledge fragmentation and an attempt to tackle the complexity and heterogeneity of science.

The theoretical ground covered by this thesis reflects an increasing call to bridge the gap between natural and social sciences from both sides of the divide, as it becomes recognised that in order to deal with the environmental issues faced by contemporary society, knowledge of both the human and the other-than-human dimensions of the environment are essential (Grafton et al. 2005). I identify this research as 'transdiciplinary' defined by Lawrence (2010) as research that is hybrid in nature, non-linear and reflexive.

This understanding draws upon the work of Robbins (2004) who outlines what he calls the 'hybridity thesis', a means by which ecologists can move forward in investigating the relationships between people and the landscapes they inhabit and shape.

> In recent history, powerful modern institutions and individuals (environmental ministries, multinational corporations, corrupt foresters) have gained undue and disproportionate power by explicitly attempting to divide and police the boundaries between human and non-human nature...leading to unintended consequences and pernicious results. In the process, resistance emerges from

> traditional, alternative and progressive human/non-human alliances marginalized by such efforts (Robbins 2004: 213).

Thus Robbins envisages a third space between human and other-than-human nature where alternative relationships between humans and other-than-humans are produced in resistance to the binaries enforced by the powers that be. Similarly, this thesis explores such a third space that is created by the hybrid knowledges collected about marine turtle and dugong in Australia.

Political ecology as a field offers an opportunity to deconstruct and explore the relationships of power and knowledge as seen in the field of environmental management. For the purposes of this thesis, political ecology provides a useful discussion on assessing the political linkages between society and environmental change, based on the premise that "'science' cannot be separated from 'politics' but that political factors underlie the formulation, dissemination, and institutionalization of scientific knowledge and networks" (Forsyth 2003: xiii).

Critical political ecology is an approach within this broader field described by Forsyth (2003) in his book of the same name. He calls for a critical appraisal of the relationship between knowledge production and social change on the basis of three conclusions:

> First, many supposedly universal and politically neutral statements about ecological reality reflect the social and political circumstances in which knowledge was produced. Second, many scientific statements are used to give legitimacy and urgency to different political viewpoints when there is actually much debate and uncertainty about such statements. Third, often the interactions of political argumentation provide a direction for knowledge production as different actors seek ways to legitimize and strengthen their political positions through scientific statements (Forsyth 2003: 115).

The problematique outlined by Forsyth above is echoed by other scholars, such as Michael Carolan who argues that the unproblematic acceptance of concepts that signify environmental degradation (such as deforestation and lack of diversity) blinds us to the

fact that these concepts "are often un-reflexively couched within the existing terms of environmental discourse and scientific concepts in ways that seek to impose structure and order onto complex realities" (Carolan 2005: 8).

An integral idea within the approach of critical political ecology is the coproduction of knowledge and social movements, defined by Sheila Jasanoff as "the simultaneous production of knowledge and social order" (Jasanoff 1996:393). This theory explains the dance between science and politics where each influences the other, with the important recognition that this an on-going, dynamic process, with no fixed end point (Forsyth 2003).

Through the idiom of coproduction it is possible to investigate the social phenomena that intersect with the ecological reality of a given situation. Guston (2001) goes further to describe as important sites of coproduction the boundary organisations that sit 'on the fence' between science and politics such as NGOs and government agencies. He argues that:

> The politicization of science is undoubtedly a slippery slope. But so is the scientization of politics. The boundary organization does not slide down either slope because it is tethered to both, suspended by the coproduction of mutual interests (Guston 2001: 405).

Guston's concept of a boundary organisation fits with the idea of a 'bridging organisation' as described by Berkes (2009) which he defines as crucial to successful co-management, as they are involved in trust-building, social learning, networking, conflict resolution and building vision and goals. These organisations also help bridge the gaps between science and local knowledge, provide access to information and resources and are integrally involved in co-producing knowledge (Berkes 2009).[23]

This situation of the coproduction of mutual interest may not hold when there is a political struggle between parties with varying degrees of influence within mainstream

[23] The importance of bridging organisations is further explored in the context of marine turtle and dugong management in Chapter 9.

society. There is a danger that the dominant discourses of society may be reinforced as conflicting opinions and knowledge systems are often edited out, or discredited through the mechanisms of the scientific or political processes.

> This may lead to the implementation of policies that are socially injust, or simply ineffective in resolving the perceived environmental problem. The science behind an environmental issue or debate may be highly uncertain, yet the mechanisms of power that operate both within the institutions of science, and within the political realm will operate in a way that minimises any potential ambivalence about the issue (Forsyth 2003: 20).

The particular concern of critical political ecology, as described by Tim Forsyth (2003), Lisa Campbell (2005) and others including this thesis, is the inequalities and social injustices that may be applied by the uncritical acceptance of environmental orthodoxies. Because of the power imbalances that often exist between the nexus of policy and science and the realities of people living in the areas discussed by this nexus, it can be very difficult for local views to be heard or acted upon within the institutions of politics and science.

This brings into question the issue of scale, a concern mainly voiced by researchers from the field of human geography, but also increasingly those ecologists engaged with complex systems.

> One of the insights from complexity thinking is that a multiplicity of scales prevents there being one 'correct' perspective in a complex system. Phenomena at each level of the scale tend to have their own emergent properties. The system must be analysed simultaneously at different scales (Berkes 2004: 623).

My particular interest in the workings of geographical scale comes from the realization that due to the increasing globalization of this world, the 'risk society' experienced by much of the industrialized cultures is being exported to people in far flung regions of the globe (Beck 1992).

> Promoting conservation action at a particular scale is not simply a matter of biological or ecological necessity, but serves the political interests of particular groups (Campbell 2007: 313).

It is important to recognize that the goals of conservation groups and local community aspirations are not necessarily aligned, and the ethical implications of international intervention at a local scale can become very murky indeed.

Despite an increasing recognition of the problems faced by ecologists explicitly working with the human dimension there is not always an acknowledgement of the political power that scientific knowledge represents within these systems. The power differentials between the scientific expert and the lay or Indigenous expert may impact upon the success or failure of projects that attempt to integrate different ways of knowing. Unfortunately, the tools needed to examine and understand the effects of power and knowledge are not routinely taught to scientists, and many ecologists remain blithely unaware of their own cultural assumptions when working with people of different backgrounds. In order to move towards these kinds of understandings, researchers need to be able to critically reflect upon the relationships between science and society, including an investigation of the power/knowledge dynamic that makes up much of this relationship.

The linkage between power and knowledge was most famously described by Michel Foucault, and published in his 1980 book of the same name:

> Knowledge and power are integrated with one another, and there is no point in dreaming of a time when knowledge will cease to depend on power...It is not possible for power to be exercised without knowledge, it is impossible for knowledge not to engender power (Foucault 1980: 52).

Foucault's notion of power is one that is productive, fluid and omnipresent. It can move very quickly from one discourse (or way of knowing) to another as the context changes (Foucault 1980). Thus power may act in different directions upon the same discourses in alternative settings. The relationship between power and knowledge is complicated - that is to say that power and knowledge flow in many different directions and the outcomes of their movements are not always predictable to the investigator (Kesby 2005).

It is precisely these murky grounds that I seek to investigate, through the exploration of the various workings of science, politics and culture around the sites of the coproduction of knowledge about marine turtles and dugong in Australia. This approach follows the suggestion of Forsyth (2003) in examining the workings of environmental science:

> To understand the evolution of environmental science in more detail, researchers need to focus on the roles of specific actors within shorter-term debates in environmental politics. Such an inquiry requires looking at how coproduction takes place on a day-to-day basis. It also requires identifying and analysing both 'actors' that influence environmental science, and the 'structures' and institutions that constitute environmental science (Forsyth 2003: 135).

4. Issues of participation and acceptance

If the challenge of exploring human relationships is taken up by ecologists, this raises ethical issues of how this is done and who is able to speak on another's behalf. These issues have been comprehensively discussed by many other disciplines that have traditionally been involved with human relationships, such as anthropology and sociology (to name but two of a myriad) and ecologists can learn much from these discussions (e.g. Cooke and Kothari 2001; Kesby 2005).[24] The move towards a more inclusive, participatory research style is paramount if ecologists and environmental managers wish to make lasting changes in the ways in which humans relate to their environment, as the support of local communities is key in environmental stewardship (Shackeroff and Campbell 2008; Zimmerer 2006).

If ecologists are serious about participatory approaches, they must also tackle the problem of how to engage in non-scientific ways of relating to and knowing about the environment. True participation requires listening to and at least attempting to understand the worldview of all the people involved in a research program (Fabricus et al. 2007).

[24] These issues are also discussed in greater depth and with reference to the appropriate literature in Chapter 3 and 5.

The relationship between local, Indigenous and lay knowledges and science is fraught with difficulty, as there is a tendency for each to claim to be the only way of viewing reality (Agrawal 1995). By this logic anything that does not 'fit' the established order cannot be legitimised, or in fact recognised within the bounds of the known knowledge system:

> I suggest that the attempt to create distinctions in terms of Indigenous and western is potentially ridiculous. It makes much more sense... to talk about multiple domains and types of knowledges, with differing logics and epistemologies (Agrawal 1995: 30-31).

Indeed as Agrawal (1995) points out, the distinction between science and 'other' ways of knowing may not be clear, though scientists often insist upon the distinction as they continue to enforce the boundaries between what is defined as scientifically valid and what is not.

This appears to come to the nub of the difficulty that ecology, and ecologists have in assimilating knowledge from 'other' knowledge systems. As these systems of classification are viewed as 'other' since they do not mesh with the internal logic of science, they present scientists with the problem of ambivalence; specifically, where can this information be classified?

Bauman (1991) links intolerance of the 'other' with the desire to be rid of ambivalence. In seeking to clarify the messiness of reality, modernity struggles with the notion of difference, particularly with how to deal with a completely 'other' point of view or system of knowing:

> Intolerance is, therefore, the natural inclination of modern practice. Construction of order sets limits to incorporation and admission. It calls for the denial of rights of everything that cannot be assimilated – for the de-legitimation of the other. As long as the urge to put paid to ambivalence guides collective and individual action, intolerance will follow (Bauman 1991: 8).

Lip service may be paid to the idea of 'Traditional Ecological Knowledge" in a project or by a management agency, but this may never go beyond the production of glossy

brochures with photographs of Indigenous elders on country, or lists of the traditional names for local species. True integration of another way of knowing the environment is far more challenging (and therefore rare) as it requires the understanding that our own way of viewing the world is as subjective as another's (Watson and Huntington 2008).

The practice of token acceptance of the exotic is related to the concept of 'toleration' as espoused by Bauman (1991) who states that at times intolerance will 'hide' under its guise but this toleration is not the same as legitimation or acceptance:

> Toleration does not include the acceptance of the other's worth; on the contrary, it is one more, perhaps somewhat subtler and cunning, way of reaffirming the other's inferiority and serving an advance warning of the intention to terminate the Other's otherness - together with an invitation to the Other to co-operate in bringing to pass the inevitable (Bauman 1991: 8).

This last idea may represent the uneasy relationship that some areas of science now have with alternative knowledge systems. As the recognition of the importance of incorporating alternative perspectives into the science-policy debate grows, certain fields of ecological science have reached out to investigate the 'other' (Drew 2005). In many cases this has been limited to selecting the parts of 'traditional ecological knowledge' that are the most 'science-like' (such as classificatory systems, location of breeding grounds and so forth). This has led to a strengthening of the perception of difference between science and other knowledge systems (Agrawal 1995).

> A virtual cottage industry has thrived from this segregation, especially within the subfields of linguistics and human/cultural ecology, to translate Native empirical observations for a Western audience. The task has been to 'reconcile' Indigenous 'myth' with Western knowledge by collecting, mapping, quantifying, and archiving not the IK [Indigenous Knowledge], but the local knowledge of soils, fish, glacier locations, or other objects of knowledge (Watson and Huntington 2008: 262).

Watson and Huntington go on to argue that the production of knowledge in both Indigenous and scientific systems is based on the practices undertaken by the investigators which are inherently subjective and value laden despite scientists' claims to the contrary

(Watson and Huntington 2008). Until practitioners of science recognise their own subjectivities it will be impossible to treat different ways of knowing on a more equal basis.

The recognition of the difficulty that scientists face in collaborative projects opens the possibility for an insightful exploration of the ambiguity felt when faced with alternative knowledge systems. By exploring points of ambivalence - where there is a divided response to a situation - researchers can reach a deeper understanding of the underpinnings of our own belief system and how that relates to one held by others. One framework for respectful exploration of ideas amongst people of differing backgrounds comes from David Bohm's rules of dialogue, written in 1991 with David Factor and Peter Garrett. In essence Bohm recommends that all participants suspend their assumptions – recognising that they exist and with a willingness to explore their basis. Participants in the dialogue must also see one another as equals, without the distortion of power imbalances. Finally Bohm (1991) calls for unobtrusive facilitation in the early stages of the dialogue in order to overcome 'sticking points for the group'.

These ideas come close to the 'transpersonal-collaborative' discourse for ecological integrity described by Manuel-Navarrete et al. (2004) who urge scientists to participate in dialogues from their own situated position, discussing what is important for each participant and attempting to understand the decisions of the other participants.

5. Defining appropriate discourses for a hybrid ecology

Manuel-Navarrete et al. (2008) describe three types of discourse that may be used by scientists discussing an ecological issue. Firstly they outline what is termed the 'normative' discourses that are typical of mainstream science, where emphasis is placed on discrete problem solving by technical experts. Secondly they recognise an 'ecosystemic-pluralistic' discourse which characterises fields such as political ecology and post normal science, where experts attempt to engage with local communities and place value on collective or pluralistic problem solving (though still retaining control over the processes of investigation and management). Finally they describe an emerging discourse termed 'transpersonal-collective' which is a much broader approach that takes in as many different viewpoints as possible into the decision making process, and weights each

equally. Control over the processes is no longer held by institutions (although they do participate) but by the collective group. Management and investigations become more fluid but also more limited in the sense that they are only applicable at a local level (Manuel-Navarrete et al. 2008: 341):

> In this last discourse, logic, deduction and prediction are complemented with a narrative knowledge that prioritizes human intentionality, intuitive validation, meaning making and finding truth in introspection rather than solely in what is externally (i.e., empirically) verifiable. Individuals assign values via inner mechanisms and judge the "worth" of information based not only on reason but also on their emotional (and spiritual) response to that information.

Each of the three discourses embraces a different perspective in regards to the place of humans in the world. Thus, the 'normative' discourses are typified by the nature/human dualism found in traditional ecology, and tend to employ 'command and control' strategies in management; the 'ecosystemic-pluralistic' discourse considers humans as a discrete part of the ecosystem and favours adaptive and participatory management; and finally the 'transpersonal-collaborative' discourse sees the world at one with humans and promotes collaborative learning as the best method of engaging with the world (Manuel-Navarrete et al. 2008).

Manuel-Navarrete et al. (2008) raise the point that the internal consistency of each of the discourses decreases as the number of perspectives that are included increase. Thus the transpersonal-collective discourse has little internal consistency, leading to a complex negotiation between all the parties, which may take a great deal of time to reach consensus. The obvious criticisms of this approach are that progress is likely to be slow and will take a great deal of energy from the participants in revisiting and reassessing each perspective until all parties can agree on a way forward.

The transformative-collaborative discourse is an approach that many practitioners who have worked successfully with Australian Indigenous communities will recognise; as the key aspects of allowing all voices to be heard and a fluid approach to the timing of decision making echoes the traditional (and in many instances contemporary) ways of conducting business 'on country' (Walsh and Mitchell 2002). The difficulty lies in

reconciling this discourse with the very different perspectives held by other parties in the discussion, often government agencies with tight budgets and timelines, not to mention reporting frameworks that primarily position them in the normative discourse, although some non-government institutions and bodies may be more flexible, and practise negotiations that fall within the ecosystemic-pluralistic discourse.

An example of this is given by Horstman and Wightman (2001) when outlining their advice to ecologists from their own experiences of working with Indigenous people in northern Australia:

> Flexibility is required at all levels, from an ability to alter fieldwork schedules at short notice to fit in with communities and individuals, to being able to incorporate Traditional Owners' ideas and desires into the project. For example, researchers must be able to alter schedules to allow for funerals, 'sorry business' and other unpredictable events, even though they may have planned work months in advance...Projects need to be discussed in detail, often several times, often with several groups. Time needs to be allowed for community members to discuss the project when the researcher is not there (Horstman and Wightmann 2001: 102-103).

During the course of this thesis I will be reflecting back to the three discourses as conceived by Manuel-Navarrete et al. (2008) and identifying moments where I observed these concepts in action, and the resulting effect upon negotiations over marine turtles and dugong by conservationists, Indigenous people and other resource users. By doing so I hope to shed light upon the relative strengths and weaknesses of each approach for the resolution of conflict between people over the appropriate management of the ecosystem.

To this end this thesis explores the relationships between Indigenous communities, scientists and marine turtles and dugong in Australia in a variety of settings and historical fields. The theoretical discussion above reflects the intellectual concepts that I as a researcher brought with me as I began my research journey. The next step was for me to step outside of the safe spaces of academia and into the 'real world' of fieldwork, as I began to explore what kinds of relationships other people had with marine turtle and dugong, beginning with an Indigenous community.

Interlude: Searching for Barry Hart

As a naïve researcher coming from a particular background - biological sciences - and wishing to investigate the interactions between cultures on an environmental issue I faced several major epistemological hurdles, such as the ethical issue of how to negotiate between cultures in a respectful and meaningful way, given that the relationship between a researcher and an Indigenous community is one shadowed by many years of inequitable and exploitative power relations.[25]

Another major stumbling point was how to engage with the vast arena of knowledge about cross-cultural interactions held by anthropology and social science without losing my grounding as an ecologist. I had no training as an anthropologist or social scientist yet I was proposing to venture into intellectual spaces dominated by these fields. It was almost like working in another culture. There was a different language, and different signposts and references to stories that I knew nothing about. I risked (and still risk) making a fool of myself by omitting to mention key events that have occurred in these traditions. By falling into obvious conceptual traps long known to the experts in these fields. By confusing long standing enemies as friends... dangerous ground for a doctorate that must be examined by both natural and social scientists.

Interestingly, in retrospect my approach to both the unknown disciplines and the unknown Indigenous culture were very similar. I found myself fascinated with new ideas and insights, yet remained conscious that although I was deeply attracted to the 'other' it was other than me. My field notes struggle with the idea – 'I am not an anthropologist', they declare – 'it is still too strange - I am an outsider'.

In order to make sure I was not erring in my translation of concepts from one world to the other, I represented my ideas back to both communities - 'Does this story make

[25] The trick is to simultaneously acknowledge and avoid repeating this history, a challenge that will be described in depth in the following two chapters.

sense? Have I missed something here?' In many cases there was a resounding 'Yes! You haven't mentioned Levi-Strauss here and his work is key to these concepts!' 'Oh. Tell me about his work - where can I find it? Point me in the right direction at least?'

This married beautifully with similar experiences in the Indigenous community - 'You need to speak to Barry Hart![26] His father was the best dugong hunter in the community and Barry is his only surviving son' 'Oh. Where can I find him? Can you point me in the right direction for his house at least?'

Unfortunately Indigenous informants (unlike published references) reserve the right to withhold their knowledge from pesky researchers, and somehow over the four years I spent in the Bardi and Jawi communities I never did get a hold of Barry.

[26] Pseudonym

Chapter Three: Ethical and Methodological approaches

In this chapter I provide an argument for the methods used in my research, by clarifying the reasons behind my methodological choices. I frame these choices in the context of the three conceptual shifts that Berkes (2004) recommends for ecologists working with communities on conservation issues – that is, the methodological approaches that I use support the view that ecosocial systems are complex and uncertain, that working on these projects requires the integration of human culture (including the political) into the field of ecology, and that a participatory approach to research is fundamental to ethical and sustainable practice.

1. Ethical Tensions in Indigenous Research

The ethics of working with Indigenous communities or any other disempowered group is challenging for scientists and managers, particularly as our training rarely encompasses an in-depth exploration of the potential impacts of our research on the study site (in this case the community) and the consequences of our agency on the power relationships and politics found in human society. If ecologists are serious about encompassing the human into our sphere of interest then we must take on these issues as matters of high importance.

The struggle for engagement with the area of Indigenous environmental knowledge parallels with other power/knowledge contestations between white academia and Indigenous culture described by authors situated in alternative disciplines, such as health, sociology and development studies. A great deal of attention has been given to the tensions that arise on the 'post colonial frontier' or the intersection between cultures (e.g. Kowal 2006).

Controversy still surrounds some aspects of traditional anthropology with criticisms from Indigenous scholars and others who argue that the idea of exploring another culture from the outside is inherently flawed. This argument is based on the premise that there is no such thing as an objective observer in research, and the conclusions drawn by outsiders will always

be coloured by their own culture and experiences, and may in fact reveal more about themselves and their worldview than that of the people they are 'researching' (Moreton Robinson and Nicoll 2006).

> Post- colonial discussions have also stirred some Indigenous resistance... to the idea that colonialism is over, finished business. This is best articulated by Aborigine [sic] activist Bobbi Sykes, who asked at an academic conference on post-colonialism, 'What? Post-colonialism? Have they left?' (Smith 1999a: 24).

Some scholars in this field contend that the colonial era is not yet over because there has never been proper resolution and negotiation between the white power structures and Indigenous communities in the form of a treaty or legal document that recognises the rights of both parties (Nicoll 2000). By this logic, Indigenous communities still living in their traditional homelands are not automatically subject to the laws and norms imposed by white government and culture, as they have never formally accepted the invaders as their legitimate rulers.

Rural and remote Indigenous communities may in this sense be conceived of as sites of resistance against the dominant white power structures – and indeed some authors describe the apparent dysfunction in Indigenous communities as an act of resistance (i.e. Cowlishaw 2003a), but this is a highly contested concept (see Sutton 2005).

Others have criticised the methodology and ethics of researchers who come into a community to learn and return little of value to the 'researched':

> The power of research was not in the visits made by researchers to our communities, nor in their fieldwork and the rude questions they often asked. In fact, many individual non-Indigenous researchers remain highly respected and well liked by the communities with whom they have lived. At common sense level research was talked about both in terms of its absolute worthlessness to us, the Indigenous world, and its absolute usefulness to those who wielded it as an instrument. It told us things already

> known, suggested things that would not work, and made careers for people who already had jobs (Smith 1999a: 3).

'Whiteness studies' is one reaction to such criticisms and aims to turn the focal gaze upon the unspoken category of white culture - often seen as invisible as it forms the basis for 'normality' in mainstream Australian and indeed international culture:

> Whiteness itself is thus atomized into invisibility through the individualisation of white subjects. Whereas nonwhites are perceived first and foremost as a function of their group belongingness (and then as individuals), whites are perceived first as individual people (and then secondarily, if at all, as whites) (Chambers 1997: 192).

Another response to these criticisms has been the growing trend of reflexivity within the discipline of anthropology that has allowed for an interrogation of the researcher as well as the researched. Australian examples include the work of Gillian Cowlishaw (1999, 2003b, 2006) and Emma Kowal (2006, 2011) who provides a compelling exploration of what she terms 'the postcolonial frontier'.

Coming from the perspective of a public health practitioner in Darwin, Kowal describes the internal culture of 'white anti-racists' working with Indigenous groups in the Northern Territory in the health arena. Her thesis provides a recognisable description of the tensions that are common amongst white service providers and researchers working with Indigenous communities across northern Australia.

Central to the tensions described is the ambivalence between what is desired by white culture and the realities experienced by outsiders when immersed in these communities. Kowal describes the desires of the white anti-racists as also conflicted - while health providers ultimately are seeking 'remedial difference', or the ability for Indigenous people to change to a more recognisable and acceptable 'white' culture, this desire conflicts directly with the

opposing desire for Indigenous groups to retain a romanticised traditional culture, a desire she labels as 'orientalism'[27]:

> Orientalism without remedialism removes our drive to help, and thus our reason for being there. It turns us into voyeurs, or worse, anthropologists. But remedialism without orientalism turns us into assimilationists. Without difference filling our sails, the tide of liberal melioration leads us ever toward the ideal 'healthy subject' which, as we will see, turns out to be white and middle-class (Kowal 2006: 254).

The attraction of the other, or 'alterity' to the outsider is strong, and Kowal describes how white anti-racists are drawn from the comfort of their mostly middle class existence in the cities of the 'south' to the frontier of northern Australia where the colonial expansion is still taking place. When these enthusiastic missionaries of a better life are confronted by the 'radical difference' that exists in the communities they seek to serve, many undergo a crisis of their beliefs:

> After this initial unsettling, postcolonisers who inhabit the postcolonial frontier experience a permanent sense of uncertainty (Kowal 2006: 220).

The great strength of Kowal's writing comes from her lucid descriptions of what it is like to be an 'anti racist' white researcher working on the post colonial frontier, as she captures the self doubt and angst that I felt during my interactions between cultures in the hybrid space that is this frontier:

> The uneasiness practitioners display when defining their professional identities can also be understood as uneasiness with the relativist possibility. If the notion that Indigenous aspirations are completely different to those of practitioners is allowed to

[27] After Edward Said's classic book of the same name that described the relationship between scholars in Great Britain with the countries and culture of the Middle East, this term has been widely used to describe the romantic images western cultures develop about the 'other'.

flourish, practitioners actions will be seen as 'imposed self determination' or neocolonialism (Kowal and Paradies 2005: 1354).

2. Dealing with uncertainty and complex systems

Traditionally scientific research prides itself in objectivity, deductive reasoning and the following of a clear, predetermined research path. This kind of research is inappropriate for investigations proposed in this thesis, particularly as there is a central recognition that the complexity and uncertainty represented by the systems under investigation cannot be described as if they were objects in a laboratory setting. The logic of doing this kind of subjective, dynamic interpretation is antithetical to the objective scientific training I received as an undergraduate. As an ecologist I was taught that the data I collected would represent the reality of the natural environment I was observing.

In order to properly engage with my research problem I made three major departures from the traditional scientific approach - I chose an evolving rather than a predetermined research path; reflective rather than deductive reasoning; and a subjective rather than an objective relationship to my research.

2.1 Subjective rather than objective research

My personal relationship to the research topic, and to my informants is a central focus of my approach to both the investigation and its analysis. I have deliberately situated myself within the research, reflecting on my own changing relationship to my subject as I continually incorporated new data into my conception of the field. By bringing my subjectivity to the forefront I allow for the interpretation of the impact of this subjectivity upon the direction of the research and the conclusions reached. This kind of approach is one that has found favour in recent sociological research, where the relationships between the investigator and the research participants are seen as key to the shaping and results of the research in question:

> The 'reflexive turn' in the social sciences has contributed towards demystification and greater understanding of theoretically and empirically based knowledge construction processes. The partial, provisional and perspectival nature of knowledge claims is recognized. There is increased awareness that 'how knowledge is acquired, organized, and interpreted is relevant to what the claims are'. The production of theory is described as a social activity, which is culturally, socially and historically embedded, thus resulting in 'situated knowledges' (Mauthner and Douchet 2003: 416).

It is by examining the very areas that physical science ignores – our personal motivations and reactions to events in the field - that sites of greatest richness for the social research can be found. This means involving our analytical heads to investigate our emotional hearts in order to discover more about the ways in which humans relate to one another (and their environment):

> Emotion is an inevitable and important part of the researcher's motivation and choice of orientation, and of the specific way in which the topic studied is handled. The research process should be explicitly guided by individual researchers' willingness to reflect upon and listen to their own feelings...It follows that self-reflection and the critical self-analysis of feelings are an important part of the research process, particularly in qualitative research...To see research work as not only a perceptual and cognitive but also an emotional project can enhance its value (Alvesson and Skoldberg 2000: 217).

By recognising the subjective nature of my relationship to my research, and recording my emotional responses to key events I believe I have created a richer record than would have been possible if I had attempted to remain 'objective' in my approach. As a great deal of my work involved creating relationships with other people in order to understand their ways of viewing marine turtle and dugong, I needed to be genuine in my approach and response to their friendship.

In relation to working with Indigenous people in the Australian context Walsh (2009) questions whether objective dispassionate research is appropriate or even possible, as cross-cultural engagement requires interpersonal relationships that express genuine empathy, interest and emotion. Additionally, people will often refuse to share knowledge unless there is a reciprocal relationship with the researcher. One must be known, and trusted to give as well as take before access to information is granted[28].

2.2 Evolving rather than predetermined research path

A second methodological approach to address the complexity and uncertainty of the research site is to use an evolving rather than a predetermined research path. In this way the researcher is not tied to any particular result from the outset, but is free to take the path of greatest richness, following leads as they emerge and constructing a story from the data that follows.

The research process used in constructing this thesis evolved over time but at its core was the idea of investigating human relationships with marine turtle and dugong. I positioned myself the researcher as an active participant in the research process, reporting back on my changing relationships with science, the Indigenous community and country (as represented by marine turtle and dugong). Flexibility was built into the research process through an open ended adaptive design that allowed for changing priorities and for new themes to emerge from the data, in what is known as a heuristic approach.

Heuristic research involves a process of discovery whereby the researcher is constantly redeveloping their approach to the subject on the basis of what they have already discovered.

> The self of the researcher is present throughout the process and, while understanding the phenomenon with increasing depth, the researcher also experiences growing self-awareness and self-knowledge. Heuristic processes incorporate creative self-processes and self-discoveries (Moustakas 1990: 9).

[28] This relationship raises several ethical issues that will be discussed in the following chapter.

The research design was influenced not only by ideas of heuristic discovery with its emphasis on intuition and evolution over time, but also the ecological concept of adaptive management with its emphasis of changing an approach to suit the current situation, as conceived by Archer (2007) who describes 'an inductive or heuristic approach, not based on traditional hypotheses but centred on an iterative process. Leads and issues were followed up as they arose, one led to another and the final position was not clear until all available evidence was to hand' (Archer 2007:10). Thus my research path spiralled out from the central core problem of my own response to turtle and dugong hunting, gradually incorporating more and more of the world in an attempt to answer why and how this issue had come to cause conflict between cultures.

The iterative nature of research has been recognised for a long time, as can be seen by this quote from Becker in 1965:

> No matter how carefully one plans in advance the research is designed in the course of its execution. The finished monograph is the result of hundreds of decisions, large and small, whilst the research is underway (Becker 1965: 602).

Researchers are able to specifically direct their audiences to why they made the choices at each moment in time and often reflect upon the underlying motivations and influences that guided the direction of their inquiry.

To this end my research methodologies were based on a reflexive style of investigation where I was continually questioning my own motivations and assumptions in order to shed light on the process of my own analysis. Recognising that I could never be an objective observer in my research, I attempted to bring forward my own personal bias in order to see what impact it had on the way in which I firstly conducted my research, and secondly, the way in which I interpreted the experiences and data that I collected. Given the length of time involved in my research (some nine years) I was able to reflect upon certain key events on a number of

occasions, each time recognising more of my own motivations, limitations or prejudices as distance gave me a broader perspective.

2.3 Reflective rather than deductive reasoning

The choice to use a reflective rather than a deductive research path was based partly on the concept of adaptive co-management, where an iterative approach to endeavours is conceptualised through feedback loops in which new information is constantly reintegrated into the decision-making process (Olsson et al. 2004); and partly on the notion of reflexivity as understood in the social sciences, which requires the researcher to double back and reinterpret their conclusions when new information comes to light, a process that recognises that the relationships between the researcher, reality, the data collected and the conclusions reached are constantly changing (Alvesson and Skoldberg 2009).

Portions of this work draw on the ideas of examining the self as a subject by focussing on the areas where I felt discomforted by my explorations, and describing these moments in a form of personal narrative. This narrative is primarily based on the entries in my field diaries, an approach that is well developed in anthropological and sociological traditions (Chase 2005; Atkinson and Delamont 2006):

> The recognition of ones own subjectivity becomes a primary focus of reflection and discussion in the research process, as it is only by clearly stating our assumptions that we can explore why it is we have come to them, and thus move beyond our inbuilt conceptual constraints (Alvesson and Skoldberg 2000: 246).

This approach, known as reflexivity in the social sciences, has become more popular as scholars increasingly question the innate subjectivity of the work they produce. Alvesson and Skoldberg (2009) propose four levels of reflection for the researcher. To begin with they suggest starting with an investigation of empirical reality - then reflect that this is only a personal interpretation of reality, then reflect upon political and ideological influences that formed the initial interpretation, then be aware of the influences of other discourses upon

your text production, in a process they call *reflexive interpretation* (Alvesson and Skoldberg 2009: vii):

> Reflection means interpreting one's own interpretations, looking at one's own perspectives from other perspectives, and turning a self-critical eye onto one's own authority as interpreter and author.

Reflection (reflexivity) is thus above all a question of recognising fully the notoriously subjective relationship between the researcher and their 'subject' or the world. Robert and Saunders (2005) call for an increased emphasis on a recognition that dilemmas that emerge at different stages of the research are often temporary, and may later be resolved through further experience or reflection. Thus the researcher is portrayed as being on a research journey, where their understandings of what is occurring are constantly refined and evolving (Mauthner and Douchet 2003).

3. Participatory research

A further shift for ecologists working in the arena of community conservation proposed by Berkes (2004) is towards the practice of participatory research. This involves bringing members of the community into the research process, certainly as informants, but ideally also as active proponents of the direction and outcomes of the research. Pain and Frances (2003) define participatory research as being characterised not by the techniques or methods used by the researcher, but rather by the degree of involvement by the participants in the research project. They see participatory approaches not so much as methodology, 'but as a process through which communities can work towards change' (Pain and Frances 2003: 46).

Criticisms of the use of participation as a research approach generally focus on the many definitions of the term 'participation' which may in fact cover a wide range of community involvement, from a mere 'consultation' or information sharing, to true engagement with the needs and desires of the community in question. This range was originally described by

Arnstein (1969) who provides what she called the 'ladder of citizen participation', which ranges from the lowly 'manipulation' up to 'citizen control' of a process. Issues of engagement still plague the use of the term participation, which is often seen as co-opted (both deliberately and unintentionally) by dominant power structures such as government institutions.

The potential misuse of this approach is discussed in depth in a collaboration edited by Cooke and Kothari (2001), which describes many ways in which the authors see participation as forming 'the new tyranny'. Examples of the challenges to this methodology are that power relations are often still imposed by outsiders on communities that are conceived (erroneously) as discrete and socially homogenous, that 'local knowledge' and action may be prioritised at the expense of recognising the importance of external processes and institutions in supporting community action, and that there needs to be further recognition of the problematics of undertaking participatory research in the field (Cooke and Kothari 2001).

This book has had a wide impact on the field of participatory research, but has been criticised by Kesby (2005) who argued that the views it raised, while valid, did not allow for the positive results that had been seen in communities where participatory techniques had been used:

> I agree that participation is a form of power, but disagree that it can therefore only be resisted. I agree that power cannot be escaped but dispute the unproblematic privileging of resistance. Because I take seriously the claim that power cannot be avoided, I suggest that it must be worked with. I propose that resisting agents must draw on technologies such as participation in order to outmaneuver more domineering forms of power. This formulation allows empowerment-through-participation to be revalorized and retheorized along poststructuralist lines (Kesby 2005: 2038).

One of the original methodologies in this field is that of Participatory Action Research (PAR), a technique that was developed in order to help communities work towards change

(McTaggart 1991; Stringer 1993). This approach was originally intended to be an emancipatory methodology to improve outcomes and the equality of relationships between a researcher and the community they work with, particularly in cases where the community is seen as disadvantaged in some way.

Despite the increasing use of such methodologies, some of the more reflexive practitioners still find themselves questioning their own agency in the research process, and the unintended consequences of their actions and ambiguous areas of unease exist within even the most collaborative of participatory projects. Riecken et al. (2005) question the us/them binary inherent in working with a technique that explicitly sets itself out to empower the marginalised, and ponder whether this stance may in fact perpetuate difference while attempting to relieve it:

> Such an orientation has the potential to make PAR into something that one 'does' to others in the service of liberation. If it is indeed liberatory, for whom is it liberating and from whom and what? Is it yet another form of missionary proselytising in which the goal for conversion is a PAR defined version of emancipation? The danger in PAR is that by defining others as marginalised or oppressed, it subjugates at the same time that it creates a we/them dichotomy. I am wary of this aspect of PAR (Riecken et al. 2005 [29]).

Although my intention was to conduct participatory research with the Bardi Jawi and Mayala communities the reality of the fieldwork was much more complex than I initially envisaged. In retrospect I found it hard to decide whether the process that actually took place could be defined as truly participatory as defined in methodologies such as PAR by McTaggart (1991:169): [30]

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[29] Available at http://www.qualitative-research.net/index.php/fqs/article/view/533

[30] A detailed discussion of these issues can be found in the two chapters that describe my time working with the Bardi Jawi and Mayala peoples. The specifics of how the researcher/community relationship initially unfolded can be found in Chapter 5. The added complexity involved when the project moved out of my control and into an institutional framework is discussed in Chapter 9.

> If we decide that something is an example of participatory action research, we are suggesting that it is likely to have improved the lives of those who have participated. If we decide to the contrary, we are questioning whether the activity has done as much as it might have (without necessarily condemning it, for it might have accomplished something).

4. Reintegrating the human – situating the researcher

Kowal (2006) describes her own reflexive ethnographic work as a practice of reflecting back on previous field notes and diaries with special attention to the ways in which her presence and interactions alters the research site. It was with this intention that I continuously wrote and reflected back on my own field diaries, which documented not only my time in the field but also my struggles with theoretical and methodological concepts throughout the entire period of my candidature.

Research that includes a personal narrative of the researcher has the ability to provide a rich insight into the ways in which research is conducted, and the often difficult nature of producing a coherent story from the complexity of the observed events. Personal narrative accounts are not unproblematic though, and have been criticised for the potential to assume that the voice of the author should be uncritically accepted, in contrast to the voices of other participants, which are generally closely examined and analysed in the text (Riessman 2003).

> Such accounts must be treated with analytic symmetry. We cannot proceed as if they were privileged accounts, or if they gave the writer and the reader access to the private domain of personal experience. The autobiographical narratives of ethnographers are subject to the same cultural conventions as are any of the other of the social actions and performances that they might document (Atkinson and Delamont 2006: 201).

In short, the reader of a personal narrative should be aware that like any other data presented for examination, the personal narrative has been carefully selected and positioned to strengthen the theoretical arguments made by the author, and it is incumbent on the writer to

support these accounts by the use of other, less subjective texts in order to provide a convincing thesis.

To this end, in the chapters where I have made use of my personal narrative to illuminate my arguments, I have also provided supporting evidence from the literature and historical research in order to triangulate (or cross verify) my conclusions. This follows the advice of Denzin (2005: 3) that 'the researcher must combine his methods in a process termed triangulation; that is events must be examined from the vantage provided by as many methods as possible.'

The following chapter provides a detailed description of the methods I used in collecting my primary data and the process used in collating and analysing both this and the secondary data sources that form the corroborating evidence of the storylines I have chosen to tell.

Interlude: My first time

8/7/2001: Broome

First day in Broome. Today was 'relaxing' day, trying to not stress about things. I'm sure everything will be okay but everything is hanging on this going right.

Tomorrow I will contact (Indigenous contact), and hopefully he will be able to take me up the cape on Tuesday. I am not banking on it though... He may be doing other things. I do feel that I need to be up there for the community meeting though. It is hard to say whether it would be better to wait until (Indigenous contact) can take me up, or go by myself. I am very nervous about going up on my own - so perhaps I should wait. I will certainly ask (Indigenous contact) what he thinks.

We are booked into the Kooljaman[31] *campsite for Tues-Fri nights so I plan to try and contact all the communities at least once in this time and then maybe again next week if I feel the need.*

I must ring each community before I go up too - scary stuff for me. I think that once I'm there, talking to people I'll be okay. I think I can answer any questions, I hope I can present myself and my project in a way that works. I have the best intentions but I cannot assume that the communities will agree that my project is a good thing.

10/7/2001 Kooljaman

Just arrived at Kooljaman. It's about 10am. One hour to go until the Community A meeting. I can't believe we made it up here okay and early. The roads were shocking because it RAINED yesterday and last night, something which is unheard of in Broome at this time of year.

When we got here they told us that the road has been closed -. but I'm here now. What am I going to say? I hope I can be clear about what I want to do and how I feel my project might benefit the community.

[31] Tourist resort located within Bardi – Jawi country and run by the communities.

LATER

Just got back from Community A. The community meeting was called off due to a lack of councillors. I did have a chat with three council members though: (senior Bardi woman, elder and hunter 1, elder and hunter 2). I spoke most with (elder and hunter 1), and then (elder and hunter 2) also. (Elder and hunter 1) seems very knowledgeable, not just in terms of traditional ecological knowledge, but also in terms of biology etc. (Elder and hunter 1) seems keen for me to do my project, he sees the need for 'someone to help us tell government that we know best' or along those lines. Really doesn't like fisheries - seen as implacable/unstoppable. (Elder and hunter 2): really keen to get a turtle farm again, and release 1-3 year old turtles. (Elder and hunter 1) is pretty keen on this too. Both were more positive after I explained that I would be up here long term.

I think I said all the right things. I didn't explain the whole project - just that I wanted to work on cross cultural communication - on giving Aboriginal science respect from government etc. Both men were very forthcoming about turtle information. They know heaps and heaps. Sounds like there isn't all that much hunting going on at present. I would have liked to speak with (senior Bardi woman) more. But that may come later. I am going to come back up next Tuesday - when the community meeting is rescheduled. Hope the road improves!! (Elder and hunter 1) is very friendly, showed me the beach and where turtles are cooked up. Invited me to come and visit him at his place 'just the other side of the airstrip'.

11/7/2001

Today I am going to call Community B and Community C and see whether I can visit them today or tomorrow. From travelling to Community A it seems (as I already know) that not a lot of hunting goes on in these other communities. But I still think it is important to talk to them. They will provide cross verification and a broadening of my knowledge.

They were telling me yesterday that a lot of hunting goes on in Broome itself, some grumbling about Torres Strait Islanders who are allowed to hunt here, whereas if hunters from here go up there they are not allowed to hunt. Community A reckons that there is a lot more turtle taken in Broome than up here. Certainly if the government are serious about this turtle management thing they should investigate this as well.

12/7/2001

Community C really wasn't really interested in what I had to say. I met up with (female elder) and she took me over to a group of men. The most important one (I think?) walked away - I got the feeling that he didn't want to deal with some gadiya[32] girl. The others spoke for a bit but mainly along the lines of 'we don't hunt much turtle'. Basically they weren't into what I was saying, which is fair enough.

Today I am going to ring (chairperson) at Community B (he wasn't in yesterday) and hopefully go in and speak to him. He is probably the only one in that community who hunts.

17/7/2001 Back in Broome

Everything is fucked up. It hasn't stopped raining for two days and the road up to the cape is impassable. I have had to miss the community meeting but I haven't managed to contact anyone up there yet.

What am I going to do about Community A? I really need to see them again. I am going to call (community administrator) this arvo and try and find out when the best time to go up might be. Best for me will be tomorrow, Thursday or Friday, because I'll still have the 4wd. But if no one's around, I will have to wait for another meeting which may be in two weeks time. In which case I'm stuffed. I would have to go back home and come back up again. So if that is the case I will have to go up tomorrow, or whenever anyway speak to 1 or 2 and then not come back until November or something. Which will be crap because I won't be able to get ethics clearance for my proposal until the end of the year at the earliest[33].

If I'm lucky, there may be another council meeting next Tuesday, in which case I will stay up here. I then have to organise a way to get up the cape: either hire a car or fly up or (very remote possibility) get a lift up with someone.

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[32] 'Gadiya' or sometimes 'kartiya' is a Kimberley Aboriginal term that roughly translates to 'outsider' and is used in reference to non-Indigenous people, particularly strangers.

[33] This initial fieldtrip was undertaken in order to begin the process of gaining community consent for my research, which was formally required by the University's Human Research Ethics Committee before I commenced any data collection. Further details of this process are described in Chapter 5.

18/7/2001

All my plans are changed. I am going to stay in Broome until Wednesday morning. I'm going up to Community A on Tuesday. I spoke to (community administrator) this morning and he told me that that was really the only day to see most of the councillors. Quite a stress - had to organise accommodation, 4wd etc, it's going to be expensive too.

(I did not record what happened at this trip - but in summary: I hired a 4wd for the day and drove up, leaving at dawn from Broome, on a five hour trip in terrible conditions due to the amount of rain that had fallen. Only to find once I got there that the meeting had already started and I couldn't go in. I waited around until midday without speaking to anyone but the office staff. I then had to leave again in order to get the 4wd back in time. It was a horrible experience, especially as the roads were very muddy and hard to drive. Madness in retrospect!)

Chapter Four: Methods

In preparing the discussion of the methods used in collecting my data for this research, I have taken the slightly unconventional approach of dividing this into two separate accounts. Primarily this is a response to the high level of ambivalence I feel over the approaches used at the beginning of my research, which I wish to explore in greater depth than a single chapter would allow.

To this end, in this first chapter I have provided an overview of all the techniques that I used in collecting my primary data, both with the Indigenous and non-Indigenous participants of the study, and my approach in collating and analysing the existing information that I used as secondary data.

In the following chapter I have provided a more detailed description and reflection upon the relationships that I formed with the Bardi Jawi and Mayala communities through the process of my fieldwork and the impact of the particular methods used on the course of my research. Through doing so I aim provide a reflective critique of the choices I made at the time and how with the benefit of hindsight and a good deal more experience I would change my approach should I ever have the opportunity to conduct such research in the future.

1. Cross-cultural research

A large part of my research was conducted as fieldwork within the Bardi Jawi and Mayala communities. This provided a distinct challenge as my training as a zoologist had not provided me with any knowledge on how to go about social research.
In order to integrate human culture and politics into my research I needed to draw upon research methods that focus upon exploring these phenomena. This involved using qualitative methods drawn from the social sciences such as semi-structured interviews and

the traditional approach of participant-observation that has been the mainstay of cultural research since its inception (Bernard 2011).

In exploring another culture, I recorded not only the views of my Indigenous participants through interview techniques, but my own personal responses to my experiences in a different cultural context. I did this in order to be able to explore my evolving research consciousness and to record my responses as an ecologist to the challenges brought up by working in unfamiliar territory and with unfamiliar methodologies. My field diaries, within which I journaled my evolving understanding of my research provide a significant portion of the primary data for this thesis, as they are a rich store of anecdotes, observations, reflections upon troubling aspects of my journey and a record of all the processes and projects that I undertook over the past eleven years.

1.1 Sampling strategy

An important part of qualitative research practice is the sampling strategy, which is the process of determining which members of a community will be involved in contributing information. In the Bardi Jawi and Mayala communities I started with a list of names that I had collated through discussions with people who were familiar with the communities, such as anthropologists, members of the local natural resource management agencies, community workers and representatives of the regional land council. These initial names represented the important people who had to be consulted and included the majority of male elders and a significant proportion of the senior hunters.

As I located each person on the list I would explain the details of my research and ask whether they would like to contribute their understandings about marine turtle and dugong. At the end of our discussions, which I recorded with hand written notes, I would ask who else they would recommend I spoke to, and with this snowballing approach I eventually spoke to all the interested senior hunters and elders and a representation of the younger men also. I determined that I had spoken to all the relevant people when I was no longer given any new names to speak to.

Table 1: Summary of all fieldtrips to Bardi and Jawi Country

Date	Time spent in field	Purpose of field trip
July 2001	4 days	Initial contact with communities to introduce myself and my project
January 2002	2 days at Bardi settlements 3 weeks in Broome	Brief visit to meet with leaders in the settlements
September 2002	2 days at Bardi settlements, 1 week in Broome	Appearance at Native Title meeting in order to gain consent for research.
October 2002	3 weeks	First data collection trip – Lalin, married turtle time
November 2003	3 weeks	Second data collection trip – Lalin, married turtle time
June 2004	3 weeks	Third data collection trip – Bargana, dugong hunting time
October 2004	2 weeks	Meetings with participants in order to review draft 'management plan' (see Appendix 1).
March 2005	4 days	Meeting to ask consent from Bardi – Jawi people for involvement with the NAILSMA Marine Turtle and Dugong project, and developing the draft 'management plan' into a Regional Action Plan (RAP).
May 2005	4 days	Further RAP development for NAILSMA – checking priorities.
July 2005	2 days	Finalising RAP priorities before NAILSMA budget allocation meeting in Cairns (see Chapter 9).
May 2008	2 days	Presenting final results of my fieldwork (in poster format) at a NAILSMA organised Turtle and Dugong meeting

I undertook seven fieldtrips of from 2001 to the end of 2004 for my research. My initial visits to the communities in 2001 and early 2002 were undertaken with the aim of gaining 'community consent' for my research. Later in 2002, after this had been achieved, I began my data collection, heavily pregnant with my first child. I did not return after this trip for a full year in November 2003, due to my maternity leave and wanting to wait until my baby was old enough to cope with the travel. In 2004 I completed my data collection and prepared a draft 'community management plan' for marine turtle and dugong. This culminated in an opportunity to help develop a government funded community ranger program[34], a process which involved travelling back and forth from the communities in during the first half of 2005, until the arrival of my second child dictated an end to this work. After this period I was less involved with the Bardi Jawi and Mayala communities and apart from a brief visit in 2008 to present the results of my research, I have not been back in a formal capacity.

[34] Detailed in Chapter 9.

In total I interviewed 29 people, mainly men (only five women), and of the men all were or had been hunters, though some of the more senior men were no longer able to participate in hunting activities (see Table 1). The strong gender imbalance was to be expected as hunting of turtle and dugong is a solely male activity in Bardi Jawi and Mayala cultures. Most of the women I spoke to were reluctant to comment on anything other than the cooking and sharing processes or the need for a ranger program to employ the young men, explaining that hunting was men's business[35].

I took a great deal of care to be sure that all family groups were approached and to achieve as much of a political balance between the Mayala, Bardi and Jawi cultures as possible. In order to protect people from any possible political and social consequences arising from having their comments published in documents such as this thesis or the community management plan, the interviews were coded so that only I would know the identity of the person making the statements.

Table 2: Gender, tribal affiliation and age of Indigenous interviewees

Number of participants	Gender	Tribal group	Age
4	Men	Bardi	Senior elders – no longer hunting
1	Man	Jawi	Senior elder – no longer hunting
1	Man	Mayala	Senior elder – no longer hunting
1	Man	Jawi	Elder hunter (more than 50 years of age)
8	Men	Bardi	Elder hunters (more than 50 years of age)
9	Men	Bardi	Younger hunters (between 20 – 50 years of age)
5	Women	Bardi	Senior women (more than 50 years of age)

1.2 Interviews

My interview technique was based on a semi-directive method as described by Huntington (2000) where 'participants are guided in the discussions by the interviewer, but the direction and scope of the interview are allowed to follow the participants' train of thought' Huntington (2000:1271). Huntington suggests that the researcher have a list of topics to be discussed but to be prepared for unanticipated associations to be made by the

[35] See Chapter 5 for further discussion on the impact of gender upon my research.

informant. In my interviews I had three areas of discussion – to begin with I would ask for any general information about odorr and goordimil, then I would prompt with a query about whether my informant had any worries about these animals, and to finish I would ask what they would like to see for the future.

The flexibility of this method suited the context of the interview settings, mainly informal conversations held sitting outside people's houses in the shade of a tree. I needed to be flexible in my approach in order to be open to the differences in worldview between myself and my participants. Particularly I needed to be aware that my participants might have very different understandings and priorities from my own, a common issue when working in a cross-cultural situation (Hortsman and Wightman 2001; Palmer 2004).

Language was also occasionally a barrier as some of the older men I interviewed were not fluent in English, and a good deal of the terms and expressions used were in Bardi or Jawi. This is a common issue in ethnographical research (Walsh 2009). In these conversations I was not always quite sure that my informant understood the purpose of my research and it was often necessary to involve a younger relative to facilitate the conversation. Again the use of the semi-directive technique was the most appropriate style for these situations as Huntington explains:

> [The semi-directive technique] is especially useful in cases where the participants are not comfortable with direct questions, or in which the researcher cannot be sure that the questions are understood as intended (Huntington 2000: 1271).

I recorded my interviews by means of handwritten notes, which I later typed up and returned to the participant to check for accuracy. This was not always possible. In two cases my participant had passed away by the time I returned to the communities, also some people were also away when I came back. There were also issues with literacy and language for some of the older participants, as I was not fluent in Bardi or Jawi, and they were not fluent in my dialect of English, and again we relied upon the services of younger relatives for translation, particularly of the written word. I chose not to tape record these conversations as I felt that the more informal approach of writing notes (which were visible and often added to at the time by literate participants) allowed for a more relaxed

conversation with people that I was only just beginning to know. Additionally the prospect of transcribing such a large number of interviews and the translation of Aboriginal English and the Bardi and Jawi terms without the presence of the speakers was daunting. Ideally I would have employed a translator to assist in these matters but my budget did not allow for this and doing so would have had political implications as there were considerable tensions between family groups at the time of my research.

I was diligent in writing an account of the interview setting and content in my own words once I returned to my camp, and my impressions of the social interactions that took place over the course of each day. These accounts proved invaluable in helping me mentally recreate each interaction and provided many subtle triggers for further conversations, by allowing me to focus on what had been said obliquely or omitted from the formal interview.

1.3 Photovoice

As well as interviews, I also made use of visual storytelling techniques, by giving my informants disposable underwater cameras and asking them to take photos for the 'management plan' that I had been asked to produce by the land council as part of my negotiations with the communities to gain consent for my research[36]. People responded to this request by photographing a range of subjects, from rubbish accumulated on the beach to the details of turtle and dugong hunts and their subsequent butchering and feasting, providing me with a window into aspects of Bardi Jawi and Mayala culture that I otherwise might not have had access to.

This photographic data collection was based on a technique known as 'photovoice'. The original technique was developed as a way of gathering people's perceptions of the world in a visual medium, and involves the researcher giving the participants cameras with which to record images of significance, 'to enable people to record and reflect their community's strengths and concerns, to promote critical dialogue and knowledge about important community issues' (Wang and Burris 1997: 369).

[36] See Chapter 5 for further details of this process and the management plan concept.

After the images are developed the photographers are asked to describe each image in their own terms, a process which can lead to a greater depth of understanding between the researcher and the participants. The strengths of this technique are that it provides a window into the participant's worldview, and allows them to guide discussions about a chosen subject and express ideas that may not be brought up in an interview alone (Wang and Burris 1997).

On subsequent visits to the communities I returned to those people I had spoken to previously with my transcript of our conversation to check my interpretations and add any further detail. This second meeting also provided an opportunity for me to collect any cameras that had been used up and were ready for processing. I then processed the film and returned the photos and negatives to the participants, retaining a digital copy of the photographs on CD.

I handed out a total of 40 cameras over my time in the communities, and had a return of five films, which were developed. I used the developed photos in my follow-up discussions with the photographers and found them an excellent means of stimulating further discussion into topics I might not have explored. Despite the fairly poor return of the films (which was not unreasonable given the length of time that passed between my visits to the communities) I found these photos really brought the stories people told me to life in a new way. I have included some of these photos in the thesis body and others may be found in the management plan document attached as Appendix 1.

2. Non-Indigenous research

2.1 Interviews and sampling strategy

The methods used for investigating my own culture were based on those I had already begun to use in my research with the Bardi Jawi and Mayala communities. The difference of course was that I was already familiar with the underlying cultural protocols and thus found the whole process less daunting. Ethically I felt on much firmer ground when working within my own culture as I felt my participants were more likely to have a similar conception of the research to myself, and I was dealing with each as an individual rather than the member of a collective. Perhaps most importantly I was no longer hamstrung by

my own whiteness, as my race became again notionally irrelevant - we were all operating within our white comfort zone. I was no longer an outsider, but an insider within the culture of professional expertise.

My sampling strategy differed from that used with the Indigenous communities as I specifically targeted those experts whose professional work was most relevant to my research. I began my research by interviewing all the scientists who worked with marine turtles and dugong in Western Australia, and then as I began my fieldwork with the Indigenous communities I broadened my sample to other non-Indigenous experts who had worked closely with the Bardi Jawi and Mayala communities, and one dugong expert from Queensland. In total I interviewed eight non-Indigenous people, five of whom were ecologists, one anthropologist, one teacher and one resource manager (from the Western Australian Department of Fisheries).

These interviews were semi structured and tape-recorded. The basic questions evolved over time but most of our discussions[37] focused around the work that each expert was undertaking and the importance they placed on the relationships they held with marine turtle and dugong, and where relevant, the Indigenous communities[38]. The gender of my non-Indigenous informants was slightly biased towards men, with three female and five male participants, and their ages ranged from early twenties to late sixties.

The data collected from these interviews formed the beginnings of my understanding of the changing relationships held by non-Indigenous Australians with marine turtle and dugong, and the influence that Indigenous culture and practices has upon our understandings of the environment. Of particular interest to me were the stories told by some of my older participants, which indicated that there had been a major shift in the way in which non-Indigenous Australians related to these animals, from being regarded as

[37] An exception to this was my interview with Professor Marsh (documented in Chapter 8) which evolved from my investigations into the history of non-Indigenous relationships with marine turtle and dugong, and which had a specific focus on the events that took place as part of the 'Dugong Wars' in Queensland in the late 1990's.

[38] Because of the importance of the Bardi and Jawi country for dugongs and turtle, two of the biological scientists I interviewed had worked within the communities. I also interviewed an anthropologist and a schoolteacher who both had a great deal of knowledge of turtle and dugong from working with the communities over an extended period of time.

food source to icons of the conservation movement. This triggered me to investigate this phenomenon further through popular accounts, scientific literature and historical records.

As with the Indigenous interviewees, I again de-identified the interview statements in order to protect individuals' privacy. Two exceptions to this were made in the case of Dr Bob Prince, and Professor Helene Marsh, who both provided a much more substantial contribution to the thesis in terms of time and information. These two individuals were happy to be personally identified and acknowledged as my primary informants.

3. Historical research

3.1 Methodological approach

My interest in the changing ways that Australians had conceived and talked about marine turtles and dugong led me into historical research. After interviewing scientists about their work in the area of marine turtles and dugong, and talking to some of the Indigenous elders I uncovered a few tantalizing stories that warranted further examination, a process I engaged with through the methodologies of environmental history.

Environmental history has been described as an attempt to understand the relationships between human beings and the rest of nature through the changes brought by time (Hughes 2006). Although I am not a historian any more than I am an anthropologist, some of the work of this thesis may well be judged to contribute to the field of environmental history. Hughes (2006) remarks that the subject of environmental history is one that has often been added to by writers from other disciplines, such as biology, geography, anthropology and philosophy, often with surprisingly successful results.

In addition there has been recognition that the discipline of history has a great deal to offer ecology, and in particular environmental managers. Bowman (2001:556) sees historians as the 'natural allies of ecologists and land managers as they struggle to maintain biodiversity and landscape health.' Environmental history is seen as an endeavour that often helps capture the public imagination and mobilise support for the conservation of natural places (Bowman 2001).

The discipline of history explicitly recognises the impact of each authors political position upon the account they create. This may seem to be a challenge to the notion of objectivity traditionally found within the sciences, or alternatively it can be viewed as an opportunity to be upfront about the underlying subjectivity that impinges on all research (Goodall 2008). Cronon (1992) comments that even when historians strive to be objective in their accounts it is still possible to recount the same evidence in completely different ways. He positions historians as moral agents and political actors whose task it is to interpret the choices that people have made in the past and present the consequences of those choices in order to make sense of the dilemmas faced in the present. This will inevitably lead to a struggle over the values that define a meaningful past (Cronon 1992).

Historians deal with this problem of competing interpretations in much the same way that scientists do – by exposing accounts to the gaze of their colleagues and peers, who are expected to rigorously debate and dissect the conclusions made and the quality of the supporting evidence used:

> The stories we write, in other words, are judged not just as narratives, but as nonfictions. We construct them knowing that scholars will evaluate their accuracy, and knowing too that many other people and communities - those who have a present stake in the way the past is described - will also judge the fairness and truth of what we say. Because our readers have the skill to know what is not in a text as well as what is in it, we cannot afford to be arbitrary in deciding whether a fact does or does not belong in our stories. Someone among our readers - a bemused colleague, an angry partisan, a wounded victim - will eventually inform us of our failings (Cronon 1992: 1373).

3.2 Historical research methods

Throughout the course of my research I collected media reports and popular literature and publications to do with marine turtles and dugong. I later conducted extensive searches of newspaper websites in order to gain a sense of the discourse about these animals in the general public sphere. Initially, a search of all the ecological literature on dugong and marine turtle in Australia was undertaken, in order to map out the basic shape of this field. The major papers and key players were identified by using ISI Web of

Science citation index - a tool that allows the tracking of how frequently a paper is cited by others. Throughout the course of my research I constantly refreshed my knowledge of the literature by checking for further publications through internet-based search engines, particularly Google Scholar. General web based searches also proved to be valuable in providing leads and snippets that could be further developed through the use of supporting literature and primary data. I printed out any web page of interest as some sites were ephemeral and had ceased to exist by the time I completed my research. Research into the policy sphere of knowledge involved reviewing government websites, action plans and international treaties to gain a sense of the strategic importance of these animals in Australian culture.

The use of publicly available sources allowed a definition of the 'public' sphere[39] of knowledge, which can be contrasted with the more privileged 'scientific' sphere of knowledge accessed earlier through the use of databases only available to universities and other institutions. Although easily available, information gathered from the public sphere is often incomplete and superficial, giving a 'ghost' of the story without much richness or depth. There is another sphere of knowledge that contains more information on the subject - the 'private' sphere that encompasses the internal workings of government departments, universities, interest groups and politicians. This sphere contains material that is unavailable to outsiders, but which adds great richness and depth to the history. Accessing this sphere requires the cooperation and consent of individuals who are personally involved in the story that is being told, and entails the application of strict ethical procedures in order to protect the participant and the researcher (O'Leary 2010).

Most importantly, the participant must feel safe in sharing their privileged viewpoint with the researcher, and this is generally accomplished by means of informed consent, where the researcher discloses the purpose of the research and the processes by which the information gathered will be used to tell a particular story. The participant must know that they have the right to withdraw the raw material that they have provided at any point, and the researcher must ensure that the participant is fully aware of how the material is to be

[39] For an enlightening discussion of the definitions of 'public' and 'private' and the tensions between these concepts when treated as a binary, see Papacharissi (2010: 27): 'Private is defined in contrast to public as: (1) what is hidden or withdrawn versus what is open, revealed, or accessible; or (b) what is individual, or pertains only to an individual, versus what is collective or affects the interests of a collectivity of individuals.'
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used. This can result in a complex dance of negotiations between the parties in order to satisfy the need of the researcher to tell a coherent story and the need of the participant to feel safe as a result of the story being told (Riessman 2003; Nelson and Gould 2005).

4. Thesis structure and data emergence

From the data collection described above I have produced five chapters that provide an exploration of different aspects of the relationship between Australians and marine turtle and dugong. For each chapter I have below provided a brief explanation of how each of the storylines emerged from the data and the process of my research journey.

In Chapter Five (Ambivalence and the Benefit of Hindsight) I provide a more detailed exploration of my field experiences in the Bardi Jawi and Mayala communities and expose the areas of ambivalence I felt at the time over my approach and which have trigged further reflection as my understandings of have developed over time. In describing these moments I have drawn upon my field diary notes, interviews with Indigenous and non-Indigenous participants and the literature on cross-cultural and participatory research. The vignettes selected highlight the areas of the research process that are often hidden or glossed over in the reporting of results, but which deserve further attention as they have the potential to disrupt and dismay the unwary researcher.

In Chapter Six (Soup or Sacred) as part of my historical research I undertook an investigation into the state records office to retrieve government department records of marine turtle and dugong knowledge collected over the past 100 years in Western Australia. All files containing the words 'turtle' and 'dugong' were requested from the state records office. This provided a history of the relationships with both turtle and dugong, including the change in focus on turtles from a commercial fishery (until 1973) to a protected species. These records were limited however and ended at 1991.

I gained access to further records through the generosity of Dr R.I.T. (Bob) Prince who had been in charge of the Western Australian Marine Turtle Project and dugong research in this State for many years. I also interviewed Dr Prince on two occasions in order to fill

in the gaps of my understandings of the process of government research into these species. All of the above sources provided a multifaceted account of the importance of marine turtles and dugong in Australia over the past 100 years or so. In order to make a coherent story from the many perspectives that I had gathered, I organised the data into a timeline and identified a number of distinct storylines that emerged from the history.

The first six storylines are drawn primarily from the archives and my own field data and are described in detail in Chapter Six, with an emphasis on the changing relationships between people and marine turtle and dugong, both in Indigenous and non-Indigenous culture.

Chapter Seven (Problematising Populations) focuses on a critical review of the ecological literature and the relationships between science and policy at both the national and international scale. This chapter emerged as a response to the Bardi Jawi and Mayala communities request for a brief literature review of the current ecological research into marine turtles and dugong, which formed part of my work on the NAILSMA[40] Turtle and Dugong Project in 2005. At an early meeting of the Odorrgoordimil Steering Committee (comprised of the senior hunters and elders of the Bardi Jawi and Mayala communities) questions were raised about the population trends of the major turtle species in the region, and dugong Australia wide.

As a result of this request I wrote a brief summary of the most recent research into the population dynamics of these species. From this work I noted that despite a strong discourse suggesting that turtles and dugong were threatened with extinction, most Australian population research showed a steady or even positive trend for Green turtle and dugong (the two species most exploited by Indigenous groups). This intrigued me and triggered a further exploration into the matter, with a particular focus on the relationship between the politics of conservation and the manner in which scientific data is interpreted by ecologists.

Chapter Eight (The Dugong Wars) utilises both interview and historical material to provide an in depth exploration of a particular series of events which encapsulates a

[40] NAILSMA stands for the North Australian Indigenous Land and Sea Management Alliance.

conflict between conservationists and resource users over dugong. From my web based searches a clear period of intense public interest in dugong emerged from 1996-2001, where there was a richness of websites and media reports discussing dugong in Australia, and particularly in Queensland. The source of the interest seemed to come from two related events - the Hinchinbrook Island controversy which involved conservation groups using dugong as an iconic species in an attempt to prevent a tourist development; and the 'Dugong Wars' which centred on the conflict between conservation groups and fishermen over proposed dugong protection areas.

Both of these events were initially investigated, until it became clear that the 'Dugong Wars' was a site of greater data richness. This case study was then extensively researched using publicly available search engines and texts, primarily Google, ParlInfo, and NewsText. Reports and papers available from libraries and from the Internet were used as primary documents, as well as media articles and websites.

In order to access the private sphere of knowledge surrounding the Dugong Wars, I contacted Professor Helene Marsh, who is the preeminent dugong scientist in Australia, and whose work at James Cook University forms the main platform of all dugong research in this country, and indeed in the world. Professor Marsh was intimately involved in the controversy surrounding the dugong at this time and seemed the obvious choice when looking for someone to verify and add to my story.

After completing the draft of the public history, I sent it to Professor Marsh, to allow her to comment and add any material. She invited me to come to Queensland and talk to her in person. When I visited Professor Marsh in Townsville I initially met with her to discuss her perspective on this history. She then directed me to certain documents and publications that she felt were important in my understanding of events. I spent two days constructing a revised account of the history from these sources. I then conducted a formal recorded interview, during which I asked for clarification on a number of points that were not clear from the documents. I have used direct excerpts from this interview, and the documents Professor Marsh provided to me to form the history. After writing the history I sent several drafts to Professor Marsh for comment and review, in order to be

sure that I had not made any errors of fact or interpretation, and to gain consent for the publication of her contributions.

Chapter Nine (Black Hands on the Steering Wheel) returns again to my primary data as I describe the process of securing government funding for a community based ranger program with the Bardi Jawi and Mayala people. This was undertaken as part of the NAILSMA Turtle and Dugong Project, a collaborative venture between five Native Title Representative Bodies across northern Australia, which aimed to support community-based management of marine turtle and dugong by Indigenous Australians. I was employed by the regional land council to work with the Bardi Jawi and Mayala communities in putting together a 'Regional Action Plan' for the project that outlined local people's aspirations.

During the process of moving from the ideas held by the communities to a document that was approved by the Federal Government for significant funding I found myself repeatedly challenged by the ideals of participation and co-management. In this chapter I have created a storyline that documents the response of the various actors to these issues and provides an evaluation of the approaches used by NAILSMA in bridging the significant gap between communities and government.

Chapter Five: Ambivalence and the benefit of hindsight.

This chapter explores the interaction of the white researcher (me) and the Indigenous community (in this case the Bardi Jawi and Mayala communities) and traces the first part of my cross cultural research journey - often fraught with ignorance and misunderstandings, and at times painful to recall. It takes the form of a series of vignettes describing moments of ethical ambivalence that I experienced during the early part of my research journey, moments that I find particularly evocative of the tensions involved in research with Indigenous communities. I have selected key moments where I felt ethically challenged and explore the issues that plagued my evolving understandings of my role as an actor within this sphere.

1. Ambivalence

I am examining these moments of self-doubt and crisis through the lens of the ambivalence that occurs when there is a conflict between two ideas or ways of thinking. Ambivalence can be thought of as the 'grey areas' found between the dichotomies of black and white, or right and wrong; or the spaces created between ideologies that seem opposing (Bauman 1991).

Bauman conceptualises ambivalence as something that 'modern' western culture has attempted to eradicate, as it challenges the notions of absolute truth and certainty that are central to modernity (Bauman 1991). With the arrival of the post modern way of thought, a great many of these certainties have been undermined, and now greater attention is being placed on the exploration of the grey areas, despite the discomfort that arises from this exploration.

This notion of ambivalence is similar to the concept described by Brown (2010: 63) as a 'paradox', or a point at which two opposites come together:

> Traditional inquiries seek to eliminate a paradox by a narrower definition of the issue, restating the problem or hoping it will go away. In an open critical inquiry, paradoxes provide a valuable diagnostic for points at which current thinking is frozen. In traditional research, a paradox is treated as a pair of opposites. In an open inquiry, the pairs of opposites are treated as complementary and provide a useful indicator of the heart of an issue.

In this vein, by revealing, rather than disguising my own moments of ambivalence I believe a great deal can be learned about the complexities of working in a cross cultural setting - it follows the reflexive nature of my research process and opens the way for further iterations of challenge and reflection - whether these take place in my own mind or in that of the reader.

2. The ethics of consent

Before I could begin my research I first needed to gain ethical clearance from the University's Human Research Ethics Committee. Because my research involved working with Indigenous people, there was an extra layer of complexity to this process, due to the history of inequitable relations between the two cultural groups and the specific concerns of Indigenous people that researchers often behaved inappropriately, taking away information from communities and providing little in return (see Smith 1999a, NHMRC 2003).

'Community consent' was required as part of my ethics proposal. But what exactly did this mean? On face value it was obvious that I needed to introduce myself and my project and gain consent for my research – but from whom? Who exactly was 'the community'? At the beginning of my research journey I did not unpack this conundrum to any great extent, but as I began to grapple with the complex reality of the communities I visited I began to wonder exactly what this term meant. Who exactly was 'the community' and how could they give their informed consent?

I needed consent from a representative of the community – how should I choose that representative? Various people suggested that I gain consent from the community councils or chairpersons - others complained that these bodies were unrepresentative of the community as a whole. Some suggested that permission from the state Indigenous Affairs department would be sufficient. Others[41] were adamant that it was only through the Native Title Representative Body[42] (henceforth referred to as 'the land council') and the claimant group that I would gain a true 'community consent'.

I wrote to the various chairpersons of councils of the various communities with whom I wished to work, outlining my research and asking whether I could come. I had no response from most, though one chairperson of a smaller community was enthusiastic about the project. As described in the interlude between the previous chapter and this, I also made an abortive attempt to personally visit the larger community during one of their council meetings to gain consent for my project. When this failed, I tried another avenue.

I contacted the land council and began a lengthy process of negotiation between the twin bureaucracies of my university and the land council in order to produce a document known as a 'Research Agreement' that outlined my rights and responsibilities as a researcher working with the community. This document had to be drawn up by the land council's lawyers, and due to the enormous caseload of work that they were engaged with, it took a good nine months to be written. This had been achieved by a great deal of badgering on my part, as I found myself ethically unable to commence data collection until this document was finalised.

Once I received the document I was all set to get it signed and get going, but my supervisors advised me that it needed to be checked by the University's lawyers before we proceeded. What followed was an extraordinarily prolonged negotiation between the land council's legal department and the University's risk management team.

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[41] Interestingly, all of these opinions came from outsiders, whitefellas for the most, who claimed an internal knowledge of the particular communities that I wished to work with. In contrast, when I arrived on site and began speaking to people who lived there, most advocated an individual approach where consent was negotiated with each of my participants after I had met them.

[42] Non-government organisations that represent the land rights of regional Indigenous groups, often consisting of an Indigenous steering committee, a legal arm and increasingly, a natural resource management arm such as a 'Land and Sea unit'.

This process took eighteen months to finalise, primarily due to the low priority my research had for the overworked staff at the land council, but also because my University's legal advice was that my obligations under the proposed agreement were too onerous. Ultimately, the University bowed to the pressure of consistent lobbying by me and my supervisor and unwillingly signed the research agreement on my behalf (after a very antagonistic exchange with the land council's legal department).

My ambivalence in this situation was intense – on the one hand I felt completely frustrated by the slow progress of the University bureaucracy and the roadblocks that were being thrown up in front of my research. Particularly I was concerned as the research ethics committee had put approval of my project on hold until the issue of the research agreement was resolved, though I recognised of course that most of the objections made by the University revolved around protecting my position as an independent researcher. Primarily I felt that the potential dangers (based on requirements such as the land council retaining the right to prevent the publication of my thesis) were negligible since my approach to the research should negate many of the potential concerns of the land council (primarily that I would disclose damaging, secret or sensitive Indigenous knowledge).

On the other hand I was furious about the stubborn refusal of the land council to negotiate or even communicate with the university on the matter. It was clear that my research was far down on the list of priorities for the land council, but at the same time they were unwilling to step down from their position of gatekeepers of Indigenous knowledge. This was particularly frustrating to me as I had approached the land council as a matter of ethical courtesy – I knew of many research projects that had taken place in these communities without any consultation with the land council but with consent granted either from individual family groups or the community councils. I sincerely believed (and still do) that the land council was operating from a position of wishing to protect the rights of the Traditional Owners – people who had been exploited by researchers many times in the past – but I felt I was being unfairly lumped in with those unethical operators.

During this period I continued to visit the communities in order to inform the people with whom I wished to work about my project, as I had little faith that the legal 'Research Agreement' process would actually lead to a trusting relationship with my potential informants, or indeed constitute what I would accept as informed consent for the project. Partly this was due to the fact that while the land council represented those people defined as the 'Traditional Owners', there were many other people living within the Bardi and Jawi communities whose traditional links were to the sea country to the north and east (where no permanent settlements now exist) or to other places both near and far. Also there was a general feeling that it was only the handful of families who were actively engaged in the Native Title process (as named claimants) and attended meetings organised by the land council who would be informed by the land council of my project. The land council was not uniformly seen as a positive or representative body by all members of the community, and during my time there some people spoke of the Native Title process as one that divided rather than united the communities.

The complexity of this situation was not unique to my research, with similar experiences occurring in other parts of the country. Davies (2007) provides an in-depth discussion of the evolving relationships between researchers, Indigenous communities and bridging organisations such as Native Title Representative Bodies and other Aboriginal organisations. She comments that:

> There are situations where Aboriginal people who want to work with researchers do not see the relevance of an outside body giving approval, even if it is an organisation that represents them and their interests, as is the case with CLC [Central Land Council]. Some researchers will see the approach as unnecessary or unwarranted gatekeeping. In practice, they may be able to do their research without complying with prescriptions for permits and agreements and their risk of being sanctioned will be low. Researchers who are initially cooperative can be frustrated or alienated by the complex procedural requirements and the knowledge that other researchers are avoiding those requirements (Davies 2007: 17).

In the end I settled for a two pronged approach - once my research began I gained individual consent to participate from each person I spoke to, and I also gained a broad 'community consent' which was achieved through the agency of the land council; they introduced me to the claimants en masse at a Native Title meeting, a few people nodded when the group was asked whether I could proceed with my research, and that was that. However, I felt ambivalent as my field notes of the meeting clearly show. Did the community really understand my project? Had they been sufficiently informed of the potential consequences? Did they care?

> *[Land Council employee] was good - almost felt like he was pushing it a bit too much, sticking up for me and explaining why it would be a good thing. Was good for me but made me feel a bit awkward. Other guy [Community member] who was chairing the meeting obviously wanted it over with, kept asking for a consensus- show of hands. Ended up asking everyone if they agreed. Few nods, but I didn't feel confident.[Community member] said there was consensus. Hmmm... Hard to know how representative this group [people present at claim meeting] is either - majority older, majority men. [Community member] said at the beginning that it was a pity the younger people weren't there to hear me since they might want to be involved. Am I bulldozing this through? Actually no one seems to care. Or is it just the way they act? It's hard being in a different culture.*
> Field diary notes dated 9/9/2002

My ambivalence towards the land council only increased as I became aware of the divisions within the communities that I worked with, since many people did not see themselves as represented by the powers structures set up by the Native Title process. I was unsure of whether the ramifications of my research project were truly understood by the people I wished to work with and whether I was in fact yet another outsider foisted upon them by the outside world. Kowal (2006) describes a similar discomfort in the field of health:

> We have seen that the failure of remote Indigenous people to adequately participate in the informed consent process creates the uncomfortable appearance

> that research is an 'imposition' – a word that signifies the assimilation era (Kowal 2006: 262).

Other authors discuss the cultural differences between gaining consent from Indigenous and non-Indigenous people, claiming that it is culturally more appropriate to gain collective rather than individual consent when working with Indigenous groups:

> This is an important difference in that Indigenous peoples are not culturally empowered to provide individual consent, as in the west, but must seek approval from appropriate people in the extended family relationships or from authority figures (McGrath and Philips 2008: 30).

Linda Tuhiwai Smith, a Maori researcher from New Zealand comments in her seminal work 'Decolonising Methodologies' (1999a) that the process of gaining consent when working with Indigenous communities is integral to the ongoing relationship between researcher and participants and that gaining the trust of the community is likely to take a great deal of time and effort:

> The relatively simple task of gaining informed consent can take anything from a moment to months and years. Some Indigenous students have had to travel back and forth during the course of a year to gain the trust of an individual elder (Smith 1999a: 136).

This was reflected in my own experiences where I slowly built the trust of key individuals through ongoing relationships over a number of years. People who appeared reluctant to talk to me on my early visits began to open up as more about my project, and perhaps more importantly, my personal approach became better known.

Davies (2007) comments that the additional cycles of approaching the communities for consent prior to developing a mutually acceptable research proposal (as is now required by research protocols developed by the Central Land Council), while complicating matters for the researcher, provide opportunities for more participatory research:

> This situation requires that researchers develop proposals iteratively, seeking permission to enter Aboriginal land so they can talk with Aboriginal people and develop a research proposal that is targeted to their interests and needs, and then applying again later to carry out the research. The process promotes the development of partnerships between researchers and Aboriginal people, and it also requires long lead times before research can be started (Davies 2007: 15).

With the benefit of further reflection I can now appreciate the time that it took to go through the process of gaining consent for my project, as it provided further opportunities to develop my research approach and my relationships with people on the ground. This experience would have been much smoother had there been a clear set of protocols for the process of negotiating between the University and the communities and land council.

3. Issues of gender

It is important to discuss the influence that my own gender had upon the research process as a whole, as knowledge of odorrgoordimil is very definitely men's business in Bardi, Jawi and Mayala cultures, a fact that I was told right at the beginning of my research when I was visiting the communities on my own to try and gain consent for my work:

> *They [group of hunters] pointed out that turtle hunting is men's business and that some old blokes might feel 'shame' in talking to me - especially if it is stories about turtles.* Field diary notes dated 17/1/2002

Although most men appeared happy to speak with me – especially when I had my husband present to avoid 'jealousing' their wives – there were a number of times when conversations were awkward, or I was avoided, particularly by older men:

> *I spoke to [chairman of community] for a while but it was difficult. He didn't seem to understand that I was pro-hunting. I probably wasn't clear enough but it was a difficult conversation - he didn't seem very interested, and he is quite old - also seems quite traditional. I didn't feel very comfortable talking with him.* Field diary notes dated 17/1/2002

This contrasted with the easy conversations I had at the same time with men when their wives were present and facilitating the conversation:

> *[Wife of hunter] was great - she is very articulate in western ways and explained things to me and to her husband. [Bardi hunter] was really good too. I felt it was a really relaxed conversation. She has given me a list which at the moment is mainly men, but I guess that's to be expected with the subject matter. Not sure how far to take [advisor's] consistent advice about not speaking to men on my own. I guess I'll try and avoid situations where that might happen. Stay outside the office on the bench, obvious to all.* Field diary notes dated 14/1/2002

These early conversations influenced my decision to take my husband with me on subsequent field trips, which was also necessary later on as I required someone to mind my baby while I conducted interviews and workshops. Retrospectively I realise that if I had been working on an issue which fell within the women's sphere this probably would have been unnecessary, as the lines between research work and child care would most likely have been blurred – something I experienced later on in my fieldwork when I was directed to speak to a group of elder women for their input in the plan:

> *They found - dug up some ghost crabs for Felix to play with - ripped off the claws and gave them to him (so much for me feeling guilty about him ripping claws off some other crabs he'd found last time!). They sat down and chatted, wanted to know what I wanted, basically...they were really chatty. Told me stories about their fathers and brothers on Kawal*[43] *rafts, with a tea chest for weight. Young girl sitting in there watching dad go for turtle...It was much more relaxed talking to [the women] than to men. So this gender thing is something I need to come to grips with. None of the blokes*[44] *have asked me to come out anywhere ... I wonder if I had been a bloke - would I have been out turtle hunting by now? I reckon - yes, probably. So my research is flawed in that sense. I would know a lot more, it*

[43] Kawal rafts were the traditional form of water transport for the Bardi Jawi and Mayala peoples, constructed of mangrove tree trunks lashed together.

[44] 'Bloke' is an Australian colloquial term for a man.

would have been easier if I was a bloke, that's for sure. Field diary notes dated 20/10/2004

I was never invited to join in on a hunting expedition, a privilege that is often granted to male researchers in these and other Aboriginal communities (see Rouja 1998 for example). I was however asked to come and collect eggs with the women, and to join in on fishing expeditions that involved family groups.

The issue of gender raises the complexity for ecologists working within Indigenous cultures when the norms surrounding key roles held by men and women differ greatly from our own. In my own cultural milieu of academia there is a strong tendency to break down gender-based divisions of knowledge, so I came from the perspective that it was perfectly appropriate for me as a woman to wish to study turtle and dugong.

Although the communities generally supported my ambitions in doing this I remain aware that despite the friendships that I eventually formed with many of the hunters and elders, my gender was always a barrier to a more complete understanding of the relationships held by these men with the other-than-human as represented by odorrgoordimil.

4. Issues of representation

At the beginning of my fieldwork I had initially envisaged that I would have an Indigenous research partner, someone who would show me around, introduce me to key people and help with getting the ball rolling. This did not eventuate, partly because my budget did not allow for paying someone to work alongside me, and also because there was no obvious candidate from within the people I met, without aligning myself to one or another side of a longstanding division in the community.

This made things more difficult in the initial phases, as I struggled to make contacts and build relationships, but in the end I was glad I was forced to be a free agent, as the political situation in the communities could become quite tense at times, with family feuds commonplace. I had heard of other researchers who had worked within these

communities with particular family groups who then were unable to make contact with other family groups and whose research was subsequently viewed as biased and incomplete by people on the ground.

Although it took me a long time to be comfortable within the communities, I valued the fact that it was up to me to make sure I had a good representation from each of the family groups.

I made the obvious steps of meeting with the community chairmen and councils, and revisiting those people I had already met and made contact with. I had a fairly extensive list of individuals and family groups that other people[45] had told me I should speak to, but I was uncertain on how to go about contacting and speaking to these individuals.

At one of the community council meetings I attended early in my fieldwork the councillors suggested that the most appropriate approach would be to simply "to hang outside of the office or shop" and talk to people as they came by. Already nervous and feeling out of place and shy, I attempted to follow this advice, against my own instincts:

> *I wasn't all that keen on the idea - since I'd rather be introduced to people personally, but that's what we did. And spoke to NO ONE. Some of that was because we were there in the middle of the day, but it was still frustrating...There were a few people around, but no-one wanted to speak with us - in fact we got the impression that we were chasing people away from the shop.* Field diary notes dated 8/10/2002

My frustration with this approach was partly based on the fact that I had spoken to all of the politically important members of the community but I wanted to do participatory research and I felt I needed to speak to all of the community, or at least representatives from the entire community. Without someone to guide me I was unsure of how to ensure that I did in fact include all the family groups and key hunters and elders.

[45] I received advice on who to talk to from a range of sources - I contacted anthropologists who had worked in the area, spoke to Bardi and Broome people I knew prior to my research, the land council workers also gave me a list of important people, and each time I spoke to someone in the communities I would ask for their own recommendations.

Other local issues also caused hiccups in these early field trips:

> *When we arrived in Community A this morning it was obvious that something was going on. There were heaps of people and more than the usual number of cars in front of the office. As we pulled up, we could see two young guys squaring up to each other - looking like they were play fighting. It didn't look too bad, but as I walked up to the office it became clear that some sort of dispute was talking place. This soon erupted into a full-scale fight, and I wasn't really surprised to learn that [the chairman] wasn't available. The fight became intense, with up to 20-30 people involved. It was clear that this was not going to be good day for talking to people. We decided to leave as soon as things settled down (the fight was taking place in the car park and getting to the car might have been tricky).*
> Field diary notes dated 10/10/2002

The nature of my field trips was that they were fairly short (three week stretches) and extremely expensive to fund due to the long distance (2500kms from my home town of Perth to Broome, the regional town) and price of accommodation (high because Broome is a tourist centre). The combination of these two factors made me feel quite desperate at times as I did not seem to be making any progress:

> *I really feel like I'm starting to run out of time, I'll only have three possible days of fieldwork left, and I haven't really had much input from anyone yet. I am hopeful but not certain that I will get to talk to people at [Community B] - I think I may need to be more proactive and seek people out. It's really hard though, when people don't know who you are - really I do need to be introduced so people don't think I'm government or something. ...I think it is important to remember that I got quite upset this morning about my inability to get things done, and I need to record that I am unsure whether this is due to personal flaws or whether this would happen anyway. I wish I could work on this part of the research in a team or with a more experienced person for advice. Naturally a PhD is an individual project but the management plan doesn't have to be. I wonder if this will get easier with time? Will I ever be familiar enough with these communities to*

just rock up and speak to the right people straight away?" Field diary notes dated 16/10/2002

Thankfully, on the following fieldtrip I was much more successful - a year later, I went up with my husband and 10 month old baby, and people seemed easier to talk to. Whether this was because I was more confident, whether some people recognised me, or whether the fact that I was travelling as a family group made me less likely to be threatening I'm not sure.

I started chasing people up directly - asking where they lived and visiting them. This seemed to be the traditional way of doing things - in that it was the technique used by other researchers, the land council and other government bodies. In a western sense it felt intrusive - we do not expect researchers to come knocking at our doors whenever they may choose to. I woke people up, interrupted meals and other social events, but it was all accepted. This is what gadiya do. That of course, does not make it the right thing to do, and I still remain ambivalent about the role that my race and position provided for me:

Reflections on how much is expected by the white person of the people worked with: Waking up early in the morning to researcher banging on your door; Enthusiasm for project not necessarily of benefit to you or your community; Land council impositions - They 'round up the mob', are often disrespectful of people in private, and provide incorrect advice. Whole culture of whitefellas working in communities is pretty bad - talking behind peoples backs about how 'useless' they are. If I (an outsider) know they think people are useless, what do people living there think? Of course they know this. Field diary notes dated 1/2/2006

Alternatives to this approach would have been to become a more embedded presence within the communities, like many anthropologists by attempting to live up there for extended periods of time. This would have had many benefits in terms of relationship building, reciprocity and the progress of my research; as a first time mother and with a husband who had commitments in the city, it did not seem possible. The idea of my own social isolation in such a setting was overwhelming. With the benefit of hindsight and a

good deal more life experience (and older children!) I think that this embedded alternative is probably the approach I would take now, given the opportunity.

5. Issues of ownership and reciprocity – the management plan

The 'community consent' gained through the intervention of the land council came with the requirement that I write a community management plan for marine turtle and dugong. This was conceived by the land council as being a reciprocal benefit for the community in return for providing data for my research. Personally I found this to be a benefit for my approach as it gave me a focus for my questions at the beginning of my fieldwork. When I began visiting the communities, the questions that people asked me about my research led me to my first moments of ambivalence as I struggled to clearly explain what the purpose of my research was, and what the potential benefits, if any, would be to my participants:

> *It just seems all of a sudden that my project is way too theoretical. I feel like people aren't really going to be interested in it unless they can see the practical applications... I feel like I need to give something of practical value to the communities, rather than a lot of academic waffle.* Field diary notes dated 15/1/2002

I also began to question my own motivations in conducting the research:

> *What is my main purpose in this journey? Am I trying to influence the way western culture views the environment? Am I trying to increase the support for Aboriginal land and sea management? Am I trying to record traditional knowledge? Am I trying to give a greater understanding of western science to Aboriginal people? Am I trying to conserve marine turtles?...I guess what I'm really trying to do is record and present as many different discourses or perspectives on this issue as possible.* Field diary notes dated 25/1/2002

It was at this time that I also received a fairly ambiguous response to my research proposal from the reviewers that I had sent it to. They were concerned about whether I would be able to fulfil my research on such an open-ended topic. Perhaps my journey

would have ended there, if the land council had not requested that I put together a community management plan for odorrgoordimil on behalf of the Bardi and Jawi people.

This was immediately something that I felt I should do – as it provided a framework and a practical purpose for my ongoing investigations into the relationship between people and marine turtle and dugong. I did however have some reservations at the outset about what the political ramifications of such a document would be for the communities:

> *I guess the thing about a management plan is that the community is going to have to come to some consensus as to how hunting is going to be regulated – to be accepted by government agencies this will need to be addressed. This may cause conflict within the community and may ultimately backfire.* Field diary notes dated 8/3/2002

These concerns were echoed by others; in particular, one of the Indigenous land council employees was doubtful in the face of his non-Indigenous counterparts enthusiasm for the idea:

> *[Indigenous employee] had more reservations as he was looking further ahead at what would happen later - would there be funding for rangers? was there the will in the community to keep going with conservation and management? It's up to them ultimately.* Field diary notes dated 9/9/2002

During my initial fieldtrips in 2001 and 2002 I struggled with the tension between allowing the communities to direct the process of my research (in line with a participatory approach) and presenting a clear picture of what my own intentions and visions for the project might be. I was inspired by the idea of a community management plan that was created and owned by the people, but disappointed by the examples of this that already existed – many seemed to be written explicitly for government to control the actions of the communities rather than expressing the views of the people who were managing the resource. I wanted my management plan to be formulated by the people who would use it, not by an outside 'expert' such as myself. This ambivalence of mine made it hard for

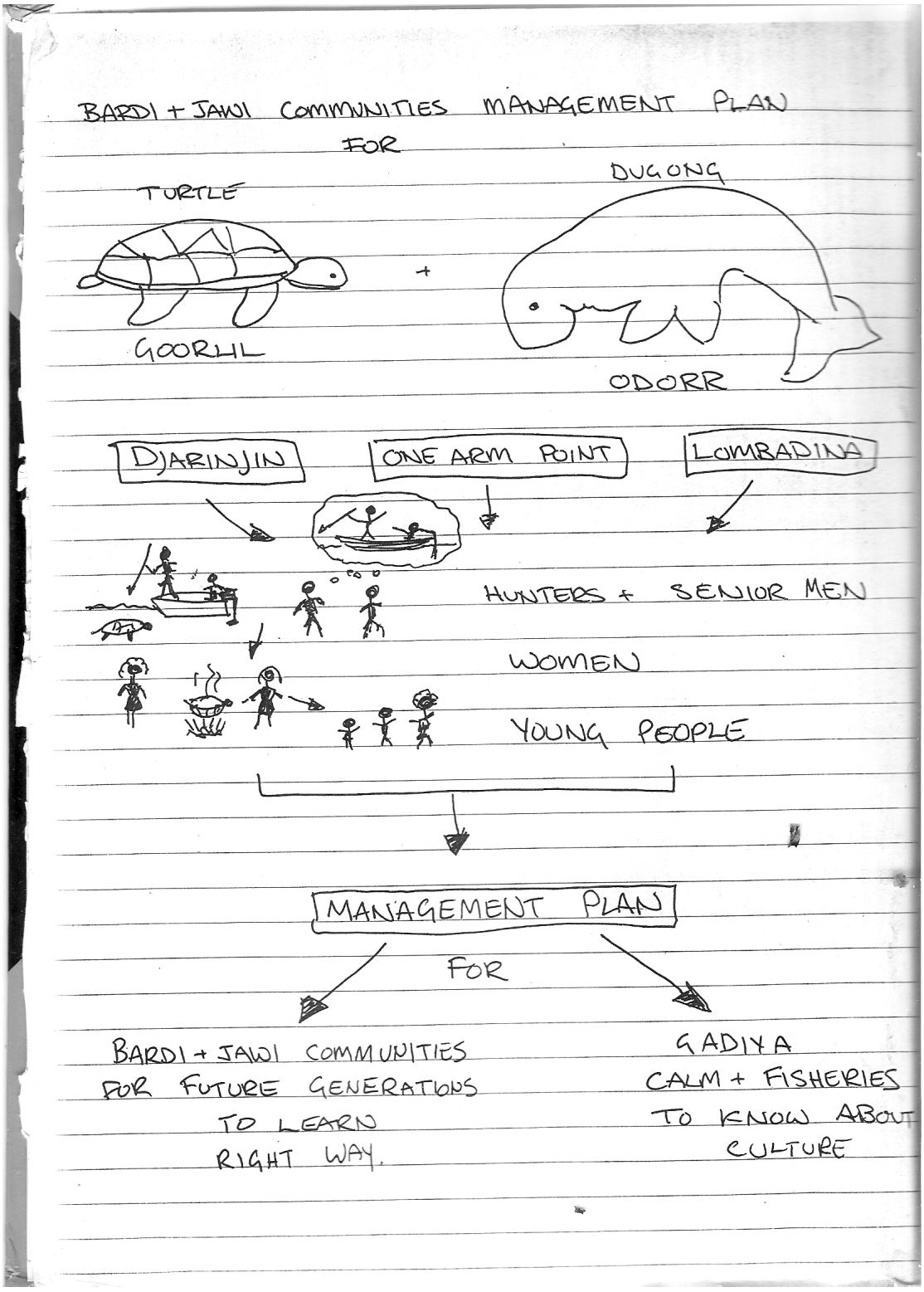
my participants to understand what I wanted from them in my interviews, as I was wary of been overly directive:

> *[Elder woman] wanted to know what exactly I was planning to do. I showed her the Hopevale Community Plan*[46]*, which she was interested in – I think this put things in perspective for her. She wants me to write a plan of what I'm planning to do, to show her.* Field diary notes dated 4/10/2002.

The issues of ownership and presentation continued to plague my thoughts as I began the data collection process. Inspired by my conversations and the literature (particularly Walsh and Mitchell 2002), I collated the information I had received so far from my participants and summarised the main areas of discussion into two pages that outlined both the vision I had of the scope of the 'management plan' and summarised the general direction of my conversations with people to that date (see Figures 4 and 5).

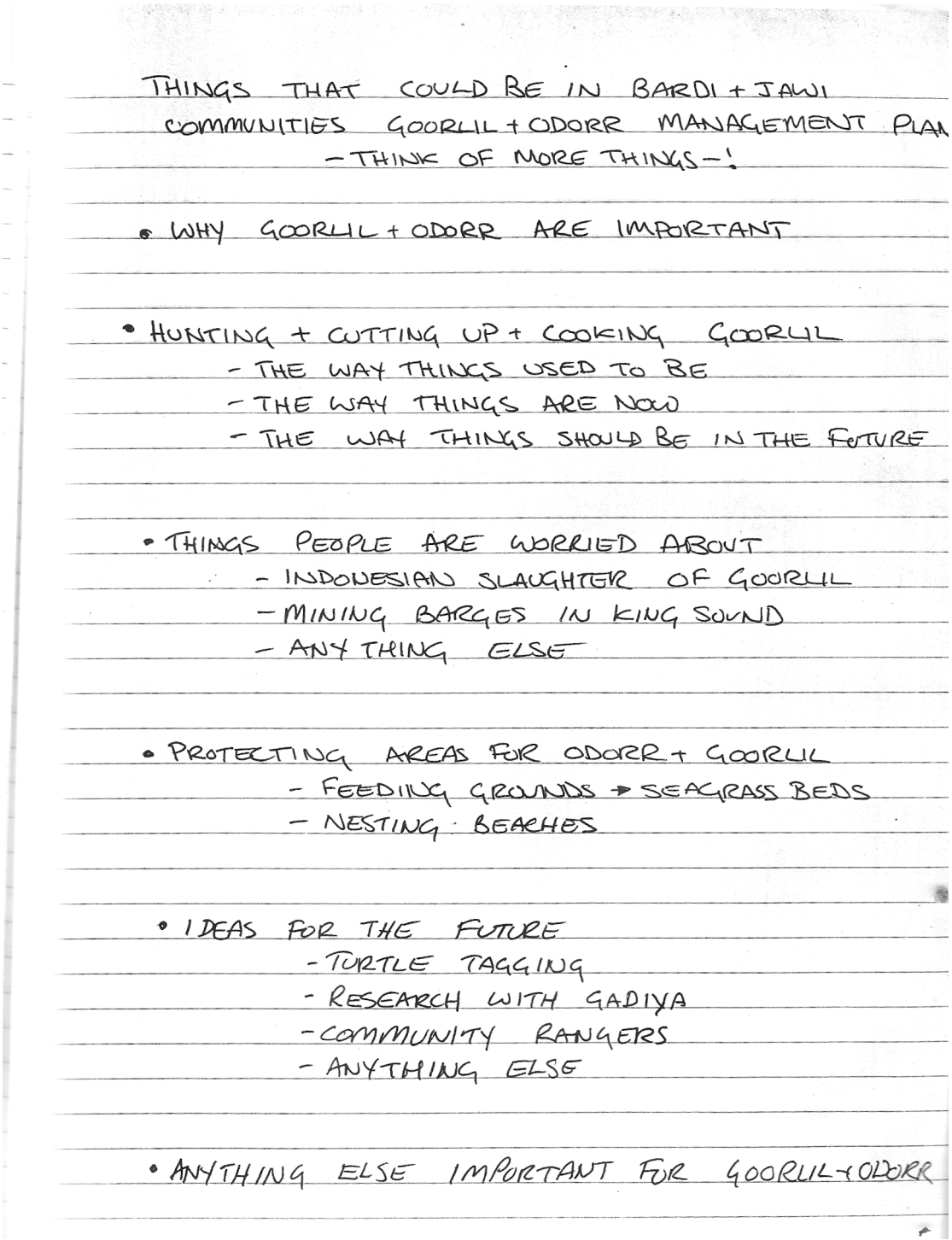
[46] See Chapter 7 for a detailed explanation of the origin and outcomes of this 'community based' management plan for marine turtle and dugong in the Great Barrier Reef Marine Park in Queensland, Australia.

Figure 4 Diagrammatic prompt for interviews in Bardi Jawi and Mayala communities[47]



[47] 'CALM' refers to the Western Australian Department of Conservation and Land Management, 'Fisheries' to the Western Australian Department of Fisheries.

Figure 5: Text-based prompt for interviews in Bardi Jawi and Mayala communities



THINGS THAT COULD BE IN BARDI + JAWI COMMUNITIES GOORLIL + ODORR MANAGEMENT PLAN
– THINK OF MORE THINGS –!

- WHY GOORLIL + ODORR ARE IMPORTANT

- HUNTING + CUTTING UP + COOKING GOORLIL
  - THE WAY THINGS USED TO BE
  - THE WAY THINGS ARE NOW
  - THE WAY THINGS SHOULD BE IN THE FUTURE

- THINGS PEOPLE ARE WORRIED ABOUT
  - INDONESIAN SLAUGHTER OF GOORLIL
  - MINING BARGES IN KING SOUND
  - ANY THING ELSE

- PROTECTING AREAS FOR ODORR + GOORLIL
  - FEEDING GROUNDS → SEAGRASS BEDS
  - NESTING BEACHES

- IDEAS FOR THE FUTURE
  - TURTLE TAGGING
  - RESEARCH WITH GADIYA
  - COMMUNITY RANGERS
  - ANYTHING ELSE

- ANYTHING ELSE IMPORTANT FOR GOORLIL + ODORR

I gave these to people when I saw them next to help explain what I was doing:

> *Jeff reminded me of the plan, which I showed to [elder woman] - she liked it but she said I should have had a picture of hunting from a mangrove raft as well as an outboard motor - to show how things were done in the past. I gave her the plan and the list of potential things to have in the management plan. [elder man] took these - he obviously was listening although he never spoke a word to me. [Elder woman] said that she would make sure the men and other people had a chance to read over and that they would add things to the list - that they needed to talk it over amongst themselves and she would let me know if people were interested in talking to me.* Field diary notes dated 8/10/2002

I used these representations to guide my conversations with people for the remainder of my data collection for the management plan. This approach worked well, and people often expanded upon the basic categories to express their own personal concerns.

The categories I presented triggered both stories about turtle and dugong at a personal level and also collective knowledge that had been handed down over generations. In terms of the general knowledge of odorrgoordimil I found a great deal of overlap in the areas and stories raised by individuals, but when discussing the worries and plans for the future in most cases each person had a specific issue that was of greatest urgency for them. For example one man wanted to see bins installed at each of the beaches so that there would be less rubbish, whereas another expressed grave concerns about the potential impact of heavy metals bio-accumulating in the turtle meat as a result of lead being shipped out on barges from a nearby port.

I was aware that reciprocity is culturally important when working with Indigenous people, and that the Australian Institute of Aboriginal and Torres Strait islander Studies guidelines for ethical research in Indigenous studies clearly states as one of its principles that 'A reciprocal benefit should accrue for [a researched community] allowing

researchers often intimate access to their personal and community knowledge' (AIATSIS 2000).[48]

I felt that the potential gains for the Bardi Jawi and Mayala communities from the management plan and my research were too abstract and intangible to serve as a suitable exchange for the knowledge shared with me. In order to redress this balance, and after much discussion with community members I decided to pay each participant for their time with a 'fuel card' which could be used at the community petrol pumps. People really appreciated the gesture (due to my limited budget the amounts were not huge, either $20 or $50 depending on the time we spent) and it helped to mitigate the mistrust that some people held in association with 'research' due to negative experiences in the past with researchers who had come to the communities, taken information and never returned.

6. Issues of participation

In a participatory project the scope of community involvement is extended beyond simple consultation to include active input in the interpretation of data and the evaluation of the project. Ideally a participatory project will involve as many people as possible in order to ensure that all viewpoints are represented and that any decisions made are appropriate and represent the consensus of the community as a whole. This is particularly important in research that aims to instigate community based management of the environment as it gives the best chance for the management decisions to be upheld over the long term (Stringer et al. 2006). It was these theories in mind that I approached the process of developing a 'management plan' from the stories that people had shared with me.

In practice, the most challenging part of my research experience was in gaining community participation beyond the initial collection of data[49]. Once I was sure that I had at least approached, if not interviewed all possible respondents I began the process of collating the data, which I again returned to the communities in order be sure it was appropriately organised. I attempted to use a participatory process in the analysis of my

[48] Available at http://www.austlii.edu.au/au/journals/AILR/2003/12.html last accessed 28/1/2012

[49] This is not uncommon in participatory projects, for example see Irvin and Stansbury (2004).

data at both a group and an individual level, as I enlisted peoples' assistance in prioritising the stories I had collected in order to produce a management plan[50] for odorrgoordimil.

Once I had collected a great number of stories, and had exhausted my list of hunters and elders, I organised a series of meetings to discuss the information I had gathered and my intentions as to how I was going to organise the results. I had hoped for sufficient input into my analysis in terms of people prioritising statements or organising statements into categories. In November 2003 I returned for another round of field trips with the intention of formulating priorities for the management plan and with a hope that through running planning workshops I would be able to narrow down peoples' priorities into a discrete plan.

I based my approach in these workshops on the participatory methodologies described in 'Planning for Country' (Walsh and Mitchell 2002), a book written specifically to facilitate Indigenous communities' control over environmental issues:

> People view country in different ways. People communicate about country in different ways...[Western systems] have in the past recorded and presented land and its resources from Western viewpoints. Often these are standardised. Rarely have they shown information that reflects Aboriginal traditions. So far, the information is unlikely to be accessible or useful to Aboriginal land owners (Walsh and Mitchell 2002: 3).

My objective was to collate all the data on turtle and dugong that I had collected and to begin to prioritise actions and concepts for the management plan. I did feel uncertain about how to structure the final plan, as all the examples I had read were very formalised and in what I considered to be 'bureaucrat-speak' which would not be particularly accessible to people within the communities:

[50] Ultimately the information collected by my research was utilised in applying for federal funding for a ranger program set up to manage marine turtle and dugong in Bardi and Jawi country. This process brought up a whole other set of ethical issues and is discussed in greater detail in Chapter 9.

> *Does the management plan need to have gadiya as well as Bardi information? Can it 'just' be pictures and simple text, or does it need to include gadiya style writing?* Field diary notes dated 6/10/2002

I wanted people to participate in the process of defining which aspects of turtle and dugong knowledge, and which aspirations should be included as part of a plan for managing odorrgoordimil. This was particularly important to me as successful 'management' of hunting practices would need to have broad community agreement on what this entailed (Bomford and Caughley 1996). Despite there seeming to be a general consensus that greater attention needed to be given to the well-being of odorrgoordimil, I was aware that the form that this might take would probably not match up with non-Indigenous concepts of the appropriate means of regulating hunting practices (Nursey-Bray 2006).

It was with all this in mind that I approached my meetings. My aim was to refine the many voices of my data into a unified set of priorities and actions. After each interview I had broken down the stories and points told to me into individual statements that pertained to a specific issue, usually one or two sentences, but sometimes a little longer. I then collated these statements into general themes or categories that emerged from the data.

Altogether I had 13 categories, each with between 16 and 62 statements. The categories were: About hunting now; keep culture strong; past hunting; past eating and sharing; eating and sharing now; how turtle live; how dugong live; other mobs;[51] how many are there? too much rubbish; we need rangers; more research ideas; more ideas and hunting management.[52]

Prior to the meetings I wrote down all the statements that I had collected onto individual file cards and prepared some A2 sheets of card headed with the general categories I had separated them into (see Photo 2). I stuck the file cards with blu-tac onto the sheets that I

[51] 'mob' is an Aboriginal English term (now colloquially used throughout much of Australia) that refers to a group of people ('that mob over there'), and in this case primarily referred to institutions and government agencies with an interest in turtle and dugong or sea country management.

[52] To view all the categories and associated statements see the 'progress report' attached as Appendix 1.

felt they belonged to, with the idea that they should be easily moved from one category to another, if people felt I had placed them in the wrong sheet.

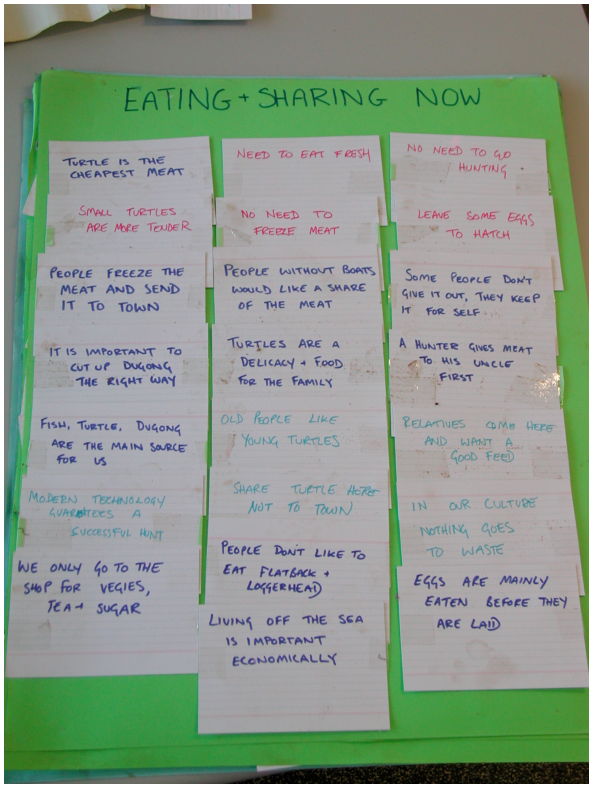


Photo 2: Example of file cards arranged on a category sheet

My first meeting was a little awkward in that initially no one showed up (after I informed all of my participants that it was happening in the preceding days, and also put up flyers at the community office and store). After an hour or so I went down to the office feeling dispirited, which turned out to be a good move, if only for my ego:

> *No one showed up and I was pretty disappointed/frustrated/angry at myself - felt I had obviously done something wrong since it hadn't worked. Went back to the office and saw {Senior elder} and [council chairman]. [Senior elder] wasn't surprised, said it was typical, no one turned up for anything anymore. I asked what I could have done better, and they said nothing, don't worry about it, you've given everyone a chance to have their say anyway. Went back up feeling a little better - 5 minutes later a group (6-8) of young guys turned up. Hooray! They were all into the books I'd brought, checking out the photos and then I had the meeting. Went through all of the ideas raised and got some more from those guys...It was good and I gave out four more cameras.* Field diary notes dated 11/12/03

In my later retrospective notes I was a little more cynical about the sudden 'appearance' of these young men - they were all from the one family group that was headed by the senior elder I had spoken to at the office. I was not certain whether the motives for their arrival were based on sympathy for me, or a political ploy to retain control over the project or both:

> *Politics of this meeting - [family group] making sure it happens on their terms? Need to make sure rest of young guys are involved. In retrospect I now feel [senior elder] would have rounded up [the young men] to make me feel better - and it worked! Unsure of long term consequences of this meeting if any. Was it just to go along and listen to this daft gadiya girl or what?* Field diary notes dated 11/12/2003

Although I was relieved and pleased that someone had come to the meeting, and that I had managed to speak to some of the younger hunters at last, it was disappointing that none of the people I regarded as decision makers attended.

My second meeting was held the following day at a neighbouring community, and was a completely different experience:

> *Got there about 8.30, found [senior hunter and elder] already in the hall, sweeping and getting chairs for meeting. Good sign! Set up with bikkies, maps and books in middle of hall, long benches all around in circle. Put signs with a big turtle and 'goorlil*[53] *meeting today' on doors. There were a lot of people around the shop and hall - mainly for the truck that had just arrived with supplies. Some elders rocked up fairly early ('round 9ish), but people were in flux, moving in and out, trying to call others over etc... Quite a few people were interested and eventually got about ten people - all older. {senior elder] came in for a sec, but was obviously uncomfortable and left after giving me a few sentences about the importance of turtles.*

[53] Literally 'seameat', usually refers to turtle, but can also include dugong.

> *Some older ladies came in a bit later as well and sat with me. I was really stoked with the turn out. [senior hunter] was really helpful, trying to get everyone in the meeting and organised, went with Jeff to try and round up another elder. ...It was a really good meeting. I felt I presented myself and the project clearly and people were enthusiastic and contributing. Everyone agreed that something needed to be done, people were keen on community rangers and limiting turtle take, also being strong about culture and traditional methods and approaches. This may have reflected age of people present but since I'd heard the same thing from younger crew I felt confident that the views I had were on the cards were pretty unanimous. I had the sense that this community at least has taken ownership of the project.* Field diary notes dated 16/12/2003

At the time I put the success of this meeting down to the presence and backing of a few key senior hunters and elders with whom I had built a good rapport and who seemed to believe in what I was trying to do. It probably also helped that this was a smaller community than the one I had previously held a meeting at, with fewer political divisions between family groups. I also heard from members of this community that they often felt 'left out' of research and government consultation as many outsiders would often only hold meetings and conduct research within the larger neighbouring community.

Although people had come to my meeting and given me further ideas for the management plan, I was disappointed that no-one had given me any direction as to refining the statements into something resembling a plan or set of actions and priorities. I was unsure at the time whether this was because people were uninterested in developing a management plan for odorrgoordimil (as it had been first suggested by outside interests) or whether they expected me as an expert to be taking charge of the process and deciding for them (which I was uncomfortable doing). Other thoughts that crossed my mind in later reflections were that perhaps culturally it would be inappropriate for people to dismiss others' ideas, unless this took place in a setting with all the major decision-makers present (Walsh and Mitchell 2002). I also later wondered if such a process also required a great deal more time than I had allowed, for a group decision to be made outside of my carefully constructed meeting scenarios. This point was raised for me in an interview I

conducted in 2004 with a non-Indigenous participant who had spent many years with the communities:

> *One of your problems with timelines is that often it doesn't give enough time for a good decision to come out... you obviously will have a timeline on all this but it would work best if there wasn't a timeline and a lot of time to do it, and whether the community could have information fed into it regularly, and it could regularly be discussed and it would actually sort of start to generate its own directions.*[54]

On subsequent field trips I tried to hold meetings to consolidate the feedback from the community as a whole but I never again had a meeting as an individual researcher that involved more than one or two people. Even at the smaller community I had no luck, setting up in the same way, with lunch laid on, I waited in vain for hours before someone took pity on me and came and had a look at what I was doing. It was an extraordinarily painful process and one that caused me to doubt my own purpose, yet again. In the end I concluded that no one was interested in taking the participatory research any further:

> *Went into [Community B] briefly this afternoon tried to catch [hunter], he was in but didn't want to come out and speak to us. Shy his wife reckoned. She said people just wanted us to speak to 'Gary mob' and leave it at that. More and more corroboration on the theme of – we've told you what you want to know, now shove off and leave us be. In the friendliest possible way of course! Feeling very much unnecessary (that's okay, means less stress). I have to (for my methodology if nothing else) go through the motions of seeking feedback and consent and participation. This cycle is unnecessary - that is what I am being told.* Field diary notes dated 25/10/2004

At that point of my research I had gathered a great many stories from community members about marine turtles and dugong, and as I had not gained any instruction from the community on how they would like these to be transformed into a 'management plan', I decided to write up a document which contained all of the varied stories I had collected, broadly organised under the major themes that I had presented at my

[54] Interview with non-Indigenous participant 5/5/2004.

'meetings'. I put in many of the photographs that people had taken with the disposable cameras and added an explanation of the research process, emphasising the open and iterative nature of the work and allowing for further additions from people I had not yet spoken to. I printed out 50 colour copies of this "progress report"[55] and bound them in plastic folders, and then sent them out to all of my informants and the community councils.

These documents were a great success. People told me that they appreciated that I hadn't edited or privileged any of the statements, and many of my informants said that they recognised many of the (anonymous) opinions as belonging to particular community members. On subsequent field trips I always brought out the documents at meetings and when meeting people for the first time, and they proved extremely useful in provoking comments and additional stories. I ended up rewriting the 'progress report' three times in order to add in further stories, and ran out of funding to produce further documents well before the demand for more ceased from the community.

I believe that a key reason for the success of the document was the fact that there was no attempt to provide a united view on any of the contentious issues that surround marine turtle and dugong within these communities. It was clearly an open process, which allowed for disagreeing statements to be read together and provided a level platform for all views to be heard without an outsider's interpretation clouding the picture.

> *[Senior elder] said I had done it properly and it was a pity they hadn't had people from the communities working with me from the start to see how I did it - because I had really listened to people.* Field diary notes dated 29/6/2004

It was at about this point that I felt I had reached the first full circle in my research, where I could for the first time see the many conflicting and messy truths that surrounded 'what the community wanted for marine turtle and dugong'.

Despite the positive feedback from the community I felt dissatisfied with my research approach being tied through my research agreement to produce a 'management plan' reflecting the community's aspirations for marine turtle and dugong as this was still an

[55] A copy of the final report can be found in Appendix 1.

externally driven aim. From the communities themselves, there was no sense of urgency over trying to decide what people wanted for odorrgoordimil.

I was tied to my research process, and tied to my research agreement - supposedly in 'the community's' interests but in reality reflecting the agendas of outsiders - both myself and the land council. Such dilemmas are not uncommon in participatory research, and in recent years there has been a growing critique of the ways in which these methodologies have been used, particularly in the context of development work in third world countries (Stringer et al. 2006, Irvin and Stanbury 2004). Some of the original critiques of participation that I recognise as valid to my own experience include the notions that:

> Participation can obscure rather than reveal local knowledges...This may result from "the tyranny of the group" where consultants prioritize community consensus over differentiation and consolidate dominant norms as "legitimized" participatory knowledge...but also from the assumption that participation's technologies are neutral tools...In fact the diagrams, sensitively managed discussions, and famously "relaxed" approach are already laden with the perspectives, values and priorities of Western experts and these shape the knowledge they produce. Moreover, the supposedly benign facilitators of participation are in fact rather domineering figures who determine both what can be known and how it can be known...This is what Cooke and Kothari (2001 term the "tyranny of decision-making and control" (Kesby 2005: 2041).

And perhaps more disturbingly, I wondered whether the following critique might also apply to my later involvement as a research consultant working on a government funded project to encourage the community based management of marine turtles and dugong:[56]

> Through participation (particularly that sponsored by the World Bank) people are drawn into becoming the compliant subjects of the broader project of modernization, making empowerment through participation tantamount to what Foucault calls subjugation (Kesby 2005: 2042).

[56] Discussed in depth in Chapter 9.

7. Conclusion

On reflection I can see that my initial engagement with the community was hampered by my own beliefs in the importance of the aims of my research, my lack of cultural and institutional knowledge of the communities I was working with and my training as an ecologist. I also was working alone, without much support from people who had undertaken similar research. Davies (2007: 91-92) provides a detailed summary of the cultural and institutional understandings needed by ecologists who dare to venture into a cross-cultural setting, advice that I wish I had had, and heeded, prior to my own venture into the field:

> Scientists who want to partner with Aboriginal organisations in research face a number of barriers from their own training and organisational structures. To be effective in operating independently, they need a good understanding of the roles and strategic approaches of Aboriginal organisations, the policy environment and cultural contexts. Developing this knowledge takes time, even with a steep, and sometimes traumatic, learning curve. Developing research proposals that respond to Aboriginal priorities also needs time and field engagement. Participatory approaches require facilitation skills and budgets for community engagement and communication.

Thankfully, I had the significant advantage of sufficient time to spend a period of four years listening to what people were saying on the ground, interspersed with periods of reflection when I was away from the communities. Through this process I was able to release some of my own expectations and became able to hear and understand more of what I was being told. I also continued to speak to others who had worked in these and other Indigenous communities, and this input, as well as my continuing exploration of the literature, helped immensely.

One of the assumptions that I eventually released was the idea that there should be a unified 'community view' on any particular issue. By releasing the responsibility for the timing of the next step in the research process, the members of the community were able to come to this in their own time. The success of my project over the long term was partly

serendipitous, and partly as a result of not pushing too hard when things weren't working, and moving swiftly when they were. The knowledge of when to act and when to reflect is a skill that probably can only be learnt through experience of the research cycle, and the process of action research (Schmuck 2009).

My experiences lead me to agree with the notion of 'karparti' ecology as explained by Horstman and Wightman (2001) in their article of the same title:

> The term *karparti* is based on the Kriol word for the English expression 'cup of tea', although pronunciation varies across north Australia (it can also be heard as 'garbordi'). The phrase '*karparti* approach' is used here as an analogy for an unhurried and respectful approach to discussions or research with senior custodians of knowledge on mutually beneficial terms...When somebody calls '*karparti*!' while traveling through country, it is time to stop and discuss where we have just been, or plan where we go next. The reasons for stopping may not be immediately apparent to the researcher, but are always important to the custodians. The '*karparti* approach' is based on guidance by the senior custodians, respect, balance, reciprocity, flexibility and time availability, and of course, a pannikin or two of tea (Horstman and Wightman 2001: 101).

The necessity of taking sufficient time to slow down and listen to others is a critical point in participatory research, but it is one that is hard to achieve outside of the relative flexibility that is granted by doctoral research. When working for Indigenous organisations (such as a land council, as Horstman and Wightman were) there may be an institutional understanding of the need for taking time to form relationships, but there still may be external constraints on timelines connected to funding, or the need for personnel to work on other prioritised projects. As Horstman and Wightman (2001) point out, this kind of shift requires changes at many levels for any successful outcome:

> ...we are not presenting a simplistic case about adding Aboriginal knowledge to scientific papers, or inviting Aboriginal people on research trips. Rather, we seek a 'sea change' in how ecologists conduct their research; how science (and which science) influences land management policy; how government agencies undertake their planning and allocate resources for environmental management; how

> resource developers conduct environmental assessments; how our society values and recognizes traditional knowledge; and, which (and whose) imperatives drive the management of land and sea in the public interest (Horstman and Wightman 2001: 100).

Despite the difficulties inherent in bridging the gap between an institutionalised framework of set dates and funding agreements and the realities of conducting truly participatory and reflexive research with local communities, the potential rewards of knowledge shared and the successful implementation of locally based natural resource management are very great. A case study of such an interaction which shows how these outcomes can be achieved is described in further detail in Chapter Nine. The following chapter, Chapter Six, provides an in-depth analysis of the data I collected from both my historical research into the relationships between people and marine turtle and dugong in Australia, and the interviews I conducted with people from different cultural backgrounds over the course of my fieldwork.

Chapter Six: Soup or Sacred?

1. Introduction

In this chapter I present a collection of stories that provide a multifaceted view of the ways in which peoples and cultures relate to marine turtle and dugong. These stories are portrayed in a historical progression that highlights the way in which culture is a dynamically evolving coproduction of knowledge and experience.

The chapter begins with three sections that outline the historical changes that have occurred in the values attributed to marine turtle and dugong in non-Indigenous Western Australia over the past 100 years. This leads to a discussion of the conflicts that have occurred as a result of the differences in worldviews held by the differing cultures, followed by an overview of the contrasting and complex values that I recorded from the Bardi Jawi and Mayala communities during my field work there. Finally I provide a consideration of the hybrid spaces and bridges that can and have been produced to accommodate different perspectives.

The primary data presented here was collected as part of my fieldwork in the communities, and from targeted interviews with marine turtle and dugong scientists.[57] There is also a range of stories gleaned from historical archives held at the State Library of Western Australia, popular and scientific literature and media reports.

2. Turtle soup and dugong oil

In this chapter I provide a focussed analysis of the older historical materials to do with dugong and turtle in Western Australia, including a discussion of the commercial harvest in the past. Recently other scientists have become more interested in historical harvesting

[57] Please refer to chapter on methodology for specific techniques used. A discussion of the ethical and methodological challenges of working in Indigenous communities can be found in the previous chapter.

of turtle and dugong, and I refer to their work as secondary sources in this chapter[58]. There is also some overlap in primary material used by Limpus (2008) where he discusses the impacts of the commercial turtle fishery on Green turtles (*Chelonia mydas*) in Western Australia.

The historical commercial use of marine turtles and dugong was a story that immediately caught my interest. Once I began to explore the historical literature and records I discovered that the primary value attributed to marine turtle and dugong over the past few centuries was one of economic importance. I found it incredible that only a few years before my birth, turtle soup, caught and canned in Western Australia was available on supermarket shelves around the world. All my life my perception of marine turtles had been one of amazing endangered species, creatures that required special protection. The commercial harvesting of these species is largely forgotten by a culture that is now focussed on conservation, and I found it fascinating to realise the extent to which they were exploited in the not so distant past. When and how did the change from soup to sacred occur?

Like marine turtles, dugong were extensively harvested during the early part of European arrival in Australia. Commercial records of their exploitation exist only for Queensland waters, but it is certain that their harvest took place across northern Australia. In particular, the economic value of dugong was seen to be its oil, which was said to have medicinal value:

> The Australian dugong is a larger species, attaining sometimes a length of 15 ft.; it occurs along the Australian coast from Moreton Bay to Cape York, and is highly valued by the natives, who hunt it with spears, and gorge themselves with its flesh, when they are fortunate enough to secure a carcase. Of late years the oil obtained from the blubber of this species has been largely used in Australia as a substitute for cod-liver oil. It does not contain iodine, but is said to possess all the therapeutic qualities of cod-liver oil without its nauseous taste...The flesh of the

[58] Daley et al (2009) have provided a comprehensive review of dugong harvesting in Queensland, and Limpus (2005, 2007, 2008) has provided an overview of all known historical impacts on the six turtle species found Australia wide.

> Australian dugong is easy of digestion, the muscular fibre when fresh resembling beef, and when salted having the flavour of bacon (Anon. 1911). [59]

From a Queensland based popular account written by Patterson in 1939 it would seem that for a period of time dugong were fairly heavily exploited in that state, a fact that is supported by other historical accounts of dugong fisheries in the region:

> As a result of constant hunting, the dugong has been almost wiped out. Years ago the tropical and sub-tropical waters of Australia literally teemed with the animals, and dugong-hunting was quite a thriving industry. In those days dugong meat was served up almost daily in many of the leading Australian restaurants. Owing to the scarcity of the creatures, however, the industry has practically died out (Patterson 1939: 358).

The commercial harvesting of dugong in Queensland continued in a sporadic manner, with occasional closures due to a lack of animals to harvest until it was prohibited in 1969 (Daley et al. 2008).

Although accounts of similar exploitation in Western Australia are not to be found in the public records, I was told stories by some of the more elderly members of the Bardi Jawi and Mayala communities that indicate that they were involved in similar practices:

> *Long time ago when I was a little boy - whiteman came here, killing dugong in dugong season - killed lots for oil. Jackson Island, sent drums, boiled dugong for oil, into bottles, Darwin way too. They still getting more this time.*[60]

Given the age of my informant at the time, this harvesting most probably occurred in the 1930's. This tallies with accounts from that period that describe the medicinal powers of dugong oil:

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[59] From the 1911 edition of Encyclopaedia Britannica found at http://www.1911encyclopedia.org/Dugong accessed 12/4/2009.

[60] Jawi elder 2003.

> Dugong oil is one of the few products much used in native medicine that have been adopted by our medical world. For centuries the Torres Strait natives have been using the oil for various ailments, but it was not until eighty years ago that the oil was found to have a high medicinal value...it is extensively used in the treatment of phthisis and similar diseases (Patterson 1939: 358).

L. MacMillan wrote a popular descriptive piece on the natural history of the dugong in northwest Australia in 1955 that gives further details of the practical uses of dugong products:

> The hide of the dugong cures well and makes an excellent thick white soft leather suitable for ladies' handbags and fancy goods. The solid bones – with a very high phosphate content – when burnt make an excellent filter ash. The blubber yields an excellent clear, soft oil with high penetrative qualities. The oil was at one time believed to have great medicinal value in the treatment of tuberculosis, but this has since been proved to be wrong. Because of its powers of penetration it probably has some value in the massage of arthritic joints. It makes a very good hair oil, one or two drops being capable of subduing the densest and most unruly head of hair (MacMillan 1955: 18).

There is some mention of dugong being protected in the early part of the 20th century by MacMillan:

> Other species of *Sirenia*[61], including our Australian section of it, would very probably have also become extinct had not the various administrations concerned very wisely enforced a strict protection against commercial exploitation for this slow-breeding and comparatively defenceless mammal (MacMillan 1955: 17).

MacMillan goes on to suppose that this protection has had positive results:

[61] *Sirenia* is the family name for the group of herbivorous aquatic mammals that include dugongs and manatees.

> Here in the northwest its range and numbers are definitely increasing; a few years ago it was seldom seen south of Broome, whereas to-day it is common well to the south of North-West Cape. Recent occurrences of the dugong off the northern rivers area of the New South Wales coast seem to indicate a similar southwards expansion of the race along the eastern coastline of Australia (MacMillan 1955: 17).

Again from MacMillan we gain a sense that despite the apparent protection given to the species by 'the relevant authorities', in the northwest it was not uncommon to partake of dugong steaks in the 1950's:

> The meat of the dugong is excellent for eating. In appearance it is somewhat like pork; it cuts like beef but has a flavour between veal and oily pork. If before roasting it is pressure-cooked to remove the oil it becomes more like beef in flavour. There is absolutely no fishy taste or smell about dugong meat (Macmillan 1955: 18-19).

The source of this meat may well have been from local Aboriginal groups, as the author goes on to explain:

> As can be gathered from the foregoing, although the dugong has considerable commercial possibilities it is fortunate that apart from hunting by aborigines, the various governments concerned have maintained a strict "all the year round" protection for this slow-breeding species. Years ago, commercial interests, using large mesh nets, almost wiped out the dugong along the Queensland coat, but effective protection has since enabled the remnant to re-populate many areas along that State's seaboard. Here in many areas of the northwest the coastal natives depend largely on the dugong for fresh meat supplies (Macmillan 1955: 19).

The exploitation of dugong by non-Indigenous peoples seems to have gradually ceased over the past 50 years; certainly there is no mention of any concern in the records up

until the 1980's. After this point voices are raised in protest over the Aboriginal harvest of these animals, which will be explored in a later section of this chapter.

From early records of European settlement, it would seem that sea turtle meat was a delicacy enjoyed by many people in Western Australia, and overseas. Subsistence and commercial exploitation of these species was extensive in the latter part of the 19th and early part of the 20th century in Australian waters. This exploitation was not confined to this region, as there was an extensive harvest of turtles globally at this time, with Green turtle (*Chelonia mydas*) being especially targeted for their sweet meat. Hawksbill turtles (*Eretmochelys imbricata)* were also caught but mainly for their shells from which 'tortoise shell or 'bekko' products were made (Limpus 2009).

Even at this time of near universal exploitation of these species there were voices calling for conservation and restraint, some on the basis of protecting the numbers of animals available for harvest, others with a more emotive response:

> (Sailors) turn them by suprisal on their backs, which is a posture they are utterly unable to recover from, and are thereby frustrated of all defence or escape, and are a ready prey to any that resolves to seize them. When the sensible creatures find themselves in this desperate posture, by which they know themselves to be in a lost and hopeless state, they then begin to lament their conditions with heavy sighs, and mournfull [sic] groans, and shed abundance of water from their eyes, in hopes, if possible, to secure their safety with their tears, and mollifie the cruel assaults upon their lives (Ovington 1691 quoted in Huxley (1999).[62]

In Western Australia the official records of a commercial turtle industry commence in the early part of the 20th century, when a turtle soup cannery was established at a small town (now abandoned) called Cossack near Onslow in the Pilbara region of north-west Australia (see Figure 1 for map) in 1931. Although exclusive licenses were issued for the large-scale commercial harvest and processing of turtles, anyone with a standard fishing license was permitted to take animals for consumption. Limpus (2008) estimates that this

[62] John Ovington (1691), Ascension Island South Atlantic, quoted in Huxley (1999), a pamphlet published by the Australian Marine Conservation Society.

operation was processing 2500 Green turtles annually. This cannery was operational for some five years before the venture came to an end in 1936 when the company in charge failed to pay their license fees.

A proposal to revive the turtle soup cannery at Cossack was received in 1951:

> As it is intended to revive the Turtle Industry along with other associated sea foods, the Western Australian Turtle & Sea Food Canning Industries Syndicate, which has been syndicated for the purposes of promoting the Company, would appreciate your views as the probability of obtaining Exclusive License to take Turtles. The demand for Turtle Soup overseas assures us that the [whole] of the output will be taken; another most important factor is that we earn dollars for Australia as the U.S.A are keenly interested in soup and steaks, and all our Australian sea foods. [63]

No records of the numbers of turtle caught or processed for this new industry were found. From the accounts in some sources, the methods that were proposed to be used do not seem a particularly efficient way of catching large numbers of turtle – as there was a great deal of physical effort put in per unit caught:

> Regarding your request for details as to catching method employed by Capt Gregson, a chaser vessel is employed to drive the turtle into the shallows, as the turtle comes up for a breather, Gregson dives on to its back, grips the back of the neck, the turtle and diver go to the bottom and the diver heaves it on to its back and shoots to the surface where the chaser is ready with block and tackle to heave it aboard [64]

It is not noted whether this industry was halted as a result of the nuclear testing at the Montebello Island group off the Pilbara coast (see Figure 1) in 1952 and 1956 that reportedly caused the deaths of thousands of nesting turtles:

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[63] Letter from George Henry Proudman, Auditor, to Chief Inspector of Fisheries 21st April 1950.

[64] ibid.

> There is a brief account of a landing on beaches south of Pitt Point, Trimouille Island (1–1.5km north of the blast site) in June 1953 that describes the stench and devastation of the turtles: '....for the entire length of the beach (two beaches, each about 500 metres long). Dead turtles were 'piled three or four deep, in a layer from six to ten feet (two to three metres) wide'...While the number of turtles killed will never be known, one of the sailors who made the above observations claimed that he saw "tens of thousands" of dead turtles. [It was] estimated from gross approximations without measurements of the turtles involved that perhaps 5000 turtles were piled ashore on the two beaches.
>
> There were two additional nuclear tests among these islands on 16 May 1956 and 19 June 1956. All three tests would have killed resident turtles in the vicinity. Radiation poisoning should have debilitated or killed turtles that arrived to breed or feed for years to come... Eggs laid on the beaches during the following years would have been bombarded with radiation from the sand. These nuclear tests probably caused the largest localised kill of marine turtles from human activities in Australia's history (Limpus 2008: 73).

At some point in the 1950s this industry ceased. The lack of detailed records of the harvest of turtles for the first half of the 20th century probably reflects the level of importance given to these species by the Western Australian Department of Forestry and Fisheries. This was not a particularly lucrative industry, and much of the interest in the harvest was located in regional and remote parts of the state.

The records resume in 1960 with exclusive licenses given to two companies, Tropical Traders and West Coast Traders Pty Ltd, which operated off the coast of Ningaloo Reef near Exmouth, and by 1961 large numbers of turtle were being caught again, during a season running from September to November (the breeding season for marine turtles):

> Catching and processing turtles on freezer boats in the Onslow area off the North-West coast of Western Australia is a new industry recently started by the Geraldton firm of West Coast Enterprises Limited. Samples of the snap frozen products have been favourably received in the U.S., Britain, France and Japan,

> while particularly promising results have been obtained in Mauritius....In the first six weeks of operations more than 40 tons of turtle meat were processed. The meat is wrapped in polythene bags and then placed in special cartons and snap frozen.[65]

These companies continued to harvest turtles until the cessation of the industry in 1973 when turtles became a protected species. In contrast to the previous 30 years, a great deal more attention was given to the extent and impact of this harvest, with the Department eventually requiring the captains to record their catches in logbooks - much to the captain's dismay:

> Log book data collection from the West Coast Traders' boat has not been so successful. Apparently, the increased work load brought about by the export processing on board leaves no time to complete accurately the log book requirements .... In the future, only one research log will be able to be completed. In view of this, and the information above, will it be necessary to continue the turtle monitoring under the present system in the future?[66]

Evidently, the idea of having to record the number, size and sex of the turtles caught was seen as an imposition by at least one of the companies involved, and they did not expect the Department to enforce this requirement:

> Mr. McGowan called at these Laboratories and offered the following information: He is unable to complete accurate data relating to the sex and biological requirements of our log book sheets, as he is involved in export handling and cannot spend the time with the days catch after it is landed.[67]

The Department had good cause to insist on the accurate keeping of records by the fishermen, as they had been inundated with complaints about the fishery as early as 1962 from the owners of the cold storage facility where the turtle meat and eggs were stored:

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[65] 'The Australian Exporter' September 1961.

[66] Report to Director of Fisheries by R. Lenanton dated 16th June 1971.

[67] Report to Director of Fisheries by R. Lenanton dated 16th June 1971.

> We are very concerned about the operations of a certain syndicate which is catching turtles in the Nor' West [sic]. When they first commenced, we were assured they had an export market for turtle meat and eggs. This was not so and we were forced to adopt a firm attitude to secure payment of storage and processing costs. The eggs, constituting a parcel [of] 267 cartons weighing over five tons, remain unsold in store. By now a considerable quantity of these would be second year turtles. A test count reveals that there are more than 128,000 eggs and I presume you have information at your disposal to estimate the possible number of survivors if they had hatched. This week 53 cartons of skin and flipper were delivered ex the "Koolama" into our cold store. This means the red and Green meat has been discarded. Such indiscriminate catching can only lead to serious depletion of the turtle population and I strongly recommend that you introduce regulations limiting the catch to the issue of a permit against firm orders. [68]

Voices of concern about the commercial practices of taking turtle increased until the fishery was closed in 1973. Similar moves had already been made in other parts of Australia, and Western Australia had the dubious honour of being the last state to ban the commercial exploitation of marine turtles.

One of my primary informants, Dr RIT Prince, who worked through these times and was instrumental in the management of sea turtles after they became protected, sums up the incredulity of the present conservationist looking back at the past:

> *We had at that stage a sea turtle fishery - we actually had a sea turtle fishery! We had whale fisheries as well under the whaling acts, and of course whales had been exploited to commercial inviability* [69]

The incredulity expressed here by Dr Prince reflects the change in perception that has occurred in our culture regarding both marine turtles and whales over the past fifty years.

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[68] Letter dated 18th April 1962 to Mr Fraser, Director of Fisheries from the General Manager of the West Australian Meat Export Works.

[69] Dr RIT Prince interviewed 2002.

This shift had its basis in the growing environmental awareness that was building momentum internationally during in the 1960s.

3. We are killing too many

Concerns over the impact of the commercial fishery of marine turtles on population levels were first raised in the early 1960s, and the initial reaction of the Western Australian government was to begin monitoring on the number, sex and size of the turtles being caught.

A letter from the Department of Fisheries to the fishermen detailing the reasons for this action gives some context for the concerns:

> You are probably aware that there has been considerable comment from time to time about the value of allowing turtle fishing at all. In many parts of the world, there is a complete ban on this type of venture as it has been found that turtles are vulnerable to fishing pressure and depletion soon takes place. The function of this Department is, of course, to permit rational exploitation of resources but at the same time must ensure that the resource itself is not depleted.[70]

It is important to note that these local shifts mirrored the growing national and international concern over species extinction that developed in the 1960's. These concerns were promoted by the emergent counter culture movement in western societies, which reacted strongly to the results of the post-war boom in development and resultant increase in resource exploitation (Hutton and Connors 1999; Merchant 2002).

In the international arena conservation was beginning to emerge as a matter of urgency with groups such as the IUCN[71] (or World Conservation Union) set up to be international

[70] Letter from the Director of Fisheries and Fauna, Mr Bowen to Mr Dease of Tropical Traders dated September 26 1968.

[71] The World Conservation Union is an intergovernmental organisation that promotes conservation action and dialogue between different countries.

foci for the organisation of research information, in the hope of preserving the most endangered species as a matter of urgency. In 1963 the head of IUCN declared:

> An immense amount of research that has taken place on certain bird and mammal groups has shown that the plight of many more species than is readily appreciated can only be described as desperate (Davis 2005: 115).

Marine turtle biologists based in the United States were running major campaigns to influence governments worldwide to halt the exploitation of these species, through such organisations as the IUCN. Throughout the 1960's and 1970's the IUCN Marine Turtle Group headed by Archie Carr ('the father of sea turtle research') was working with the precise aim of influencing just such governments as Western Australia to ban commercial exploitation of sea turtles. In 1964 he stated:

> We are not at deadlock with the Green turtle as we were with the buffalo. We are killing it out idly, aimlessly, with no conviction of any sort, with most of us not even aware that it is going...The awful trouble is that this renewed demand for sea turtles comes at a time when there are too many people in the world to supply with turtle soup and tortoiseshell. If they are to have these things the only possible way is to produce them on turtle farms (Davis 2005: 114).

Carr was reportedly impatient with the go slowly and carefully tactic of the IUCN at this time - he felt that the organisation should be more proactive in lobbying governments to protect species:

> It seems to me that when an organization of the stature of IUCN decides to give special attention to the plight of a group, it should go far beyond tactical stop-gap measures, and put into effect a major strategy of intervention. If IUCN can't mount a cooperative international campaign to protect and restore international resources then nobody can (Davis 2005: 116).

As stated above, Western Australia was the last of the Australian states to run a turtle fishery and in 1969 the Department of Fisheries and Wildlife appointed Dr R Bustard as

Western Australia's delegate to the Working Meeting of Marine Turtle Specialists to be sponsored by the IUCN. In a letter to Dr Bustard confirming this appointment, Henry Shugg, the Chief Warden of Fauna at the time stated:

> The Department is concerned that the present rate of exploitation might cause a serious reduction in the population numbers. The two people with exclusive rights are required to provide data on a daily basis so that the effects of fishing will be recorded. The Minister for Fisheries and Fauna has stated that he is not in favor of a general increase in turtle fishing activity, at least at the present time. The Department would welcome any research activity on turtles in Western Australia, but would not necessarily commit finances.[72]

Meanwhile, the local pressure to cease commercial hunting also continued, as this 1970 letter from the Western Australian Naturalists Club shows:

> Some concern has been expressed by members of this club over the commercial fishing of turtles as practiced at present in waters of the north west coast. It is their impression that the population density has decreased remarkably in the last few years, though no proper counts have been made to confirm the observation. [73]

Others wrote in with more personal accounts:

> Recently I spent fourteen days in the [Point Cloates] area and was perturbed at the apparent lack of turtles in a[sic] area where one year previous there was an abundance of these animals.. ..... I believe there were three boats, now two who are licensed to take turtles. One boat, 'Tringa' has I believe a quota of 40,000 and information from a crew member is that they are having trouble filling their quota. Such obvious depletion in such a short period requires I believe a departmental enquiry before irrepairable [sic] damage is done.[74]

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[72] Letter from Harry Shugg (chief warden of fauna) to Bustard 24/2 /1969.

[73] Letter dated 9/12/1970 from WA Naturalists club to the Department of Fisheries and Fauna.

[74] Letter from Ross G. Robinson dated 4th August 1970 to H Shugg Chief Warden of Fauna.

One V. Cox of Broome wrote in to complain of:

> Whites taking turtles at Derby and selling them to natives for exorbitant sums of money... One old chap - a friend of mine has a small cutter of 20 feet that he sails out to the nearer islands 30-35 miles away and with no motor that is quite a way. He tells me that there just isn't any turtle left out there, not of reasonable size anyway. Which is pretty grim as turtles are part of his tribe's natural diet and he is allowed to hunt them by law anyway. [75]

From my interviews with Dr RIT Prince in 2001 it was made clear to me that the issue of marine turtle harvesting in Western Australia was a source of internal conflict within the Department of Fisheries and Wildlife at that time. Although Dr Prince went on to be the preeminent expert on sea turtles in Western Australia, at that time he was concerned with the management of kangaroo harvesting, a field which gave him an insight into the sustainability (or not) of the turtle fishery.

Dr Prince recounts how he and others within the Wildlife section of the Department raised concerns about the levels of harvest:

> *[Turtles] were considered not to be anything much at all except a fishery and the fact is that we had a conflict within our own department.*

The concerns of Dr Prince and others were based on the recent new knowledge about sea turtle biology that indicated that these species would take a long time to recover from extensive harvest:

> *....everywhere else said that unregulated commercial exploitation seemed to be the about last thing you'd want to do to a sea turtle stock.*

It would seem that the growing awareness of the vulnerability of sea turtles from the conservation lobby was not a popular discourse with the fisheries managers:

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[75] Letter from V. Cox of Yampi sound to Department of Fisheries and Fauna, 9/12/1971.

> *At that stage I said 'why is the Department of Wildlife and Fisheries running a sea turtle fishery?' And basically one of my friends who was in fisheries science was told that he needed to do something about this but 'you wildlife bunny huggers - it's nothing to do with you, it's fishing!' You know like a within departmental dispute.*[76]

The differences in opinion and purpose between the divisions of Wildlife and Fisheries in this Department were clearly growing: [77]

> *Actually I wrote something myself, and a colleague wrote a letter to our director... saying 'why is this department if it purports to be the wildlife conservation department, actually operating as a fisheries arm in this way?'*

By 1973, the pressure upon the Department was obviously sufficient that the shift was made. Bernard Bowen, the head of the Department, wrote to the Minister advising him that the Department felt the fishery should now be closed. The reasons behind the closure are quite evidently public pressure, rather than scientific evidence:

> The Department has been under pressure for some time to prohibit turtle fishing because such populations have been shown in other areas to be quite incapable of withstanding fishing pressure and also because of the general public feeling against the practice of turtle fishing. ... Throughout Australia this State is the only one to still allow turtle farming in any form.[78]

Following this advice, the minister officially closed the fishery at the end of June 1973. This may not have been an entirely popular decision - as from reading the press release one is left with the impression that there was the possibility of controversy over the availability of turtle soup:

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[76] Interview Dr RIT Prince December 2002.

[77] This division was to some extent resolved in 1983 when the Department split into two – Fisheries, and Conservation and Land Management.

[78] Letter to the Minister of Fisheries and Fauna from Bernard Bowen Director of Fisheries dated 17th May 1973.

> There will be no more fishing for turtles in Western Australia after June 30, this year, the Minister for Fisheries and Fauna, Mr A.W. Bickerton, announced today. World populations of Green Sea Turtles have declined as the result of commercial exploitation said Mr Bickerton, and Western Australia has a responsibility to protect those turtles which return annually to our shores.... "This did not mean to say" Said Mr Bickerton "that turtle soup would become a delicacy of the past; the future of the turtle products industry lies in the establishment of turtle farms.[79]

4. Flagship species

The shift from the exploitation of turtles to their conservation took place primarily as a response to a perceived decline in the local populations. This occurred concurrently with the increase of international pressure due to the recognition of conservation of natural resources as a matter of new urgency. The changes within the Western Australian legislation to prevent the exploitation of marine turtles reflect the broader move towards increased regulation and protection of natural resources worldwide as described by Caroline Merchant:

> During the latter half of the twentieth century, the resource conservation movement based on efficient use of natural resources changed to an environmental movement concerned with quality of life, species preservation, population growth, and the effects of humanity on the natural world. A multitude of government projects, policies, and laws, together with citizens' movements, increasingly regulated economic development and sought to preserve remaining wilderness areas (Merchant 2002:174).

Manuel-Navarrete et al. (2008) conceive of the broader shift towards conservation as part of the existing normative discourse about the environment moving from an anthropocentric to a biocentric emphasis (while retaining the modern dualistic view of humans and nature). This meant that while people began to focus more energy on

[79] Press release from Minster of Fisheries and Fauna dated 30th May 1973.

preserving 'the natural world' for its own right (rather than as a resource to be carefully managed), they still did not conceive of human culture as a congruous aspect of that world. Manuel-Navarrete et al. (2008) describe the 'normative' discourse of the environment and its management as being:

> ...based on the belief that our current social organization "works" (or might work with some minor adjustments) to solve the global environmental crisis. All that is required from individuals is professionalism and an ethical commitment. Solutions to the crisis are derived from both scientific truths and morally correct analyses. It is argued that the only way that real change can take place is through the effective implementation of policies to preserve nature (Manuel-Navarrete et al. 2008: 339).

The normative approach characterised much of the early approach to conservation of marine turtles and dugong and other species in the 1970s and 1980s. Grove-White (1993) desribes 'orthodox' environmentalism in the United Kingdom as emerging in 1988 after United Nations Brundtland report on 'Our common future' was released in 1987. The international response to this saw governments taking on board certain key issues (such as the hole in the ozone layer, and threatened species) which had been legitimised as 'real problems' through the process of scientific research and policy formulation:

> Environmental problems worthy of the name are thus regarded as *physical* problems, arising from specific human interventions in natural systems; their character and boundaries are, so to speak, given to us from nature, their authenticity guaranteed by natural scientific investigation and confirmation. This being the case, the argument continues, what is now needed are 'solutions' to mitigate these physically defined 'problems' - solutions which may be found in persuasion or regulation, in technological innovation, in international agreements or in the application of economic instruments (Grove-White 1993: 18).

This pattern of government taking on the responsibility for the protection of the environment and threatened species took place throughout the developed world, leading to a further shift in public perception of the value of these animals. At the time that marine turtles became protected in Western Australia, a similar shift was occurring in

relation to whaling, although it took an extra five years for the more lucrative whaling industry to be completely closed down (in 1978) by the Western Australian government. The cultural shift that occurred in the case of whaling was even more pronounced than that which occurred with marine turtles:

> Whales are not the relatively ordinary and uncomplicated natural resources they were some thirty years ago, when it was possible to publish a book in which commercial whaling could be portrayed as a fine and dignified profession...There has been a profound shift in the perception of these animals. Today, people who whale are often depicted by influential animal rights and environmental organisations as the worst of eco-criminals, barbaric and cruel. In campaigns against whaling it is also compared to slavery and cannibalism.. Even the Holocaust, a concept usually reserved for the fate of peoples, is considered a fit metaphor for describing the over-exploitation of former times (Einarsson1993: 74).

Niels Einarsson (1993) argues that it is the symbolic value of whales as representatives of the wider environment that has led to their current position of importance in western cultures. He sees whales as acting as a metaphor for more complex environmental issues, representing a concrete goal to aim for in an ongoing battle, where the 'saving' of the whale becomes the test of the ability of humans to prevail against environmental destruction (Einarsson 1993).

Like whales, dugong and marine turtles are often used in a symbolic sense to represent the ocean. I found that in all the cultures I investigated, the image of a turtle (and less frequently) the dugong was used to symbolize a particular group or organization's link to the ocean. This symbolic use is of course nothing new, as these creatures have been icons in many different cultures over at least millennia (Frazier 2004), and possibly longer.

The modern use of species such as dugong and turtles as 'flagships' for the conservation movement has been characterised as moving beyond a simple association with the ocean to a representation closer to that of national flag waved in battle (Einarsson 1993), or in more recent times, a marketing logo for an environmental cause (Home et al. 2009). This

approach has been criticized by some for narrowing the public focus to a few selected species at the expense of others (Clucas et al. 2008), where other commentators view flagships as bringing benefits to others that share habitat or threatening processes (Home et al. 2009)

Yet this symbolic importance does not account for the level of emotional attachment that some people have with these creatures. From the standpoint of the rational and scientific perspective, it becomes very difficult to explain why these animals are so important to our cultures:

> How and why are people attracted to (or repelled by) marine turtles? What motivates them to do what they do? What are their expectations regarding how people and these reptiles should interact? ...In some cases the attraction for marine turtles is so great that conservationists' enthusiasm has been likened to some sort of religious fervour (Frazier 2004: 282).

Others argue that this is because it is not a rational response, but rather, an emotional connection that people have made with these creatures that are so evidently other-than-human. Milton (2002) raises the idea of personal and impersonal ways of relating to the world, where the impersonal is when the non-human world is assumed to be reducible to one of non-intentional processes, whereas the personal understanding of the world sees the other-than-human as 'intentional beings and/or beings worthy of moral concern' (2002:33).

There appears to be a bifurcation in the human relationship with nature as represented by charismatic megafauna such as turtle and dugong, one extreme being the rational scientific (criticised as mechanistic) view of the world, the other the spiritual and/or emotionally connected (criticised as irrational) view of the world. The arguments made by Milton (2002, 2005) are that animals such as marine turtles and dugong provoke an emotional response because we recognise aspects of ourselves in them.

In the rational scientific worldview, marine turtles and dugong are important representations of the biodiversity crisis, threatened species which act as flagships for important habitats or suites of species:

> Diplomatic delegations from scores of countries meet expressly to discuss the conditions of marine turtles, ways to conserve them, and even to negotiate international instruments such as treaties and memoranda of understanding – documents specifically focused on marine turtles...Annual expenditures on turtle conservation are estimated to be at least 20 million US dollars worldwide (Frazier 2005: 8).

Einarsson (1993) argues that the symbolic importance of whales is due to the humanised image that has been implicitly and explicitly created for them by people in order to serve the interests of conservation, through the metaphor of anthropomorphism. This rather cynical view represents the unease created by the space between the rational (or impersonal) and the irrational (or personal) response to the world creates. This is also an example of ambivalence as defined by Bauman (1991) as a challenge to certainty, and more broadly perhaps even modernity itself.

Milton (2005) argues that 'anthropomorphism' or the projection of exclusively human characteristics onto the other-than-human is a misleading term, and proposes 'egomorphism' or the recognition of oneself in others as a more appropriate concept, as it relates to our understandings of the other-than-human.

> Environmentalists have been immensely successful in generating public sympathy for whales. It is because whales are genuinely understood to be thinking, feeling, conscious beings that so many people object to their being killed (Milton 2005:259).

Milton points out that many scholars appear to have difficulty with the concept of other-than-human beings displaying traits such as emotion, purposes and personalities, yet these

understandings are readily accepted in the non-academic world as inherently valid[80]. Milton (2005) goes on to suggest that emotions, and emotional responses are essentially ecological phenomena, proposing an ecological model of emotion which recognises that emotions are what connect individuals to their surroundings and 'that the essential ecological relationship is not between culture and the environment (as in cultural ecology and cultural constructionism), nor between a population and the environment (as in the ecosystem approach), but between the individual human being and their surroundings' (Milton 2005: 12).

One attempt to reconcile this relationship from the rational perspective is the idea of biophilia (or love of life) first described by the scientist E.O. Wilson in 1984 in his book of the same name. Wilson defined this as the "innate tendency to focus on life and life-like processes" (Wilson 1984:1), and saw this tendency as an integral part of being human, and possibly as a biological need essential to our developmental growth.

In his later writings Wilson acknowledged that biophilia remains an ambiguous concept for many ecologists, as scientific training emphasises the separation of reason from emotional responses, yet on the other hand it is often this attraction to the other-than-human that underlies the drive to undertake ecological work.

> Part of the canon of peer-reviewed science is the assumption that the scientist is a "disinterested" observer who seeks to describe natural phenomena as objectively as possible. Papers in journals represent distillations of results of certain observations or experiments, but rarely do they describe the pathways that were fruitless or the zigzag route whereby a discovery was made...any kind of deeper truth about the fellow organisms with whom we share space may require the shucking of this shibboleth if we are to understand the intricacies of other life-forms and how we may fit in (Kellert and Wilson 1995:16-7).

[80] For example, there is usually no controversy in stating that dogs are emotionally attached to their owner, or are able to communicate a wish to go for a walk, or their fear during a thunderstorm. All of these traits are aspects of humanness that we recognise in an other-than-human being, and which allow for a close personal relationship with that being.

During my interviews with scientists who worked directly with marine turtle and dugong there was a tendency for them to deny any personal relationship with the other-than-human. The scientists I interviewed were adamant that they did not have emotional feelings about the animals they studied:

> *I don't have any, 'illusions' about them. I mean they're a large, crucial order of animals that are important to the marine ecosystem, I suppose there's a certain adventure factor I mean, wrestling large, wild animals - a lot of testosterone goes down.* [81]

The masculine posture of this scientist may reflect the enjoyment of the physical interaction with an animal, which in other cultures is experienced through hunting:

> *It was a pleasure actually dealing with the animal - after dealing with seals it was a pleasure dealing with an animal that you knew wasn't going to rip your head off. Could crack your jaw with a flick of its tail but it wasn't gonna bite you.*[82]

This personal distancing from the animal mirrors the findings of Campbell (2002) who interviewed many marine turtle scientists in North America and found that although there was a general recognition that people were emotionally attached to the animals they worked on, all but four of the individual scientists denied that they were so affected:

> While experts saw their own views as based on science, they saw alternative views as based on "something else," i.e., emotion. For example, five experts felt that non-scientific "conservationists" were emotional about turtles, while they were not: "I wouldn't say it's really the biologists that are in that group. It's more like the conservationists without the biological training". This research suggests this is not necessarily the case: three of the four experts who acknowledged their emotional responses to turtles were active research scientists (Campbell 2002: 1242).

[81] Male dugong scientist 2002.

[82] Male dugong scientist 2002.

During my interviews with marine turtle and dugong scientists I picked up similar sentiments:

> *It wasn't the touchy-feely 'Oh aren't they gorgeous', they're dumb, they're big, they're cold, they're like little robots or big robots... I mean I like them from working with them, but none of that touchy – feely 'I would die to save this sea turtle' business, because I'm not like that at all.*[83]

But there was also a recognition by participants that not all scientists felt dispassionately about these creatures:

> *A lot of scientists that do work with them in the states and in Europe, they are passionate, totally passionate about these animals, and very vocal and I think they've really been able to push the political agenda to raise their [turtles] profile with their own governments and get this animal on protected species lists and keep them there.*[84]

The importance of maintaining a publically objective relationship with the environment mirrors the characteristics of the 'normative' discourse as described by Manuel-Navarrete et al. (2004), which conceives of the ecosystem as an entity with inherent 'integrity' which is lost or degraded by the impact of any human-induced divergence from its baseline condition[85].

Interviews with scientists showed a clear sense of ethical responsibility in relation to the protection of marine turtles from anthropogenic threat:

> *It's something we can do easily, to protect them - just not kill them. When they're all dead the future generations are going to say well they knew, they knew all they had to do is stop killing them, why didn't they? I don't want to have to answer to that when I'm eighty....Say the Leatherbacks in Terengganu Malaysia, that*

[83] Female turtle scientist 2002.

[84] Female turtle scientist 2002.

[85] The precise setting of such a pristine baseline is one of the areas of weakness for this discourse and can be a matter of great contention due to the long history of human society.

> *population is on its last legs, I don't know if they've officially declared it [extinct] but it's pretty damn close. And Leatherbacks are two metres long, I mean they're huge, and this animal which has been doing what it is doing in its lifetime for probably sixty to eighty years and in the species lifetime millions of years - and we've pushed it to extinction in a couple of hundred - it's just ethically totally unacceptable.*[86]

The urge to protect marine turtles and dugong as expressed by the scientist above mirrors the main thrust of the conservation movement which promotes the idea of a dualistic world where the agency of human beings is limited to two non-overlapping roles, either as protectors of a pristine wilderness or as destructive consumers of natural resources.

It was sentiments like these that have led to a conflict between people who are concerned with conservation, and Indigenous groups that still hunt these species. This conflict was not present prior to the 1960s as both groups had a consumptive relationship with these species. It was after this time that the relationship between cultural groups over the issue of turtles was fundamentally altered, as they ceased to be a legitimate food source for non-Indigenous Australians. This shift was not replicated within Indigenous culture in Australia, as the cultural and economic importance of hunting both marine turtles and dugong remained key in many coastal groups.

5. Cultural battleground

It is often perceived as inequitable that Indigenous Australians are legally allowed to hunt these marine turtles and dugong (Ponte et al. 1994). There is also much debate over the techniques used and appropriate cultural constraints. Some argue that traditional methods (which catch fewer animals) should be enforced to enhance conservation; others argue modern 'humane' methods should be used to prevent suffering of individual animals:

> There remain tensions between territory and national conservation law and policy and the claim for traditional hunting rights by some Indigenous groups. The claim to hunt, kill and eat endangered animals such as dugong (*Dugong dugon*) is

[86] Female turtle scientist 2002.

> difficult enough, but to hunt them with traditional weapons would see a rise in intercultural conflict over animal welfare (Albrecht et al. 2009: 22).

Some of the problems non-Indigenous people have with Indigenous harvest of these animals are based on the argument that modern hunting technologies combined with the already precarious position of these animals (due to prior commercial exploitation and habitat destruction) has led to a situation where the traditional use of marine turtles and dugong by Indigenous peoples is now unsustainable (see Marsh et al. 2004; Heinsohn et al. 2004)[87].

> Internationally, marine turtles and dugongs are regarded as being vulnerable to extinction. Most of the world's population of dugongs are found in the waters of Northern Australia, making Australia the largest, and most globally important, refuge for dugongs. However the survival of dugongs and marine turtles in Australian waters is under threat due to a number of factors. High on the list are human-made threats such mesh fish netting, Indigenous hunting, boating and illegal take. While the commercial fishing industry, recreational users and coastal developers must take their share of the blame for declining marine turtle and dugong numbers, it is also clear that the present levels of Indigenous hunting cannot be sustained.[88]

The conflict between conservationists and Indigenous people on this issue can be traced back to the early 1970s, which, as has been explored above, was a time when the wider Australian society shifted its attitude on turtles from a fish to be exploited to an animal of special concern. Bustard published a book 'Sea turtles in Australia' in 1972 that argued strongly for turtle conservation:

> While it is clearly correct for aborigines living in a tribal way of life to be able to continue to take their normal food even when this is totally protected from use by Europeans, it is not correct for assimilated aborigines to be able to do this...

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[87] These arguments will be examined in greater detail in the following chapter, Chapter Seven: Problematising Populations.

[88] From the website of the NSW Young Lawyers Animal Law Committee http://www.lawsociety.com.au/page.asp?partid=6216#anchor47819 accessed 20th May 2009.

> Together with many conservationists, I feel that this situation is quite wrong and poses a serious threat to the safety of certain native fauna. Aborigines who adopt a European way of life must forfeit their rights under the act (Bustard 1972: 177).[89]

Turtle biologists continued their calls for traditional hunting to cease through the 1980's and beyond, raising particular concerns about the changes in the methods used by hunters to catch their prey:

> [Turtle biologist] said that the only people that he considered dependant on turtles for survival lived in Indonesia and a few small communities in southern PNG. 'It is a fallacy to hold that Indigenous people were so attuned to animal populations that they regulated their own take'... 'In the past the kill was regulated by technology and hunters had to be very proficient to survive. But if these excellent hunters have modern technology they can increase their capacity enormously. A modern rifle and 4 metre dinghy with a 40 hp outboard motor gives them massive killing power.' [90]

This specific problem with hunting methods is a persistent theme in my data and the historical records, but it may be worth noting that this discourse primarily appears in personal accounts, rather than the academic literature, perhaps because there have been no studies done to show the impact of different technologies on the harvest:

> Whilst I think most Western Australians will agree that Aborigines should be able to pursue their traditional hunting for sustenance it should be on the basis that

[89] The language used in this book to refer to Indigenous Australians is typical of the relationship that existed between colonisers and the colonised at this point in time, in what is now known as the 'assimilationist' era. There was a strong discourse within white Australia that predicted that all 'traditional' practices would eventually die out as Indigenous people became 'assimilated' into white culture (which was perceived as the much more attractive choice for any peoples). Aboriginal people in Australia were only granted citizenship of their own country after a referendum held in 1967, and it is likely that this book was written in the context of the 'dog tag' citizenship laws, which allowed Indigenous Australians to receive certain 'rights' (such as staying out after a curfew, drinking alcohol or living in a town) if they severed all connection with their previous life, including speaking their native tongue, cultural activities and even 'associating' with their family members.

[90] Article in The West Australian Wednesday Oct 23 1986.

> they use traditional weapons. It is certainly not acceptable that they can use modern appliances.[91]

This sentiment holds the idea of material cultural change as one that is irreconcilable with the continuation of practices and indeed relationships. Many anthropologists and others with knowledge of Indigenous cultures have argued that culture is not static and that peoples will incorporate new technologies into their practices when these become available. This view is upheld by the Australian Law Reform Commission, which in 1986 concluded that it was the purpose of the activity rather than the method that defined hunting as a 'traditional' practice.[92] The question over whether the capacity to kill more animals has resulted in an actual increase in the numbers harvested is still extremely contentious, even within Indigenous communities (see below).

This issue is not restricted to Australia and marine turtles and dugong. Many other Indigenous hunting practices around the world have caused conflict with people who morally object to the killing of animals as a general rule (in the case of animal rights activists and some vegetarians), or the specific harvest of species which are seen to be important in an ecological or emotional sense (whales and fur seals are two prominent examples). The arguments made against hunting may be seen by Indigenous peoples as undermining their cultural integrity, as has been argued by Inuit scholars:

> The animal rights movement has redefined Inuit culture and, more importantly, what measures are applicable to its analysis. In so doing, it has found Inuit to be a former aboriginal people who are now just like us. This is so because the artefacts that made Inuit what they were are no longer a part of the visible present. Images of dogteams and snowhouses, harpoons and predator-prey ratios, and wardrobes of 'traditional' sealskin clothes are established and then compared to the snowmobile and rifle that equip Inuit today.....In this anthropology, the word 'tradition' becomes a semantic telescope that is used the wrong way round. What

[91] Letter from JW Donaldson to WA Minister for Fisheries reproduced in Moran 1997; obtained from Broome CALM office.

[92] Australian Law Reform Commission (ALRC), The Recognition of Aboriginal Customary Laws, Report No 31(2) (1986).

> is distant is good; what is contemporary is bad because it has been tainted by modernity (Wenzel 1991: 5-6).

More recently, Tyrrell (2010:138) also argued that "The imposition of wildlife regulations has brought about cultural, perceptual and relational changes. And each of these changes has arguably had a negative impact on the animals that conservationists strive so hard to protect. Those who set the rules of management continue to misunderstand and misinterpret the cultural and symbolic role of animals locally, assuming that through the act of hunting, animals are a mere commodity for Inuit. In fact, it would appear that the imposition of management practices actually serves to transform these animals into commodities and no longer sentient co-inhabitants of the Arctic environment".

Hunting may be opposed on an animal rights or cruelty basis. In particular the widely publicised practice of some north Queensland Indigenous communities of live butchering of turtles has provoked a great deal of controversy. Graphic, disturbing descriptions have been published:

> The blood ebbs in billowing clouds of crimson. In the shallows, a giant Green sea turtle lies stricken in its upturned shell, its flippers gouged from the sockets above the carapace and tossed into the water. A marauding reef shark edges closer. The hunter runs his knife in an arc around the perimeter of cartilage and tears off the plastron, the soft breastplate shell, as dispassionately as if he were peeling the lid from a can. The female turtle, it's internal organs exposed to the sun and swarming flies, writhes in silent agony. The choicest cuts of flesh are hacked slowly from within the seething cavity. Then the eggs, the liver and finally, the long coils of silvery grey intestine plump with undigested seagrass. After 10, maybe 15 minutes the butchering is done, but still the violated animal clings to life. It draws its straining head up from below the waterline, mouth gaping and eyes blinking in a final vain protest. The hunter reaches down and snaps the neck back into the emptied shell, then casts it adrift like a toy sailboat, back out to sea and the waiting sharks.[93]

[93] "Slaughter of Innocents" by Mark Baker found at http://www.awpc.org.au/other_fauna/innocents.htm last accessed 20th May 2009. More recently, in March 2012, further accounts of turtle suffering as a result of

I find myself confronted by these reports - even though I am wary of the emotive language used here, it is true that the Indigenous approach to animal welfare is different from mine. I accept that in order to kill an animal some level of suffering is inevitable, but I struggle with the moral and ethical implications. If I eat meat I must accept my part in the death of the animals I consume. How does the Indigenous worldview approach this? I have seen Aboriginal kids catch tiny frogs and skewer them for bait without a flinch - the frogs are food and part of their environment. Myself, I could not kill a number of frogs in my honours project without trauma. How does this reflect on our respective worldviews?

Indigenous people counter the claims of cruelty by arguing that the descriptions of their hunting practices are one sided and without cultural context. Melissa Nursey Bray, a researcher who worked in a community where the practice of live butchering of turtles is traditional, recounts:

> When developing the Hopevale Plan, Elders requested of the consultant that a section be included that stated that Green turtles must be butchered while still alive on the beach. When the consultant tried to clarify how this was preventing cruelty (for it seemed to her to be the opposite), she was told it was vital that the blood from the turtle ran back into the sea to ensure its spirit was returned to its ancestors. To kill the turtle first and then butcher it was to deny it the right to a future life, which in traditional Aboriginal culture is considered cruel in the extreme (Nursey-Bray 2009: 7).

Indigenous hunters from other parts of the world also argue that their practices when embedded in the proper ethical framework are morally correct and respectful of the creatures that are hunted:

> The ethical dimension is important and nobody can accuse traditional hunters of immorality. The killing of animals in hunting cultures is commonplace and

Indigenous hunting practices have been filmed and broadcast on public television and are also available from websites such as http://www.unleashed.org.au/take_action/protect-turtles-and-dugongs (last accessed 23rd March 2012).

> natural, so completely open that children can view and participate in it without growing up to be psychopathic killers on that account (Lynge 2002: 25).

The key term used by hunters to describe their ethical relationship with their prey is respect. The problem is that outsiders often do not recognise the ethics or the relationship, as they see only the actions - actions that in the context of their own culture are unthinkable. Indigenous peoples and their supporters often describe the attitudes of those opposed to hunting as imperialist:

> It is one thing to postulate that whales are special and that animals should have rights, and another thing to condemn the cultural practices of people relating to the use of animals and attempt to force them to give up these practices. Animal rights transformed into practice easily turn into what might be called ethnocentric cultural imperialism (Einarsson 1993: 80).

Over the past 20 years or so there have been various exposes of Indigenous hunting in the mainstream media - each release leading to passionate calls for the hunting practices to be stopped. Often these media reports are based on erroneous and exaggerated reports of many animals being killed, and provoke strong reactions from the general public:

> I read with great dismay the article [about Bardi hunting practices] titled "In for the Kill", along with many thousands of concerned Australians, marine scientists, animal welfare groups and children of all ages, cultures and interests, all of whom must still be in shock at the contents of the article. [94]

Interest groups such as the animal welfare lobby utilize these articles to mobilise support and to try and change legislation. The emotive article quoted above, by Mark Baker, is now archived on the Australian Wildlife Protection Council website with an exhortation to 'Take Action':

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[94] Letter from Mr C Thomas to 'The West Australian' Newspaper circulated to Ministers, Director of the Department of Conservation and Land Management (CALM) and Broome Regional Manager of CALM. Reproduced in Moran 1997,

> Please Write To [Federal Minister for the Environment] Urging that he take action to implement legislation to stop the inhumane slaughter of both the turtles and dugongs. Mention that it is high time these animals were afforded strong protection and should not be allowed to be slaughtered - especially as described above - under the guise of 'traditional hunting practices."[95]

My data includes an account by a government employed wildlife scientist, who was evidently distressed by his witnessing of the Indigenous harvest of a baby dugong, and the subsequent discovery of an empty turtle shell (which he presumed had been eaten):

> I am personally disgusted by both these acts, and believe it is unnecessary in an area in which people have regular employment and shopping facilities. I believe the legislation concerning the taking of dugong and turtle by so called Indigenous peoples in this situation needs to be reviewed, and the practice prohibited. [96]

Subsequent communications from the same district office point to further cultural conflict on this issue:

> This region is about to investigate the possibility of creating a nature reserve of the main beach area. This would enable us to prohibit Aboriginals from taking turtles for food. It would also keep vehicles and dogs off the beach... If the area was vested as a nature reserve it would most certainly require considerable policing during the lengthy nesting season (Nov-March).[97]

This final statement shows how the legal take of animals by Aboriginal people could have become, very quickly, illegal. In the days before the Native Title Act of 1993 and the subsequent formation of specific bodies to protect the Native Title interests of Traditional Owners, it was relatively easy for a state government department to contemplate legislating

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[95] http://www.awpc.org.au/other_fauna/innocents.htm .

[96] Letter from Department of Conservation and Land Management Wildlife Officer based in Karratha to head office in Perth 23rd August 1985,

[97] Letter from Department of Conservation and Land Management District Wildlife Officer Karratha to head office in Perth dated 15th February 1988.

away the rights of Aboriginal people in the name of conservation[98]. The nature reserve in question did not eventuate, but the use of wildlife reserves as a threat to Indigenous rights is one of the contributing factors to the conflict between conservation agencies and Indigenous peoples worldwide.

Marker (2006) describes the racist situation in a North American school after a court decision allowed the Makah people to undertake a whale hunt – he describes a strong backlash against Indigenous school students, and attempts to understand the hatred aroused by this cultural practice by relating it to the historical relationships between colonisers and the colonised:

> There is a deeper kind of suspicion and resentment about the Indigenous Other that simply finds public legitimacy in the claims of injustice or unfair special status for Indians. Tribal elders have told me on a number of occasions that political backlash movements are largely an excuse for Whites to vent long-held hostilities toward Indians. There is a deep and enduring aspect to the racism experienced by Aboriginal students that is unlike the experiences of any other oppressed ethnic minority. There is a deep insecurity within the consciousness and conscience of settler societies that, when confronted by the Indigenous Other, is awakened to challenges about authenticity in relation to land and identity. There is embedded in this encounter with Indigenous knowledge a challenge about both epistemic and moral authority with regard to Indigenous relationships to land and the spirit of the land (Marker 2006: 486).

For their part, Indigenous peoples are often scathing of what they see as the urban person's severance from the realities of life and death:

> In modern times a whole new sub-species of *Homo sapiens* has appeared, a product of the urban and industrial society that experiences its fundamental dependence on the biosphere as something embarrassing, inferior, even immoral (Lynge 2002:1).

[98] Ironically, it is the same governments that now oppose Native Title Claims on the basis that Indigenous people no longer exploit natural resources in a traditional manner.

Personally I found the ethics of hunting a very difficult issue. Raised as an urban liberal woman with very little contact with death I found the idea of actually killing an animal for food a hard task to contemplate. Much of my early experiences with animals was as pets, or wildlife admired at a distance. I did not enjoy fishing - the one way in which city folk sometimes manage to harvest our own meat[99]. Not being a vegetarian or vegan, I am responsible for the death and suffering of animals that I ultimately consume. Yet I am able to live without a direct knowledge of this suffering and so can therefore avoid my own responsibilities.

Some who are critical of hunting practices claim that the cultural context of respectful relationships no longer exists in the modern world. This argument often utilises the fact that hunting technologies have changed to contend that the relationship between hunter and hunted has also changed. This debate is not limited to non-Indigenous peoples, as will be seen in the following section.

6. Soup can be sacred - Indigenous voices

In my years of fieldwork with the Bardi Jawi and Mayala communities of the Dampier Peninsula, I was told many different stories about turtles and dugong. The depth and complexity of viewpoints challenged my preconceptions, as I was given a sense of what the relationship with these animals had been in the past, what it was now and how it was changing into the future. Different people in the community were moving in different ways, but the continuity with the past in the way people related to turtle and dugong was very strong.

Hunters told me of the bond they felt with the dugong - how the dugong is a feeling and thinking animal, with many similarities to humans:

[99] Now however, I live in the country, and have had the privilege to be able to raise and slaughter my own chickens – an experience that has shifted my perspectives somewhat, and one that I recommend to other ambivalent omnivores.

Moonlight is a good time for dugong. I went out last night - I was the only one. They moved around in the deep, didn't come up on the reef. They only want to climb on the reef when they're sure. Dugongs are smart, like people, a thinking animal. They have that feeling if there's danger around - he'll move away, get very touchy. Turtle aren't as smart - they wander all over the place, if you chase it away it'll be back next tide. We mostly get turtle on this tide. Not on a spring tide during the day - but at night - yes.[100]

One senior man told me of his experience witnessing the birth of a dugong:

There was a dugong by herself- in shallow near the rocks, playing. When the tide goes down so just her back is showing - she goes to a pool that's where she sits. The tide comes in and out, she plays around aware of the birth coming. The tide turns that same way, that same area, there are movements, fins - then – a bag of water, then a baby. The mother drags baby to the rocks, the tide turns. The mother stays on the outside in a calm place, keeping the baby near the rocks, pushing it up to get air. A couple of days after this, she goes the same way, stays two to three weeks out further at a calm place, not a deep place, closer to shore. When the baby is big enough - not feeding - we can get the mother one - but do not do this much. Mothers are very important. Mothers and daughters travel together. The male ones come in to make love. Inandinarr[101]*. We know which is male or female. Males try to cut out young one from the mother one, the male wants an older wife. So we then have to go after the young one. Life is so beautiful.*[102]

There is no dichotomy here between the relationship of deep connection to the dugong as a sentient being, and the relationship of the hunter to his prey.

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[100] Bardi elder and hunter 2004.

[101] A word that specifically refers to the mother baby dyad in dugong, though it can also mean a mother and her two calves.

[102] Senior Bardi elder 2005.

Others have written about the relationship between Bardi hunters and the dugong, particularly Philippe Rouja who in 1995-6 spent some time living and hunting with a particular Bardi family:

> If ever the Bardi hunted Inandinarr they would not kill the old mother or the baby but kill the one 'in between'. If the youngest calf was old enough they would kill the mother and the eldest calf, leaving the youngest calf. They express great emotional distress when recounting stories of when they were forced to kill baby dugong when they mistakenly killed the mother. They would rather the baby be dead than wandering around looking for its mother (Rouja 1998: 244-5).

Rouja also reported on the relationship between hunter, prey and community, and how this is formalized by the use of ritual, particularly in the butchering and division of the meat:

> Before a dugong was butchered the hunter would draw lines upon the carcass in charcoal according to traditional patterns. Ritual songs were sung as the dugong was butchered. The portions of meat were then distributed to persons in various kin relationships to the hunter (Rouja 1998: 144).

As a woman, it was not possible for me to gain first hand experience of the hunting and butchering of the turtle and dugong, but my informants told me that many of these traditional rituals still took place, though not universally:

> *A hunter gives the meat to his uncle first - the man who brings him through law, His Mum and Dad wait for last. Your Jawal*[103] *brings you through law, he is your boss in real Law, he gives the meat to his brothers first. There aren't many people who still follow this practice, but some people do.*[104]

[103] Jawal refers to the man who is responsible for teaching a young boy to hunt, usually his mothers' brother.
[104] Jawi elder and hunter 2003.

Many people spoke to me about the rituals for increasing goorlil that were carried out in the past[105]. This was generally known as 'singing' the turtle or dugong and is a practice that occurred at the beginning of each respective hunting season, drawing the animals to the coastline where they could be easily captured. This ritual acted as a communication between people and goorlil and was intended to increase the numbers of turtle and dugong coming to visit Bardi and Jawi country:

> *Married turtle - at running water time it is the season for married turtle. There is a married turtle song - if you sing every afternoon around 5pm-8pm, the turtle come the next morning. At running water time - people used to walk along, four or five men, talk to Lalin[106] rock, sit on the rock all day, singing the married turtle. Every tide and current has a different name. The old people know it. Every rock is different.*[107]

In one of my interviews with non-Indigenous people I spoke with an anthropologist who had worked closely with the Bardi people, and she told me that these rituals also acted to connect people to specific locations on country:

> *One of the women sang me the coastline for them... basically you sing them both to shore....at the beginning of every turtle season, you were supposed to sit and sing the coastline, which was all the landing points where the turtles would come in, so she sang that, and it's like a map of country and a map of resources, and a reaffirmation of her identity and her belonging and her right to have these things, and that was incredibly powerful .*[108]

The relationship between Indigenous people and their country is powerful and is closely related to a person's well being - so that someone who is removed from their country may become unwell. One means of rectifying this may be through the agency of goorlil, as my participant explained:

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[105] It is possible that some of these things still occur, but as a woman and an uninitiated outsider I would never have been informed of this.

[106] Lalin generally refers to the season for married turtle.

[107] Senior Jawi elder 2003.

[108] non-Indigenous participant 2004.

A friend who just came down brought some [dugong] with her for someone who was down here, usually saying 'well we know she's crying for country, we must give her this, this will make her feel stronger again'.[109]

Other ways of retaining the connection between people, country and food are the rituals of returning the remains of hunted animals to their environment in an act of replenishing the landscape:

We used to bury the bones of the fish so the tide could come and take it back. Before, At One Arm Point, in Lalin[110]*, we would camp at one spot, used to get goorlil - never waste. Put all the bones from the dugong into pyramids, turtle too. Not chuck em back. They don't know this time. If you look after the land, the land will look after you. If you waste from the sea - it will be all gone.*[111]

Older hunters were very clear in the correct protocols that needed to be observed while hunting in order to respect the animal and ensure the continuity of the relationship into the future:

You need to recognise the turtle first - is it fat to eat? Good hunters can tell. If you want a turtle - kill it, don't wound it. Get turtle for a community, not for one individual. You have to respect the turtle, can't chuck away food. We've lived with it for all our lives, we need to preserve it. Don't over hunt, share the meat. Only hunt fat ones. Preserve for the next generation.[112]

[109] non-Indigenous participant 2004.

[110] Married turtle time, usually in September/October.

[111] Senior Bardi woman 2004.

[112] Senior Bardi Lawman 2003.

There was a clear sense from all of the men that I interviewed that their knowledge about hunting seasons was communicated to them through the agency of other aspects of country[113]:

> *Seasons - people know the right seasons by the trees flowering- it tells you what time of year for turtles. The white gum, when its bark is falling off - that means the rain is coming soon - the married turtles are out there, when the rain comes the turtle hunting is poor. Also when the big paperbark is flowering, the turtles mate and float in with the tide....It's all to do with the reefs, ecosystems, the water colour changes...The wind changes. When I was growing up with the old man looking after me he taught me ceremony, Law, hunting- when to go, about the flowering trees. You can tell by the colour of the turtle whether it's fat or poor. I teach my kids, and nephews the same things.*[114]

There are strict taboos on hunting that persist to this day. One young hunter informed me that there are restrictions on who can hunt for married turtle:

> *If your wife is pregnant or you have a young baby, you can't hunt married turtle.*[115]

He told me a personal story to back this up:

> *I was out hunting, with my wife and small daughter, just caught a small turtle then I saw a married turtle [two mating turtles]. I went for them but missed [this is unusual as mating turtle provide a very easy target]. I couldn't spear them because my daughter was still too young- you are not allowed to hunt married turtle if your wife is pregnant or your child is still very young. My daughter woke up just as I was throwing the spear, the female turtle then knew it was wrong for me to catch her and moved away.*[116]

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[113] This is a relationship that has been observed by many other people that have worked with Indigenous communities in Australia, most notably Deborah Rose.

[114] Bardi elder and hunter 2003.

[115] Young Bardi hunter 2004.

[116] Young Bardi hunter 2004.

Other Indigenous peoples around the world echo the sentiment that a prey animal has agency in that it can choose or refuse the hunter:

> Non-natives most often employ the verb 'to take' to describe hunting; ...But the Koyukon believe that hunters do not 'take' anything; instead, animals choose to give themselves to the hunter. The 'gift' is made as a result of the 'luck' of the hunter, and a hunter has luck when he has been respectful... Respect is the act of following strict rules that guide one's behaviour and actions toward or away from the animal and all other living and non-living things (Watson and Huntington 2008: 261).

The continuity of cultural beliefs and practices is still strong in Bardi Jawi and Mayala cultures, and particularly in respect to hunting practices. Of course culture changes with time and especially when it is disrupted by another way of knowing. Aspects of Indigenous relationships with turtle and dugong have changed dramatically, in ways that are both welcomed and feared by outsiders.

There is a growing 'conservation' discourse within Indigenous culture - that mirrors the changes seen in non-Indigenous culture - but with a stronger emphasis on personal responsibility for managing the problems. The discourse does not match exactly with non-Indigenous conceptions, and varies between individuals:

> *We need a holistic approach to environmental management, planning ahead for 50-100 years. Need to include everything, not just Turtle and Dugong. Everything is interrelated, social and environmental factors together. There should be limits on the amount of turtle one person can catch. Sometimes I catch too many but if there was a limit I would think about it more.* [117]

In general I found most hunters and elders to be well informed about goorlil biology, both at a local and an international level:

[117] Bardi hunter 2002.

In the United States, at the Boyen Islands they are worried about growths they are finding on the faces of the turtles. We haven't seen that here although some turtles carry old wounds and barnacles. [118]

People were worried about how many turtle and dugong there were and whether the numbers were decreasing over time. There was no consensus on this[119] but there were many voices of elders noticing change for the worse, a fact that was generally attributed to the noise of outboard motors chasing the animals away from their preferred feeding and nesting grounds:

Why are they on some reefs and not others? The old people know where they should be. Young people don't realise they're chasing them away, that turtles know about people. Cable Beach[120] *used to be a big nesting beach, but not any more - tourists are ruining the beaches. Every year the turtles go back and their families to the same nesting beaches. It's like the eagles, they always nest in the same place, generation after generation, same family on the same rock. If you ruin the nest there will be no more eagles.*[121]

One year that I was there people raised the idea that global warming was having an impact on their local climate, as the turtle season was unusually late:

But there is nothing yet. It's late October, November, December - getting later and later. It looks like Christmas should be in January.[122]

There was a strong sense of change over generations with many commenting that younger hunters do not respect turtles and dugong as much as their elders. There has also been a shift in hunting methodology over the past thirty years - although this shift is resisted by many of the older men who continue to 'scull' with a paddle rather than 'chasing' with an

[118] Bardi elder 2003.

[119] For the full range of opinions see the management plan in Appendix 1.

[120] Cable Beach is the main tourist beach in Broome, a site where there are often traffic jams just after sunset as all the four-wheel drive vehicles attempt to leave the shore at once.

[121] Bardi elder 2003.

[122] Bardi elder and hunter 2003.

outboard motor. There is much debate over the sustainability of the modern hunt, and a clear conflict between traditional ways promoted by the elder power base and the younger men who are seen as being addicted to 'chasing' and the petrol engine:

> *In the old days people used to catch few dugong. Now, much more. People are worrying about if there are any left, [because of the] motor boats. In the moonlight, [you can] kill many, when the moon comes - get plenty - too much. Old people are saying 'it's too much'. This time, turtle and dugong - there's not much. Before, there was many. Old people worry - they've been living more than young people. [Young people] kill too much. In married turtle time, [we should take] maybe ten, that's all. Same as dugong. But they killing over, because they have outboard motors.*[123]

There was a general recognition that 'chasing' techniques involving following the animals with an outboard motor until they tire, scared the animals away which ultimately meant that less were caught:

> *With modern ways if you see five or six Dugong and you chase one and miss, they all go away. If you scull for one and miss, the others are all still there - another four chances is a big difference.* [124]

Certainly at least one of my respondents was unrepentant about hunting in the modern way:

> *We can't go back to the traditional way - people don't want to go out and come back with nothing. I will support the traditional ways but I don't think it's going to happen.*[125]

[123] Senior Bardi elder 2003.

[124] Bardi hunter and elder date 2003.

[125] Bardi hunter 2003 .

'Traditional ways' covers a lot of ground though, as technologies and techniques have changed greatly over time. In the distant past dugong hunting was a group ambush from the tops of cliffs, involving stuffing the nostrils with grass so they would drown:

On the edge of the reef, one woman would throw rocks.
They come over the reef, run into the men, they caught them with their hands,
drowned them.
Told the women 'We got them', take them back to camp,
light fire, wrap them in bark.
People were really quiet, no noise
when they got dugong.[126]

Since the development of metal harpoons dugong hunting is now far more similar to turtle hunting, using the platform of a boat to spear the animal and then jump in and wrestle it either aboard or alongside the vessel (Rouja 1998). Before the invention and widespread use of outboard dinghies from the 1970's on, the Bardi and Jawi peoples sometimes had access to small wooden boats or pearling luggers for hunting expeditions, and in the distant past prior to European colonisation they traditionally constructed mangrove wood rafts, known as a kalwa. These rafts were used to traverse the ocean between islands and acted as hunting platforms for catching turtle primarily owing to the difficulty of wrestling a large dugong in deep water (Rouja 1998).

Elders today are often disparaging of some of the ways younger hunters go about catching turtle and dugong. In their minds there is a proper way to go about hunting and by following protocol proper respect for the animal and for culture is preserved. Some of the things that are seen as undesirable include practices that make it too easy to catch the animals, such as taking turtle while they are still trapped in the shallow water on top of a reef:

> *The tide come in, they feed on top of the reef, you can catch them before they go into the deep water. We don't like that - we old people.*[127]

[126] Story recorded from Mayala elder 2003.
[127] Senior Bardi elder 2003.

Particularly the older men resent anyone taking too many turtle at any one time, as this leads to a lack of respect for the resource:

> *Tradition, right way, people need to be told. It should be done the right way, with respect. Not going out taking five or six at a time. They are beautiful creatures.*[128]

Despite the negative comments recorded from the elders, when speaking to me the younger men echoed these sentiments strongly - giving me the impression that everyone knows the rules and right way even if they do not always follow them:

> *When I was a kid we went out with our uncles - there were turtles everywhere, that's changed. We used to go out on a full moon at night. It's not the same - there's still turtle around but not as much as before. It used to be a sacred thing - we couldn't make any noise or we'd get belted by our uncles. Now it's like fun, there was more respect before. Sometimes young people are annoying on turtle trips - not much respect, but nothing stays the same. I hope that my kids and grandkids can still hunt turtle, and still show respect.* [129]

The skills needed to hunt in a traditional way gives prestige to the hunters that follow protocol - there was a sense that modern ways (particularly the overuse of outboard engines) were lazy ways. When I was working up at the communities there was one old man in his 60's who refused to ever use modern methods - he was a renowned hunter and very much respected throughout the communities. As another elder put it:

> *I admit I've been doing the modern ways, I want to go back to the old ways. If [Mayala Elder] can do it, so can we, so can the young people.*

Most informants considered 'Galloway' or proper hunting to include instances where a tinny dinghy is motored out to the hunting ground followed by the use of paddles and

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[128] Bardi elder 2003.

[129] Young Bardi hunter 2004.

sculling for the hunt itself. The old man referred to above relies on his knowledge of the tides to take him to the hunting grounds without the use of an outboard motor at all. [130]

Traditionally, and to this day, a Bardi (and presumably Jawi and Mayala) man gained prestige from his hunting ability, and as traditional hunting using a paddle is seen as more difficult, it is still a prized skill:

> *There is a hierarchy of men related to their skill as goorlil hunters. Night hunting is seen as more skilful, this gives more prestige, more masculinity. There are two cultures - two tracks - I'm talking like a gardiya now, but I'm a traditional person too, I'm a young elder.*[131]

The experiences and data I collected with the Bardi Jawi and Mayala hunters suggest to me that there is still a strong culture around dugong and turtle hunting and that many of the proper ways of hunting are still being passed on to the younger generations. Most of the younger men I interviewed expressed similar sentiments to their elders in terms of wanting to preserve culture and the populations of turtle and dugong in their area. Some of this was undoubtedly due to the cultural pressure to conform to the rules set by the elders, and the expectations of outsiders such as myself, and may not reflect actual practice.

I observed a clear pattern of people becoming more conservative or conservation minded in their approach as they grew older, a trend that was attributed by one participant to the sense of responsibility to the future gained by becoming a parent:

> *Young blokes chase too much, but when you get older you change - you want to preserve things for the next generation.*[132]

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[130] The skill of riding the tides and currents is still highly prized by the Bardi and Jawi hunters as it provides a back up when things go wrong. On one occasion when I was out at the communities a couple of young boys did not come back from a fishing trip to the islands for several days – while this was news it did not provoke panic or the deployment of rescue vehicles - instead people correctly assumed that they had run out of fuel and were waiting for the right tide to take them back home.

[131] "Young' Bardi elder and hunter 2004.

[132] Young Bardi hunter 2004.

Blame for unsustainable or undesirable hunting practices was always attributed to the generation younger than the hunter in question, to the point where a 19 year old participant blamed the 12 year old boys!

The economic importance of goorlil harvest to these impoverished communities should also not be underestimated. This importance was reflected in research published in 2009 by the Australian National University, which detailed the first socio-economic study into the importance of marine turtle and dugong for Indigenous communities in Australia, with a research project based in the Bardi Jawi and Mayala communities:

> Based on the harvest survey undertaken by the Bardi Jawi Rangers, an estimate was made of the economic value of dugong and marine turtles as food using a replacement value method. This method provided an estimate of the cost of replacing dugong and marine turtle meat with meat of a similar quality that is available from a local store...it is estimated that the food value of dugong and marine turtles in the three Bardi and Jawi communities over 12 months from February 2007 to January 2008 was just over $340,000 - a contribution equivalent to 11 per cent of average household income each week (Buchanan et al. 2009:xi).

Well-known and respected turtle researcher Archie Carr had this to say about Australian Indigenous peoples' harvest of marine turtles:

> If there is any justification for the exploitation of the diminishing sea turtles of the world it is to nourish seaside people who have always depended on them as a source of protein (Carr and Main 1973). [133]

7. Conclusion

This chapter describes the changing relationships between humans and marine turtle and dugong in Western Australia since the arrival of Europeans and provides an historical background on the current conflict between cultural groups over the hunting of goorlil. Despite the strong feelings on both sides of the debate, it can be argued that there exist a

[133] Letter to Senator Willesee by Archie Carr and Bert Main, prefacing 'Report on an inquiry into ecological implications of a turtle farming project' 1973.

few points of ambiguity where there are opportunities for moving towards mutual learning from the exchange of knowledge in order to develop management strategies which are acceptable to all.

Clearly there is some uncertainty on the part of the Bardi Jawi and Mayala communities over whether their current hunting practices are sustainable over the long term, particularly given the multiple pressures upon goorlil from areas beyond their control (such as Indonesian harvest of Green Turtle and the impacts of climate change on seagrass habitat). This ambiguity provides an opportunity for cross-cultural learning where the communities may engage with the scientific methodologies for further exploring this area of uncertainty.[134]

On the other side of the cultural divide, we can see challenges for non-Indigenous culture in our inability to reconcile carnivory and respectful care for another species. This difficulty is perhaps based in our resistance to the idea that we too may be eaten:

> Our worldview denies the most basic feature of animal existence on planet earth – that we are food and that through death we nourish others. The food/death perspective, so familiar to our ancestors, is something the human exceptionalism of western modernity has structured out of life (Plumwood 2008:324).

Plumwood (2008) argues that as a result of our cultural fear of ending through death, and particularly predation by another species[135], we project a similar fear onto our perceptions of other creatures, sensing that they too must dread their ends. In this way we 'become' the other by placing our own values upon their experiences, whereas hunters in Indigenous cultures also 'become' their prey, but perceive a willingness to die and to be eaten, a gift to the hunter which is part of the reciprocal relationships that animist cultures observe between all entities:

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[134] The ethical and methodological challenges in undertaking such an exploration are detailed further in the case study described in Chapter 8.

[135] As I write this the national and international media are consumed by reports of the latest shark attack victim off the West Australian coast, with an attention to each gruesome detail that is quite out of proportion to the blasé response engendered by the everyday fatalities caused by automobiles, the numbers of which are at least 300 times the number of humans eaten by sharks and crocodiles combined in this country.

> Nowadays we are often told that it is undignified for a human being to kill wild animals and eat them. How in the world did we reach this stage? First the urban person has become alienated from nature and like everyone else fears the unknown. Therefore the city dweller shuns the sight of the predator feeding off its prey and abhors the smell of bleeding innards...Second, hunting and killing animals means inflicting physical pain on them, but urban people believe that pain ought to have no place in life... To inflict pain knowingly and willingly is immoral and undignified. It is a sin...The hunter in the wilderness looks at this matter in a completely different way. Physical pain is part of life and always has been for every living creature. Birth is painful, death is painful, and few things in between are not painful in some way... All living things suffer; it has always been this way. Suffering is the price of life, and life feeds on death. Have the city dwellers forgotten this truth of life? (Lynge 2002:2)

One response to this conundrum comes from the recent revival of an 'animist' worldview amongst certain sub-cultures within the broader 'western civilisation'. For example, Graham Harvey (2005) has written an 'Animist Manifesto' that details an approach to respectful carnivory:

> All that exists lives. All that lives is worthy of respect. You don't have to like what you respect. Not liking someone is no reason for not respecting them. Respecting someone is no reason for not eating them. Reasons are best worked out in relationship – especially if you are looking for reasons to eat someone – or if you are looking for reasons not to be eaten (Harvey 2005).[136]

Harvey works with the presumption that that the practice of taking life is one that can be undertaken with respect to and perhaps even consent from the animal in question. This concept of respect again links back to the sentiments espoused by many Indigenous cultures that see their prey as being active participants in the hunting process:

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[136] First published in 'Strange attractor journal two' (2005), edited by Mark Pilkington; also available at http://www.evolver.net/user/little_lightening_bolt/blog/animist_manifesto.

> Hunting as a right has, for Inuit, its foundations in their customary and consistent acknowledgement of the environment as an active element of their day-to-day lives. This acknowledgement embodies within it the belief that animals also possess rights - the right to refuse Inuit hunters, to be treated with respect, to be hunted and used wisely (Wenzel 1991:4-5).

Harvey's focus on upon building relationships with the other-than-human is problematic for our culture as much of our philosophical thought is based upon a clear separation between ourselves and the rest of existence (Abram 1996; 2010). These relationships have become more important to non-Indigenous culture with the shift from an anthropocentric to a biocentric view of the environment over the past century, leading to the realisation that the mainly dysfunctional nature of these relationships are now threatening the existence of many human and other-than-human populations. Scholars such as Naess (1973), Abram (1996; 2011) and Wilson (1983; Kellert and Wilson 1995) have consistently argued that the only way to permanently repair the damage done is to change the very basic ways in which we relate to the rest of existence:

> Our sense of urgency is prompted by the conviction that the modern onslaught upon the natural world is driven in part by a degree of alienation from nature. Our modern environmental crisis – the widespread toxification of various food chains, the multifaceted degradation of the atmosphere, the far-ranging depletion of diverse natural resources, and, above all, the massive loss of biological diversity and the scale of global species extinctions – is viewed as symptomatic of a fundamental rupture of human emotional and spiritual relationship with the natural world (Kellert and Wilson 1995: 25-26).

The rupture described by Kellert and Wilson above is also known as the nature-culture divide and refers to the idea that human beings should be classified in a different way to the other-than-human. This concept of human exceptionalism (the idea that we are somehow 'special' in relation to all other creatures) arose in part from the Cartesian separation of mind and body – which led to the further separation of the human mind (as the only kind of mind that exists) from the rest of matter (Abram 1996).

It has been argued that 'modern' cultures have at their base the separation of humans from the other-than-human world around them. The creation of a binary category of nature and society is seen as one of the major outcomes of the enlightenment that has made possible the technological and cognitive developments of science. Many argue that this has come at a cost, as our disconnection from the living world has allowed widespread destruction of the global environment in order to fuel the never-ending growth of our economies and populations (Abram 2011).

> The ecological crisis is a symptom of a deeper, metaphysical crisis in human consciousness and an accompanying crisis of culture. A reorientation to the living world will be possible only in the context of a reorientation to materiality per se and a new appreciation of the possibilities inherent in our relation to world, and its local modality, place (Mathews 2005:8).

Following on from this recognition has come a call to abandon the concept of 'objectivity' and to embrace subjectivity in an attempt to re-discover our place in the world:

> What happens if we begin from the premise not that we know reality because we are separate from it (traditional objectivity), but that we can know the world because we are connected with it? (Hayles 1995: 48)

How can we become more connected? Clearly the relationships held by Indigenous peoples (despite all our attempts to assimilate their cultures) still embody a different relationship to country. Scholars such as Rose (2008) have argued that non-Indigenous people can come to a more balanced position by considering alternative, and particularly, Indigenous ways of relating to the world:

> The idea that our local teachers can really teach us anything profound about ourselves and our world is often denigrated. A conventional view seems to be that they can teach us about themselves, and it is useful for us to know about them, but they can't really teach us much that is useful about us (Rose 2008: 166).

In Australia Indigenous scholars have also called for non-Indigenous Australians to look more closely at the ways in which they relate to this country:

> What might our nation look like if white people begin by seeing themselves as custodians of the land who are worth no more or no less than all other living things? (Moreton-Robinson 1999: 15)

Other Indigenous voices point out that in order to understand our place in the ecosystem we need to recognise our role as consumers of other beings and also our potential as food for others:

> If we look back over the horizon of time and observe the human race as it grows out of the mists of prehistory, one thing is certain: humanity appears as a link in the great biological machinery in which all parts, in one way or another, are interdependent. We are part of the biosphere, or if you wish, of life on earth, plant life as well as animal life. Our ancestors have always gathered, harvested, and killed in order to eat. Even in death we serve Mother Nature as food for worms (Lynge 2002: 1).

The relationship between humans and other-than-humans in Indigenous cultures is often described as fitting an animist worldview, where humans and other-than-humans are actively engaged in reciprocal communication about the world (Bird-David 1999). Hornborg (2006) argues that animism is a natural tendency to all human peoples and that it is only poorly suppressed in 'modern' cultures, reappearing in our attachment to many different objects and symbols:

> Is it really true that we, modern 'Westerners', do not animate the objects around us?...Bruno Latour argues that we have, in fact, 'never been modern'. The notion that the world of objects and the world of subjects are separable, in any other than an analytical sense, has been an illusion from the start (Hornborg 2006: 22).

Graham Harvey (2006) goes one step further and argues that academics, particularly ethologists (those who study animal behaviour) could learn much about respectful relationships with animals from animist cultures:

> Others and otherness keep us open to change, open to becoming, never finally fixed in being. Alterities resist entropy and encourage creativity through rationality, sociality (or, as William Blake said, 'enmity is true friendship'). Animism is neither monist nor dualist, it is only just beginning when you get beyond counting one, two... At its best it is thoroughly, gloriously, unashamedly, rampantly pluralist (Harvey 2005).

Plumwood (2008) talks about an emergent animist-materialist worldview where people recognize our place as food in the ecosystem. I would argue that if we come to terms with our own role as food we also come to terms with our role as consumers. There are growing calls from other environmental philosophers such as Adrian Franklin and Deborah Bird Rose for 'modern' society to listen to Indigenous cultures in order to find a more sustaining means of relating to our environment or country. Peter Docker echoes this call to learn more from Indigenous Australia:

> White Australia needs to become 'blacker'. We need to educate ourselves. We need to understand Aboriginal Law better. We need to learn about the relationship between country and story. We need to learn Aboriginal Languages so we can pay proper respect. There is vast ecological knowledge in this country – perhaps even the answers to the world's burgeoning environmental disaster – but this knowledge is not in the English language (Docker 2009).[137]

I also found this idea echoed by a non-Indigenous participant who had worked with Bardi people for many years, specifically the concept that there is more to be known about this country and our relationship with it than is explained by science:

> *I actually think it's very powerful to look at it through someone else's eyes, and felt the same about Esperance which is the other place I work, I mean they're not just big rocks of granite, they're these sleeping ancestors who do x y and z and you can see the path they've followed. And you can look at the dunes up there and see the blood of the ancestor who died doing this, and you can see the sand banks*

[137] Peter Docker interview published at http://www.fremantlepress.com.au/news/46 last accessed on 30/5/2010.

which are lulug the shark sleeping out there....There's always that sense - it's almost spooky - there's always that sense that maybe you're wrong - and that your very prosaic, western science, might not be quite the answer to everything - and there was always enough things that people do or people say that jar you. Personally it was 'Oh I dreamt of your baby' you just think 'What?' 'Yes you're going to have a boy, and he's going to be this...' You think 'What?' and then you get pregnant, you have the child and he does all these things that they've told you, and you think 'Okay...' and 'Yeah, maybe we should be a bit more open minded'...[138]

It is the transformative potential of such unsettling experiences that characterises the opening of the third space from which a hybrid form of knowing can emerge. By authentically engaging with 'the other', ecologists can create the opportunity for cultural exchange which will enrich both Indigenous and non-Indigenous knowledge systems and provide the basis for adaptive, cooperative management of our relationships to country.

The following three chapters provide a detailed exploration and evaluation of the ways in which the management of the relationships between humans and marine turtle and dugong have unfolded in Australia over the past twenty years, with an emphasis on the impacts that different approaches have had on the success of these measures.

[138] Interview with anthropologist 2004.

Interlude: Turtle Hunt

Photo 3: Going out with Marko[139]

This was a big spring tide – it was right out. Saw a few turtle that day, seen a few inside here too. Most of the time turtles are out on the deep reef during the day – they dive down away from boats. At night, they are everywhere on the reef – there are not too many boats. Now with the full moon you can see them bright as day, see their markings and sucker fish, chasing a black shape in the water.[140]

If you go out on a fishing/hunting trip you may come back empty handed. Hunting is not as easy as it sounds - you need to be lucky, you might harpoon him, you need patience. [141]

You don't have to scull, you can drift with the tide.[142]

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[139] Pseudonym.

[140] Bardi Hunter 2003.

[141] Bardi elder 2004.

A fishing trip

Well, when we got to [elder woman's] place she said "guess what? - you guys want to go on a fishing trip?" Of course we said yes, so we went down to the beach. The family and a bunch of kids were going camping on one of the islands (might have been the other side of Sunday Island). We were in a big boat with the women and a couple of girls - we took all the girl children (gender separation!) and took off. There was a freshly caught turtle on its back in the bough shelter on the beach - male, good size. Still alive - one of the guys poured some water over it. I took a photo.

As we went over the water [elder woman] pointed out a lot of stuff - the second island out which had a special place where the men went to increase turtle, I think. There were a number of islands all very beautiful with craggy red cliffs, mangroves surrounding, fig trees and small beaches. [Elder woman] knew where all the water places were. She also pointed out settlements - camping grounds past and present. The tide was very full as we travelled out, but she explained that when it went out it went so far that in many places you could walk from island to island. She pointed out where the deeper places were - where you could float a boat at low tide. She spoke quite a bit about the past, when people used to ride the tide on mangrove rafts. How they had much tougher feet back then - they could walk on the reefs without shoes on. She spoke of the seasonality of resources, pointing out that there was a correct time to collect/hunt everything. Oysters - big and small, turtle, dugong, cockle shell. And that you knew the right time by seeing the fruit on the trees.

We saw humpback whales near to where we dropped the kids off. [Elder woman] said they chased away the dugong and that was when married turtle season began. She pointed out the areas of seagrass beds where turtle and dugong are plentiful - the feeding grounds. We fished for a while in a mangrove lined passage, but no-one had much luck. There were several juvenile turtles around the boat. About dinner plate size to a little larger.

[Elder woman] said of the beach where we dropped the kids that there were many small Rai or fairies attracted to the kids. This didn't sound like a negative thing. She pointed out many areas where they took classes - I think of American students who come to learn each year - but I'm not sure. There was also a ceremonial Law ground for young men that we passed by. Field diary notes dated 5/10/2002

[142] Jawi elder 2003.

Photo 4: Caught on the incoming tide

It was a female turtle, fat. I speared the turtle, you need to wait till it comes up for air, if you chase it long enough it comes up and you throw the spear from the boat. If you use a galwa[143] *you need to lay down when they come up for air and jump sideways so the raft doesn't slide back. Manawan*[144] *is the wood for the turtle spear, tipped with a metal rod, you sit a harpoon on that made out of steel – whatever you can find.*[145]

It was *undurd* or turtle-mating season and he was hunting. They could see this thing on the surface shining. They thought it was *undurd* so they went there but it wasn't. It was just an ordinary turtle. The *lululu* was bearing it up in the water. The old bloke that was with him said that's a *lululu*. [he] told him that the shark was keeping the turtle up there for them. [146]

[143] Also written as 'kalwa', a mangrove raft traditionally used by Bardi and Jawi peoples.

[144] woolybutt tree *Eucalyptus miniata.*

[145] Bardi hunter 2003.

[146] Sampi vs State p175.

Yarning with Harry

As we came into the camp area, we could see a small fire burning the dry grass. At first it seemed like no-one was there, but then Jeff spotted some people tending to the fire. It was Harry[147]*, another bloke and some kids. They came up and I reintroduced myself to Harry who seemed pleased to see me. He had been burning the area in preparation for a large meeting of 1000 people from around the Kimberley, coming up to camp at the end of the month.*

We went and had a chat at one of the tables scattered around the camp area. Harry was great to talk to, really positive about the idea of a management plan. He has done a lot of work with CALM[148] *in the past and seems quite conservation minded. He said he was sick of gadiya scientists coming over to tell him about his country - said that what I was doing was the right way to approach things. He spoke about his time working for CALM, and the problems he had with people who didn't understand where he came from and his right to speak about and for turtle. He said it was good that I kept coming back - that people would be happy that I wasn't like CALM - who came up without telling people they were coming and never reported back. His area on the east coast is sparsely populated and he says there are many dugong but they don't tell anyone about it. Also that there are lots of hawksbill and loggerhead turtles, which people generally don't eat. He spoke of how he no longer hunts as much, he prefers to fish. He feels like in his time he's killed too many turtle and dugong. Now he hardly hunts dugong - only when people ask him to. Turtle a bit more, but he likes to hunt for beef, turkey, crabs and other things as well, you can't just live on turtle and dugong - although some people try. He gave me a lot of information on the distribution of turtle species, but I'm not sure I got it all right. It might be a good idea to go back with a map and mark out the areas - feeding areas and nesting areas.*

He said that up at One Arm Point turtles were hard to find up on the reefs (where they should be caught - rather than the channels) and that a lot of people were starting to go more at night when they were easier to find. Even without moonlight you can see (dugong at least) because of the phosphorescence. He told us a lot about how things were done in

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[147] Pseudonym.

[148] CALM was the acronym used by the state conservation agency at the time, which was called the Western Australian Department for Conservation and Land Management.

the old days, and a bit of his family history - how his father (or grandfather) left Sunday island because he didn't like the missionaries (they give you trouble with one hand and take your land with the other) or the Bardi people (His father was Jawi I gather). He said the family got on with the missionaries at Lombadina much more easily because they (the Catholics) were much more easy going than the United Church mob - allowed people to fish, or not go to church, and that in the 60's a priest from Germany who was also an anthropologist encouraged people to start up Law ceremonies again, which had been banned for 20 years. He spoke about his journeys to South Africa - where they ate Olive Ridley turtle and Leatherback: he couldn't eat it, and to Japan to see men he had worked with on the pearling luggers. Field diary notes dated 7/10/2002

Photo 5: A place of reciprocity with the ocean - where the sharks come in to feed.

We used to bury the bones of the fish so the tide could come and take it back.[149]

There is a certain shark - Lulul. If we have bad luck, if we miss that turtle, or the spear comes out the shark might bring it back for a feed. It's happened to me, and a few other people - it's our God's helper, God's gift.[150]

If you look after the land, the land will look after you.[151]

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[149] Senior Bardi woman 2003.

[150] Senior Bardi elder 2003.

[151] Senior Bardi woman 2003.

Cultural change

We talked a lot about cultures moving forward, the pros and cons of change and which direction we should move in. Anton saw it that western culture conceives of new ideas and moves forward to achieve them – something he feels Aboriginal culture doesn't do to its detriment. He put forward the idea that western culture had advanced from a more primitive hunter-gatherer state but that Aboriginal culture was still there. I refuted this to some extent, trying to point out the advantages I saw in Aboriginal culture: looking after country, family importance... He mentioned that the family feud between two of the prominent families was stopping ceremonies from taking place. He is concerned that in the future there will be less and less sharing between families and communities – he reckons Aboriginal people are becoming more and more westernised with an increasing focus on individual rights rather than collective responsibilities. He doesn't think you can easily change this though – 'you can't make people share...' It makes me feel sad – in a lot of ways I think westerners could learn so much from the traditional ways of doing things, but our culture is destroying the tenets which support the traditional culture. Field diary notes dated 7/10/2002

Photo 6: Gumanan and Nindil

In Green turtle there can be deposits of fat incorporated into the membrane that hold the intestines together which are carefully removed and put aside to be roasted over the coals, or distributed with a lean piece of meat...**Gumanan** is the membrane in between the intestines with fatty deposits, or the liver. Goes with person who takes the **Nindil** – the skirt or piece of meat that lines the stomach of the turtle (Rouja 1998: 150-151)

When we got back there was a big mob of people in the beach shelter, and the turtle was all cooked up. The intestines had been given to the sharks but the rest of the innards were in a large Tupperware container – uncooked. Field diary dated 5/10/2002

In our culture, nothing goes to waste.[152]

We eat everything.[153]

[152] Bardi elder 2003.

[153] Bardi elder 2003.

Photo 7: Lanyjarr and Boolgoo

Lanyjarr *n*

The underpart of turtle

* *Lanyjarr niimar gorna goorlil.* The underpart of turtle is good meat.[154]

Boolgoo *n*

Bitter part of turtle guts

* *Boolgoo gorna marlinngan. Arramarran, lorgid arrinyanirr liinyjab arroongooloonirr arrarlinjamb.* Boolgoo is good to eat. When we cook it, we peel off the inside which we throw away and then we eat this part of the guts.[155]

Turtles take a long time to breed and grow.[156]

If you waste from the sea - it will be all gone.[157]

[154] From 'Ardiyooloon Bardi Ngaanka: One Arm Point Bardi Dictionary'. Compiled by Gedda Aklif (1999), Kimberley language Resource Centre.

[155] Ibid

[156] Bardi hunter and elder 2004.

[157] Senior Bardi woman 2003.

The old man's story

He told me some stories (history) about the old times, specifically about his roots, his people came from the islands, from Mayala and Jawi sides. He explained how people had been rounded up and brought into the missions at Sunday Island and down at Lombadina. About pearl luggers going round to 'stray' people (or were the luggers 'stray'?) and taking Aboriginal wives. He talked about families coming in to the missions, but being separated and made to stay in dormitories. About the first mission bloke, Bird, who went away to World War One and never came back. About all the men rounded up from country and missions and stations and sent to war, and who never came back, sorry time. About white man's way being to shoot people over land - talking about a war video he had seen, with them all dying on the beach, fighting over the sand (I'm thinking 'Gallipoli' or 'Saving Private Ryan').

That reminded him of other stories, he told me about how long time ago two schooners came around, into Cygnet Bay. They saw a group of four or five "Aborigines" walking. Came in on their dinghy and made hand signals to indicate they wanted fresh water. The Bardi men showed them where to get it. Then, they shot two of the men (no explanation given). And ran away to their boats. Next time, schooners came in and went to the water source, Bardi mob were waiting - 'hiding their spears'. They speared two of the men, the rest got away in their boats. A bit later, a big mob of soldiers on horseback came up to Gulun (near Mudnunn) and massacred the people there. They shot them, and kids too, and hit them over the head as they rode past. Some escaped by hiding in a crack in the rock. The soldiers continued north and also killed people up at Ardiyooloon (One Arm Point now). Women and kids too. Some people hid in the mangroves. Then some luggers came up and ferried the soldiers across to Sunday Island. Same again, they shot the people there. There is a place, where they shot four or five men, one was climbing up the rocks to get away, they shot him in the shoulder and he dropped - but got up and ran away. Now, if you go to that place, if someone takes you there, you will see, they put up a stone there at that place, you can see where the bullet hit the rock. Then the soldiers saw all the smoke signals sent up by the 'Aborigines' and they went away - they knew the Bardi and Jawi mobs were sending signals - telling about what had happened. Field diaries dated 26/10/2004

Photo 8: Sharing it out

In the old days people used to share out the turtle, leave some for everybody to take a piece.[158]

Our lifestyle is about sharing, generosity and hospitality.[159]

If one is caught that is particularly fat, the shell is cooked in the fire, set in the coals like a huge bowl. The fat lining the shell melts and collects in its base as liquid oil, which is then drunk. Once drained off, the shell is turned over and the inside roasted. When cooked, it is pulled off the coals and people cut away the gristle and small pieces of attached meat left around the neck and spine. On a particularly fat turtle, the outside edge of the carapace is cut away and eaten, sometimes extending two to three inches into the carapace between the incorporated ribs. (Rouja 1998: 143)

[158] Jawi hunter and elder 2004.

[159] Bardi hunter and elder 2004.

Chapter Seven: Problematising Populations

1. Introduction

In the previous chapter I provided an overview of the ways in which Australian attitudes towards marine turtle and dugong have changed over the past century, and the repercussions this has had for the relationship between Indigenous and non-Indigenous cultures. In this chapter I specifically explore the regulatory and managerial framework that structures most of the interactions between these cultures on the issue of marine turtle and dugong hunting and conservation.

As before, I am focusing on integrating the three shifts in ecology as proposed by Berkes (2004)[160] as a means of resolving the conflict over Indigenous hunting of marine turtles and dugong in Australia. In particular I am interested in how marine turtle and dugong scientists are responding to these shifts if at all, and how this relates to the ongoing conflict between conservationists and Indigenous hunters in this country.

Given that the opposition to Indigenous harvest of turtle and dugong is most often framed in terms of conservation risk, I wish to examine this risk closely, both at an Australian and international level, exploring the complexity and uncertainty of this ecosocial system (as defined by Berkes 2004), and particularly exposing the impact of cultural beliefs on the knowledge produced about marine turtle and dugong.

This chapter provides a critical review of the current scientific literature on the status of marine turtle and dugong populations both internationally and in Australia. The purpose of this review is to provide an overview of current and historical discourse on this subject, and an exploration of the political motivations that underpin the positions found in the literature. To this end I will be viewing the scientific literature through the lens of critical political ecology in order to deconstruct the relationship between the political position of

[160] see Chapter One.

the scientists and the knowledge they create and promote about marine turtle and dugong:

> Particular attention must be paid to the ambiguities and inconsistencies within discourses, in order to determine how particular definitions of nature may serve the interests of particular groups and disempower other groups, other species, or other aspects of the environment (Hytten 2009:19).

It is hoped that by following the approach of critical political ecology in investigating the productive interplay between knowledge and social order and by teasing out the roles of individual actors and institutions, this thesis can add to the understanding of how orthodox knowledge about marine turtles and dugong populations is influenced by the politics of the conservation movement.

The application of critical political ecology to the issues examined in this thesis is not a novel approach; Lisa Campbell has worked for some time investigating the political influences upon marine turtle science at different socio-political scales (e.g. Campbell 2007). In particular Campbell is critical of the way in which experts in the field of marine turtle biology and conservation utilise international scale conservation actions (such as conventions between nation states) to control the actions of people at a local scale. She argues that it is more appropriate to address on the ground conservation issues through the use of local scale conservation actions, even though this may reduce the political power of the expert. Campbell believes that experts can mask their values (which may differ from local peoples') by acting at a global or national scale - an arena where their personal political influence is greater (Campbell 2007).

Following on from this argument, I begin the chapter with an exploration of the contested status of marine turtle populations internationally, and relate this to the situation within Australia. Dugong are primarily found within Australian waters, so my discussion of their status begins at the national level. I link the ascribed status of these animals at both the national and global scales to the policies implemented by the Australian government in order to manage their conservation. I then examine three case studies that outline the impact of the global, national and local action of scientists upon Indigenous communities in Australia.

2. International case studies: population status of Green and Hawksbill turtles

There are seven species of marine turtle found worldwide, and all are completely aquatic, sea dwelling reptiles distinguished by their hard shells and large size. Their range varies from species to species but as a general rule all bar the Leatherback and the Loggerhead are restricted to tropical waters on either side of the equator. These latter two species are also found in cooler waters of all the oceans in the world. Most species are global in their distribution, with the exception of the Flatback, which is restricted to Australasian waters and Kemp's Ridley (*Lepidochelys kempii*) which is restricted to the Gulf of Mexico and Atlantic Ocean.

Research and monitoring of marine turtle populations is fraught with difficulties due to their oceanic life and migratory habit. Much of their life history is undocumented as hatchlings leave their natal beach for the open ocean and do not return for decades. Most research is conducted on nesting females, as they are much more easily detected, counted and caught when on land. Scientists make use of tags and radio tracking devices in order to gain some insight into turtle migrations between nesting events.

Once sexually mature, females do not breed each year, but return sporadically to the beaches in response to factors that are still for the most part unknown to science. Given the longevity of these species and the large generational gap (between 25-40 years by most accounts) it is extremely difficult to produce sufficient data in order to detect population trends over time. In addition, most nesting beaches are in remote areas, which are both difficult and expensive to visit for research purposes. Nesting aggregates may be extremely large (up to 10,000 females arriving to nest each night) which further complicates efforts to quantify their numbers.

Given the migratory nature of marine turtle populations, management and monitoring need to occur on a global scale to be effective, with countries cooperating in the conservation of these animals. This is not always possible, as different countries have different conceptions of the risks faced by the animals, and different priorities and resources available in terms of conservation measures. Due to the barriers in communication between governments, non-government and intergovernmental

organisations play a large role in promoting marine turtle conservation at the global scale (Hamann et al. 2010).

One of the most respected conservation organisations is The World Conservation Union (IUCN) which is an intergovernmental organisation that supports and develops cutting-edge conservation science, implements this research in field projects around the world and then links both research and results to local, national, regional and global policy by convening dialogues between governments, civil society and the private sector. The IUCN is made up of a number of commissions that take responsibility for different aspects of conservation work. The most well known of these is probably the Species Survival Commission (SSC) which produces the 'Red List' of threatened species - this list incorporates all of those species (both plant and animal) which have been defined as fitting within a category of risk, with the risk in question defined as the long term survival of the species (Godfrey and Godley 2008).

> The Red List classifies globally endangered plant and animal taxa and is regarded as the most comprehensive and authoritative list of its kind...IUCN has developed a clear and standardized framework for the assessment of species status which increasingly relies on rigorous scientific input (rather than subjective expert opinion) and has become recognized by the scientific community as a valuable and necessary tool in biodiversity conservation and research (Cooke 2007: 166).

The Red List criteria are determined by specialist groups of scientists who work in a particular field - these volunteers collate the most recent research information on populations of species in their given area and review the status of their species annually. In 2005 the IUCN passed a resolution mandating the use of the Red List for national legislation, international conventions, conservation planning and scientific research (Marsh et al. 2012).

The Red List is particularly pertinent for marine turtles as all species bar the Flatback are currently listed as either Endangered or Critically Endangered at a global level (see Table 3). These listings have remained practically unchanged over the past several decades (Godfrey and Godley 2008).

Table 3: IUCN listings for marine turtle species

Species	IUCN listing	Listing definition	Population trend given by IUCN
Leatherback *Dermochelys coriacea*	Critically Endangered	'facing an extremely high risk of extinction in the wild in the immediate future'.	70% decline in less than one generation (20 years)
Hawksbill *Eretmochelys imbricata*	Critically Endangered	As above	84-87% decline in past three generations (120-150 years)
Kemp's Ridley *Lepidochelys kempii*	Critically Endangered	As above	Declining, no data given.
Green *Chelonia mydas*	Endangered	'facing a very high risk of extinction in the wild in the near future'	48-67% decline over three generations (120-150 years or since 1853 at some sites)
Loggerhead *Caretta caretta*	Endangered	As above	Declining, no data given.
Olive Ridley *Lepidochelys olivacea*	Vulnerable	'facing a high risk of extinction in the wild'.	30-50% decline in populations over the past three generations (120-150 years).
Flatback *Natator depressus*	Data Deficient	'there is inadequate information to make a direct, or indirect, assessment of its risk of extinction'	No data given.

For the most part the status of all these marine animals as defined by the IUCN Red List is uncontroversial and backed up by mainstream global public sentiment. However, there is dissent present in the global margins and even amongst the core group of researchers responsible about the data that is used to define the conservation status of these species. For the rest of this section I will be focusing primarily on the species of marine turtle that have engendered the most controversy in their treatment by conservation science, which is to say, the Green and the Hawksbill turtles.

It is no coincidence that the two species of marine turtle that have caused the most controversy are also those most likely to be exploited by humans, either as a food source or as a source of 'bekko' or tortoiseshell.

> Use of sea turtles, both consumptive and non-consumptive, exists worldwide. Whether we wish to eliminate it, manage it, or promote it, we first need to understand it, like any other aspect of sea turtle conservation. Consumptive or direct use of sea turtles is a contentious subject, and support or opposition to it is

> a major dividing line for many people involved in sea turtle conservation (Godfrey et al. 2003: 33).

The IUCN Red List for a species gives its current status, but also a population trend - either increasing or decreasing. For all of the marine turtle species bar the Flatback, this trend is given as decreasing (see Table 3). When the broader literature on the status of regional or local (as opposed to global) populations of Green and Hawksbill turtles is examined, the picture becomes very different and much more complex.

2.1 Green turtle

Recently there have been a series of papers published showing increases in populations of Green turtle around the world. Many of these are located in the Atlantic Ocean; in particular populations at Hawaii and Ascension Island have shown strong recoveries from their numbers in the 1970's[161]. This has been credited to the protection from hunting which occurred at this time, and shows a surprisingly fast recovery for these slow lived creatures, in one case an estimate of an increase of 285% in 30 years (Broderick et al. 2006), in Costa Rica another of 417% over the same period (Troeg and Rankin 2005). The overall global population level was estimated by the same authors to be somewhere in excess of 2.2 million individuals.

The publication of figures such as these has lead to some questions over the IUCN's decision to continue to list this species as Endangered, as it seems unlikely that the species as a whole could become extinct in the near future:

> There are few, if any, conceivable scenarios that could lead to every single Green turtle disappearing from the world's oceans in the foreseeable future (Godfrey and Godley 2008: 3).

Counterarguments made by other scientists using historical projections suggest that current numbers of Green turtles are so far below what they would have been 100-150 years ago that the species must still be considered Endangered (McClenachen et al. 2006). This is based on one of the IUCN criteria for the status of Endangered which is

[161] Balaz and Chaloupka 2004; Broderick et al. 2006; Chaloupka et al. 2008.

that the species has shown a decline of 80% over three generations: in the case of long lived sea turtles this takes them back over a century to preindustrial times.

> Populations of endangered Caribbean sea turtles are far more depleted than realized because current conservation assessments do not reflect historic nesting data...Recent conservation efforts have resulted in large population increases at several nesting sites, but loss of widespread nesting throughout the Caribbean and reductions in the Caribbean-wide population since human hunting began indicate that Caribbean turtles are far from recovered (McClenachen et al. 2006: 290).

Of the 32 index sites used by the IUCN to determine the conservation status of Green turtles, 15 show a decline in numbers over the past 30 years or more (see Table 4). Of the remaining index sites 5 show no change over the past 30-35 years, and 12 show increasing populations in recent times (IUCN 2012). The rate of change varies for each site, and many of the data sets represent a single years work at the site, which given the highly irregular nesting patterns of marine turtles, makes determining a population trend without regular annual counts a difficult business.

Table 4: Green turtle populations with documented declines since 1980 (from IUCN 2012)

Population site	Earlier estimate	Later estimate	Decline in recent history.
East Pacific Ocean, Mexico	15,000 (in 1970)	851 (in 2001)	94% over 31 years
#Indonesia (Berau Islands)	200 female per night peak season (1940s)	25 females per night (1984)	87.5% over 40-44 years
Indonesia (East Java, Suka Made)	1,555 nests (1973-1983)	255 nests (1992-2001)	84% over 21-29 years
#Indonesia (West Java, Pangumbahan).	2,500, 000 eggs (1950s)	400,000 eggs (1980s)	84% over 30 years
#Phillipines (Turtle Islands)	1,401,450 eggs (1951)	917,189 eggs (1981-1985)	34% over 30-34 years
Malaysia (Terengganu)	928,900 eggs (1961) 317,105 eggs (1991)	218,354 eggs (1998-1999)	32% over 8 years
Gulf of Thailand	405 nests (1973-1983)	255 nests (1992-2001)	37% over 21-29 years
*Myanmar (Thamilar Kyun)	1,744,164 eggs (1883-1898)	<250,000 eggs (1999)	Insufficient data
India (Gujarat)	866 nests (1981)	461 nests (2000)	47% over 19 years
Pakistan (Hawkes Bay and Sandspit)	1286 nests (1981-1985)	Approx. 600 nests (1994-1997)	53% over 13-17 years

Yemen (Sharma)	30-40 females per night, peak season (1966, 1972)	15 females per night, peak season (1999)	50-62.5% over 27-33 years
Isles Epaces (Europa)	153,000 hatchlings (1983-1987)	119,000 hatchlings (1990-1994).	22% over 7-11 years
Isles Epaces (Tromelin)	427,600 hatchlings (1983-1987)	377,000 hatchlings (1990-1994)	12% over 7-11 years
Turkey	1000 females (1978-1982)	76-383 females (1998-2001)	92- 62% over 20-23 years
Equatorial Guinea	200-3000 females per night (1940) 50-100 females per night (1980)	1468 nests (1997-1998)	Difficult to determine as methods varied. IUCN (2012) puts it at 80% over 50 years (1940-1990).

Populations with no data for the past 25 years * Earlier population estimate is > 100 years old.

The accuracy of past projections utilising patchy data can be debated, as some involve reconstructing ecologies back over long periods of time (up to 1000 years in some instances), based largely on anecdotal reference, photographs and limited paleontological records. The complexity and dynamism of the past cannot be recreated through such stochastic samples, and the usefulness of fixing upon one particular number as the optimum population size for the future, based on an irretrievable past, may be limited (Lackey 2007). Arguments have been made that in the case of marine turtles such historical projections add little of value to the debate:

> Recent sea turtle assessments have relied on historical reference points that are at best crudely derived, sometimes using circular arguments assuming specific rates of decline. When compared to current estimates of the abundance of wild populations, the extent of the decline that has really taken place in the global population is at best vague and at worst speculation. There are simply not enough reliable data available on historical levels of sea turtle abundance around the world, making it impossible to scientifically apply the Red List criteria with confidence. The recent global assessments on sea turtles generated by the MTSG[162] are not sufficiently grounded in real data to be considered reasonable (Godfrey and Godley 2008: 3).

Broderick et al. (2006) also critique the IUCN's global listing process and suggest that the application of the Red List criteria to marine turtles as globally distributed species (rather

[162] The specialist group that advises the IUCN on the status of marine turtles is known as the Marine Turtle Study Group or MTSG.

than sub-populations) detracts from other more threatened species that may be at greater risk of extinction.

These critiques are not limited to Green turtle, as there has been a robust debate in international circles over the past twenty years concerning the status and sustainable use of the Hawksbill turtle.

2.2 Hawksbill Turtle

In particular, a founding member of the MTSG, Dr Nicholas Mrosovsky has been at odds with his fellow scientists over this species. Mrosovsky has long debated whether Hawksbills ought to be listed as Critically Endangered and argued against their listing as such in 1996. His main objection was that the Marine Turtle Study Group (of which he is a member) as a whole favoured 'taking the status of the most imperilled population of Hawksbills and applying this to the entire species' (Mrosovsky 2003). He felt that this was twisting the reality of the situation, especially given that the group has published an official position on the matter stating "The species is not expected to become extinct in the foreseeable future" (Meylan and Donnelly 1999).

This debate continued up until 12 years later, with Mrosovsky and other supporters publishing a series of papers in the journal 'Endangered Species Research' questioning the methodology of the IUCN Red List and its application to marine turtles and other species. One of their major criticisms is based on the broad global listing of species rather than assigning differing categories to separate populations of the same species:

> Assigning a distinct Red List category to the global population, as a single management unit, does not capture the reality of regional and local populations that tend to have different (positive or negative) trajectories (Godfrey and Godley 2008: 1).

In some cases IUCN specialist groups have based their assessments not on the most threatened populations but on the global situation as a whole. This was the approach of the Crocodile Specialist Group to saltwater crocodiles, which are listed as 'lower risk/least

concern' on the Red List[163]. This species has a large range and some populations that have been greatly reduced - meaning that they fit the criteria of Critically Endangered locally even though the species is in no danger of extinction due to large populations protected in Australia (Mrosovsky 2003).

Another reptile that is used in comparison to marine turtles by Godfrey and Godley (2008) is the tiny Western Swamp Tortoise, currently listed as Critically Endangered with a total world population of between 25-30 mature individuals within a range of 100-150km. This species has seen a severe reduction in numbers (from ~300 individuals in the 1960's) and has a similar life history to marine turtles, being slow to mature and slow to reproduce.[164] This, argue the authors, is a true case of a Critically Endangered reptile:

> When a species that may number in the millions in an ocean basin is classified as being at the same 'very high risk of extinction in the wild,' as a species represented by just a few individuals, there is something fundamentally wrong with the assessment system (Godfrey and Godley 2008: 1).

Mrosovsky and Godfrey (2008) call for greater scientific standards in assessing species, with an emphasis on objectivity, transparency and authority:

> These goals require not only that the assessments be done by experts on that species, but also that the sources of information or opinion of the experts be available and traceable. Otherwise what is meant to be authoritative becomes merely authoritarian. Transparent science gives way to secret science (Mrosovsky and Godfrey 2008: 185).

It is worth emphasizing here that the scientists in question are not proposing that marine turtles should not be species of concern to conservation organisations such as the IUCN, but are calling for a more honest appraisal of the risks that these species face both at a regional and international scale:

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[163] IUCNredlist.org

[164] Environment Australia SPRAT database
http://www.environment.gov.au/biodiversity/threatened/species/western-swamp-tortoise.html
accessed 22/02/09

> We do not advocate abandoning attempts to assess risk of extinction for sea turtles. We believe that sea turtles are conservation-dependent species, and should be managed accordingly. They do not, however, need to be on the brink of extinction to deserve our focus (Godfrey and Godley 2008: 3).

The thorny issues surrounding the international listings of both Green and Hawksbill turtles primarily arise from an attempt to solve local issues at a global scale, with the primary focus of the IUCN listings being to influence national governments to undertake top-down regulatory management of these threatened species. The consequence of such global action at a national scale is explored in the following section.

3. Conservation status of marine turtles in Australia

There are six species of marine turtles found in Australian waters - *Chelonia mydas,* the Green turtle, the Hawksbill turtle, *Erotmochelys imbricata,* the Loggerhead turtle *Caretta caretta,* the Flatback turtle *Natator depressus*, the Leatherback turtle *Dermochelys coriacea* and the Olive Ridley turtle *Lepidochelys olivacea*. They are all listed as threatened species (see Table 5) under the Environmental Protection and Biodiversity Conservation Act (henceforth EPBC Act).

The EPBC Act is a fairly recent piece of legislation, coming into existence in 1999 when it replaced the previous Endangered Species Protection (ESP) Act (1992). All turtle species bar the Leatherback have the same listing on both Acts (see Table 5), as the schedule of the ESP Act with listed species was adopted completely (and without review) by the EPBC Act. The Leatherback has changed its status as of December 2008 to become Endangered (but not to Critically Endangered as was proposed). The new EBPC act provides public information on the advice of the Threatened Species Scientific Committee and as such the Leatherback is the only species of turtle for which justification for its status is readily available:

> ...the estimated global population of adult female Leatherback Turtles has declined from 115,000 in 1982 to around 36,500 in 2007 (Pritchard 1982, Spotila et al. 1996; Dutton 2007). This represents about a 68% reduction in adult female Leatherback Turtle numbers globally over the last 25 years, that is, in

approximately one generation. The Committee accepts that the Western Pacific population is a subset of the global population and concludes that it has probably experienced at least a similar very high rate of decline...The Committee further judges that this population has experienced a very high rate of decline over the last generation and that this decline is expected to continue in the face of current threats and the possible future threat of climate change. Therefore, the species has been demonstrated to have met sufficient elements of Criterion 3 to make it eligible for listing as Endangered.[165]

Table 5: Status of marine turtles in Australia (from SPRAT database[166])

Species	Listing under EPBC Act	Estimated Population size	Definition of listing under EPBC Act	Population trend
Leatherback	Endangered	36,500 Globally (Dutton 2007). Australian populations data deficient.	'facing a very high risk of extinction in the wild in the near future'.[167]	68% reduction over 25 years (Globally)
Loggerhead	Endangered	Between 2000-2500 nesting females (SPRAT database)	As above	80% reduction over 30 years (GBR sub population)
Olive Ridley	Endangered	Australian population estimated at 1000-5000 nesting females	As above	No data available (SPRAT database).
Hawksbill (*Caretta caretta*)	Vulnerable	Australian population estimated at between 10,000-15,000 nesting females (Limpus 2009)	'facing a high risk of extinction in the wild in the medium-term future.'[168]	Difficult to determine at most sites, however there has been a documented 3-4% decline per annum at the Milman Island (GBR) sub-population.
Green	Vulnerable	2.2 Million globally. Australian populations hard to determine due to lack of data but	As above	All monitored populations appear stable. The SPRAT database states that the southern Great Barrier Reef populations are

[165] Advice to the Minister of the Environment, Heritage, Water and the Arts from the Threatened Species Scientific Committee on Amendment to the list of Threatened Species under the Environment Protection and Biodiversity Conservation Act 1999.

[166] The Species Profile and Threats Database which provides the information for listings under the EPBC Act, found at http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl and last accessed on 19th November 2012

[167] Section 179 of EPBC Act 1999.

[168] Section 179 of EPBC Act 1999.

		estimated to be in excess of 70,000 (SPRAT data base)		increasing by 3-11% per year.
Flatback	Vulnerable	Insufficient data	As above	Thought to be stable

The change in species status under Australian legislation was based upon the global population estimates, as there is insufficient data to determine the population of Leatherbacks in Australian waters. The major cause of decline is thought to be loss through bycatch in pelagic longlines, with 50,000 turtles estimated to be caught globally each year (based on figures published in Lewison et al. 2004). Given the previous estimate of 36,500 animals as the total species population (the 2000 estimate was 34,500) this is an extremely high figure (Dutton 2007). The mortality of turtles caught as bycatch is thought to range from 4%-27%, though due to the paucity of data the exact number of deaths is unquantifiable (Lewison and Crowder 2007).

> A study of the global population of Leatherback Turtles in 1982 estimated that there were 115,000 adult female Leatherback Turtles extant (Pritchard 1982). In 1996, the population was estimated to be about 34,500 (within the range of 26,200 to 42,900) (Spotila et al. 1996). A recent report has revised this figure up to around 36,500, with information on additional nesting sites that were not previously available (Dutton 2007). This represents about a 68% reduction in adult female Leatherback Turtle numbers globally over the last 25 years, that is, in approximately one generation.[169]

It should be noted that prior to 1982 the global population was estimated to be 29,000-45,000 though this number did not take into account the rookeries of the Eastern Pacific that had not yet been discovered (Ross 1982). In the Pacific, the World Conservation Union (IUCN) notes that most Leatherback nesting populations have declined by more than 80%. In other areas of the Leatherback's range, observed declines in nesting populations are not as severe, and some population trends are increasing or stable.[170]

[169] Ibid.

[170] http://www.nmfs.noaa.gov/pr/species/turtles/Leatherback.htm

The other turtle species have not as yet been assessed against the EPBC Act criteria[171], and have been allocated the status they held under the previous act - for which the assessments were never made public. Listing on the EPBC Act means that the Australian Government must produce a 'recovery plan' for the species, and in the case of marine turtles this has been done as a group:

> Marine turtles are recognised internationally as species of conservation concern. Six of the species found in Australia are listed in the 2000 IUCN (World Conservation Union) Red List of Threatened Animals. All marine turtle species occurring in Australian waters are listed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). In addition, all marine turtles occurring in Indo-Pacific region are a priority for conservation under the Convention on the Conservation of Migratory Species of Wild Animals (the Bonn convention or CMS).[172]

Due to the lack of information on historical, and in some cases current population sizes of most marine turtle species, the recovery plan adopts a 'threat based approach' as opposed to setting recovery targets. The exception to this is in the case of Loggerhead turtles where a recovery target has been set for the east coast population, which has had a documented decline of up to 80% over the past 30 years (Limpus 2009b).

Other international conventions carry weight: CITES and the CMS are of particular importance. Australia is a party to both of these international agreements and as such is obligated to legislate to protect the animals listed under the conventions. CITES prohibits the international trade of species and their products, whereas the CMS is concerned with

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[171] Criterion 1: It has undergone, is suspected to have undergone or is likely to undergo in the immediate future a very severe, severe or substantial reduction in numbers
Criterion 2: Its geographic distribution is precarious for the survival of the species and is very restricted, restricted or limited
Criterion 3: The estimated total number of mature individuals is limited to a particular degree; and either
(a) evidence suggests that the number will continue to decline at a particular rate; or
(b) the number is likely to continue to decline and its geographic distribution is precarious for its survival
Criterion 4: The estimated total number of mature individuals is extremely low, very low or low
Criterion 5: Probability of extinction in the wild that is at least:
50% in the immediate future; or
20% in the near future; or
10% in the medium-term future.

[172] Recovery Plan for Marine Turtles, Environment Australia 2003.

the protection of migratory species across their range. Under the CMS there are two categories of migratory species listed - those deemed to be threatened with extinction are listed on Appendix I, which requires signatory nations to:

> Strive towards strictly protecting these animals, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them. Besides establishing obligations for each State joining the Convention, CMS promotes concerted action among the Range States of many of these species.[173]

Less threatened species are listed on Appendix II, whereby nation states are encouraged to conclude global or regional agreements to protect their populations and habitat. Under the CMS all species of marine turtles bar the Flatback are listed on Appendix I.[174]

Population trends that are available for marine turtles in Australia show declines in the populations since the 1970s in the case of the Loggerhead turtles and Hawksbills. In terms of the Hawksbill, there is a paucity of data, but a recently released report by Limpus and Miller (2007) on monitoring undertaken from 1995-1999 on Milman Island in the northern Great Barrier Reef shows 3-4% decline per annum in nesting females in this population.

Populations of Hawksbill breeding in the Great Barrier Reef region (GBR) are probably susceptible to commercial harvesting in other countries, which may partly explain the decline observed by Limpus and Miller (2007). Hawksbills tend to be less of a direct management issue in Australia as they are not a target species for Indigenous hunting and any anthropogenic deaths of adults are probably accidental. This is reflected in the Hawksbill's conservation status in Australia, listed as Vulnerable rather than Endangered under the EPBC act.

It is not clear from a review of the literature why Green turtle and Flatback populations in Australia are listed as threatened. In the case of the Flatback, there is very little known

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[173] http://www.cms.int/about/intro.htm accessed 22/02/09.

[174] Convention on the Conservation of Migratory Species of Wild Animals (CMS) 2006.

about the extent of the stock in Australia but at those beaches where monitoring takes place the populations appear to be stable over the past 30 years (Limpus 2007).
A recent review of eight of the major Green turtle rookeries worldwide, including two (Raine Island and Heron Island in the GBR) in Australia showed increases in nesting abundance at six of the eight sites, including the two Australian sites over the past 30 years (Chaloupka et al. 2008).

Numbers of nesting turtle are subject to significant interannual variations (for example at Raine Island, one year there were ~1000, the next ~12,000) and so it is really only possible to determine trends in populations over long periods of time.[175] Stochastic sampling is of very little use with these species. The growth at Heron Island is linear at 4.3% per year, whereas the Raine Island population appears to be 'levelling off' after a period of linear growth throughout the 1980's and 1990's (Chaloupka et al. 2008).

Despite these encouraging trends, much of the literature gives the impression that these species are still under immediate threat. For example Limpus (2008) when discussing the Heron Island population of Green turtles states that while the population is 'not showing signs of decreasing numbers' over the past four decades that there are 'warning signs within the breeding population that indicate the possible excessive loss of adult turtles from the population' (Limpus 2008: 76).

In terms of the Raine Island population Limpus (2008: 78) states that the twin impacts of climate and habitat change on hatchlings and the 'excessive' harvest of adults 'represent a very serious threat to the survival for this population' within the current generation (about 100 years). In summary, Limpus (2008: 79) concludes that in terms of the national status of the Green turtle population:

> The eastern Australian stocks clearly warrant continued listing as a vulnerable species. Given the uncertainty of the status of the Western Australian stock and the existing multiple threats to its population stability, this stock warrants retention of its vulnerable status. In the absence of population stability and mortality data

[175] These variations have been linked to changes in global oceanographic conditions such as the El Nino/La Nina or Southern Oscillation Index (ENSO) (see Limpus 2008).

> for the small Ashmore Reef and Scott Reef stocks and given the poor conservation outlook for *C. mydas* populations in the Australasian region, the precautionary principle could be invoked for listing these as threatened populations also.

The reasons for his concern are primarily the level of Indigenous harvest, as well as the more minor issues of boat strike, entanglement in fishing gear and possible habitat degradation (Limpus et al. 2005). Given that the levels of Indigenous harvest are almost completely undocumented it is hard for scientists to accurately estimate the impact of hunting on these stocks.

Another major unknown is the impact of harvesting outside of Australian waters, which has been estimated to be severe (Limpus 2008). This is a real issue for several of the Australian stocks of Green turtle, as their migratory nature means they do travel between neighbouring countries. The World Wide Fund for Nature (WWF) estimates that up to 100,000 Green turtles are killed in the Indo-Australian archipelago each year (WWF 2004).

Complicated mathematical models of the future impacts of Indigenous hunting have been attempted by Chaloupka (2002). In this study complex life history models were run showing the impacts of a 1% harvest per year over 25 years, starting at 100 years into the population model. Not surprisingly this resulted in a net decline of the population over time, and depending on the parameters (such as the age class of the turtles harvested) there was a range of results from a 10% to 50% decline over 50 years (Chaloupka 2002).

The results of such models led experts such as Limpus (2005, 2008) to conclude that Indigenous hunting levels of Green turtle are unsustainable, and require more stringent regulation in order to ensure the survival of the species. In terms of the southern Great Barrier Reef stock of Green turtles he concluded in 2005 that:

> These levels of loss are not sustainable and the southern Great Barrier Reef Green turtle stock should be at risk of a significant population decline if the current management regime continues. Because Native Title rights currently

> preclude the option of an enforced total protection of Green turtles under the [Queensland] *Nature Conservation Act 1992*, the conservation management agencies of eastern Australia are faced with a task that no management agency has succeeded in achieving over the past three centuries, *viz.* sustainably managing a Green turtle population under an active harvest strategy (Limpus et al. 2005: 3).

Similarly, and based on the same modelling data supplemented by anecdotal reports of numbers of turtles caught by Indigenous communities in the northern section of the Great Barrier Reef, Limpus (2008) also concluded that:

> The northern GBR *C. mydas* stock is impacted by two independent threatening processes: The excessive harvest of adults and near-adult turtles throughout much of the foraging range for the stock and climate and habitat related loss of hatchling production. Taken together, these impacts represent a very serious threat to the survival for this population within the life of the current generation of northern GBR *C. mydas* (Limpus 2008: 78).

From the population monitoring of the past 20 years or so detailed in the literature (which do not show any long term declines for Green turtles) I can find little direct evidence that Indigenous harvest is actually impacting upon Green turtle populations in either of these regions (or indeed anywhere in Australian waters). It would appear that in the case of mainstream Australian marine turtle science the criticisms of political ecologists about the influence of power and politics on the interpretation of uncertain data remain pertinent, as has been observed by others at the international level (i.e. Campbell 2002, 2007):

> Sea turtles do migrate, and some populations of sea turtles face high levels of threat; a critical realist approach demands that these biological and ecological facts be acknowledged. However, these are not the only facts, and that ecology is political is illustrated through the sometimes selective use of ecological data by conservationists (Campbell 2007: 327).

Much of the research on turtle populations detailed above comes from State and Federal Government departments, and reflects the priorities of politicians and a centralised

system of control. These studies have led to a top-down, adversarial approach to the management of Indigenous hunting in Australia, which is detailed in case studies later in this chapter.

In contrast to this approach, collaborative research between turtle ecologists and Indigenous communities in northern Australia such as the Dhimurru Miyapunu project undertaken in the late 1990s by Dr Rod Kennett and others (Kennett et al. 1999) has led to the formation of partnerships[176] that seek to redress the prevailing adversarial positions of those who wish to protect marine turtles, and those that hunt them. With a strong local focus on 'two-way learning' these projects build upon the idea that Indigenous communities are ideally placed to deliver the on-the-ground management of turtle populations, with the assistance of the latest scientific research and technologies (Kennett et al. 1998; Kennett et al. 2004; Bessen 2009).[177]

These partnerships have spread to include dugong experts, due in part to similar conflicts over the impact of Indigenous hunting on a species of which the status of many regional populations remains uncertain.

4. Dugong population status

The dugong (*Dugong dugon)* is a marine mammal, a large sea grass browsing herbivore that is colloquially known as a 'sea cow' or 'sea pig'. Although the population range historically extended to the Middle East and Africa, and remnant populations still exist in these regions, the majority of animals are now found within Australian waters, and this is where much of the knowledge about dugong originates (Marsh et al. 2012). Internationally the dugong is listed as 'Vulnerable' by the IUCN.

The dugong is not listed under the Australian Government's EPBC Act as a threatened species, but it is protected under state legislation in all the regions that it is found in, and is listed under the above Act as a marine migratory species, a classification that gives it special protection under the Federal Government's commitments to the Convention for Migratory Species (CMS). The lack of threatened species status nationally is largely due to

[176] Such as the NAILSMA organisation described in Chapter 9.

[177] See below for a further discussion of the Dhimurru Miyapunu project.

the documented number of dugongs (~ 10,000) present in the protected area of Shark Bay in Western Australia, which provides certainty to regulatory authorities that the species is unlikely to become extinct in Australian waters.

Marsh et al. (2012) provide a population status for each of the sub-populations found in Australian waters (and around the world). They based their assessments upon the criteria set out by the IUCN Red List and the guidelines for the regional and national application of these criteria as set out by Gardenfors (2001) and IUCN (2003). Their assessments were 'Critically Endangered' for the sub-population found along the south (urban) coast of Queensland; 'Vulnerable' for the northern Great Barrier Reef and Torres Strait; and 'Data Deficient' for the remaining Australian populations.

Estimations of dugong populations are complicated by the large migrations that these animals undergo, particularly in response to changes in the availability of seagrass meadows. Aerial surveys have been undertaken on a reasonably regular basis in Queensland and to a lesser extent in the Torres Strait, Western Australia and the Northern Territory. Population estimates from these surveys, though showing considerable variation between surveys, appear to be stable over the long term (although some researchers report that the Torres Strait populations are being harvested at an unsustainable level see Marsh et al. 2004).

The major threat to dugong in Australian waters is perceived to be Indigenous hunting (Marsh et al. 2012), though in the past gill netting has also been implicated in declines (see the case study in chapter 8). Although there has been no documented decline of dugong populations over the past twenty years or so in any of the study areas, there has been research in the Torres Strait region which estimates the take to be between 110-1226 dugongs annually across the region (Heinsohn et al. 2004). The exact number of animals harvested is hard to determine as most of the surveys have been sporadic and localised, but at least one study documented a firm figure of 145 dugongs in 1994 and 170 in 1998 from Mabuiag Island alone (Kwan 2002).

In 2004, research on the impacts of hunting in the Torres Strait involving two different attempts at population modelling, concluded that the current level of harvest if continued would lead to local extinction (Heinsohn et al. 2004; Marsh et al. 2004). The two forms of models used were the Population Viability Analysis (PVA), and the Potential Biological

Removal (PBR) method. In the case of the PBR method, there is a need for a minimum population estimate (the lower 20th percentile of the total population estimate) and a recovery factor which is an index of how far the population needs to recover in a historical sense from an idealized past population size. In this case as there are no population data prior to 1987 the authors used a recovery factor of 0.5 which is the recommendation for threatened stocks of unknown levels. Endangered stocks are assigned a value of 0.1 and populations at optimum size are assigned a value of 1.0. Thus the results given by the PBR method are inherently conservative, building in protection for the species in question:

> The Potential Biological Removal method was used in conjunction with the aerial survey data to estimate sustainable anthropogenic mortality from all causes for a range of empirically-derived estimates of dugong life-history parameters. These estimates of a sustainable harvest are so far below the current harvest that it must be unsustainable (Marsh et al. 2004: 435).

Population Viability Analysis was used by Heinsohn et al. (2004) to simultaneously determine the sustainability of the dugong harvest in the Torres Strait, utilising the same population numbers as Marsh et al. (2004). The flexibility of the PVA approach is one that allows different life history parameters (such as the inter-birth interval which is variable in dugong and different levels of hunting) to be explored in both optimistic and pessimistic versions of the model:

> PVAs are usually conducted as simulation models used to make quantitative predictions about population size over time and the likelihood of extinction and they examine the relative effectiveness of alternative management options (Heinsohn et al. 2004: 418).

The PVA run by Heinsohn et al. (2004) showed that when the best case scenario of no hunting and a small inter-birth interval (2.8 years) was applied to the model, the dugong meta population remained at the same level over 200 years. If in the same no-take situation the inter-birth interval was increased to 6.3 years, the metapopulation decreased

over 200 years. These results indicate the inbuilt tendency for this analysis to show a pessimistic result for the dugong population.

Heinsohn et al. (2004) argue that these results support their concern for the slow breeding dugong, but it is questionable why the model is unable to show an increase for a protected population (where there is no hunting), given that population estimates over the past 20 years (under a hunting regime that is labelled unsustainable by the authors) have shown no significant change or decline. From a critical perspective it is clear that the outcomes of these models provide a satisfactory match to the values of the conservation biologists who devised and utilized them:

> Our results and those of Marsh et al. (2004) confirm that dugongs continue to be drastically over-harvested in the Torres Strait and that this may also be true in northern Cape York waters. Our analyses emphasise the urgency of the situation and we hope they will add renewed impetus to new and existing programs aimed at reducing the harvests to sustainable levels (Heinsohn et al. 2004: 424).

McNiven and Bedingfield (2008) provide a historical view on the sustainability of dugong hunting in the Torres Strait. They describe their excavation of a dugong bone mound that they calculated to represent 300 years worth of dugong bones from a particular village on Mabuiag Island, and found the remains of 10,000-11,000 dugong, which gives an annual total of 33-37 dugong for that village alone. When this figure is extrapolated out to the wider Torres Strait, a total take of 300-500 dugong per year is reached (McNiven and Bedingfield 2008). Given that it is estimated that a similar number of dugong are being harvested today (see above), this paper raises the possibility that the harvest levels of these communities may not have increased in modern times as has previously been believed (McNiven and Bedingfield 2008). The inference that the authors draw is that this may have historically been a sustainable loss for these populations, though they recognize and reiterate the conclusions of Marsh et al. (2004) and Heinsohn et al. (2004) that the current situation is not sustainable:

> We argue that the current dugong fishery in Torres Strait is uncharacteristic not in terms of hunting rates but in terms of unsustainability; a situation most likely reflecting a regulated hunting system under unprecedented stress and pressure to

> change rapidly in the face of a dugong population crash. Further research is required to determine why dugong populations have decreased dramatically over the past century to the point that Torres Strait Islander dugong hunting rates need to be lowered rapidly and drastically to achieve sustainability (McNiven and Bedingfield 2008: 10).

It is unclear from this paper why the authors believe that the dugong population has undergone a 'crash' as there is no firm evidence of any such occurrence in the region. Given the uncertainty inherent in estimating dugong populations it is not unreasonable for scientists to err on the side of caution when calculating what may be a sustainable take for a given region, but it is also important ethically to publicly recognize this uncertainty, a fact that the leading dugong scientists are increasingly aware of. In a change of emphasis from the papers published in 2004, Marsh et al. (2007) (reporting on the results of the 2006 aerial survey which showed little change from 2000) concluded that:

> The dugong population in the Northern GBR/Torres Strait region is substantial (>20,000 individuals) and is genetically healthy. We believe that there is time to work with local Traditional Owners and commercial fishers to develop appropriate management arrangements without dugongs becoming locally extinct within this region (Marsh et al. 2007: vi).

In reference to the 2004 papers that predicted that the current harvest was unsustainable, Marsh et al. (2012) reflect that:

> Both population viability analysis and potential biological removal modeling based on estimates of the abundance of the Torres Strait dugong population (Heinsohn et al. 2004; Marsh et al. 2004) suggested that the population was seriously overharvested. The failure of five large-scale aerial surveys spanning 20 years to detect any evidence of decline in the Torres Strait dugong populations despite an estimated unsustainable harvest level and relatively precise population estimates suggests that the surveys continue to underestimate population size (Marsh et al. 2012: 330).

The reflexivity shown by Marsh and others in revising their initial concerns for the Torres Strait dugong population may be seen as evidence for a shift in the ways in which these ecologists are approaching their work. Many of the individuals responsible for dugong research, and some of the turtle scientists in Australia are now also actively involved in cross cultural collaboration with Indigenous groups in order to solve the conflict that is represented by the differing perspectives on Indigenous hunting. [178]These shifts have been a long time coming, and as yet are not reflected by other more conservative members of the scientific community who remain locked into an adversarial conflict with Indigenous communities in Australia.

5. Uncertainty and risk

The scientific knowledge underpinning the threatened status of marine turtles and dugong is contradictory and uncertain. For the main part this is due to the biological characteristics of these animals, which make research problematic. Their dispersed oceanic lifestyle and migratory habit mean that populations can only be estimated, and longevity of marine turtles is an additional complicating factor when determining population trends over time, as generational change takes much longer than the average research project. It can be extremely challenging to resource ongoing population monitoring when useful data is only produced after 10-50 years of work. What is evident is that despite the uncertainty about the risks faced by these animals, many scientists are deeply concerned with their protection and promotion at both national and international levels.

The uncertainties in the scientific knowledge of both marine turtle and dugong can be interpreted in three ways as outlined by Brugnach et al. (2008). They describe 'epistemic' uncertainty as a situation where there is little knowledge about a problem (such as the lack of long term population studies on the majority of dugong and marine turtle stocks in Australia), 'ontological' uncertainty as that which reflects the underlying variability and

[178] This collaboration is described in detail in Chapter 9 where I argue that this endeavour has allowed a new hybrid space to be created where co-production of knowledge about dugong may occur, leading to a shift in the positions of both parties to accept the inherent uncertainties present in our understanding of the impacts of human harvest of dugong in Australia.

complexity of problem (such as the inherent variability in the numbers of nesting turtle and dugong present from year to year) and 'ambiguous' uncertainty as a situation which reflects the different perspectives brought to a problem by various stakeholders (such as the varying opinions on the sustainability of Indigenous hunting of these species).

When the tensions of uncertain science and unknown harvest levels are framed in these terms, it can be seen that there may well be hope in the acceptance of the multiple viewpoints of different stakeholders as mutually valid ways of describing the same situation. Considering ambiguity as a different "nature" of uncertainty can also help develop more useful strategies to deal with it. When confronted with multiple incompatible frames, there are other options than either trying to "correct" the frames or to single out the only right one (an epistemic strategy), or accepting these frame differences as an unchangeable fact (an ontological strategy). In this way, ambiguity brings into focus strategies that aim at integrating different frames, negotiating a mutually acceptable frame, or finding a workable relation between the different views and actors (Brugnach et al. 2008: 33).

By accepting the ambiguous nature of the uncertain knowledge about the sustainability of Indigenous harvest of marine turtles and dugong, all parties become able to meet together in a hybrid space that allows new solutions to this intractable problem to be found. In order for this to occur, however, there still needs to be a shift in the position of some of the parties from an adversarial to a cooperative stance in solving the problem.

The field of political ecology also provides examples of instances where the co-production of knowledge breaks down due to the power imbalances inherent in the relationship between the dominant and minority culture:

> While it may be true that the dominant discourses of society are reinforced by science, conflicting opinions and knowledge systems are often edited out, or discredited through the mechanisms of the scientific or political processes (Forsyth 2003: 20).

It is this fraught relationship between the politically powerful majority view and the intractable action of the minority that comes to light when the history of conflict between conservationists and Indigenous groups on the issue of hunting marine turtles and dugong is examined more closely.

6. Dealing with Indigenous harvest: Australian case studies

As was explored in the previous chapter, Indigenous hunting of marine turtles (mainly Green turtles) and dugong has been a controversial issue in Australia since a shift in the perception of these animals from a legitimate source of food to sacred symbols of a threatened environment occurred in mainstream Australian culture in the 1970s.

As a result of this controversy, there have been a number of occasions where the Australian Federal Government has intervened to address this perceived issue. As a general rule these interventions have been driven by the Federal Government's obligations under international agreements (as described above) and carried out in a top-down manner and within a regulatory framework. There has been some shifting of this position in recent years with growing support for community-based consultation which has led to some instances of Indigenous controlled management plans being funded and carried out 'on country'.

A particular geographical area of significance to this issue is the northern part of the Great Barrier Reef Marine Park World Heritage Area in Queensland. Indigenous communities located within this protected area are subject to greater scrutiny over their hunting activities than others, partly as a result of the additional level of governance (the Great Barrier Reef Marine Park Authority or GBRMPA) that is present due to the national and international significance of the area.

In legal terms there are provisions under the Great Barrier Reef Marine Zoning Plan (2003) to regulate Indigenous hunting through a system of voluntary agreements known as Traditional Use of Marine Resources Agreements (or TUMRAs). Although the formation of these TUMRAs is voluntary, once a community has entered into such an agreement they become enforceable under the Great Barrier Reef Marine Park Act 1975.

It is debatable whether all the communities which have signed up to TUMRAs realise that doing so is voluntary, and there is some debate whether such regulation is in fact a breach of the Native Title Act (1993) section 211 which provides that:

> Where a law prohibits or restricts an activity from being carried out by persons except in accordance with a license, permit or other instrument granted or issued to them under the law, determined Native Title holders do not need such a license, permit or other instrument to engage in certain Native Title activities. Indigenous communities and individuals with a determined Native Title right to hunt and fish may do so for their personal, domestic or non-commercial communal needs without the permit or license required by non- Indigenous people, or Indigenous people who are not determined Native Title holders.[179]

In the specific case of the GBRMPA TUMRAs it has been stated that:

> This regime is not intended to extinguish any Native Title rights and interest or to affect the operation of section 211 of the *Native Title Act* 1993 in relation to any provision in the Zoning Plan.[180]

This being the case it can be argued that the TUMRAs are not a legally enforceable means of preventing hunting, though unless the communities who sign up to a TUMRA receive legal advice on this matter it is unlikely that they will be aware of this fact.

In addition to the uncertain legal ground for the regulation of Indigenous hunting, there is also the far more intractable issue of enforcement of any such regulation. If in theory the government can restrict the numbers of turtle and dugong caught, in practice there is very little they can do to prevent this being ignored. Most hunting occurs in remote parts of northern Australia where there is unlikely to be the infrastructure or personnel to monitor or enforce these regulations.

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[179] Native Title Act (1993) section 211.

[180] p 6 of 'Sustainable and legal Indigenous harvest of marine turtles and dugongs in Australia – A National Approach', Draft, available from www.ioseaturtles.org/Features/national-approach.pdf last accessed 12/2/2012.

Research into hunting methodologies and the number of animals taken is also problematic, as many Indigenous communities are suspicious of outside interest in their hunting activities as such interest often relates to a wish to limit or ban the take of animals. In addition, hunting often takes place in very remote areas, which are difficult or impossible to access without permission and assistance by the people in question. Some of these issues are outlined in the following Australian case studies.

6.1 Hopevale community management plan

One example of an attempt by government to externally regulate hunting is the situation that took place in the early part of this century at Hopevale community in Queensland, which borders the Great Barrier Reef World Heritage Area on Cape York Peninsula (see Figure 3 for map). The history of the Hopevale community in relation to turtle and dugong hunting is outlined in the 2006 doctoral thesis of Melissa Nursey Bray 'Conflict to Co-management: eating our words'. Most of this history takes place before the introduction of TUMRAs by the GBRMPA in 2002 and provides a clear example of the failures of the top down imposed management of this issue.

The Hopevale community has a history of government regulation of hunting starting in the early 1980s, and growing community resentment over this regulation[181]. Nursey Bray (2006) describes a situation where the community instigated an attempt at 'co-management' as a result of a series of research recommendations from projects undertaken by international and Australian students. The community based Hopevale Natural Resource Management Office[182] was established in 1996, with the aim of setting up a community based management plan and rangers to enforce the plan. In 1998 the community in conjunction with GBRMPA began work on a joint management plan that was finalised at the end of 1999:

> The overriding vision of the Hopevale Plan is to address the twin objectives of maintaining the Aboriginal cultural right to hunt and the conservation of Green

[181] The regulation took the form of the issuing of permits for a restricted hunting area in a restricted hunting season.

[182] It is unclear from the history given in Nursey Bray 1996 whether this was a community run organization or one staffed by outside experts. The relationship of this organization to GBRMPA is also unclear.

> turtles and dugongs and: 'To develop and implement controlled and sustainable hunting practices that will minimize the impact on and may contribute to the protection and survival of Dugong (Girribithi) and Turtle (Ngawiya) species for the enjoyment and use of future generations (HVAC 1999c)' (Nursey Bray 2006: 183-4).

At first the plan appeared to be a great success - it won awards and grants from various government bodies and institutions, including the 2000 Prime Minister's Award for Community Leadership and Sustainability (Nursey Bray 2006). Implementation of the plan on the ground was not so successful. The community as a whole was not behind all aspects of the plan, and Nursey Bray describes active resentment at prescribed hunting timelines, controversy over the authority of the young rangers to control the activities of their elders, lack of essential infrastructure such as boats and cars, and administrative errors in the issuing of permits. The legality of the management authority controlling the hunting of Indigenous communities was also under question at this time as the ramifications of s211 of the Native Title Act were realised when a Traditional Owner from the Gulf of Carpentaria successfully fought off charges of illegally harvesting crocodiles under the Queensland Fauna Conservation Act.[183]

Additionally complicating matters in an already politically volatile situation, in 2000 on the basis of the listing of the Green turtle as a threatened species under the new EPBC act, the Federal Environment Minister Robert Hill banned the issuing of all permits to hunt Green turtles in the GBRMP World Heritage Area. Nursey Bray (2006) states that in Hopevale and many other Indigenous communities this was interpreted as a ban on all Indigenous hunting, a move that was seen to be a complete backflip on previous agreements between the community and management agencies. This move resulted in a breakdown in communications between the community and GBRMPA who were seen as untrustworthy and unsupportive (Nursey Bray 2006).

Furthermore, in the following year (2001) due to some confusion in responsibilities between the management agency and the community two different people (one

[183] *Yanner vs Eaton* 1999 High Court of Australia 53.

Indigenous, the other not) were employed to take the single position with the role of implementing the plan. In order to solve the problem the role was split into two, but this merely continued the conflict as the two men had very different ideas about the outcomes of the plan. In particular, the non-Indigenous man proceeded to vehemently proclaim against the hunting of threatened marine species to the community at large (Nursey Bray 2006). The two men were both retained over the course of the year in conflicting roles, which mirrored the greater conflict over the rights of Indigenous people to hunt these species. I wonder if this dual appointment could have provided the opportunity for the development of a third space where a hybrid understanding could have taken shape, if the power imbalances between their supporting institutions (one the community council, the other the government agency) had not been so great.

In 2002 there was an alleged 'slaughter' of 280 dugongs at Hopevale. This incident remains ambiguous as no physical evidence of the dead dugong were found by the management agency, though some community members reported to Nursey Bray that this was because agency staff refused to visit the site. The apparent breakdown in traditional control over hunting was blamed on the non-Indigenous coordinator's failure to implement the plan (Nursey Bray 2006). Apparently this incident was the final straw for the community who felt they had tried to implement the plan in good faith but that they had been repeatedly failed by the management agency (Nursey Bray 2006).

This type of reaction to external control of hunting levels, methods and practices is one that Tyrrell (2010) has described in her account of the Arviarmiut and Nunavimmiut Inuit people and their changing relationship with polar bears and beluga whales respectively. Tyrrell (2010) describes a situation where the external imposition of conservationist management practices has undermined the existing reciprocal and respectful relations between Inuit and the other-than-human. She argues that as a result of the highly regulated quota system, hunters have now become focused upon their right to harvest an animal, or set number of animals, rather than upon the 'negotiated dance' between predator and prey that formerly was the cornerstone of Inuit hunting culture (Tyrrell 2010). Tyrrell comments that this has led to a situation where younger hunters now appear to behave in a manner that reflects the disconnection of culture and nature that so often characterises non-Indigenous societies (Tyrrell 2010).

Despite being couched in terms of community based management (with significant consultation of community members and artwork from the community's children) the Hopevale Management Plan was clearly based in the context of the management agency wishing to protect these 'endangered species' from the threat of Indigenous harvest, and was structured and framed in a manner that matched the format of the government management regime. As such it represented an intrusion of values and priorities from the dominant Australian culture that did not match with those held by the Indigenous hunting community (Nursey-Bray 2006).

If this case study is viewed through the lens of Berkes' (2004) three potential shifts in ecological approaches to problem solving, it can be seen that there has been an attempt by the management agency to engage with the human dimension of the issue, by involving the community in a consultative fashion in the development of the management plan.

The approach taken by the management agency in this instance appears to lack a truly participatory framework in its engagement with the Hopevale community. Although the community was consulted about their aspirations for marine turtles and dugong, these aspirations (to continue hunting as a part of cultural survival) were not placed on par with the agency's need for conservation. A key example of this is the inflexible permit system that was put in place by the outside agency which limited take to 20 dugong and 25 turtles per year. This system was managed from a centralised base in a city far from the community, and there could be no direct negotiation over the issuing of permits as circumstances changed for the community or the management agency. Indeed on one occasion permits that had been issued were in fact revoked without consultation (Nursey-Bray 2006).

Nursey Bray (2006) argues that the process to produce and implement the plan was community driven but that misunderstandings such as the differing meanings given to key terms, such as 'sustainability', by the community and the management agencies led to the failure of the plan. Additionally, she believes that the differing values assigned by the two parties to marine turtle and dugong led to irreconcilable differences in the approaches and expectations each brought to the project. The key recommendation that Nursey

Bray makes from her experiences is the need for a 'common discourse' on natural resource management between governments and Indigenous groups and she calls for 'the implementation of a methodology for management that prioritises social justice in conservation' (Nursey Bray 2006: 370). This common discourse as described by Nursey-Bray can also be viewed as the potential for hybridity, where each group contributes their own values in a dialogue characterised by mutual respect.

Once the validity of each argument is given space to exist (rather than being pulled apart in the search for weaknesses) then the possibility of a third space can open up, but not before. If each party can recognise where the inflexibilities of the other exist, then the areas of possibility can be mutually worked upon to produce a new direction that both may be happy to pursue. This requires negotiation and a flexible approach that will take time to develop, and in a cross cultural situation careful translation of concepts will probably be necessary.

6.2 National Survey and Marine and Coastal Committee Taskforce

An attempt at regulating turtle and dugong harvest at a national level was undertaken by the Australian Federal Government from 2004. This involved the setting up of a taskforce on the issue, after a public debate erupted in August 2003.

This controversy was the direct result of a national survey of recreational and Indigenous fishing conducted in Australia during 2000-2001. The survey came up with some extraordinary figures for dugong and turtle harvesting - 1600 dugong and 6000 marine turtles per annum respectively. These figures were proclaimed by the then Federal Minister for Fisheries Ian McDonald, and caused much controversy in the media.

> The report found about 1,500 dugong, 25,000 turtles and 42,000 turtle eggs were killed. Senator McDonald says that's too high and is depleting some populations. "We'll be working at some strategies on how to better address that. Now, whether that includes total banning or a much more managed take of the species is

> something that the Indigenous people working with the Government will work out." [184]

If the details of the survey are examined carefully it can be shown that in total 17 households across Australia reported dugong harvest, and this unknown number of dugong was extrapolated into a total of 1600 dugong per annum. In one case a single household in Queensland was estimated to catch 160 dugong per year, an extremely unlikely feat.[185]

The science behind the survey methodology was robustly critiqued by experts in the field, especially once they were advised of the details of the extrapolation techniques used, as the number of Indigenous households actually reporting hunting events was extremely low.

> A 'ball park' figure that is not robust is of limited value and I consider that it was irresponsible to have published it as part of the survey. You advise the 'expansion factor for the Queensland coastal communities was 75'. I interpret that to mean that the actual catch records on which the estimate of 1,293 dugongs was based was ~17 animals. If the expansion factors for Western Australia and the Northern Territory were of similar magnitude, the recorded catch must have been substantially less than for Queensland – presumably less than five animals in each region.[186]

Part of the response by the Federal Government to the results of this survey was to set up a 'Marine and Coastal Committee Taskforce' in 2004 to deal with Indigenous hunting of marine turtles and dugong. This Taskforce was established by the Federal Government and involved the states and the Northern Territory 'in the development of a nationally

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[184] ABC News 'PM' transcript dated 4th August 2003. http://www.abc.net.au/pm/content/2003/s917156.htm accessed 19/2/09.

[185] The National Recreational and Indigenous Fishing Survey report can be downloaded from http://www.daff.gov.au/fisheries/recreational/recfishsurvey last accessed 17/08/2010.

[186] Letter from Professor Helene Marsh, James Cook University to Dr Stan Jarzynski, Australian Government Department of Agriculture, Fisheries and Forestry dated 19th November 2003.

coordinated approach to dugong and turtle management, including Indigenous harvest of these species'. [187]

The membership of the Taskforce was initially only drawn from government departments, with an emphasis on natural resource and environment portfolios, as well as representation from departments of Indigenous affairs. The main purpose of the Taskforce was to develop a draft 'National Approach document'.

An Australian Government Working Group on Indigenous Take of Turtle and Dugong was set up as a subsidiary of the taskforce, to research 'the nature and extent of Indigenous take of dugong and turtle to determine the extent to which this form of mortality affects populations of the species.'[188] Again the membership was drawn solely from government departments with no community representation. One of the first tasks of the Taskforce was 'to consider how to achieve stakeholder (especially from Indigenous communities and/or relevant scientists) engagement in the work of the Taskforce.'

The initial draft of the National Approach document was titled 'Sustainable and legal Indigenous harvest of marine turtles and dugongs in Australia' and had an emphasis on the legality or otherwise of Indigenous hunting, with an inbuilt assumption that the levels of take were unsustainable, if not illegal.

> At the core of the approach are seven goals aimed at moving all Indigenous harvest of marine turtles and dugongs to a sustainable and legal base...Where illegal Indigenous harvest is occurring, enforcement and compliance actions should be pursued. Illegal harvest includes any harvest of marine turtles and dugongs where the individual does not have a legal right to conduct that harvest. The challenge for compliance is the dispersed nature of many Indigenous communities, particularly in remote areas of northern Australia, as well as the practical difficulties of compliance issues on water. The national approach seeks to encourage, and enable, Indigenous communities to help end illegal harvest...

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[187] Sustainable Harvest of Marine Turtles and Dugong in Australia 2005 available from http://www.environment.gov.au/coasts/publications/turtle-harvest-national-approach.html last accessed 17/8/2010.

[188] Ibid.

> While aware of the myriad of cultural, social and economic factors that influence Indigenous harvest, the objective of this National Approach is to ensure the conservation and protection of marine turtles and dugongs.[189]

Some of the ideas promoted in this draft were controversial in Indigenous circles, particularly Goal 5 '*Alternative approaches to hunting'* which suggested 'pseudo hunting' with rubber tipped harpoons as an alternative to satisfy the cultural requirements of the practice. Given the subsistence nature of much of Indigenous harvest of these species the inclusion of this was perceived to be ill-advised if not downright rude.[190]

A review of this initial draft by social researchers Jon Altman and Geoff Buchanan (2005) was critical of this first draft, particularly of the threat based language and the top-down regulatory approach used.

> The Draft appears to place greater emphasis on Indigenous harvest as a threat than on Indigenous community-based management as an opportunity for a holistic approach to the monitoring, management and sustainable harvest of these species across northern Australia...Given that the Draft acknowledges the absence of hard data (Goal 1: Improve the information base) it appears presumptuous in viewing Indigenous harvest as a threat on a national scale.[191]

The final document had several major changes, obviously taking into account these sorts of expert comments. The title had been changed to 'Sustainable Harvest of Marine Turtles and Dugongs in Australia – A National Partnership Approach' and Goal 5 '*Alternative approaches to hunting'* was no longer part of the document. The language and goals had shifted to incorporate co-operative management with Indigenous communities rather than the regulation of such communities.

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[189] Draft 'Sustainable and legal Indigenous Harvest of marine turtles and dugong in Australia - A national Approach', document available from www.ioseaturtles.org/Features/national-approach.pdf last accessed 17/8/2010.

[190] Bardi elders and hunters personal communication 2005.

[191] "Some Comments on the MACC Taskforce on Dugong and Marine Turtle Populations Draft 'Sustainable and Legal Indigenous Harvest of Marine Turtles and Dugongs in Australia - A National Approach' Jon Altman and Geoff Buchanan Centre for Aboriginal Economic Policy Research The Australian National University, Canberra 30 June 2005" at www.aph.gov.au/senate/committee/ecita_ctte/.../sub167att2.pdf

Despite the improvements the document and the approach remain controversial amongst those who work closely with Indigenous communities, as the entire project rests on the assumption that current harvest levels and practices are unsustainable - an assumption that has no basis in collected data. The extrapolated numbers in the original survey are given very little weight by scientists, and hard data on harvest numbers are not readily available for more than a few isolated communities over short stretches of time. The focus on Indigenous harvest as unsustainable appears inequitable given the paucity of real data.

> When a 2004 Recreational and Indigenous Fishing Survey reported high levels of harvest, the immediate reaction of the Minister for the Environment, Senator Ian Campbell and the then Minister for Fisheries and Conservation, Senator Ian Macdonald, was to threaten to close these customary fisheries, overlooking the question of compensation. Little reference was made to numerous other human interventions that impact on these iconic and globally endangered species (Altman 2006: 3).

Although a change in the political flavour of the Australian Government in 2007 largely abated the push to prevent the hunting of marine turtle and dugong through a legal regulatory framework, the discourse that underlies these approaches has not disappeared. During the lead up to another federal election in 2010, conservative politicians again raised the idea of preventing the hunting of both marine turtle and dugong through legislation if they were re-elected. Interestingly, in contrast to statements made in earlier years (where Indigenous communities were often vilified), there seemed to have been a shift to incorporating some form of participatory process into these proposed regulations, and a recognition that this process would need the active support of the communities in question.

> The Federal Opposition has pledged to dramatically cut the number of turtles and dugong being hunted in Far North Queensland by cracking down on poaching and 'non-traditional take' by 90 per cent...The Opposition's environment spokesman Greg Hunt said immediate action was required to protect the dugong

> and turtle populations. "Personally, I would like to see all of the take ended but will start by seeking a cooperative arrangement with local traditional elders." [192]

There is an ongoing concern from mainstream Australia about the impact of Indigenous hunting on these species. This concern is largely based on the perception that these species are vulnerable to exploitation and that their populations are decreasing due to the Indigenous harvest. There is a recognisable rhetoric promoted by certain scientists and the media that supports a view that the current harvest of these species by Indigenous groups is unsustainable, yet when these claims are examined the reality of the situation becomes more ambiguous.

> There are substantial challenges associated with conserving threatened species that are of cultural and dietary value to and exploited by Indigenous peoples. These challenges are particularly difficult in developed countries such as Australia where the wider community perceives Indigenous hunting as a major threat to wildlife, even when there is limited scientific basis for this perception. (Nursey Bray et al. 2010: 367)

I argue that a large part of the conflicts that have occurred between government agencies and Indigenous communities over the hunting of marine turtles and dugong are formed by a narrow focus on the numbers of animals harvested. Not only are these numbers often inaccurate, but given the lack of reliable information held by ecologists about the population sizes of marine turtle and dugong in these regions it is hard to accurately determine what a sustainable harvest might be.

The inherent uncertainties in working with these migratory animals where the total population estimate is likely to change each time it is measured, makes this situation ideal for the application of adaptive management as described by Berkes et al. (2000) and others. This reflexive approach to management works around such uncertainties by continually integrating new information into a decision-making process. Even more appropriate to this situation would be the use of adaptive co-management as a strategy, which would require the cooperative management of the harvest of these animals between

[192] The Port Douglas & Mossman Gazette, p1, 11/02/2010.

management agencies and the communities that hunt them (Olsson et al. 2004). The Hopevale community plan may be conceived as an attempt to achieve this goal, but one that failed due to an inability to effectively communicate between the two parties. Unfortunately as these kinds of problems recur, the goal of co-management becomes harder to achieve due to the history of conflict that builds up between communities and management agencies.

The reductionistic approach taken by the management agencies in the above examples contrasts sharply with the recommendations made by Berkes (2004) to include a systems or holistic view and to integrate the human (cultural) aspects of the problem into our information gathering. Acknowledging the range of uncertainties in the system may help bypass conflicts between conservation and hunting motivations.

One example of this is the Dhimurru Miyapunu (marine turtle) project in east Arnhem land which began in the mid 1990s. This involved the Yolgnu Aboriginal community inviting scientists to work with them on turtle conservation issues, a initiative which brought the two cultures together in a spirit of cooperative two way learning.

6.3 Dhimurru Miyapunu Project

The Dhimurru Miyapunu Project is one of a series of successful partnerships run by the Yolngu people of north-east Arnhem Land (see Figure 1 for map) through the Dhimurru Aboriginal Land Management Organization ('Dhimurru').

> Dhimurru's two-way partnership approach is encapsulated on the logo depicted on the badges worn by Dhimurru rangers and staff. This logo shows the black (*Dhuwa*) and white (*Yirritja*) cockatoo facing each other, encircled by the rowu vine found on both Dhuwa and Yirritja coastal country. The logo calls for a framework to encourage cooperation amongst Yolngu clan groups to work together, and also for a cooperation between Yolngu and Western knowledge systems and management approaches (Kennett et al. 2004: 161).

The Dhimurru Miyapunu project was set up as an opportunity for Yolngu to work cooperatively with turtle scientists in caring for Miyapunu in their country. As such the framework and priorities for the project were primarily Yolngu based, with a focus on the impact of 'ghost nets'[193], the management of access to the coastline (now also protected as part of the Dhimurru Indigenous Protected Area), the cultural management of hunting, and investigations into the distribution and population dynamics of local turtle species (Kennett et al. 1999; Kennett et al. 2004).

> They [the Yolgnu] are also sharing traditional ecological knowledge and working with Western scientists to help manage and protect the area's unique land and sea resources. And the flagship project, which has come to be regarded around the world as a model of cross-cultural cooperation, aims to conserve the sea turtles which for hundreds of generations have played a crucial role in Yolgnu culture as a subsistence food, as well as in songs, dances, ceremonies and art. [194]

The results of cross cultural knowledge exchange are not always entirely positive, as different ways of understanding the world may undermine and disrupt what is known, causing cultural disturbance.

One example of this was the loggerhead turtle story, which emerged from the engagement of the Yolgnu and the Yanyuwa people (from the neighbouring Gulf of Carpentaria) with the Dhimurru Miyapunu project. During their work with turtle scientists Yolgnu hunters discussed turtles that they had captured which had been tagged by scientists working on nesting beaches in Queensland and Western Australia. Yolgnu cosmology had always held that these animals lived their entire lives in local coastal-marine waters, and in particular the loggerheads (Garun) (who did not nest on the beaches in this region) were believed to lay their eggs underwater (Yunupingu 1999). After discussions with the scientists about their ecological knowledge which held that these turtles nested in Queensland, Senior Lawmen and hunters from both the Yolgnu and Yanyuwa

[193] Derelict fishing gear, often from international waters, that accumulates off the coast of Northern Australia and is responsible for the deaths of many marine animals including turtles.
[194] P 21 'The Australian' Magazine April 14-15 2002.

communities were taken to the Mon Repos Sea Turtle Research Centre in Bundaberg, Queensland, where they saw a Garun laying eggs on the beach (Kennett et al. 2004).

If the cultural group is sufficiently grounded and resilient this kind of disruption may not lead to permanent damage, but instead a shift to a new understanding of the ways things are. This is of course the aim of much cross cultural research with Indigenous peoples, where the participants engage in knowledge exchange in the hope of influencing a change in either or both cultural groups. The danger in working with a significant power differential, such as is found between a settler culture and those they have dispossessed, is that the impact of colonisation has often resulted in a fragility in the social structure of the colonised peoples.

In his paper delivered in 1998 to a conference held in Darwin on 'The Conservation and Management of Marine Turtles in Northern Australia', Djalalingba Yunupingu, a Senior Lawman for Garun, clearly articulates his divided position on the matter:

> I didn't believe the people who told me, in my community, about the loggerhead turtles. Where they're nesting right in underwater, somewhere. And I didn't believe them when they told me. Why, should it be that turtle going to be lay at the beach. And then I had a trip to Bundaberg and talked to Col (Limpus), one of the guys talking to you mob. I met him and I proved to myself, with my own eyes, and then I go back and I tell my community (Yunupingu 1998: 9).

In the Yanyuwa communities similar issues of disbelief and conflict between knowledge systems were also apparent after their representative (a young hunter) returned with his story:

> "I have listened to these words, these words concerning the dugong and sea turtle, these words from the scientists, but tell me, what does it do to the Law of my father, is it too now just merely words?" These are the words of a senior Yanyuwa woman on hearing the results of scientific research done on sea turtles and dugong on her country... she was shocked to learn of things which had been told, which at first glance, seemed to contradict the knowledge she had accumulated

> from her ancestors and a lifetime of observing the environment (Bradley 1998: 25).

The Yolgnu Dhimurru Corporation made a video film about the issue in order to help the communities deal with the new information[195]. The film included footage of the Loggerhead turtle nesting, as well as traditional songs about the turtle and an open discussion with Mr Yunupingu, who was the traditional custodian of the knowledge on the loggerhead turtles:

> In the film you see Joe Yunupingu really struggling, really experiencing pain, as he considers the new knowledge that this study has shown him, and what it means for his knowledge system, his cosmology, his fidelity to his core values. Bear in mind that this is a very robust community with secure tenure and a great deal of sophistication in dealing across knowledge systems. This film alone should alert one to the problematics of intercultural sharing of knowledge (Deborah Rose 2002 pers. comm.).

The response of the Yolngu elders to this disturbing knowledge was ultimately one that reflected the strength and integrity of their culture, as they found ways to integrate the new ideas into their traditional worldview:

> This new knowledge reinforced Dhimurru's conviction that it must work with other peoples who share the region within the migratory range of Garun and other Miyapunu [turtles]. Significantly, it has also required Elders to carefully fuse new information into a framework of traditional Law and ecological knowledge that has been accumulated from past ancestors and a lifetime of observing Miyapunu (Kennett et al. (2004: 163).[196]

This kind of 'fusion' of traditional and scientific knowledge is only possible when the senior knowledge holders (either Indigenous or scientific) grant legitimacy to the new

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[195] *Nhaltjan Njuli Mitwatj Yolngu Djaka Miyapunuwu: Sea Turtle Conservation and the Yolngu people of East Arnhem Land*. Dhimurrru Land Management Aboriginal Corporation 2001.

[196] Paper jointly authored by Mr Yunupingu and Mr Munnungurritj, both senior elders of the Yolgnu people.

information. The validation of new knowledge within an existing framework, particularly when that knowledge directly contradicts what is already known, is problematic, as this kind of disruption may cause the unravelling of what is known. Bradley (1998) recounts the impact of this same experience of observing the nesting of loggerhead turtles on the Yanyuwa people whose country lies near Borroloola in the Gulf of Carpentaria:

> When the young hunter mentioned above returned from Mon Repos and recounted how he had seen loggerhead turtles nesting it caused a degree of confusion and in one instance, from a senior man, anger: What right did this young man have to challenge the Law of his senior relatives and the Law as given by old people? What did such knowledge do to sacred songs and rituals? Did they no longer make sense? To an outsider such a revelation may not be considered to be important, but in a community where people stand at the heart of the total ecology to which they are intimately connected, and where knowledge is the basis of power and authority, such information had profound implications...Ultimately the old people, in this instance, chose to ignore the information. Though the young people may accept it at a day-to-day level, they have no right to dismiss the tradition of their forefathers and foremothers. Thus no synthesis of information was made, but an uneasy alliance of old and new coexists together (Bradley 1998: 28).

The stated aims of cross-cultural ecological research are to encourage two-way learning and understanding in order to improve conservation of species by both Indigenous and non-Indigenous cultures. In light of the above stories, I would also ask - how do we retain cultural diversity as well as biodiversity through our work?

Martina Tyrrell (2010) argues that these are indistinguishable and interdependent goals, as without cultural integrity, Indigenous people may become disconnected consumers with little reason to care for their country. The fear of cultural loss is one taken very seriously by elders in many Indigenous communities and may well take precedence over any attempts to restrict hunting practices. Locally driven, bottom-up participatory projects still may not serve the interests of cultural continuity.

Bradley (1998) goes on to argue that there is a great deal to be gained for western science from listening to Indigenous knowledge holders, particularly about how to reintegrate the human dimension into ecological understandings. He does so with the proviso that 'the culture of western biological knowledge continually contesting indigenous scientific structures has to cease' (Bradley 1998: 31).

This emphasis on human relationship with country as crucial to the restoration of the natural environment is also echoed by the Yolngu people:

> The Yolngu message...is consistent. It is a message that efforts to restore Miyapunu on country are integrated within a social-spiritual-ecological system. Restoration is not just focused on 'fixing' the physical elements of country but improving human knowledge and relationships to this system (Kennett et al. 2004: 165).

7. Conclusion

The above examples support the idea that conservation action happens at various scales – from global policy driven to the local participatory level. Many ecologists such as Marsh et al. (2012) and Limpus (2008, 2009) still seem to rely upon global and national scale action as the best means of promoting the protection of marine turtle and dugong, through the use of international Memorandums of Understanding, conventions and treaties, while noting that these things provide little change at the local on-the-ground level (Marsh et al. 2012). Those who have worked at the local level, such as Nursey Bray (2006) and Kennett et al. (2004) have encountered difficulties in the translation and communication of concepts across cultural groups, and have achieved mixed success in their respective goals of conservation and cultural continuity.

In terms of the three forms of scientific discourse described by Manuel-Navarrete et al. (2004; 2008) I would characterise the application of the majority of ecological marine turtle and dugong knowledge as fitting within the 'normative' paradigm – that is to say the belief system underlying the knowledge produced and the actions taken is one that views

human influence upon these species as something to be limited as much as possible, mirroring the nature/culture dichotomy that is inherent in traditional scientific practice.

There appears to be some movement towards what Manuel-Navarrete et al. (2004,2008) describe as an 'ecosystemic-pluralistic' discourse as in recent years there has been an acknowledgement that alternative worldviews are held by other stakeholders and that in order to engage with Indigenous groups and others there will need to be some room for negotiation with these other ways of knowing about these animals:

> The deliberate hunting or incidental killing of sirenians is typically done by relatively few people within subsistence communities. Not only do such people have direct and measurable impacts on sirenian populations in particular areas, but they can be valuable to efforts to identify threats to sirenians and their habitat because of their expert knowledge, acquired over a lifetime of hunting or fishing...It seems prudent, therefore, to develop a community-based programme that includes all stakeholders...but to take special pains to involve the hunters/experts (Marsh et al. 2012: 418).

In welcoming the input of local hunters and experts Marsh et al. (2012) have begun the process of legitimising co-operative and community based conservation action, yet there is still no process put forward for reciprocally supporting the cultural or other aspirations of these communities in such an engagement. Marsh et al. (2012) recognise that their area of technical expertise may be an impediment to such a venture, and suggest that transdisciplinary partnerships between experts from the social sciences as well as ecologists, are the key to such work.

The approach taken by Kennett et al. (1999, 2004) in the Dhimurru Miyapunu project seems to take a more participatory stance in terms of their 'two-way' research, with understandings flowing in two directions, described in the Yolngu 'ganma' metaphor of the meeting of salt and fresh water:

> There is always a dynamic interaction of knowledge traditions. Fresh water from the land, bubbling up in fresh water springs to make waterholes, and salt water

> from the sea are interacting with each other with the energy of the tide and the energy of the bubbling spring. When the tide is high the water rises to its full. When the tide goes out the water reduces its capacity. . . . In this way the Dhuwa and Yirritja sides of Yolngu life work together. And in this way Ngapaki [197]and Yolngu traditions can work together. There must be balance, if not either one will be stronger and will harm the other (Marika-Mununggurritj 1992, p. 5).

With the sharing of such concepts, and the resulting reframing of scientific understandings as represented by the hybrid accounts produced by Kennett et al. (1999, 2004), this approach fits within the definition of a 'transpersonal-collaborative' approach to ecological management as described by Manuel-Naverrete et al. (2008). The success of such an approach lies in the advice succinctly given by Bradley (1998), which is to 'listen' and 'take time'. By doing so, strong relationships of trust can grow between people with different conceptions, allowing the creation of a third space where a hybrid knowledge can grow.

In the next two chapters I provide two contrasting case studies that outline the possible consequences of following either the normative (Chapter 8) or the ecosystemic-pluralistic (Chapter 9) approach to conflict between marine turtle and dugong conservationists and perceived threats to the species.

[197] Similar to 'gadiya', 'ngapaki' refers to outsiders or non-Aboriginal persons in the Yolngu language.

Interlude: Conversation with Helene Marsh

The Jeremy Jackson[198] Story

The Jeremy Jackson thing. That's a really interesting story too. That's a very famous paper, you've probably seen that paper, [it was on the] cover of Science[199]. Well, this is slightly a story against me, but - one of the authors on the Jeremy Jackson paper is Terry Hughes who runs the Coral Reef Centre of Excellence here - a very good scientist - anyway ... Terry told me about this paper and said 'Oh I'll email it to you' and this was when it was in press. And I read it - because it's got some stuff about dugongs. And I read the text. It was a classic example of a manuscript prepared for publication where the tables are all at the end - and I did not read the tables. I read the text, and I thought - 'Oh that's alright. Terry if you'd come and talked to me for ten minutes, the text would have been a lot better, but it's okay'.

And then people kept saying to me - 'Oh you and Terry you have such different views about the historical dugong population on the east coast of Queensland' - 'Oh, do we?' And then Alison Green, a friend of mine, who was then running the research section of GBRMPA, said 'Oh Helene, you know you and Terry have such different views I really need to have a meeting and reconcile them' and I thought, 'Yeah'- I sort of didn't really know what it was about, anyway she contacted Terry and said 'we need to have this meeting' and Terry rang me up and said 'Do we really need to have this meeting? Is this such a huge problem?' and I said 'Oh I don't think so' he said 'You are aware of the historical stuff we've quoted?' and I said 'Yes' and there are a couple of historical accounts, of truly huge herds, and I went 'Yeah, I'm aware of all that.' And he went 'Oh we've got better things to do we don't need to meet' and so that was fine.

And then one day, out of the blue, I got an email from somebody or other that wanted to know something or other, I don't even know what it was. And I thought the perfect

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[198] Dr Jeremy B.C. Jackson, senior emeritus scientist at the Smithsonian Tropical Research Institute.

[199] Jackson et al. (2001) *Overfishing and the Recent Collapse of Coastal Ecosystems* Science **293**(5530): 629-637.

person to answer this request is not me, it's a woman at the University of Florida called Karen Bjorndal who's a fairly famous turtle person - you've probably heard of her - and I know Karen, and I thought 'Oh what's that email I'm not sure', so I just googled 'Karen Bjorndal' to get the email address to tell this other person.

And up came the press release for the Science paper. Which she'd been an author of. And I'm reading down - '...the dugong population on the east coast of Queensland at the time of European settlement was between one million and three million' {pause} 'What!? Where'd they get that from?' So I went back and I looked at the Science paper as opposed to the manuscript. And there, embedded in there is this table, which I had skipped, which surely says that. Now with a Science paper you can actually go behind the tables and find out where it came from. And where it came from (this is an <u>amazing</u> story - it will disillusion you with science forever) -

So there's the coast of Queensland - two very big groups of dugong reported, one in Moreton Bay and one they say 'Wide Bay' and I don't know what they mean by 'Wide Bay' it must be Hervey Bay because there aren't heaps of dugongs in Wide Bay ever, but anyway, that's not important. And then they said alright this guy says that the herd - and it's in that Welsby book, but they didn't even go back to the original source, 'that the herd is a black beacon, and it's in July'- and I know the exact place where it is and it's where Amanda did her work and you can see this sight today, on the right day - 'and there was this huge herd of dugong and it must have been - we don't know how many were there but it must have been this long by this wide and there were this many spouts at any one time'. That's what it says. 'And we can't imagine how many were there'.

As I say you could go there today and see exactly the same thing. So then they said [Jackson et al.] they took this photo of a bunch of 29 dugong which was either taken by me or George Heinsohn and it appears in the Biological Conservation paper published in 1978 about the discovery of the dugongs in Moreton Bay, and there are all these dugongs.

And I look at the picture and I think - 'oh bunch of dugongs, bunched up because of the plane' and they have said 'alright, average dugong is about three metres long, and so this must be this big, and therefore the density of dugongs must be this' - sample size of <u>one</u>.

We have here [a box that] contains hundreds of hours of vertical videos of dugongs from exactly the same place - did they ever come and ask? - No.

'So this says that the density of dugongs in a herd is this, therefore this herd that was estimated to be this, must have had 100,000' - or whatever - it was some incredible number of dugongs - I've forgotten [the exact number]. 'This many dugongs, and there must have been - ten such bays along the coast that would have been capable, and therefore the dugong population of the east coast at the time of European settlement is this'.

Incredible, and then, 'and Helene Marsh's 1996 report says that there are only this many, therefore there has been this incredible crash.' - I just couldn't believe it. And I emailed Terry, and I said - 'Terry - this is just crap!' I said ' if there were this many dugongs in Moreton Bay, and even if the whole Bay had been covered with seagrass at this time they would have eaten their way out of house and home in a week! Get real here!' and Terry sent me this incredible email back:

'Dear Helene, you know you've confused space and time - and do you want to be'- this was the final thing - 'do you want to be the person in the world who knows the most about dugongs and has done nothing to save them?' 'Thank you Terry!'

Anyway I read this email at the San Francisco airport, just after I got off a flight from Sydney and I had enough sense to think I am not answering this email now. And I thought about it for a few days and then I decided that Terry was the sort of person that there was no point arguing with, I just wrote back and said 'Dear Terry, thanks for your input, you and I will just have to agree to disagree', so then when we wrote the historical thing we said 'Well - <u>triggers</u> not targets for conservation, we can have meaningful targets but really we can't believe this could possibly be true', and then we wrote another paper which Louise Chilvers took a lead on, because there was a subsequent paper written by John Pandolfi et al. – also in Science, which basically took all that stuff of Jeremy's and then claimed that Moreton Bay was three quarters of the way to ecological extinction - largely because of the decline in the large herbivores and the carnivores.

And I even talked to Jeremy about this - and I said 'Jeremy' - this was before they published that second paper, and I said 'Jeremy this is just crap'. I said 'Eastern Moreton bay has hundreds of dugongs in crystal clear water next to this major city, and it has the highest density of coastal dolphins ever recorded anywhere in the world.' 'Oh' he said, 'there used to be more'.

I said 'Maybe - I don't know, but you're telling me that the signal of a degraded ecosystem is to lose the large herbivores and the carnivores. And you're telling me that this bay is two thirds of the way to ecological extinction. And I'm telling you that it has the highest density of coastal dolphins and this really high density of dugongs'. 'Oh' he says 'Moreton Bay is really two bays. The western Bay is very degraded, and the eastern Bay is fine.' And I said 'Well I actually think that's true Jeremy, but that's not what you said'. Anyway, so then we published this second paper that just basically said something about coexistence of large marine mammal populations and a large city. Because it was just crap!

Because - look, I'm really sympathetic to the view that we have got shifting baselines and that we don't know what it was like in the past, etcetera - of course that's correct - but it's pretty shonky! I mean look at that! {points to diagram of dugong extrapolation} You should give that to a first year class!

Now I don't know if that was Terry, or Roger Bradbury who is another friend of mine who was another co-author on the paper, or who - but I really couldn't believe it. And they hadn't even gone back to the primary literature – which is sitting on my shelf over there. I mean!

I'm sure there were a lot more dugongs on the east coast of Queensland than there are now, but as for this extraordinary figure in Science - impossible. And the other thing that is really interesting when you go into the historical record (and another one of my students, Ben Daly actually did) the dugongs came and went, all the time.

Now people attributed that to over-harvest, and some of that was undoubtedly due to over-harvest, but they couldn't come back so quickly, so there was also this confounding

affect of movement which no-one understood. Anyway – that's a bit of an aside, but it's an amazing story about how people misuse information for these really political aims - and it's still happening.

Chapter Eight: The Dugong Wars

1. Introduction

In this chapter I explore a case study that illuminates the damage caused by taking an adversarial approach during a conflict of interest over a protected species. In this case the conflict occurred between conservation groups and fishermen rather than Indigenous hunters, yet I believe the lessons learned are pertinent to the resolution of conflict between any interest groups over an environmental issue.

The data presented in this chapter are primarily drawn from a single interview that I conducted with Professor Helene Marsh, who is acknowledged as the most senior dugong scientist in Australia, and indeed the world. The reliance upon one primary informant to recreate a case study has obvious limitations – the account will be skewed to favor their interpretations of what occurred. I stand by the decision to not interview some of the other 'players' in this story as this would have increased the complexity of the data to such an extent that I would probably have had to limit my thesis to a discussion of this one case. I would ask my readers to view this story with its limitations in mind – this is primarily Professor Marsh's account of what happened, and may not reflect the views of others who were involved.

Additionally I have used the social science strategy of 'triangulation' in order to mitigate the effects of relying upon a single source for the telling of the story. Lincoln and Denzin (2000) state that triangulation 'is best understood as a strategy that adds rigor, breadth, complexity, richness and depth to any inquiry' (Denzin and Lincoln 2000:5). In this case I have used media reports, parliamentary records, published and unpublished scientific reports, websites, meeting agendas and minutes, and industry publications and newsletters to both support and question Professor Marsh's account of what happened in this story. In order to double check my interpretation of the events I chose to work in a participatory manner with Professor Marsh in finalising this chapter, sending her my drafts for comment and approval. The final version presented here has been read and approved by her.

Following on from the previous chapter I also wish to explore this case study in the context of the history of dugong research in Australia, as I believe the experiences of the key players in this case study have had an impact on the move towards reflexivity that can be seen in the way that dugong scientists now accept the uncertainty of their knowledge and how that relates to the potential threat of Indigenous hunting.

Functowicz and Ravetz (1992) describe three kinds of problem solving strategies dependant on the level of uncertainty present in the system. When uncertainty is relatively low, the traditional approach of applied science to gather empirical evidence and develop theories in an academic sphere may well be appropriate. When the complexity of problems is increased (such as when dealing with the human impact upon an environment) and there is a moderate level of uncertainty in the system, multiple (possibly competing) interests may conduct rigorous scientific inquiry along different lines, in which case the planning for action will require the political debate over the values and reliability of the judgements of the 'professional consultants' involved (Functowicz and Ravetz 1992). Finally the authors suggest that when uncertainties and potential risks are high the best practice is to involve an 'extended peer community' and debate both the uncertainties and the possible courses of action widely within the broader community in a process they describe as post-normal science.

This story provides an example of the inadequacy of a normative (Manuel-Navarrete et al. 2008) approach to environmental problem solving. A normative approach fits within the first course of action described by Functowicz and Ravetz (1992) and requires professionalism and an ethical commitment from scientists, with solutions to be derived from scientific truths and morally correct analyses. There is in this case an understanding that preserving nature can only take place through direct (top down) policy implementation achieved by influencing decision makers as effectively and efficiently as possible (Manuel-Navarrete et al. 2008). The problem with this approach only becomes clear when things do not go as planned:

> It is important to note that this reasoning provides a consistent, coherent, and, consequently, highly incomplete formalism. This incompleteness becomes quite evident upon asking some basic questions: What if scientific findings are

> controversial? What if political actions, once implemented, do not convey the results they were intended to? What if decision makers' agendas are not only guided by scientific findings?...These questions do not indicate that this discourse is wrong but simply that it is dramatically incomplete (Manuel-Navarrete et al. 2008: 339).

The following case study raises all of the above questions and provides a detailed exploration of the shortcomings of a normative approach to the solution of an environmental crisis where uncertainty is high.

2. The Dugong Wars[200]

This story begins in Queensland, Australia, in the mid 1990s, where the issues of ecological conservation and resource use can be portrayed as diametrical opposites, where proponents were at loggerheads. In particular, controversy surrounded the type and level of fishing that should be allowed within the Great Barrier Reef Marine Park, which takes up some 345,000 square kilometres of offshore waters along the coast of north Queensland (see Figure 3 for map).

This has been a persistent issue in north Queensland, and one that provokes great passion on both sides of the debate. In this particular case, dugongs were seen to be under threat by the inshore gill net fishery that operated along the coast. The resulting debate was fiery, and the measures undertaken by government to solve the problem were controversial. In order to understand why this was so, it is necessary to look in more detail at the particular groups and personalities involved in the debate, and the historical and political context of the policy decisions made.

In 1996 the Howard (conservative) government came into power, and in the subsequent 1998 and 2001 federal elections issues of environment and resource use were raised in

[200] This caption is taken from the Australian Broadcasting Corporation (ABC) program of the same name that covered some of the story told here and was aired on ABC television in 1998. This title has passed into common language and is often used to refer to the conflict that occurred in Queensland at this time, and it is an apt title for this story as the nature of the following history is a battlefield, with 'winners' and 'losers', but like all battles the war was never won, just prolonged. Bitterness and anger still remain in the hearts of those who 'lost' and even now, more than 10 years after its peak, the issues remain current.

the coastal town electorates of north Queensland. In federal elections the state of Queensland is often seen as crucial to the outcome of the election as there are a number of marginally held seats that often change hands. Regional Queensland is seen as a particularly conservative area where the parties that represent primary industry and development are generally favoured above those that champion conservation issues; however, in northern Queensland there is an inherent conflict present in the division between people reliant on primary industry such as fishing or cane farming (an industry that has often been implicated by conservationists in the pollution of coastal waters) and those reliant on the tourism industry based on and around the Great Barrier Reef.

The dugong became a pawn in the political byplays of the day, with interest groups using this debate as a tool for their own perceived gains. In addition to the case study explored below, there were a series of other controversies that took place at the same time or shortly afterward that involved the dugong as a symbol representing the protection of the coastal environment. The most prominent of these was the 'Hinchinbrook' controversy that revolved around the development of a marina and resort on the Hinchinbrook Channel, a known dugong habitat. The conservationists claimed that this proposal (which was seen as aesthetically unpleasing and out of character with the surrounding environment) would have a major impact on the local dugong population. Ultimately the newly elected federal government reversed the previous administration decision to halt the proposal and supported the developers' interests over that of the conservationists' in a controversial decision that was later unsuccessfully challenged in the federal parliament through a Senate enquiry. This controversy was prominent on the national stage at the same time as the case study outlined below in 1996, and there were certainly links made between the two campaigns. The Dugong Wars conflict was also polarised, with the Great Barrier Reef Marine Park Authority (GBRMPA) and conservation groups on one side, and the commercial fishers and their 'union', the Queensland Commercial Fisherman's Organisation (QCFO),[201] on the other.

The Dugong Wars story starts with the first dedicated survey of dugong numbers in the southern Great Barrier Reef (GBR) area undertaken in 1985, which provided a baseline population level for comparisons in later years. In 1992, a research team from James

[201] now QSIA Queensland Seafood Industry Alliance.

Cook University (JCU), commissioned by the Great Barrier Reef Marine Park Authority (GBRMPA) and headed by (now) Professor Helene Marsh, conducted repeat aerial surveys of the southern Great Barrier Reef. They noted the lower numbers of dugongs (about 1,600 less than previously estimated) with concern.

GBRMPA had commissioned Professor Marsh and her team to do aerial surveys of the dugong populations in the southern GBR every five years, in order to understand the population dynamics. As the survey techniques were still quite new and unrefined, Professor Marsh was uncertain whether this result was a true reflection of the status of dugongs, or whether it was artificially low due to sampling errors:

> *I thought that 'well, it's a bit of a worry that we've got this result but what does it all mean? I don't really know, and is it a problem with the bias or is it a real effect, and if it's a real effect is it a mortality or a migration?'*[202]

In order to clarify these results, GBRMPA asked the research team to repeat the survey two years later in 1994. The result of this survey was not significantly different from the 1992 survey, and suggested that the numbers of dugong in the region had indeed declined. Professor Marsh and GBRMPA now felt that there was an issue to address. Why had the numbers declined?

> *At that point I was concerned but not panicky, even with the second survey, and I haven't really re-read my report, but from memory I think I was still pretty cautious about 'hey what's really going on here?'*[203]

The report on this drop in numbers took some time to be publicly released, but the strength of the conclusions meant that the results and possible management options were being looked at from quite early on by the Marine Park Authority and policy makers. The Senate Estimates Committee on Environment and Heritage discussed the matter in

[202] Helene Marsh Interview 2007.
[203] Ibid.

May of 1994, noting the concerns of GBRMPA that there may well have been a decrease in the population of dugong in this region. [204]

When the report was released, in October of 1996, the debate had already moved on - the decline in dugong numbers was no longer disputed by this stage in the media, although the extent of the danger to the Southern GBR population quickly became contentious after the following passage in the report suggesting that the population was Critically Endangered as defined by the IUCN Red List was seized upon by various interest groups:

> The surveys suggested that the number of dugongs in the southern GBR has declined by approximately 50% over the past eight years. Over a large section of the region, this decline is over 80%. According to IUCN criteria, a population is Critically Endangered if it has an 'observed, estimated, inferred or suspected reduction of at least 80% over the last 10 years or three generations, which ever is longer' (IUCN p 15). Three generations of dugongs (using IUCN Red List Criteria) equates to over 100 years (Marsh et al. 1996: 10).

In retrospect Professor Marsh felt that this statement was probably unwise, given the political climate at the time:

> We introduced unnecessary complications into the debate by stating that the rate of decline along the more than 1300 kilometres of coastline between Cooktown and Hervey Bay entitled the dugong to be considered as 'critically endangered" in this region. Some members of the conservation lobby took this finding out of context, claiming that the dugong was "critically endangered" at a global scale, which of course is incorrect. [205]

At this early stage in her reporting of the issue Professor Marsh seemed fairly open minded about the cause of the decline:

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[204] Senate Estimates Committee 1994.

[205] Published in 'Sirenews' 31st April 1999, also available at http://www.tesag.jcu.edu.au/staff/helene/bulletproof.html

> The reasons for this decline in dugong numbers are probably complex and may include habitat loss, traditional hunting, and incidental drowning of dugongs in commercial gillnets.[206]

Some of Professor Marsh's later statements focused on the problem of the situation for the fishers:

> Many fishers do not appreciate the seriousness of the "Dugong Problem" or the way it threatens the future of mesh netting as a commercial fishing method in the Great Barrier Reef region (Marsh 1997: 57).

Taken out of context (as many media grabs are) these quotes may have led to the impression that Professor Marsh believed that fishing was the major cause of the declines. Another contributing factor to the swing against the fishermen was the fact that a number of dugongs had been found washed up on the beaches, some with net marks and other mutilations:

> The deaths of four dugongs in the Hervey Bay region last week constituted a major issue for an animal whose numbers were dropping rapidly, James Cook University specialist Helene Marsh said...It brought to more than 50 the known number of dugongs killed in gill nets in the past year.[207]

Professor Marsh personally had a lot of experience of dugongs being caught in shark mesh nets and gill nets over the course of her career. It would seem that when a dugong carcass was found washed up, the logical implication for many in Queensland was that it was due to drowning in a net:

> *I was initially introduced to dugongs because they got drowned in nets all the time around here, and in fact the first dugong I ever saw was dead on the beach*

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[206] Published in 'Sirenews' 24th October 1995 available at http://www.sirenian.org/sirenews/24OCT1995.html

[207] Excerpt from article in Herald Sun Newspaper 20th September 1996.

because of a gill net. A commercial gill net and not a shark meshing. And we used to go out and do these things with George Heinsohn, and cut up dugongs and we never knew where they were from, but a lot of them were caught in the nets.[208]

Conservation groups were quick to point the finger at the fishermen. From Professor Marsh's account it would appear that many within the environmental movement were waiting for any excuse to reduce or even eliminate the fishing effort in the Great Barrier Reef World Heritage Area. The GBRMPA seemed sympathetic to this view, and quickly emerged as a strong critic of the fishing industry:

I also suspect, although I don't know, that they [GBRMPA] were probably being put under a lot of pressure from Green groups, and in my opinion, Green groups hate fishing in a very symbolic way, in the way they hate logging. And the irony is of course is that there are many other things that can have just as serious environmental impacts that get ignored... I mean I'm not a strong pro- fishing lobbyist either, but I do realise that for Green groups, the idea of <u>any</u> fishing in the Great Barrier Reef region is an anathema, and yet many of them have no idea of how big it [the Great Barrier Reef region] is.[209]

There was also the case of Shoalwater Bay - where a number of 'cowboy' fishermen had caused the deaths of dugongs while gill netting (Preen and Morrisette 1997). This case was more clear cut and was used as an example of what might be happening along the entire QLD coast:

Well Tony[210] *was working in Shoalwater Bay and Shoalwater Bay was of particular concern for several reasons...there was certainly evidence of several dugongs in Shoalwater Bay being found, you know, tied up to mangroves or with net markings or whatever. And Shoalwater Bay was very, very, very definitely frontier cowboy country because the general population couldn't go in there, there were a*

[208] Helene Marsh Interview 2007.

[209] Helene Marsh interview 2007.

[210] Dr Tony Preen a former post graduate student of Helene's.

few gill netters who had licenses to operate there but really they were doing what they liked.[211]

Shoalwater Bay demonstrates why the modification of fishing practices will not result in an adequate reduction in dugong mortality. Despite the presence of a Code of Practice...the size of the dugong population fell by about 50% over eight years. The continuing high rate of gillnet related dugong deaths forced the closure of most of Shoalwater Bay to netting in 1995 (Preen and Morrisette 1997: 7-8).

This last quote is an excerpt from a report written later by Dr Tony Preen. Professor Marsh characterises Dr Preen as a brilliant scientist and passionate conservationist whose fiery nature led him to act in ways that she found unwise:

Very, very, classy scientist. I've had a lot of PhD students... and he [Dr Tony Preen] would be unquestionably one of the best. Very, very, very, very, good. Smart as paint, excellent field biologist, ready for the fight.[212]

Dr Tony Preen was a vocal opponent of the fishing industry and Professor Marsh felt that he may have been organising people within the Green groups to place pressure on GBRMPA and the minister about the declines:

My suspicion would be that Tony was really micromanaging that [the pressure by Green groups], I don't know for sure but he was certainly very heavily connected with Green groups...I always expected that Tony would leave academia and join Greenpeace as a science advisor.[213]

A 'Dugong Review Group' was set up and in late 1996 a pivotal meeting was held at GBRMPA in Townsville. The meeting was opened by the then Minister for Environment, Senator Robert Hill, in a blistering opening statement that Professor Marsh

[211] Helene Marsh Interview 2007.
[212] Ibid.
[213] ibid.

believes was as a result of the Green pressure, evidenced by the picket line of protesters outside the building:

> *There were people lobbying in the street in Townsville...out in front of GBRMPA there were protesters with nets and probably crosses for dead dugong and all that stuff, and he [Minister Hill] came in with a really strong statement so I think he was really, really being pushed by the Greens.*[214]

The Minister seemed quite clear that the reason for the decline in dugong numbers was related to the gill net fishery:

> ...most importantly, I hope that the fishing industry can identify and accept arrangements which minimise the impact of that industry on the dugong population...If all interested parties cannot voluntarily and co-operatively take the necessary action to protect dugong then the Commonwealth will be left with no option - it will need to take further action itself. The Commonwealth has various options available to it - including creating sanctuaries... I trust that resort to these measures will not be necessary. [215]

One of the major things discussed in the meeting was the numbers of dugongs that had been found dead on the shore. GBRMPA had tabled a list of 24 dead animals, of which at least nine were found to have died as a result of gill nets. There was some dispute over the exact numbers killed as a result of fishing nets:

> To date 24 deaths have been reported. Tony Preen said that this would undoubtedly have been far less than the actual number as most of the reports are from urban beaches. Helene Marsh said that the number was a very significant cause for concern that the decline in dugong numbers is continuing... Tony Preen added that in the Mackay area there had been about an 85% decline and this year 11 carcasses had washed up near Mackay, most with signs of gillnets. He thought the situation was extraordinarily serious. [216]

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[214] ibid.

[215] Senator Robert Hill, Minister for Environment October 4th 1996.

[216] minutes of Dugong Review Group meeting October 1996.

At the meeting the numbers of dead animals found was discussed and found to be unacceptable. Some of the fishermen's representatives raised the question of whether some of the dugong had moved rather than died:

> [Fishermen's representative] sought to clarify the evidence that the decline in dugong numbers is not due to movement by the animal outside the region. ...Tony Preen said that as the population south of the GBR has decreased, and the population north has remained stable the missing animals cannot be accounted for.[217]

Professor Marsh describes the atmosphere as highly polarised and it is clear that tensions between the fishermen and the environmentalists were rising:

> *I think it was always polarised from day one, in that there were groups that were really 'shock horror concerned'... and the fishing industry was totally defensive...I think it's very important to understand a few things about the fishing industry. One is that the inshore gillnet fishery is essentially a lifestyle fishery. Oh there are these people who are going to do it irrespective of whether they make any money at all. That [money] is not the issue, and the second one is that I think the fishing industry is full of blokes who are interested in winning fights and not solving problems...So it seemed to me that they regarded it as a sign of weakness to be prepared to sit down at the table and negotiate easily a solution. I mean to a certain extent they did in the end, but - they didn't want to.*[218]

As a result of this meeting the GBRMPA asked for 'emergency response measures' to be submitted to the Great Barrier Reef Ministerial Council to be held the following month. Submissions were gathered from the groups present at the meeting and the recommendation of providing 'interim dugong protection areas' was carried to the Ministerial Council. This proposal was accepted by the council and a report on the extent

[217] Ibid.

[218] Helene Marsh Interview 2007.

and type of protection areas was commissioned by the GBRMPA. Dr Tony Preen and Nina Morrisette were contracted to do this job:

> *I was in Canberra, on study leave...And I remember talking to Ian McPhail who was the then chair of GBRMPA as I was leaving Sydney airport...and he said 'There's been an agreement for there to be a chain of sanctuaries and they're going to commission a report to help design the chain of sanctuaries and we'll ask Tony Preen and Nina to do it because you're out of the country."*[219]

Professor Marsh did not proof read this report before Dr Preen handed it in to the GBRMPA, partly because she was spending three months study leave in Florida, and additionally the GBRMPA did not have it peer reviewed before it was released publicly:

> *I came back...right at the beginning of February - and Tony – let's say I got back on a Monday, and Tony had to hand in the report on the Friday, and I was head of department at that stage - I was pretty busy, and [I} remember Tony coming in and saying 'Do you want to read it?' And I said "That'd be good', and I never did. And I felt that there were probably two things happening there – one was that Tony was probably running out of time, and the second one was that he didn't want me watering it down. I don't think I would have watered it down but I would have certainly toned down the language - absolutely. And then GBRMP released it very quickly, because I think they were busy covering their arses - and it was never peer reviewed. And then poor old Tony got the caning for that all the time, which was really, really unfair.*[220]

At the same time as Dr Preen was preparing his report on the new dugong sanctuaries, the QCFO were also preparing a submission on an alternative way to reduce the impact of gill netting on dugong populations and meeting with the net fishermen to gather support for their suggested measures:

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[219] Ibid.

[220] ibid.

> A series of meetings with net fishermen held late December and early January to address the impact of mesh netting on dugong were a huge success...a wide range of changes to netting operations in the Dugong Protection areas and other areas were decided...Fishermen also strongly supported severe penalties (including license suspension) applying to anyone who does not comply with these special arrangements. Strong support was also forthcoming for accreditation in the Endangered Species Awareness Course (which is nearing finalisation) to become compulsory for all net fishermen in 1997...In the meantime, it critical that all net fishermen take every necessary action to eliminate dugong mortality caused by mesh netting. Remember you will not have to worry about your impact on dugong if net fishing is banned like it has been in Shoalwater Bay. This is still the solution pushed by Green groups and many government officials.[221]

Both the Australian Marine Conservation Society and the Wildlife Preservation Society had representatives at the dugong review group meeting, and when the QCFO came up with their report to mitigate the effects of gill netting on dugong, these two conservation groups supported the fishermen's efforts to decrease dugong mortality. This is what AMCS had to say:

> We propose that net fishing should be restricted in the Dugong Protection Areas proposed by Preen and Morrisette (1997) in line with the industry proposal for the implementation of the QCFO Dugong Conservation Strategy...We are alarmed that GBRMPA and the Great Barrier Reef Ministerial Council have progressed the idea of Dugong Protection Areas where net fishing might be excluded without having looked closely at the economic and social implications of such actions.[222]

In the case of the Wildlife Preservation Society (WPS) this support was short lived, as the membership overrode the initial decision in a backflip that may have been partly engineered by Dr Preen. Dr Preen was scathing of the decision by AMSC and WPS to support the fishermen's proposal, and wrote a three page letter to GBRMPA pulling apart

[221] QLD Fisherman February 1997 page 3.

[222] AMCS Dugong conservation policy 20 February 1997.

the AMSC 'dugong policy'. In particular he objected to the idea that all stakeholders (fishers, scientists and Indigenous groups):

> ...should collaborate and share their knowledge of dugong activity along the near 2000 km coastline where dugongs have declined. The outcome of such collaboration being site-specific fisheries regulations that have the potential to reduce dugong deaths in nets. This approach would require consultation with virtually every gill-netter along the coast (approximately 900[QCFO, 1997]); consultation with Indigenous groups, some of which have not been prepared to make their knowledge of dugong activity available; and critical analysis of the beliefs of these groups (fishers and hunters) in the context of the scientific knowledge of dugong biology and ecology. Such a process, if possible, would take a long time.[223]

In other words, Dr Preen was advocating a top down regulatory approach rather than a bottom up consultative methodology. On the fax cover sheet used to send this letter (all of which became incorporated in the GBRMPA report released later on) he has written to Peter McGinnity, Director of Planning at GBRMPA:

> Dear Peter, I have prepared some comments on AMSC's Dugong policy, and am sending a copy for your information. I doubt AMSC will change their policy, but I'm confident that the Wildlife Preservation Society will - at their State Council meeting tomorrow. [224]

Pressure from other conservation groups probably also played a part in the Wildlife Preservation Society's change of heart:

> QCC, which is the peak umbrella body of conservation groups in Queensland, is extremely concerned that two environment groups represented at the meeting, the Australian Marine Conservation Society and the Wildlife Preservation Society of

[223] Tony Preen 'Comments on the dugong conservation policy of the MCS 24 February 1997', incorporated into GBRMPA (1997).

[224] Fax sent from Tony Preen to Peter McGinnity dated 24 February 1997, incorporated in GBRMPA (1997).

> Queensland, threw their support behind the QCFO proposals for dugong conservation.[225]

Dr Preen had written a fairly inflammatory report that had little sympathy for the fishermen or their proposals for change:

> ...it does not matter how good the complex regulations are, just a small percentage of 'cowboys' amongst the gill-netting fraternity will still be able to drive the dugong in the Southern GBR to extinction. [226]

Professor Marsh describes Dr Preen's adversarial position as partly due to his competitive personality, and particularly due to the acrimonious nature of the debate. Neither side was prepared to consider the other's viewpoint:

> *Tony was - alpha male, champion canoeist - 'I'm going to beat those bastards' type of an approach - and he was winding up Green groups and so... it was polarised from day one. And the whole scene was very polarised, I mean the Hinchinbrook thing had made it very polarised as well.*[227]

Professor Marsh felt that Dr Preen had overstepped his role as advising scientist to become an advocate for conservation measures. She believed that this was an unwise, even risky position to place himself in. Although Professor Marsh has not gone into detail about her relationship with Dr Preen at this time, one can imagine that it became fairly strained after the report was released:

> *One of my problems, in a way, because it is a problem - or burden - is that I actually find it fairly easy to see both sides. And that used to drive Tony berserk!*[228]

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[225] Letter from Queensland Conservation Council to Ian McPhail Chair of GBRMPA.

[226] Preen (1997) notes from oral report to GBRMPA 20/2/97 included in GBRMPA (1997).

[227] Helene Marsh Interview 2007.

[228] Ibid.

Later on Professor Marsh wrote a 'cautionary tale' on the Dugong Wars episode in which she gives advice to researchers based on her experiences which gives an insight into her position on the situation:

> It is important for you to be clear about your role, especially when an issue is controversial. I believe that the role of the scientist is to provide information collected using the scientific method, and to interpret that information so that it is accessible to decision-makers. Some scientists choose to extend this role to become advocates for a particular policy position. The line between information provider and advocate is a fine one. However, scientists who transgress this boundary should be aware of the attendant risks to their reputations as scientists, and of the increased probability that they will be excluded from advising those at the table where decisions are made. My advice is aimed at the scientist rather than the advocate.[229]

As an advocate rather than a scientist, Dr Preen did pay the price of exclusion from the decision-making tables. As a result of the report, a series of committees were formed to refine the recommendation and areas to be reserved. These were made up of a mix of stakeholders, but Dr Preen was left out of the process:

> *Ted Loveday made it loud and clear that they were not having Tony on it. And he certainly appeared before committees to give advice but they weren't having him there. And you know that was non-negotiable. Whereas they were prepared to have me there. And that was for me a quite interesting lesson, you know, do you take the extreme stance and not be there when the decisions are made or do you hang in there and try and solve the problem. And maybe - I don't know what the answer to that is actually - I mean my instinct is to try and be there and try and solve the problem, and Tony was very very upset about that. And it was it was a real loss, because he really is good and did know a lot, but you know when people behave in a very extreme way in the end, people just decide that 'we've got to move on'.*[230]

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[229] Published in 'Sirenews' 31st April 1999, also available at http://www.tesag.jcu.edu.au/staff/helene/bulletproof.html

[230] Helene Marsh Interview 2007.

Ted Loveday was another strong personality, this time on the side of the fishermen. He was the president of the QCFO and a loud and proud defendant of the fishing industry:

> If GBRMPA and the extreme minority groups it now seems to represent think the $700 million seafood industry will accept this unjustified, unnecessary and vicious attack on commercial fishermen, their families and other sectors of the industry they have made a grave mistake.[231]

Despite the 'extreme' nature of his views on the conservation lobby, and indeed GBRMPA, Ted Loveday was involved in every step of the process to determine the size and extent of the new Dugong Protection Areas. Professor Marsh believes that the decision to include Ted ultimately came down to politics:

> *You could have said well on that line why are we having Ted Loveday there as well, like let's leave all of these people out and get on with it, I guess - the reason why Ted was allowed to be there and Tony wasn't, was probably two-fold - one that the fishermen probably had more clout, politically, - probably three - Ted was relatively much more senior than Tony, though they weren't all that different in age, and the third one was that there was probably seen as a certain redundancy between Tony and me, and so if I was going to be there, Tony could feed into me.* [232]

Ted Loveday's approach to the situation was antagonistic to say the least. He fired off barrages of media releases attacking GBRMPA, Professor Marsh and Dr Preen, conservation groups and the government:

> The Authority isn't interested in sensible compromise because they just want commercial fishermen out. We now know they are prepared to sacrifice 300 to 400 Queensland families on the excuse of protecting dugong.[233]Their main goal is not conservation, it is self preservation! They need to get themselves in the media

[231] Ted Loveday 'QLD Fisherman' July 1997.

[232] Helen Marsh Interview 2007.

[233] QCFO media release 23rd June 1997.

> to gain members and remain relevant and it seems the NQCC [North Queensland Conservation Council] will go to any extreme to do so, even if it means destroying hard working Queensland families.[234]

The emotive rhetoric in these statements was carefully crafted to target the 'mainstream' public opinion in Queensland, which at the time was flirting with Pauline Hanson's One Nation Party[235] and reflects her similar focus on the 'Aussie Battler' demographic. In contrast to Dr Preen however, there is a sense both from Professor Marsh's accounts and the media releases themselves that Ted Loveday did not necessarily personally believe the rhetoric he pumped out - there is a feeling that he 'spun' a line to achieve a particular gain:

> *I bet if you rang Ted Loveday up he'd say - 'Oh Helene, good mate of mine, enjoy her, you know, we both enjoy thinking big picture - how is she?' - and that's certainly what I'd say if I talked to Ted - but then - but he still, despite all that, his instinct every inch of the way was to stab me in the back, discredit me - in other words - win, not try and solve the problem - so it was very tense and difficult from day one...I don't know whether Ted was actually like that or whether you had to be like that to be a lobbyist or you just had to pretend to be like that to be a lobbyist.*[236]

The result of the lobbying by Ted Loveday and the QCFO was that the original proposal of 'Dugong Protection Areas' (DPAs) that excluded gill netting entirely put forward by Preen and Morrisette (1996), was transformed into a system of DPAs that were divided into Zone A (where gill netting is restricted to certain types of nets deemed less damaging, or, in two cases, Shoalwater Bay and Hinchinbrook, banned altogether) and Zone B where 'net mesh netting practices allowed...[but] these practices are, in theory more restrictive than those practices that occur outside DPAs' (State Government of Queensland 2006: 3).

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[234] QCFO media release March 7th 1997.

[235] A right wing political party based on severely limiting immigration and the rights of Indigenous Australians under the guise of 'equality', arising from a backlash from conservative Australia to the 'political correctness' of the 1990's.

[236] Helene Marsh interview 2007.

Unsurprisingly, this result was not received well by the conservationists. Jeremy Tager (then a member of the North Queensland Conservation Council, and subsequently spokesperson for Greenpeace) later wrote:

> The commercial fishing industry began to wage a massive and misleading media campaign, attacking the Marine Park Authority (calling it incompetent), the scientists (calling them biased), conservationists (calling them radical extremists), the dugong (asserting that they're not endangered), and the DPA selection process. Senator Hill quickly capitulated. He abandoned the existing process and initiated new working groups dominated by the fishing industry, alienating dugong scientists and the conservation movement. [237]

Professor Marsh herself had a more measured response, reporting in her editorial of 'Sirenews'[238] that:

> These initiatives have not received wide support. Conservationists regard the closures as inadequate...The fishers are also upset by the impact of the closure. I would have liked the measures to be more extensive...However, I regard these initiatives as an important first step (Marsh 1997).

At the same time the 'battle' between the competing viewpoints was being waged through the media and other platforms. Professor Marsh found herself in a position where she was personally a target of the fishermen's rage. She later discussed this saga in another editorial for 'Sirenews':

> It was a quiet Sunday morning. I decided to check the e-mail that had accumulated during my recent aerial survey work in remote Cape York, a region mercifully beyond the range of mobile phones, making Internet connection difficult for non-residents. Idly scrolling though my e-mails, most of which seemed to contain trivia that were already irrelevant, I came across a missive from the

[237] Article from 'Earth Island Journal ' found at http://findarticles.com/p/articles/mi_hb6393/is_2_41/ai_n28729733/?tag=content;col1 last accessed 30/8/10.

[238] Sirenews is the official newsletter of the IUCN Sirenian (dugong and manatee) specialist group, accessible at www.sirenews.org.

> Director-General of IUCN, the World Conservation Union in Geneva, Switzerland. I assumed his e-mail contained uncontroversial information relevant to my responsibilities as Chair of the IUCN Sirenia Specialist Group. I was wrong. The Director-General's office was querying a letter which they had received claiming that Tony Preen and I had engaged in misconduct by falsely asserting a decline in the dugong population and disseminating misleading information. We were also accused of wilfully engineering an artificial emergency to milk the public purse. This was the start of an unpleasant campaign of letters, media and internet releases, and documents produced by a self-proclaimed "wise-use group" attacking our science[239].

This attack obviously had a lasting impact on Professor Marsh, as she went on to write about it again in an article for the *New Scientist* titled 'Beware Flying Mud!':

> A self-proclaimed "wise-use group" mounted a vitriolic campaign of letters and press releases slurring the professional reputations of the researchers involved. It professed outrage that the governments had succumbed to demands from conservationists to close fishing operations without considering that loss of habitat might be contributing to the dugongs' decline. Our research group was pilloried because the report had not been peer reviewed, even though it was the GBRMPA that decided to go ahead and publish. The wise-use group used anonymous scientists to challenge the significance of our findings. Yet our research had been peer-reviewed and published in journals (Marsh 1999: 65).

Professor Marsh's advice to other scientists unlucky enough to be caught in a similar situation was simple: Be careful about what you include in reports, use peer review to protect your back and avoid advocating a particular position:

> Application of these suggestions should reduce the likelihood of public attacks on a potentially influential scientific report or paper. But remember, I found the cost of a letter from a defamation lawyer to the "wise-use group" an excellent

[239] Sirenews 31 April 1999 available at http://www.tesag.jcu.edu.au/staff/helene/bulletproof.html

investment. And some days, a career in a more esoteric discipline like taxonomy looks increasingly attractive.[240]

Professor Marsh felt that she (unlike Dr Preen) represented a middle ground of rational scientific opinion, and despite the attacks from both sides she maintained a position of communication with all parties:

> *I remember reading about somebody, I can't remember who it was, and this person said - 'I have the burden that I find it very easy to see more than one point of view'. And of course there are other people who believe, perhaps correctly that someone has to be at the extremes to force the debate back to the middle - maybe that's right, I don't know ...I don't feel very comfortable taking the position at the extreme end, but I do accept that maybe in the way our society works you have to do that.*[241]

The ironic twist at the end of this story is that when Professor Marsh and her team conducted their next aerial survey of the dugong population in 1999, they discovered that the numbers had increased again to the levels found in 1987. Five years is far too short a time for this to have been anything else but a remigration of animals back into the area which they had left sometime between 1987-1992, possibly as a result of damaged sea grass beds recovering enough to support the population again. Very little was said publicly about this result, particularly by GBRMPA, which co-released the report announcing this increase with another that reconstructed a massive decline in the dugong population over the past 40 years through the review of the numbers of animals caught in shark nets (Marsh 2001).

3. Conclusion

The attitudes of the major players in this debate were adversarial, looking to attack each other and focus on weakness, and to appeal to decision-makers by promoting themselves in the media to attract public attention and therefore political support. This required the minimisation of any public recognition of the underlying uncertainty and assumptions

[240] ibid.

[241] Helene Marsh interview 2007.

made in the original report to GBRMPA. This minimisation was primarily carried out by those with an agenda to stop or reduce the impact of gill net fishermen on the dugong populations, a ploy that was recognised by the fishermen and their representatives who responded with acrimony.

The inability of parties on both sides to communicate honestly and respectfully with each other made the recognition of these underlying uncertainties (even after the event) politically impossible, resulting in an ugly struggle for control over the policy process.

This approach provides a clear example of how the Wilderness-Normative discourse (as described by Navarrete et al. 2004) prevalent in traditional scientific approaches to the conservation of the environment can fail to achieve a positive outcome when uncertainty and political stakes are high. Simply reducing the underlying uncertainty by further research may not provide the answers needed to address issues of immediate concern (such as the apparent dramatic decline of a protected species), and adoption of the precautionary principle requires scientists and policy makers to act to protect rather than to wait for conclusive results.

The above case study shows a case of a 'Type II' error by the scientists – as they found a relationship (between a decrease in dugong numbers and the activity of fishermen) when it did not exist. As a general rule this is an unacceptable error – traditionally scientists would rather commit a 'Type I' error (not finding a relationship when it exists). However, in a situation where decision stakes are high (i.e. a population of dugong may die out) there are other considerations, as pointed out by scholars such as Ravetz (2004):

> More broadly and critically, privileging Type I errors over Type II errors is a methodological choice that, intentionally or unintentionally, supports a political-economic system which places a higher value on economic growth than the health of the environment and/or people (Marshall and Picou 2008: 235).

One way of redressing the imbalance between the way science weights Type I and Type II errors is to adopt the 'precautionary principle', which was developed in order to deal with ecological risk in situations of scientific uncertainty:

> In order to protect the environment, the precautionary approach shall be widely applied to States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation. [242]

Importantly, in order to avoid the type of scenario that played out during the Dugong Wars, Marshall and Picou (2008) point out that ultimately the debate over whether to apply the precautionary principle or whether to privilege Type I or Type II errors needs to take place through an open discussion with the extended peer community in which all uncertainties and possible outcomes are tabled. If this approach is taken through the process of post-normal science the responsibility for the policy decisions made and their results becomes shared amongst all the stakeholders.

In this case, I believe that an overt recognition of the uncertainties and assumptions present in the original research by all parties may have led to a more open and collaborative approach to the reaction of authorities to the perceived problem:

> More research will not necessarily reduce uncertainty and decisions often need to be made before conclusive evidence is available. Meanwhile, the potential impacts of wrong decisions on, for instance, health, economy, environment and credibility can be huge. Communication of uncertainties aimed at policymakers, as well as other parties involved in policymaking, is important because uncertainties can influence the policy strategy that is selected. Furthermore, it is a matter of good scientific practice, accountability and openness towards the general public (Wardekker et al. 2008: 627).

In the case of the Dugong Wars the decision made by policy makers was perceived to be wrong and impacted on the credibility of the scientists (particularly Dr Tony Preen) and depending on who was spoken to, on the environment and the local economy. None of the parties were satisfied by the outcome of the process. Perhaps more importantly it reinforced the acrimonious relationship between conservationists and fishermen in the region, which has led to ongoing conflict over the management of the Great Barrier Reef.

[242] From principle 15 of the 1992 Rio Declaration on Environment and Development.

For the general public, there is still a great deal of lingering uncertainty over exactly what took place. Many people still believe that dugong numbers underwent a serious decline during the period (as the subsequent return migration was given little attention by the media). Others who are aware of the return of the dugong believe that the whole controversy was deliberately manufactured to restrict fishing in the region:

> We had an example of GBRMPA's deceit, when they claimed that the dugong numbers in Queensland had dropped by half. The numbers had dropped by half in the southern half of the Barrier reef and they had increased dramatically in the northern half – they almost doubled. All that had happened was that the dugong had moved north.[243]

The lack of openness and accountability in the reporting of the scientific uncertainty by GBRMPA has lead to serious mistrust within the wider community:

> When conducting the dugong studies approximately 10 years ago, the scientific data provided by GBRMPA was later shown to be falsified – no effort was made to review decisions based on the false data.[244]

The long-term outcome of the Dugong Wars has been a continuing uncertainty over the effectiveness and necessity of the 'Dugong Protection Areas' (DPAs) that were put in place by government. For example, a 2006 survey of stakeholders of the Inshore Fin Fish Fishery by the Queensland Department of Primary Industries and Fisheries on the issue of DPAs found that there was a great range in opinion over whether these areas were effectively protecting dugong or not. A DPA working group agenda paper summarised the main suggestions raised by stakeholders as:

- Strengthen netting restrictions in DPAs (e.g. convert all B zones to A zones)
- Maintain or relax netting restrictions in DPAs

[243] Bob Katter, conservative independent MP for the rural north Queensland seat of Kennedy, quoted from a debate in the lower house of parliament in 2002.

[244] A letter from two gill net fisher people written in protest in 2005 when GBRMPA's action in setting up a new series of protected areas excluding fishing over 25% the marine park was publically reviewed by government.

- Add additional DPAs to the current network
- Allow netting in DPAs during the barramundi seasonal closure[245]

In 2005 the entire Great Barrier Reef Marine Park was rezoned in order to provide increased protection for fish stocks from commercial exploitation. A 2008 review of the effectiveness of the 2005 rezoning on the protection of dugong found that the original DPAs had become almost redundant, as the new zones cover a great deal more of prime dugong habitat:

> DPAs now play a relatively minor role in the overall protection of dugongs in the GBRWHA despite their iconic status. Only about 7% (172km2) of the high conservation value and 11% (232km2) of the medium conservation value dugong management units where the risk of bycatch should be nil are within the designated DPAs Zone A (foreshore and offshore set or drift nets are prohibited)...If the netting restrictions for DPA Zone B were upgraded to the same level as Zone A, the increase in dugong protection would be minimal (Grech et al. 2008: 1134-1135).

Given that the ultimate role of the DPAs in protecting dugong is now seen to be minimal, as an outsider I am ambivalent about the process that took place in their creation. It would seem that a great deal of damage to personal relationships took place as a result of the adversarial approach to the solution of an ecological problem. This damage has the consequence of undermining any potential for finding mutually acceptable solutions as parties to the conflict become wedded to their defensive positions rather than open to any possibility of a third space. In response to this ambivalence I wish to explore the theoretical explanations of why the adversarial approach has so often been used in such situations, and the potentials for alternative ways of managing such situations in the future.

The growing reliance of politicians and management agencies on scientific evidence for policy decisions has increased the pressure on scientists to provide certainty even when this does not exist. Scientists struggle to provide policy makers with clear choices when their data is ambiguous or inconclusive:

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[245] Department of Primary Industries and Fisheries DPA working group agenda paper dated 12th February 2007.

> Ecologists are having an identity crisis. As concern for the environment heightens, ecologists are increasingly being called away from the more traditional life of academia and into policy and public consultation. Some ecologists support active participation in a new social contract of active engagement[1]; others argue that such involvement is blatant advocacy and undermines the image of neutrality underlying the credibility and effectiveness of science[2]. Ecology is wrestling between two models of science: a science apart from society and a science directly engaged with society. The twin missions of science, to pursue truth and to serve society, appear to be at odds (Bradshaw and Bekoff 2001: 460).

Functowicz and Ravetz (1992) describe the role of scientists directly lobbying or advising policy makers on controversial issues (often representing opposing views) as 'professional consultancy', a practice that requires experts to fight for the interests of their clientele, introducing multiple truth-claims when there are divergent values represented by different interests (Bidwell 2009). Professional consultancy is a relatively recent phenomenon, and one which has in some cases damaged the reputation of scientists as the role requires a shift from the purely objective, removed ideal of the applied research scientist, a shift that has led to the public questioning of the motivations and hidden interests of all scientists (as the distinction between the consultant and the researcher is not always transparent).

> Professional consultancy exposed science for being a value-laden process, operating in an arena with multiple stakeholders, each armed with professionals making truth claims backed by "science." Skeptics of traditional science argue that the ideal of the objective scientist is a myth, research may be value-laden, most research is politicized, and funded research projects are increasingly wedded to commercial interests. Furthermore, as the relationship between environmental problems and technological failure became increasingly apparent, the public's faith in science and trust of scientists has waned (Marshall and Picou 2008: 237).

The concept of professional consultancy is not well accepted by disciplines such as ecology or conservation biology, where the mingling of values and advice is seen as advocacy, a charge that is seen to undermine the credibility of the scientist in question. Some scientists within these disciplines are open to the recognition of the influence of their ethical views upon the outcomes of their research, yet others are not:

> "We all know it is wrong to tell lies, except to confuse the enemy in wartime". If conservation is a war, what are the duties of conservationists and scientists in this war?...This dilemma...reveals the often schizophrenic nature of conservation biology, which encompasses both scientific investigations and advocacy (Bowen and Karl 1999: 1013).

This quote reflects the adversarial stance which is seen when the results of ecological research are of a politically contentious nature, leading to 'wars' fought in scientific journals or even the media, where scientists dissect and refute opposing viewpoints. This kind of paper conflict often leads to the accusation of advocacy being thrown at one or both sides, as a way of discrediting their arguments. Some go further, suggesting that some scientists may even fabricate results to reach their desired goal:

> An advocate knows the answer and looks for evidence to support it; a scientist asks nature how much support there is for competing hypotheses. (Hilborn (2006) quoted in (Bowen et al. 2007:12).

The notion of objectivity is so ingrained into the structure of scientific thought that it becomes difficult to tease out the subjective and political aspects of science without this being seen as an attack on the scientists or scientific work in question.

Yet not all scientists are wedded to the idea of themselves as a detached objective observer. In a paper entitled 'Values are a good thing in Conservation Biology', Noss (2007) outlined his view of the subject:

> Objectivity and subjectivity in science are inextricably linked. Stern (2005: 977) points out the paradox: "Science, despite its famous emphasis on achieving objectivity by eliminating human error, can make its claims of objectivity only because it relies on the subjective judgments of fallible human beings and social institutions to detect and correct errors made by other fallible humans and institutions" (Noss 2007: 18)

Noss is here alluding to processes such as peer review, which provides the mechanisms through which scientists can judge the validity of new knowledges. It is pertinent to note here that in the case of the Dugong Wars, the original report by Preen and Morrisette was not subject to this validation, a process that may well have helped to avoid the adversarial positions that formed from its release.

The paper by Noss was one of a series of five on the issue of advocacy and science in *Conservation Biology* and it must be noted that many of the other authors argued that advocacy has no place in science or that conservation biologists should only use advocacy for the greater good (Chan 2008, Lackey 2007)). The debate over the role of values in science, and particularly in conservation biology has a long history and remains robust and unresolved, provoking much comment amongst the discipline[246].

Earlier in this chapter Professor Marsh makes the point that as a scientist one walks a fine line between an advocate and an information provider, and she seems to indicate that a good scientist always retains a sense of objectivity about the information they are presenting to policymakers:

> A scientist whose work is likely to be controversial cannot afford to damage her credibility by mixing valid points with ambiguous evidence. Equivocal material not central to the argument should be omitted from a potentially controversial report as it may distract attention from the main evidence...It is too easy to select information that supports your argument – or, more scarily, to bury the information that doesn't support your argument.[247]

An alternative to the return to the ambiguous concept of the totally objective scientist is suggested by Noss (2007: 18) who proposes the notion of 'honest advocacy' as a solution for science:

> If we can be inspired by our positive values—life, truth, fairness, and the standards and professional norms of science—then we can be honest advocates. The key to

[246] see debate in Conservation Biology in 1996; 2002

[247] Helene Marsh in Tyndal-Biscoe interview 2002 available at http://www.science.org.au/scientists/hm.htm last accessed 16/8/08.

> honest advocacy is the willingness to question our own assumptions and change our opinions when compelling evidence suggests we should.

This reflects the call made by Frazier (2005) who sees a return to objectivity as the removal of ethics and morality from discussions about conservation, a move he views as inappropriate. Frazier calls for scholars within the discipline of conservation to be activists for the interests of the animals and habitats they work with (Frazier 2005).

Similarly Bradshaw and Bekoff (2001) argue that by repressing the intrinsic subjectivity of all science, calls for increased objectivity actually make scientists more vulnerable to claims of political manipulation:

> As one researcher suggests, the significant difference lies between the levels at which assumptions are made: 'The subjectivist states his judgments whereas the objectivist sweeps them under the carpet by calling assumptions knowledge' (Bradshaw and Bekoff 2001: 462).

In the case of the Dugong Wars, the assumptions made by the scientists about the cause of the decline in dugong numbers were seen to be a truth claim representing the credibility of their scientific research. When these assumptions were challenged on the basis of the suspected bias towards conservation interests the scientists reacted by defending their positions rather than acknowledging the uncertainties underlying their conclusions.

In situations such as the above case study, where uncertainty is high, conflicting values are in dispute, decisions urgent and the risks (to environment, economy and reputations) high, Functowicz and Ravetz suggest the use of post-normal science as an alternative to the adversarial approach typical of such controversies. The major shift in the post-normal approach is to bring in an 'extended peer community' of all the potential stakeholders where an increased level of participation in the decision making process will lead to negotiated outcomes. In such a process the decisions on which action to undertake are no longer the sole responsibility of a few politically motivated policy makers, but are shared amongst representatives of the entire community. This allows all viewpoints to be

heard in an open forum, and the assumptions and motivations of all parties to be clearly stated.

A post-normal approach to decision making reflects a shift from a normative to an ecological-pluralistic framework for science – one that requires increased openness, reflexivity and participatory methodologies from the scientists involved (Manuel-Navarrete et al. 2008). It opens the possibility for a two way learning process, where scientists are no longer just the experts brought in to inform, but are also able to be influenced and learn from others in the extended peer community:

> A formal process of negotiation is promoted, where a large number of stakeholders' values are included and made explicit. This breaks up the monopoly of moral principles and experts in influencing managerial decisions and embraces a pluralistic approach. This discourse acknowledges the possibility of different but ecologically equivalent regimes in a given ecosystem. There is not a unique ecologically "correct" ecosystem to be preserved...[ecological integrity] must be discussed in political and social arenas as well as in legal or ethical ones. Scientific and managerial arenas are extended toward society through formal participation (Manuel-Navarrete et al. 2008: 336).

The movement towards an ecosystemic-pluralistic approach only becomes possible when adversarial positions can be released, and all sides of an argument are able to recognize the ambiguous nature of the data and become open to multiple possibilities, without this ambiguity becoming a weakness to be exploited. Ambiguities then become areas of possibility – negotiation points and places where hybrid knowledge can flourish in zones where ground can shift for either party.

One area of hope in the Dugong Wars situation is the ongoing process that brings scientists and fishermen together to re-evaluate the effectiveness of the DPAs and other dugong protection. This is done in the context of the developing understanding of the migratory nature of dugong populations and is informed by regular surveys of the number of animals present along the Queensland coast. This provides the perfect opportunity for the implementation of adaptive co-management of the fishery and the dugong population,

if respectful relationships can be maintained along with the understanding that the knowledge held about dugong populations is still one that is uncertain and evolving.

This shift echoes the calls by Berkes (2009) and others to move towards co-management of natural resources between all interested groups:

> The concept of governance suggests that we look beyond government, toward public–private–civil society partnerships, as a way of dealing with the shortcomings of single agency, top-down management. Co-management, or the sharing of power and responsibility between the government and local resource users, is an arrangement whereby such partnerships can come about (Berkes 2009: 1692).

This chapter has provided a detailed exploration of an adversarial situation between conservation groups and resource users. The damage done to reputations is one aspect of the outcomes of this process. As pointed out at the conclusion of the previous chapter, another outcome has been the new reflexivity shown by dugong scientists in the debate over Indigenous hunting and its impact on dugong populations, possibly as a result of the ambiguities and uncertainties that were exposed by this process.

The next chapter, 'Black Hands on the Steering Wheel' provides an exploration of my own involvement in an ecosystemic-pluralistic approach to solving the conflict over Indigenous hunting of marine turtles and dugong in Northern Australia.

Chapter Nine: Black Hands on the Steering Wheel

1. Introduction

In this chapter I wish to provide a description and critique of the highly successful marine turtle and dugong project run by the partnership known as NAILSMA (North Australian Indigenous Land and Sea Alliance) across northern Australia from 2005-2009. I conceive of this project as an example of the coproduction of knowledge between Indigenous and scientific knowledge about marine turtle and dugong in a hybrid space created by NAILSMA, which acted as a bridging organisation between local communities and government.

NAILSMA was formed through the partnership of several Native Title Representative Bodies from across northern Australia and run by a steering committee and dedicated project coordinators under the auspices of the Cooperative Research Centre for Tropical Savannas in Darwin. The organisation is dedicated to advancing the interests of Indigenous land and sea management across northern Australia[248].

My critique is based on my own experiences as a consultant for the early planning and development phase of the project in 2005, after which I was not involved in the project due to the birth of my second child. My 'insider' knowledge of this process is therefore limited to the initial phase of the project implementation, and the concerns I raise about this part of the project only applies to this time period and should not be applied to the later stages of the project, about which I can only comment as an outsider.

Upon reflection, I conceived of the process that took place in setting up the NAILSMA marine turtle and dugong project as fitting within the ecosystemic-pluralistic approach to environmental problem solving as defined by Manuel-Navarrete et al. (2008), who see this as a less consistent but more complete approach (as compared to the traditional normative approach) in accounting for the complexity and uncertainties involved in

[248] see http://www.nailsma.org.au/

dealing with ecosocial systems. The uncertainties involved in working with complex situations are put up front and the responsibilities for decision-making are broadened through the use of formal participatory processes.

2. Description of project

After the National Recreational and Indigenous Fisheries Report, which suggested over-harvesting of marine turtles and dugong, was released with much fanfare in 2003[249], the NAILSMA organisation was approached in October 2003 by the Environment Department of the Federal Government to deliver a Dugong and Marine Turtle initiative. This initiative was seen as an opportunity for Indigenous communities to respond to the criticism received as a result of this Report by taking the front seat in sustainably managing the resource.

NAILSMA submitted a tender with the assistance of the five Native Title Representative bodies that cover the Northern Australian Savannah region that has been NAILSMA's focal area. After a long period of negotiation, a contract for A$3.8 million was signed in December 2004, for a 2.5 year project across northern Australia.

At that time I was still working on my 'community management plan' with the Bardi Jawi and Mayala communities, when the manager of the regional land council's 'Land and Sea Unit' told me about this forthcoming project in June of 2004. At that stage the tender had not yet been finalised, but she wanted to approach me over the possibility of working for the land council on developing a 'management plan' for these communities that would fit the brief needed for the NAILSMA project. In late 2004 the land council contacted the communities to discuss the project, which was due to start in early 2005. The land council held a meeting at which the CEO of NAILSMA was introduced to the communities and received the go-ahead for the project to be run in Bardi Jawi country from those present.

NAILSMA held the first 'face to face' meeting of partners in February of 2005. The main focus of the meeting was to agree on the processes to take place in setting up the five pilot

[249] See Chapter 7 for details on this report and the questionable methodology used to reach these conclusions.

projects to be run by each of the five partner organisations: the Kimberley Land Council, the Northern Territory Land Council, the Carpentaria Land Council, the Torres Strait Regional Authority, and Balkanu Cape York Development Corporation (based on Cape York Peninsula in Queensland).

Each region was asked to prepare a 'regional activity plan' (RAP), to be written in the following six months and which would outline the plan of action for each pilot project. According to the minutes of the meeting, the guiding principle of the workshop was to be 'black hands on the steering wheel'. This was to become a key phrase in NAILSMA's running of the project.

A set of criteria for successful funding of the pilot projects was agreed on at the meeting. These criteria were considered to be non-negotiable and included a strong emphasis on locally owned projects that supported Traditional Owner authority; that were community driven with demonstrated support by the majority of the community involved; that encouraged participation; and that were collaboratively led by Indigenous people.

The structure of the governance of this project included an advisory body made up of scientists and representatives from relevant government departments, known as the 'Technical Reference Group' or TRG. There was also a Joint Steering Committee made up of high-level public servants from the Federal Government who were in charge of overseeing the development of the project and its acquittal and evaluation.
Issues of relative power and influence plagued the relationship between the TRG and the partnership from the beginning, a state of affairs that reflected the adversarial situation that Indigenous hunting of marine turtles and dugong provoked in the scientific community.

As described by Nursey Bray (2006) in her account of the Hopevale management plan, there was a sense that Indigenous groups and conservationists were working towards different goals when they spoke of managing this resource. Given the relatively close relationship between members of the TRG and government, there were some fears amongst the partner group that this would lead to a top down approach to the project, rather than a participatory process that would allow the communities to take the lead.

The concerns held by the land councils and the Indigenous communities about the influence of the scientific community on the success of the project were recorded in the minutes of the first face-to-face meeting of the partner groups and included:

> • concern that white fellas are taking over the show, urge the TRG to take this into consideration;
> • want the best advice from the TRG and will take it into account but at the end of the day, the decision needs to reflect the aspirations of the communities;
> • success will be born out the hard work of the communities themselves, often with scant resources, pulling ideas together.[250]

At the beginning of March 2005 the partner organizations were asked to have a rough draft of their Regional Activity Plans (RAPs) completed at the end of the month. This timeframe was driven by government, and was a result of the initial negotiations that the NAILSMA group had settled on when applying for the original tender. There was ultimately some flexibility in this timeline, but the government was not interested in a prolonged 'set up' period prior to the project implementation.

The initial vision of the partner organisations emphasised community ownership and participatory processes and empowerment of Traditional Owners. It is clear that the intentions of those driving the process were to make this project as inclusive as possible, however, the practicalities of getting 'Regional Activity Plans' written in the short time frame provided by the federal government was where the process inevitably began to move away from these initial ideals.

Towards the end of April 2005 there was a teleconference between all of the NAILSMA partners and it was at this time that I became more aware of what was happening in the other regions. Up to this point I vaguely believed that they were running the same sort of consultative process as we were, and writing similar sorts of documents.

> *The most interesting thing for me was - all gadiya talking, and an emphasis on gadiya projects - i.e. monitoring harvesting...I also felt that from the sounds of*

[250] Minutes of partner meeting held in Darwin 8th February 2005.

things the other partners' level of consultation was going to be far less than ours, simply because they are all working at a regional scale and talking to really big mobs. Obviously this has some advantages - more people involved, but disadvantage is the lack of community ownership. Field diary notes dated 26/4/2005

One of my key realisations from this teleconference was that some of the partners not only had not properly consulted with the communities they were proposing to work with, but that they had no intention of doing so before the RAP was written. It was challenging for me to let go of my own assumptions about what represented best practice in such a situation and come to terms with the reality of the situations faced by the other regions. As time would tell, there was still enough flexibility in the project for this consultation to take place at a later date – during the project implementation phase of the project. It just meant that each region moved through the project at their own pace.

By late June 2005 most of the draft RAPs had been completed and sent to the partner organizations and the Technical Reference Group for comment. The response from the Technical Reference Group to the RAPs was mixed. In particular some of the groups felt that the pressure from the scientific advisors to address overharvesting over and above other matters was unwarranted.

Some of the TRG comments have come in, specifically [prominent scientist's]. People were a bit upset, they were a bit harsh apparently. There was talk about the influence of the TRG members on the 'joint steering committee' (bureaucrats that will give the final okay) and the presence of 'Chinese walls' (i.e. information leaking through). Field diary notes dated 7/7/2005

The final presentation of RAPs to the TRG was to be at a face to face meeting held in Cairns in late July 2005 which would also decide the budget allocation of the project to each region. When it came time to select community representatives to take to the meeting, a complex political situation soon unfolded. We had been given sufficient funding to bring along two community representatives, but the complexity of the political situation in the communities meant that we ended up taking five people, in order to bring

a balanced representation of the different communities, geographical regions and family groups[251].

The meeting in Cairns was held over four days. The first two days were 'partners only' as we thrashed out the details of the budget and who got what. The estimated budgets of the partners outstripped the actual budget by some $2.4 million, so adjustments clearly had to be made.

Our region was well represented with three members of the Land Council staff including myself, and five Traditional Owners. There were no other community representatives present from any of the other four regions. To say I was taken aback would be to put it mildly. Each of the partner organisations had been allocated funding to bring two community representatives, yet this did not occur. Our community representatives were disappointed at the lack of 'countrymen' but were well used as token voices by the rest of the meeting. It was with some irony that the executive officer of NAILSMA (an Indigenous man) opened the meeting with the statement that 'black hands are needed on the steering wheel', as he gazed around a room that was predominantly white.

During the meeting the partners negotiated the distribution of the funds amongst the groups. This was allocated on the basis of perceived need – highest priority being given to those regions seen as being 'under pressure' from government to stop hunting. At that point in history the political party holding power at the federal level was seen to be anti-hunting with an agenda to legislate to remove or reduce Indigenous peoples' rights to hunt endangered species, and this was discussed as a real and present threat at the meeting.

Those regions where scientific research had indicated a decline in dugong and turtle populations due to overharvesting were the recipients of a greater portion of the available funds. In retrospect this may have been misplaced, as it was the regions where greatest community ownership was present that became the most successful in carrying out the project – and there was a strong relationship between a lack of community involvement

[251] Ironically of the five community members who came along there were two representatives from the same (most politically powerful) family group – this was a reflection of the strong relationships between certain families and the land council governance structure.

(probably due to fear and suspicion of government agendas) and the regions under the most political pressure to stop or limit hunting.

The third day of the meeting was held with members of the TRG and representatives from the Joint Steering Committee who were authorised to give the project the go ahead from Canberra once they were satisfied with the presented RAPs and associated budgets. This meeting was to allow the NAILSMA group to present each region's RAP and final budget for comment, leading to the overall approval of the project by government. Again there was talk of the threat by certain politicians of the then current government to stop hunting – a 'solution' described as 'very tempting' for then Minister for Environment, who was described as being strongly influenced by 'dangerous right wing think tanks'.

The opportunity given to NAILSMA was described as one that had come from within the federal environment department (rather than from the politicians) and had been supported in the long term by courageous bureaucrats who wanted to give communities an opportunity to manage this resource. It was emphasised by members of the TRG and the public servants present that the only way to achieve success for the project in such an adversarial environment was to produce tangible results at the ground level. The partners were urged to go for manageable tasks that could be done well rather than trying to solve all the problems at once.

All of this discussion caused some anxiety amongst the land council representatives present, but the attitude of the NAILSMA executive officer was one of equanimity as he reminded us that the reality for Indigenous people in this country was that 'everything is political' and that although it was likely that there was a political fight ahead, we should just focus on this project and do it well. Other strong Indigenous voices also emerged at this point to reiterate the power held by the communities in continuing their cultural practices despite the pressure from the white power structures to prevent this.

The outcome of this meeting was that the project was approved by the joint steering committee and NAILSMA proceeded to roll out the regional activity plans through the partner organisations. It was at this point that my association with the intimacies of the

project ended, although I kept in touch with the Bardi and Jawi communities and received official updates from NAILSMA on the projects as they unfolded.

Despite a rather slow start, and my misgivings about the lack of proper consultation of community groups, the actual running of the projects seems to have been extremely successful, particularly in the Bardi Jawi and Mayala communities (later referred to as the 'Bardi Jawi All-Stars' by the NAILSMA coordinators).

Over the first three years of the project, NAILSMA produced a series of three 'message discs',[252] which contained videoed accounts from each of the partner regions as they began work on their regional activity plans. These stories provided a fascinating peek into the operation of the Regional Activity Plans on the ground. These snapshots, although engaging, could not provide much of a sense of the complexity of what was occurring with in each region, and my account of what took place is limited to information held in the public sphere.[253]

The first task was to set up project coordinators and community based officers to run the projects, and following on from this, the establishment of Ranger groups in those places (such as the Bardi Jawi and Mayala communities) where they did not already exist[254]. Through the governance of a community based steering committee and the support of the partner organisations, the individual priorities of each region were addressed through on the ground activities. Innovations included the *I-Tracker* which utilises GPS technology for recording information in the field[255]. Significantly, the linkages between regions and cultural groups was seen to be one of the major strengths of the project by participants, a process made possible by the bridging role played by the NAILSMA organisation[256].

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[252] A concept based on the traditional Aboriginal custom of 'message sticks' which were used in communicating with other tribal groups.

[253] Herein lies the distinction between 'insider' and 'outsider' knowledge. As a participant observing the initial process of setting up these projects, I was able to record a great deal of the complexity that is involved in such work. Once stripped of this privilege, I found myself limited to a keyhole, where there had once been an open door.

[254] See Message Disk 1, available from NAILSMA http://www.nailsma.org.au

[255] See Message Disk 3, preview available at http://www.nailsma.org.au/projects/nailsma/md3.html

[256] These sentiments are found in stories on all three Message Disks.

The NAILSMA Dugong and Marine Turtle Project was officially judged be a great success, with numerous ranger groups established and existing groups supported through the program. Local communities were seen to take a lead role in management activities in most of the regions and a strong sense of cross regional partnership was fostered through exchange visits with other regions.

The success of the project was no doubt assisted by a change in the federal politics in late 2007 when a more politically favourable government was elected. One result of this was a further allocation of funds in December of 2007 that allowed a one year extension of the project's activities, followed by a further boost in 2008 which meant that the project finally wrapped up in June of 2009. The success of the Dugong and Marine Turtle Project was recognised in 2008 when it was awarded a 'Banksia Award' for the Indigenous category of the National Banksia Environmental Foundation Awards, and came 'Runner Up' in the People's Choice award at the same event. The award was presented by the new federal Minister for the Environment who issued a press release stating "These Indigenous people are the 'front-line' managers of the north Australian coast".[257]

Subsequently many of the activities supported by the Dugong and Marine Turtle Project have been continued by the new initiative known as the 'Saltwater People Network' also funded by the federal government through their 'Caring for our Country' fund, a project that commenced in early 2010.

3. Evaluation of project

At the end of 2009 the NAILSMA group published an evaluation of the Dugong and Turtle Project written by Bessan Consulting Services. The process used to evaluate the success of the project was multilayered using various methodologies including the 'Most significant change' approach to gauge the different stakeholders' responses to the project.

The overall evaluation was that 'The Dugong and Marine Turtle Project is a stand-out success' based on the project outstripping original government expectations (Bessan 2009:

[257] Press Release dated 18 July by the Hon Peter Garrett, Minister for Environment, Australian Government.

1). This evaluation was used by NAILSMA to argue for Indigenous involvement essential to conservation projects in northern Australia, as success in such projects has been rare, especially when the process was driven and controlled by government. There is some discussion of what I would call a hybrid approach to conservation, as the document outlines a shift in the ways in which Indigenous communities have engaged with the 'two tool box' approach that involves the use of Western science alongside 'Indigenous ecological knowledge'.

> [This approach] is embedded as a *modus operandi* in partnerships, values and operations and the project is providing a model of equity in the application of this approach (Bessen 2009: 12).

There seems to have been a smaller shift on behalf of the non-Indigenous approach to conservation, as the document describes a reluctance on the behalf of government agencies (particularly at the state and territory level) to fully support this hybrid approach.

> In terms of changes in policy and practices of institutions and agencies, progress is uncertain (Bessen 2009: 12).

Perhaps historical tensions between the institutional bodies (particularly the land councils and state run natural resource agencies) may have prevented a truly hybrid space operating at this level. The evaluation document notes that the relationship between the project partners and outside agencies varied in the different jurisdictions, which may reflect the specific relationships between personalities at the operational level.

> In Queensland, the relationship appears to be supportive with the agencies but there is disengagement and some dysfunction on land and sea management by peak Indigenous bodies as a result of historical issues, which is limiting progress at the ground level. In the Northern Territory, the relationship and policies were initially supportive but in recent times the relationship between the marine wildlife agencies and the project appears to have deteriorated and policy is opaque. In Western Australia, the project began in relative isolation but good on-ground success has lead to a better level of support from the State agencies (Bessen 2009: 18).

These varied results for the different regions were in part based on the history of relationships between scientific institutions and communities. The impact of past relationships on the success of hybrid co-production of knowledge is also recognised in the international literature:

> Co-management is path-dependent. That is, the outcome is strongly influenced by the history of the case. Long-term studies characterize co-management not as an end-point but as a process in which relationships among the parties are constantly changing. The length of time needed for this evolution or development process may be quite substantial, perhaps as long as a decade (Berkes 2009: 1694).

The recognition that building long-term relationships with communities is essential to the success of conservation projects was key to the approach used by the NAILSMA group, and this was backed up by the final evaluation of the project by all participants:

> Across the region, the assertion of cultural authority (cultural protocols and practices) on the direction and management of the project at the community level has been a critical factor in its success (Bessen 2009: 15).

The principles of community based conservation and a participatory approach to the implementation of the RAPs during the lifetime of the project helped to overcome many of the initial problems that I described above. For example, in the Torres Strait, a region that I was particularly critical of due to a lack of community input into the planning phase, a long-term process of community engagement finally brought results after two and a half years of painstaking on the ground work by the NAILSMA project officers.

> In areas like the Torres Strait, the participatory approach took 2.5 years of community consultation to get community elders and people to come on board. However, for the first time there is strong support and endorsement for plans which include mechanisms to increase sustainability, such as penalties for take, closures and zonings (Bessen 2009: 15).

The importance of sufficient time as essential for meaningful change cannot be overemphasised, as it takes time to build relationships and trust between groups of people. A new project must start somewhere, but successive iterative initiatives building on the relationships already created can eventually lead to an adaptive co-management system as described by Berkes (2009) and others:

> Through successive rounds of learning and problem solving, learning networks can incorporate new knowledge to deal with problems at increasingly larger scales, with the result that maturing co-management arrangements become adaptive co-management in time (Berkes 2009: 1692).

The criticisms of the NAILSMA Dugong and Marine Turtle Project from within the partnership were mainly directed at factors that resulted from the limitations imposed by the project budget and constraints imposed by government.

> The major issues were: administrative complexity; short time frames (e.g. RAPs in 6 months, quarterly reports); shortages and high turnover of staff; limited local capacity; and not enough meetings in regions (Bessen 2009: 14).

Clearly, although the NAILSMA partners ideally would have liked the initial phases of this project to be truly community driven, there was a realisation that this wasn't feasible for most regions under the political realities of the Federal Government's timeline and budget constraints.

The realities of working for a land council are that people and resources are always far scarcer than the amount of work needed to be done, and in most cases there was not a single dedicated person allocated to working on this project - instead already overworked individuals were adding it to a portfolio of projects for their region. Our region's position was rather unique in that I had spent three years working on this exact topic before the project came up and so I had a good working knowledge not only of the issues but also of the communities and personalities involved. The feedback from the land council partners at the end of the project reflected this issue generally:

> The project was structured such that Regional Activity Plans had to be developed by each partner before Regional Facilitators or Project Officers could be employed. The Project Partner Feedback Survey showed that the partners struggled with this step due to not having a dedicated Project Officer to develop the activity plan and then drive its implementation. As soon as dedicated staff were employed to drive the plans, the project gathered significant momentum (Bessen 2009: 15).

The role of NAILSMA as a bridging organisation between the partners, the TRG and the various levels of government was crucial in this process. They were involved in balancing the external pressure from government with the needs of communities and land councils. Another role was in coordinating cross regional projects and research[258]. The strength of the NAILSMA organisation was its ability to bridge the gaps between previously antagonistic partners, and although they may not yet have been entirely successful, progress has been made, building relationships that in the future may result in fruitful engagement between communities and management agencies.

> Using science together with Indigenous knowledge requires, not a synthesis of the two kinds of knowledge, but an ability to develop mutual respect and trust, a task that can easily take a decade and does not always succeed. The role of bridging organizations is critically important in this regard in facilitating knowledge "translation", but their role goes far beyond knowledge issues and into the coordination of a number of other tasks that enable co-operation (Berkes 2009: 1699).

4. Conclusion

At the end of my role in the initial development of the RAPs I was left at a point of ambivalence, wondering whether this project was more akin to empowerment or

[258] These projects produced concrete evidence of coproduction of knowledge through 'Message Disks', research publications and knowledge handbooks. See http://www.nailsma.org.au/projects/dmtp_publications.html for downloadable versions of all the publications produced.

subjugation through participation. In examining the results of the four year on the ground project, I tend to believe it is the former. Certainly the project evaluation published by NAILSMA in 2009 gives a clear message that the communities involved have seen positive change as a result of the process. The Bardi – Jawi evaluations in particular give a real sense of empowerment of the community through the opportunities offered by the Ranger program.

> We came from CDEP and the dole[259] to this project...it's a big turn around, old people and children, and the whole community are happy and feeling more worthy, doing something they are passionate about, caring for country, involving people in country. People were on their last legs. Then this project came along and got them going...Worked through barriers, now everyone wants to be a Ranger (Bessen 2009: 22).

The positives for the community were not seen as limited to the younger generation that mainly made up the Rangers, but also for the elders who received increased respect as the most knowledgeable members of the community.

> The whole program's been a turn around for all of us. The people...the elders, they've got something to contribute. I mean, they thought "For the last few years of our lives, I don't know what we're going to do, sit back and just pass away", but all of us have just seen them come up, like they are in their 20s and 30s, these are people that are 60s and 50s and 70s and maybe older, but the important part is I think, to revitalize everything in the culture before we lose our elders as well. Younger people generation, started to realise that, "Who's there if the elders are gone?" (Bessen 2009: 22).

During the process of developing the plans for the Dugong and Turtle project I worried that this project constituted an attempt by the white power structure to 'colonise' the last

[259] "CDEP and dole" refer to Government welfare programs; 'The dole' is a colloquial Australian term for unemployment benefits, also frequently referred to as 'sit-down money' by Indigenous Australians. CDEP was a program developed specifically for Indigenous communities that required recipients to work a number of hours on often menial tasks within their community for a small increase in the unemployment benefit. Due to the remote location of most Indigenous communities these positions were frequently the only employment available to community members.

remaining outposts of Indigenous sovereignty - the ability of remote communities to determine their own cultural practices. But in reality there are at least two different agendas at the basis of a project such as this. The one put forward by Federal Government in the interest of conserving marine turtles and dugongs is that 'overharvesting' will be curtailed as the result of local people becoming aware that their cultural practices are unacceptable given the scientific understanding of the status of marine turtle and dugong. The other is the agenda of the Indigenous communities and supporting institutions seeking greater control over the land and seas that they have always inhabited.

The relative power of each agenda in the hybrid space created by an undertaking such as the NAILSMA Dugong and Turtle Project is fluid (as can be seen by the shift from resistance to support from government when the political landscape changed), yet the relative danger in this case was greater for the Indigenous communities in that they come from a poorly resourced and potentially less resilient position. Yet this evaluation of the NAILSMA project by a member of the Bardi Jawi rangers shows the way in which traditional culture can also be supported by the experience of working within a hybrid space:

> We look after the country, we look after species so that they in turn look after us. What we see as important and the context of it all, is to maintain culture, and looking after the country I guess at the end of the day, we will be rewarded as people, because we at the end of it are starting to see the importance I guess. By doing cultural or traditional work of looking after the country. Elders been telling us all the year round, look, that's why we've still got turtle, that's why we've still got dugong, because if you listen to us and do what we say, or you do the traditional way of looking after country, all your resources will be sustainable in the country (Bessen 2009: 22).

From this and other statements it is clear that the Indigenous relationship with their country can sit alongside the western concept of sustainability, so that caring for country is seen in the broader context of using and maintaining the species, rather than that of outright protection as espoused by conservation discourses.

> Co-production of requisite knowledge requires all parties to recognise that all knowledge is partial and incomplete, that evidence is debatable, and that there are ways of knowing determined by culture semiotics and values (Harris 2007: 303).

If the debatable nature of ecological knowledge, and the uncertainties rife in our knowledge of marine turtle and dugong, can be recognised by scientists and managers, then there is the opportunity here to create a hybrid space where the co-production of knowledge about these species, and our relationship to country can take place.

There are emerging examples of this kind of work taking place, especially across the northern part of Australia, where land managers and scientists are working closely with Indigenous communities on issues of 'caring for country' or conservation. In their exploration of the ethical and cultural issues surrounding the introduced water buffalo in the Northern Territory of Australia, Albrecht et al. (2009) raise the possibility of an emergent hybrid culture - which incorporates aspects of both Indigenous and 'modernist' relationships to this species:

> Given an emergent hybrid economy in Arnhem Land, it is also possible to conceive of an emergent hybrid culture where a blend of traditional and "Western" knowledge, technologies and values will become mainstream....The collaboration of scientists, working under animal care and ethics protocols, and Indigenous owners, as described in research documented in this paper, serves as pioneering model for how different value systems can interact and make possibilities for new, inclusionary hybrid positions to emerge. Such an inclusive, hybrid ethical position, as a foundation for good environmental management, may well serve as a best-practice model for all situations where potential conflict between Indigenous beliefs and sound conservation is likely to occur (Albrecht et al. 2009: 21).

The NAILSMA project can be seen as fitting into the ecosystemic–pluralistic approach to ecological problem solving as described by Manuel-Navarrete et al. (2004, 2008), in that it involved bringing a wide range of stakeholders into a participatory process. The ecosystem-pluralistic discourse is described as being less consistent than the normative, as

it incorporates a systems approach, as well as engaging the human dimension by using formal participatory processes to widen the scope of decision-making (Manuel-Navarrete et al. 2008).

Additionally, I would argue that the processes set in place by this project allow for adaptive co-management of both marine turtles and dugong to take place at those locations (such as the Bardi Jawi and Mayala communities) where the relationships between management agencies (or the bridging organisations that are their representatives) and local people are strong enough to subvert the normal power imbalances. As the interactions that were instigated by this project continue to evolve, and local people are increasingly empowered to conduct or participate in the research that forms the basis for management decisions, an adaptive approach to community based decisions on hunting practices is likely to emerge.

The difficulties of working within this approach include the challenges presented by dealing with the inflexibility of institutions, and their inability to meet the social expectations of the groups they work with. Additionally the political agendas brought by government agencies to a process may preclude the ability to reflect the on-the-ground needs and aspirations of the community in question (Manual–Navarrete et al. 2008). These findings closely reflect my own experiences in this project, specifically, the ambivalence that I felt over the ultimate control of the NAILSMA project and the level of involvement of the Indigenous communities in the initial project development.

Supporting the realisation of the limitations of such an approach, Manuel-Navarrete et al. (2008) suggest a new framework for science, and indeed society as whole, that they term the 'transpersonal-collaborative' discourse:

> The social practices described in the previous discourses [normative and ecosystemic-pluralistic] are perhaps necessary to enable us to buy time and deal with short-term issues, but at the same time, their hegemony is digging us deeper into the current rut. We must promote other social practices that get at "the heart of the matter" so to speak, rather than simply dealing with surface symptoms. The deeper issue is one of inner change, resulting in cultural transformation (Manuel-Navarrete et al. 2008: 338).

The authors suggest that through collaborative sharing we can learn to be open to multiple possibilities through a self-reflexive dialogue that allows the formation of new and ever-changing identities. This will allow an adaptive and localised response to ecological problems and conflicts which incorporates a wide spectrum of worldviews into a mutually agreeable strategy (Manuel-Navarrete et al. 2008).

Despite the progress seen in the conflict resolution process by NAILSMA, the evaluations of the project still indicate that in some regions there is not yet sufficient trust between community groups and the management agencies to allow for this relationship to grow. In part this may be driven by the fear in some quarters of the conservation movement that the continued Indigenous harvest of marine turtles and dugong (which is seen as an inalienable right by land councils under the NAILSMA project) is an unacceptable risk to these populations.

Which brings me back to another point of ambivalence: what is the real danger of losing marine turtle and dugong populations? These are internationally important species and their protection is the responsibility of all peoples. Should Indigenous communities choose to be engaged with a conversation with government over the future of hunting, even if the negotiations are not taking place on a level playing field? Or would they be better off in a position of complete resistance, insisting upon their sovereignty and right to determine their own cultural practices? What are the moral and ethical implications of all of this in a broader sense?

> Certainly Foucault... was right to suggest that "everything is dangerous" and that even emancipatory discourses are systems of power with the capacity to dominate, but it is important to recognise that some things are more dangerous than others (Kesby 2005: 2044).

What is more important, and what is more dangerous? Cultural integrity or species protection? Can't we have both?

My questions multiply into more and more questions. What Indigenous people really think and what postcolonisers should really do are equally unclear. On the postcolonial frontier, there are no answers, only performances (Kowal 2006: 122).

Chapter Ten: Discussion

1. Introduction

Over the course of this dissertation I have provided a detailed exploration of the many different ways Australians (both Indigenous and non-Indigenous) relate to marine turtles and dugong. I have done so with the express purpose of bringing to light the ambiguities and uncertainties that mark these relationships, in the hope of opening a hybrid or third space where points of conflict can be resolved.

This exploration has been conducted within a framework for a new approach to ecology as suggested by Berkes (2004). Specifically, this means that I have sought to take a systems view, to integrate the human dimension into my exploration and conduct my research in a participatory fashion, allowing my contributors to directly inform and shape the outcomes of my research, with a reciprocal ethic which incorporates two-way learning and teaching between cultural groups and individuals.

This dissertation can also be read as a personal journey that explores the changes in my perception of the initial problem and how it might be resolved. By reflexively reviewing my writing I can trace how the experience of undertaking this exploration broadened my understanding of the issue of marine turtle and dugong harvest in Australia from a simple dualistic conflict to a much more complex and dynamic problematic with many interwoven threads.

The interrupted structure of this thesis reflects the process of my research as I went through cycles of active engagement with my topic followed by reflective lulls, some chosen, others enforced by circumstance (births, deaths and illness). The challenge as a researcher was to continually re-engage with my subject after each separation, every time with new insights into the problem. This forced a re-evaluation of my prior conclusions and allowed for my sense of ambivalence to emerge at key junctures of the thesis. The difficulty became one of integrating my different voices into a coherent story that still provided an accurate account of my journey.

By identifying my own moments of ambivalence with the issues that I encountered, I was able to transform these from experiences of discomfort into opportunities for deepening my understanding of the conflict. I used the ecological discourses described by Manuel-Navarrete et al. (2008) to categorise my responses and those of others to the issues that arose. This allowed me to view alternative positions as valid in their own right, and identifying the weaknesses in adopting an inflexible or normative attitude in relation to the complexity of the issues at hand.

2. Adaptability as a strategy

If the shifts towards a hybrid ecology is to be supported, there are a series of challenges that ecologists need to consider. Firstly, if it is recognised that clear unambiguous solutions to our ecological problems may not be possible, then an acceptance of some degree of uncertainty becomes integral to any management process. It follows then that built in adaptability and the ability to reflexively review the impacts of any decisions are key to managing this uncertainty in a practical manner.

Adaptive co-management is an approach to the management of natural resources that builds an acceptance of such uncertainty into a participatory framework that is reflexive and dynamic. By designing management practice to constantly re-evaluate the information that is synthesised into decision-making, communities and institutions are more able to swiftly react to a given situation as parameters change. In terms of process this will require regular reviews of the available information and the changing perspectives of all involved. Governance skills and the ability to negotiate between parties may become prerequisites for ecologists working within this approach.

Following an open-ended methodology may also lead to fears that nothing will be achieved, through vagueness of purpose and no decisive action being taken. The importance of solid governance structures comes into play in this situation, with somebody or some group taking responsibility for directing the process, even if the

process is consensus building over a long period of time[260]. Without some sense of a direction people are likely to become frustrated with inaction which may lead back to a conflict situation.

In this situation ecologists may explore what the risks are of doing nothing, and weigh these up in balance with the possible detrimental effects of taking a contentious path. Sometimes further time is needed to collect information or build relationships, and at other times leadership in the negotiation process may be needed. Finding a common goal for all the parties concerned is often an important step in moving forward.

An example of this can be seen in the data presented from my discussions with the Bardi Jawi and Mayala communities, which showed no consensus over whether the hunting of marine turtles and dugong needed change. This uncertainty provided the opportunity for the community to examine this issue more closely, in the context of a community based ranger program, and the ongoing research into both the socio-economic and biological relationships between humans and the marine animals.

The local people in these communities now find themselves in a more powerful position in relation to the outside institutions that sought to regulate their hunting practices, and the institutions in turn have gained on-the-ground support for the research that they need in order to make management decisions. The time taken for this outcome to evolve was lengthy and required a good deal of trust on behalf of both parties. The role of the bridging organisations (NAILSMA and the land council) were also of critical importance in negotiating between the levels of community and government.

The difficulties of working within such an ambiguous space are not to be brushed aside as there are many barriers to be overcome. Another example of how things don't work was seen in the case of the research that Melissa Nursey-Bray (2006) undertook with the Hopevale community. Here was an ambiguous situation where multiple viewpoints were expressed but progress could not be made because the communication between the

[260] An example of such a body would be a bridging organisation that can negotiate with both sides of the divide. An unsuccessful example of such an attempt was seen in the role played by the Federal Government in the Dugong Wars, where a Federally directed focus group attempted to mediate between conservationists and fishermen. The failure of this was in part due to a non-transparent agenda, which changed with the application of political pressure from the various interest groups.

groups was not clear. Respectful dialogue requires time and listening and the successful translation of concepts. The power imbalance that existed between the community and the government was supported by an imposed management framework, and misunderstandings about what would determine a successful outcome for the project meant that people were pulling in different directions.

The consequences of not following an open-minded approach can mean entrenched conflict between groups. Also the risk of misunderstanding or misinterpreting data becomes higher when we cannot afford to listen to other points of view for fear of losing 'the battle'. The chapter on the 'Dugong Wars' provides an example of the problems that result from conservation waged as a war, where passionate advocates become isolated from the decision-making process, and ultimately none of the parties were satisfied by the outcome. By acknowledging the uncertainties inherent in their research ecologists can create a space for dialogue with an extended peer community where multiple interests can negotiate a flexible approach to management.

In terms of marine turtles and dugong, scientists can learn to negotiate with Indigenous communities about harvest levels and community management of the resource. By being open to the possibility of reciprocal learning, this process also provides an opportunity to learn new ways of relating to the environment. This may include a further integration of the human and the other-than-human spheres of knowledge providing the possibility of overcoming the damaging cultural separation of ourselves from the rest of existence. I argue that this potential benefit is perhaps the most important outcome for non-Indigenous culture from our interactions with Indigenous cultures, as the integration of ourselves into our surrounding world may be integral in changing our current path of environmental and social destruction. My own views of how I fit into this world have been profoundly shifted through my learning experiences with Indigenous communities over the course of my doctoral research.

3. Personal shifts

I can trace my own personal journey as an ecologist through my changing discourse on the issues I am exploring. My introduction to this topic by colleagues at an ecological research station (see Prologue) was framed in a normative discourse, which defined the problem as a conflict between two distinct groups, the Indigenous hunters and the

conservationists. The solutions discussed at this early stage were primarily based on increased regulation, or outright prohibition of hunting. Although I was never personally comfortable with these proposals, my early field notes document that I did see my role as an outsider coming in to the communities to educate people about the impacts of hunting upon threatened species.

Following the possible ways of following an ecosystem approach as described by Manuel-Navarrete et al. (2008), I can also identify a shift in my approach to an ecosystemic-pluralistic discourse as my research progressed, and I became entangled in the complex realities of the study site.

Even so, I continued to be tripped up by my older habits of responding to further moments of ambivalence in a way that reinforced dualisms. I became angry when my research uncovered times when other scientists behaved in ways that I considered unethical, as they were located in an alternative discourse (primarily I had difficulty with viewpoints from the normative sphere which prioritised the protection of species over human interests). I often found it difficult to let go of my initial reactions when I confronted opinions that differed significantly from my own.

This is where my responses remained for much of my research. Grappling with the pluralistic nature of the issues I encountered, I attempted to work in a participatory manner, placing my own uncertainties (and that of the science I represented) up front when discussing potential management strategies with the Indigenous communities. It was during the process of negotiating with government over the NAILSMA project that I began to feel hemmed in by the constraints of working 'within the system', even when that system was pluralistic in nature and structured to be participatory. My experiences in this situation are echoed by the critique of the ecosystemic-pluralistic discourse as described by Manuel-Navarrete et al. (2008: 340):

> The idea of incorporating a plurality of perspectives in decision-making can be intuitively appealing. It requires, to some degree at least, a shift of power from technical and political elites to the "ordinary" people. However, control over decision-making is seldom given up in real situations. As a consequence, formal

> participation usually has complex dynamics derived from existing power structures. Eventually, its potential to challenge patterns of dominance may be transmuted into new avenues of power and influence that ultimately undermine collective decision-making.

After my fieldwork period ended (with the NAILSMA project) I spent a further six years analysing, researching and reflecting upon my experiences. Gradually I sifted through my responses at different times and pulled out the key moments that shaped my understanding of the relationships between humans and marine turtle and dugong, and the impact that these relationships had on the management strategies used by government. I delved further into the non-Indigenous experience through historical research and in-depth interviews with people such as Professor Marsh. Through this process my personal position on the subject would fluctuate and transform as I was influenced by my contact with other people and ideas. This dissertation began to take shape as a multifaceted exploration of the subject, but one that was filled with moments of uncertainty and ambivalence. This worried me for a long while – wasn't the whole point of a thesis to come to conclusions? What if there *were* no final end point or destination to the journey?

My attention shifted from trying to resolve the conflict about marine turtle and dugong to trying to resolve my own ambivalence. As I further researched the ways in which we know things I found that I was not alone – once I moved beyond the mainstream ecological literature I discovered several rich veins of research that dealt with the inherent uncertainties of reality[261]. With these tools I was able to reconceptualise my ambivalence as a strength rather than a weakness, and eventually accept the evolution of my research.

Manuel-Navarrete et al. (2008) describe this kind of open-ended learning process as fitting within a transformative-collaborative discourse where the researcher is continually transformed through a collaborative relationship with the world that they are actively exploring:

[261] See chapters one through four for detailed discussions on these themes.

> Because learning transforms who we are and what we can do, it is an experience of identity. Through experience, individuals internalize the ongoing dialogue from the world around them. Ideally, each voice incorporates its own evaluative position at the same time as it remains open to the potential truth of "the other". This self-reflective dialogue allows the emergence of new, temporary, and open-ended identities. New and ever-changing identities or accretion points are experienced as conclusions that seem to be locally valid or right (i.e., concerned with the quality of our motivations, the worth of the ends we seek, or the good or right life for us in our time and place), even if we are aware that from our limited perspectives, we can never attain anything that is final or absolutely certain (Manuel-Navarrete et al. 2008: 338).

4. Methodological challenges

> Since every wicked problem is uniquely based in its place and time, approaches to research design will necessarily be eclectic, looking among all the suitable possibilities for a good match. The inquiry research methodology is designed to fit the focus of the inquiry, not the other way around. The question remains: how is the researcher to meet these requirements for originality, depth, breadth and still establish confidence in the validity and reliability of their findings? (Brown 2010b: 104)

At the beginning of this thesis I made the claim that my methodological approach to this subject would be situated, subjective, iterative, reflective and participatory in nature. Each of these concepts comes with its own set of limitations and weaknesses, which have impacted on the course of my research.

Situated research can be interpreted as biased, or presenting limited understandings of the problem. I can only ever see what is in front of me, and while this has been in some instances mediated by the many different perspectives I have incorporated from other sources, there are always limitations. For example, in Chapter 8 I chose to base my understandings of the Dugong War based on interviews with a single participant, rather than seeking out many of the people involved (as was suggested by my interviewee). This

was a decision I made at the time due to the constraints of my research – I felt that if I had brought in multiple perspectives, this one sub-story would have taken up the entire thesis. My account would have been richer, and more rigorous, yet instead I chose to openly state the limitations of my approach. The transparent documentation of such decision-making in the research process is essential in subjective accounts of qualitative research (O'Leary 2010).

Subjective research requires triangulation or corroboration of multiple data in order to improve the reliability of the conclusions reached (Gray et al. 2007). In my case this was done wherever possible, but at times (such as when describing the NAILSMA project) there were not many secondary sources to draw upon. Ideally this would not be the case, as a lack of alternative support from the literature, or other documentary sources for my interpretations makes them less reliable (Altheide and Johnson 2011). In retrospect I could have strengthened this part of my research through conducting interviews with the key players in this story, or undertaking an iterative collaborative review of my chapter with them, as I did with Professor Marsh and the Dugong Wars. On the other hand, the extra time that this would have required may well have pushed past the already stretched limitations of my candidature as a doctoral student, a risk that I was unwilling to take.

The iterative and non-linear process that I have described, where the research cycle moves through the stages of planning, acting, and reflection (or reading, writing and reviewing during the latter stages of the research) means it may at times be hard to follow, although I have attempted to mitigate this as much as possible by following the journey from beginning to end, ordering the chapters according to when they were conceived of as much as was practical. This follows the approach suggested by O'Leary (2010) when following an unconventional format in writing up research. This non-linear approach meant that my theories tended to emerge from the data at particular points where a key phrase or subject would leap out of the surrounding text or conversation, connecting to a thought or query that I had in mind. This required a constant reviewing of the primary data and the relevant literature resulting in multiple perspectives and possibilities for further investigation. This revisiting of the data is described by Ellingson (2011:604) who states:

> We cannot hope to come close to exhausting our empirical materials, and so we produce legitimate and often highly valuable scholarship by drawing fresh water from already drilled wells.

While this process allowed me a much wider understanding of the various aspects of the relationship between humans and marine turtle and dugong, the disadvantage of this approach is that the messy melange of ideas that are produced need to be given coherence and structure, which requires time and patience as the elements gradually coalesce into a recognisable story or form. This kind of narrative synthesis (as opposed to reductive analysis) is typical of the heuristic form of enquiry as described by Moustakas (1990), and conducted by many others such as Colley (2010).

Reflective and reflexive inquiry requires the disclosure of the personal, a tactic that opens the research up to the charge of navel-gazing, self obsession and disregard for other points of view. Some reflective research based on personal accounts has been accused of being narcissistic and uninteresting, or self-flagellating – particularly when the subject is the internal discomfort of a middle class white researcher in a challenging field situation (Agyeman and Spooner 1997, Finlay 2002). Fortunately, or unfortunately, these kinds of evaluations are highly subjective reactions that may potentially occur with each reading of the text, depending on the position of the reader. Limiting the personal to relevant insights that highlight particular issues of importance to the readers understanding of the research is recommended when undertaking such an approach (Morrison 1998, Sparke 2002).

The issues I had with the participatory process that I attempted in the Bardi Jawi and Mayala communities have been described in depth in previous chapters, but it is important to reiterate that the complexities of a real study site are far greater than is commonly discussed in the literature (Finlay 2002, Mauthner and Douchet 2003), and as an inexperienced and under-resourced researcher, I was likely to struggle to gain meaningful participation from people in a cross-cultural setting.

All of the above issues lead me to another point of ambivalence with my own research. I have undertaken to investigate an immensely complex situation – a wicked problem, as

defined by Brown et al. (2010). Such an inquiry is recommended to be undertaken as a collaborative venture with experts from diverse fields (Brown 2010). Had this been the case, I believe many of the above issues would have been resolved through collective problem solving. I am proud of the work that I did, but I would not recommend the lonely and disjointed approach that I was obliged to undertake[262]. Feminist scholars such as Reed et al. (2012) describe reflexive, collective inquiry into social issues, which allow for collegiality and the integration of multiple perspectives on each area of the issue, strengthening all aspects of the research project. Doctoral research is ultimately an individual endeavour, yet there are ways of integrating other perspectives from fellow students and interested colleagues if the physical structure of a University is accessible. The lack of this, firstly due to my commitments at home with small children, and secondly due to distance, added extra challenges to my journey as a researcher.

At the completion of this journey I have now reached a point of equanimity where I can just *be* with the various aspects of this thesis, and particularly the conflict that initially drew me in. The relationships between humans and marine turtle and dugong, and between Indigenous and non-Indigenous Australians is a continually unfolding story which I hope to further influence and participate in, but the path forward is something that can only be determined in relationship and collaboration with the country and people concerned – there must be a relocalisation of decision-making.

Indeed, the ramifications of following a localised response to ecology are that the relationships between the human and the other-than-human become enriched, as we strengthen our ties to our own places, furthering our knowledge by sharing with others who are also tied to these landscapes.

5. Broader implication of shifts

The three shifts in ecology proposed by Berkes (2004) may be seen as part of a broader (contested) paradigm shift that is taking place in many aspects of our culture, as we question the dualisms of human/nature and mind/matter that characterised and formed

[262] It is probably worth mentioning that for the last three years of my research I have been an external student located some 450km from my University. Without the advances in remote access to digital resources, my research may well have ended with my move away from the city.

the technological expansion of the last few centuries. The incredible success of the reductionistic approach in creating evermore specialised areas of knowledge has sadly been mirrored by a growing disassociation between knowledge areas, but also between ourselves and our communities, both the human and the other-than-human. Within the field of ecology this may now be beginning to change as ecologists and managers struggle to solve the environmental problems that have arisen as a result of these fractures.

There is still a great deal of resistance to the full acceptance of these shifts from within ecology, perhaps mainly because when we holistically engage with the human in a participatory manner our work immediately becomes much more complex and messy. The reductionistic universe is simple to manage, even if the results of our management are not what we had hoped for. Yet it is becoming clear that the methods that ecology has been promoting for the past thirty or more years are not producing the results that we require. The environmental crisis as first comprehended in the 1960s, 70s and 80s has not been addressed and mitigated, in fact in many cases it has only grown worse as humanity has expanded its desire for conspicuous consumption with the resulting devastation of 'natural environments':

> ...the mechanistic worldview has not delivered promised progress. A proportion of the population, particularly in the western world has increased its material wealth but at a great expense to the environment. Increasing disparity exists between the rich and powerful, and those without the ability to meet basic needs. At the same time there is no perceptible increase in the happiness levels of those who comfortably meet basic physical needs (Duxbury 2007: 261).

Perhaps it should not be surprising that the health and well being of Indigenous Australians has also not improved over the same period, despite a barrage of top down government initiatives and funding programs from various political perspectives (Altman 2009).

These problems seem intractable and interrelated. Without clear control and responsibility for the management of country, many Indigenous communities are left in a peculiar no man's land of token 'land rights' but very little in the way of actual say over

what goes on in the land and (particularly) sea that they are living from. It may be argued that this is also the case for many non-Indigenous Australians, who are also far more likely to suffer the additional problem that they are not spiritually connected to any land or seascapes. Without the primary relationship between humans and country our cultures seem destined to face a future of further dissonance, excess consumption and environmental degradation.

6. The fourth shift: re-situating the human

The research conducted as a part of this doctoral work is only the beginning of a path towards a model for a hybrid ecology. There are many voices speaking of new potentials for collaborative knowledge production and learning between Indigenous and non-Indigenous Australians. I believe that we as ecologists need to open our ears to these voices, challenging as some of the concepts may be to our beliefs about our place in this world, as current models are clearly not sufficient to allow meaningful relationships between humans and the rest of existence.

The three shifts for ecology proposed by Berkes (2004) take us to where participatory human relationships are viewed as part of the ecosystem to be studied, but stop at the brink of a transpersonal-collaborative approach. Partly this is because in order to fully embrace this concept we must move well beyond the traditional sphere of the sciences and tackle the philosophical position of ourselves in our world. I conceive of this as a potential fourth shift that ecologists may choose to take – towards the open reintegration of the personal with the environmental, wiping away the perceived separation of the human from the other-than-human. This fourth shift pulls the other three with it so that humans become fully participatory members of the complex system that can be called 'the ecosystem' or perhaps just 'country'.

The benefits from this shift signal a transformation not only for the ways in which humans interact with marine turtle and dugong, but in our relationships with each other, and the ecosystem as a whole. Manuel-Navarrete et al. (2008) urge ecologists to open themselves to a transpersonal-collaborative approach:

> We desperately need to integrate the biosphere into our psyche in order to put an end to their current dissociation and thus strive toward higher levels of complexity (Manuel-Navarrete et al. 2008: 341).

The ecophilosopher Deborah Rose in her 2005 article calls for a 're-situating of the human' in our country by engaging with Indigenous ecological philosophy. She describes four areas in which the Indigenous worldview can inform 'western' philosophy, those being the idea that other species and 'country' are seen as sentient and capable of agency; that life processes do not prioritise human needs and desires; the idea that humans share kinship with nature; and finally the idea that humans are called into action by the rest of the world rather than acting autonomously. Rose suggests that if these ideas were integrated into our ways of thinking about the relationships between humans and the rest of the world, we could create a new way of interacting with our environment that might ameliorate much of the disconnection and destruction that we currently face (Rose 2005).

> The proposition has been that humans are part and product of country's self-organisation. Neither the teleogical end-point nor a random outcome, human beings are brought forth as essential and enmeshed parts of country's life. Along with life's other manifestations, humans are deeply implicated in the coming into being of life in country (Rose 2005: 302).

I propose that this re-situating of our relationships with the other-than-human represents a step beyond the three shifts proposed by Berkes (2004), as it requires a personal movement towards a participatory relationship with the world that surrounds us at every moment. The realigning of our perceptions of our immediate surroundings so that we are constantly connected is a huge challenge for modern society, which goes well beyond the traditional responsibilities of ecologists.

> I know now that this is the way...I must drive out my old self and let the universe in. The creatures will come creeping back – not as gods transmogrified, but as themselves. Beaked, furred, fanged, tusked, clawed, hooved, snouted, they will settle into us, re–entering their old lives deep in our consciousness. And after them, the plants, also themselves. Then we shall begin to take back into ourselves

the lakes, the rivers, the oceans of the earth, its plains, its forested crags with their leaps of snow. Then little by little, the firmament. The spirit of things will migrate back into us. We shall be whole. (Malouf 1978: 96).

Epilogue: Koorabup - the rivermouth

Here I wish to revisit the ***ganma*** *metaphor used by the Yolngu people of north-east Arnhemland to describe the process of mixing the salt and sweet, seen as a site of great productivity, and used in contemporary times as a symbol of the mixing of two cultures.*

> Yolngu people see a powerful metaphor in the meeting and mixing of two streams which flow - one from the land, the other from the sea - into a mangrove lagoon on Caledon Bay in NE Arnhemland....Thus, we may use the term 'ganma' in English to refer to the situation where a river of water from the sea (Western knowledge) and a river of water from the land (Yolngu knowledge) engulf each other on flowing into a common lagoon and becoming one. In coming together, the streams of water mix at the interface of the two currents, creating foam at the surface, so that the process of ganma is marked by lines of foam (Watson and Yirrkala Community 1987[263]).

These areas of contact and mixing can be amazingly productive, but also very dangerous, depending on the relative power of the two watercourses. The meeting of the great Fitzroy river and the sea in King Sound near Bardi Jawi country (see Figure 2 for map) comes to mind, the immense power of the 12 metre tides causing swirling current eddies that can swamp a boat and take it many kilometres out to sea. Only experienced sailors can navigate these waters safely. With the power of ganma we have the chance to create a new creative space between cultures, but we need to remember the potential for harm, when one watercourse swamps the other, as has occurred in the past. Our actions in this time are shadowed by the actions of others in our past.

We have such a site of the mingling of freshwater and salt in my home, which is a small rural township on the southern coast of Western Australia. It was once called Koorabup, the place of the hare wallaby, or the place of return (see Figure 1 for map). The place of the Biboolmun, who are one of the many tribes of the Noongar people. The place where the river meets the wide inlet, and the waters mix until they flow to the sea.

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[263] Accessed http://singing.indigenousknowledge.org/exhibit-1

The rivermouth was a site of great importance for thousands of years for the Biboolmun people. They gathered to feast on the rich foods provided by the mixing of the salt and the sweet. The children played on the white sand, the women watched from the shade of the paperbarks. So it had been from the beginning of time, so it would be forever.

Until one day. The noise of the horses galloping up would have been a warning, but it all happened too fast. The strangers were upon them before they fully realised it was an attack. The guns blazed and people fell as they began to run. The men and their spears fell first, the women and children afterwards. Maybe someone escaped, maybe a small child managed to hide cowering in the bush. History does not say.

Written history does not record this event at all in fact. The records of our town are silent on the fate of the original inhabitants, merely commenting that they had all but disappeared within ten years of the first settlers' arrival. It is common knowledge that many died as a result of infectious diseases brought by the new settlers, but the other, more unsettling tales of rape and murder are passed over quickly or ignored.

But our oral history does still remember[264]*. There are snippets and details passed on in hushed whispers, or loud cries. The sight of the brown bodies drifting into the inlet, the drowning of the small children in the river, the way in which the attackers used their stirrups to smash the skulls of the older children who ran away. The red blood staining the white sand, and the terrible, terrible grief.*

I would like to be able to say that this was an isolated event, the result of a particularly vindictive or violent renegade group, but it is not true. Other, even darker tales are told by the Indigenous survivors in my region, of deliberate bushfires lit to kill and clear away any trace of the inhabitants before the logging teams moved in to take possession.

Having lost any innocence over the history of my country I now question whether every town in Australia has a similar story lurking beneath the surface of what is known, or believed. During my fieldwork in Bardi Jawi country I was taken aside and told the sorry

[264] One example of the 'unofficial' remembering of this story was through the performance of 'Our Secret River', a project run by Denmark Arts as part of the Brave New Works festival #17 in 2010. See http://www.nicduncan.com/?p=231 for a photographic record of the event.

business that occurred there in the 1930's, a similar tale of ambush and slaughter of innocents[265]*. Our country is stained with the blood of the past.*

> ***Lest we forget*** **-** Because the enduring legacy of *terra nullius* allows white Australians to continually forget the battles fought by Indigenous nations in and for this place (Nicoll 2004: 25).

More than just the murder of a group of people, these events represent the dominance of one form of knowledge over another. First outright genocide, then the cultural genocide that followed with the rounding up and resettling of the survivors, forcible separation of children from their families, and the banning of language and cultural expression.

These acts of genocide were not the work of madmen or sociopaths, but were the almost inevitable result of the domination of the 'rational' modern resource-exploitative way of relating to the world over the more reciprocal place-based animism that was present before invasion. As ecologists we need to be mindful that the ecological loss that we seek to prevent is primarily a consequence of the modus operandi *of our own cultural heritage and the destructive power of reductionist thinking.*

> Bauman's (1989) clinical analysis of the Holocaust as what we might call a 'normal accident' of modern rationality, reflecting the quintessential reductionist instincts of modern scientific culture – in ordering, dividing, simplifying, deleting the 'disorderly' other, controlling, and excluding or externalizing (for example, unpredicted consequences) – is perhaps the most harrowing reminder that, amid abundant self-conscious complexity-representation, its essentialized opposite also lurks in practice (Wynne 2005: 71).

The capacity for sudden changes in these early relationships is detailed by the Noongar writer Kim Scott who writes in his historical novels[266] *about the potentials that existed for cross cultural learning and friendship in the early days of white settlement of Western Australia, and of the exploitative use of what were reciprocal relationships by less scrupulous colonists. This tendency for the misuse of knowledge and relationship is echoed by other Indigenous retellings of history:*

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[265] See the interlude between Chapters 6 and 7 for the complete account.

[266] Benang (1999) and That Deadman Dance (2010).

> If you go back to the great explorers of this country, they all had some blackfella with them who showed them where all the waterholes were and all the best country was. The next minute there's a whole mob of other people coming into the place and the blackfellas are being dispersed...Knowledge is a very powerful thing. It's not to say that knowledge is not to be shared, but how do we encourage the people who don't live in our country to respect our interests?
> (Kimberley Land Council 2000: 13)

And as for my town? With the death of the local Indigenous inhabitants we lost far more than lives. A whole way of belonging washed out to sea with the blood of the Biboolmun.

Those early settlers came here to harvest the immense trees that grow on the mountainsides and in the valleys, shipping the timber away on the railway they built over the river. They were very efficient and some 10 years after first settlement there were no more trees to be cut. The photographs taken at this time show stark hillsides of mud, marked by the occasional broken stump.

Over time, the forests have returned, though a hundred years is not yet long enough for these trees to reach their maturity. People have returned to the town, mostly because of the environment. The landscape I walk through is renowned as one of the most beautiful in the region and tourists come each year to spend time amongst the tall trees. There is in this country, the promise of redemption. Yet so much has been lost.

> We'll run out of history, because Whitefellas fuck the Law up, and they're knocking all the power out of this country (Rose 2008: 160).

We lost the songs of this country, its stories, the knowledge of how to live in this landscape. It is only now, some 100 years later that we begin to try and pull the fragments of culture back together, slowly, painfully we try and heal as a community, to call back our Noongar friends to come and live and share their knowledge with us in this haunted place.

How do we do this? How can we pull together the tattered fragments of story and song into a new and whole fabric of place-based knowing? Certainly not without the active assistance of the descendants of those who once sang this land into being.

There appears to be an invitation from some members of the Indigenous community for non-Indigenous people to become more connected to this land, yet there is an active resistance to these concepts as well. Where do we stand? We are white. We are the oppressors. Some of us want to change our relationships to this country and its original people. How can we do this without reinforcing the oppression that our very existence represents?

What place might there be for new stories to replace those that have been lost? Is there a place for a non-Indigenous dreaming in this country? How can this cultural renewal take place without further damaging the fragile alliances that are forming between the settlers and the dispossessed? It is a shifting sinking sand of moral ambiguity and uncertainty that may hold the answers to these questions, a morass that cannot be traversed alone or without trepidation.

If wadjelas[267] *become connected to country what becomes of the Biboolmun? If we seek indigeneity what distinguishes us from the truly Indigenous?*

> Even though that Wudjari Country (Esperance, Coomalbidgup) calls to me in my dreams – when my body goes back to dust and water I will fly there – this doesn't mean I can say it is my Country. Those are words for a Traditional Owner, A Wudjari man. I am of that place. I can hear its song even though I can't sing it. See? Confusing (Docker 2005: 388).

At a recent meeting one of our local elders remarked that the Noongar people had never abandoned their boodja,[268] *that the spirit of the land knew they had been forced away from it and that it lay sleeping awaiting their return. He acknowledged the wadjela desire for reconnection to country but was firm in stating that we must wait our turn, and follow after the original inhabitants if we wish to continue on this path.*

In my town we dearly hope that Koorabup is truly a place of return for the Biboolmun, for our own sakes and those of our children, as we continue our longing for true belonging in this country.

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[267] literally 'whitefellas', a term for non-Indigenous people in the Noongar language.

[268] boodja means the country, or heartland of the Noongar people.

I worry about whether my words really are sustaining the respect for the awesome which so characterized my Aboriginal teachers' approach to the living world, or whether my words are opening gaps wherein the awesome can be tamed. Probably they do both, and perhaps this is one of the great tensions about wanting both to respect difference and to communicate across difference: the attempt opens possibilities for both disruption and domestication (Rose 2008:158).

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Appendix One:

REPORT ON PROGRESS OF BARDI AND JAWI COMMUNITIES TURTLE AND DUGONG MANAGEMENT PLAN JULY 2004

ABOUT THE MANAGEMENT PLAN

WHO THE PLAN IS FOR:

This Plan is for all the people who live on Bardi and Jawi Country, at the communities of One Arm Point, Djarindjin, Lombadina and all the smaller outstations.






WHY DO WE NEED A MANAGEMENT PLAN?

By writing up a community management plan, we can sort out what everyone would like for the future.

It is a way of collecting together everyone's ideas for turtle and dugong.
Once it is finished, the plan can be used to apply for funding, so these ideas for the future can actually happen.
Also, the plan can be used to educate other people about how Bardi and Jawi people want to look after their country.

This plan could be useful in working out how to manage changes, like what will happen once the road is finished

WHO IS WRITING THIS PLAN?

All the information, and most of the photos in this plan come from people who live in these communities.

Zoe Car from Edith Cowan University in Perth, was asked by community members to help put this plan together. To do this she has been travelling up to the communities to talk to people about their ideas.

ABOUT ZOE AND HER RESEARCH

Zoe is a environmental management PhD student at Edith Cowan University in Perth. Her research is looking at the best ways for Indigenous and non- indigenous people to work together on caring for country, with a focus on turtle and dugong management in Bardi -Jawi country.

Zoe works in this building: the School of Natural Sciences, and the Centre for Ecosystem Management at ECU in Joondalup.

Zoe is married to Jeff Atkinson, and they have a small son, Felix. They usually all come up to the communities together, and stay at Kooljaman.

WHAT HAS HAPPENED SO FAR?

The work on this plan started after Zoe was asked to work on this plan at a native title meeting in September 2002.

Zoe and Jeff came up for a field trip in October 2002 and started speaking to a few people about the plan, finding out who to speak to and what people were interested in.

Zoe didn't come back until November 2003, because she took time off to have her baby, Felix.

On that next field trip, in November, Zoe spoke to people about turtles, and organised two meetings, one at Djarindjin and one at One Arm Point. The meetings were to show people what she had done so far and to make sure people were happy with how she was doing things

People at the meetings had a look at what people had said so far, and had the chance to put in more ideas or change things around.

.

These meetings were to see if people wanted to make any decisions on which ideas were most important for the plan

Not very many people came to the meetings, so no decisions were made.

CAMERAS AND PHOTOS

One idea for this management plan is to put lots of photos in it. This will make it more interesting to read, and it is easier for some people to tell stories with photos instead of words.
To make this happen, Zoe has been giving people disposable underwater cameras.

These cameras can only be used once, but they can go underwater to take photos.

People can take photos of anything they think should be in the management plan. The best thing would be if every idea in the plan had a photo to go with it.

Once the camera is finished, people can hand it in at the community office, or wait until they see Zoe again. Zoe will develop the film and send the photos back to each person. Zoe will keep a copy of the photos on a computer disk to use in the management plan.

WHAT IS GOING TO HAPPEN NEXT?

Zoe is writing up a draft management plan, using all the ideas and photos that people have given her so far. This will be finished by November 2004, when Zoe will come up again and present the draft plan to everyone. This is when people can make any changes or suggestions for the plan. Because this is a community plan, everyone has to be happy with what is in it. If you aren't happy, please talk to Zoe.

The Kimberley Land Council has applied for some turtle and dugong funding. They would like to know which ideas people think are most important so they can ask for money for these things. To talk about this, they will organise a special meeting sometime in September. Zoe will probably come up for a couple of days for this meeting, and people can talk to her about this report, and the management plan, then.

If anyone has any cameras they want to give back, this would be a really good time- then the photos can be included in the draft management plan.

CONTACTING ZOE

If you want to contact Zoe when she is still in Perth you can phone her on : 9381 7263
This is my home number so you can ring any time of day.
If you want to fax, the number is 9400 5509
If you would like to email, the address is z.car@ecu.edu.au

WHAT PEOPLE HAVE SAID SO FAR:

Mainly people have talked about how people used to hunt, eat and share turtle and dugong, the ways in which that happens now, their worries for turtle and dugong, and their ideas for the future.
The main ideas for the future that have come up are:

- Rangers
- Research into breeding turtles
- Monitoring turtles and dugong
- Managing hunting levels

In the next pages you can read everything that people have said so far. People's statements have been arranged in broad categories by Zoe Car. These categories might not be right- this is something we can change easily. Also, you might not agree with some of the ideas, or where they are arranged- again, we can change this.
Please think about any changes you would like to make and let Zoe know next time you speak to her.

ABOUT HUNTING NOW

I was a turtle hunter when I was young. It's the only thing we get to.

This community is involved with fishing mainly- there isn't much turtle around here.

People follow the resources, they move across to dugong and Talbot bay when it's hard to find them, people from Djarindjin sometimes go to beagle bay, and as far as red bluff and Carnot bay from One Arm Point.

It's all to do with season, if it's hard to find dugong and turtle you need to travel to find these animals.

Tide movement is important- you've got to have the right tide for turtle to get up o the reef- there might be 2-3 days without the right tide.

On some reefs, there have never been turtles- but people know where to go

There are certain times for hunting. Now it is Married turtle time.

Is it wrong to kill breeding turtle? The eggs never go to waste

September to March- eggs are on the beach.
We hunt ordinary turtles at other times.

A real good turtle hunter will see it first, as it goes underwater he will check it out, is it right to eat? Too old? Not enough fat?

Nowadays, some people spear it, cut it open and check the fat- sometimes throw it away if there's not enough fat, That's not good
Turtle hunting happens at most times, dugong hunting only at certain times.

May-June July the cooler months are for dugong hunting.

You need to recognise the turtle first- is it fat to eat? Good hunters can tell. If you want a turtle-kill it, don't wound it.

We fish a lot here, get a bit of oyster, when we are sick of it, we go out for turtle

Nothing has changed, people don't really slaughter turtles- they're mainly for feed.

As the moon gets bigger we go out onto the beach- the turtles start laying. We only hunt females in season, people are worried about females.

We hunt both ways today. Boats are used for other things, fish, stingray, dugong. A couple of people hunt at night. I teach my sons how to hunt, sometimes we get nothing, so we just leave it.

If you go out on a fishing/hunting trip you may come back empty handed. Hunting is not as easy as it sounds You need to be lucky, you might harpoon him, you need patience.

We fish on the out going and in going tides, we go all day.

Young blokes chase too much, but when you get older you change- you want to preserve things for the next generation.
Need to follow turtle, got boats to follow turtle now- outboard is a safe way. Still go to the better places

You can tell by the colour of the turtle whether its fat or poor. I teach my kids, and nephews the same

things. It's the same for dugong. The old people try to teach the same thing- how much do people know the difference between fat and skinny?

Dugong are really big and fat at this time of year. You spear them, they take off for a while, then you have to jump on them, hold the tail, turn them over and tie them up and drown them.

If you want to hunt the traditional way, you need to know how to track it down, how it's feeding, how it's breathing, sometimes they zig zag.
If you go the traditional way you learn the way of the dugong. If you're on a reef you know it's a feeding ground, you know where it's coming up for air.

You need patience to hunt in the traditional way, they have their own time for when they have to come up to breathe- you can time this with a watch.

With modern ways if you see 5-6 Dugong and you chase one and miss, they all go away. If you scull for one and miss, the others are all still there- another 4 chances is a big difference.

If your wife is pregnant or you have a young baby, you can't hunt married turtle.

When you are hunting you need to know when the tide is in or out, what time of day.

Younger boys practice by getting young ones

No moon/lights: go out and follow Goorlil- Joondomen (?) the phosperence on the turtle in the water- glowing plankton.

Moonlight- Nimingar: go out on the beach in the Kooljaman area- the tide brings them in, wait for them. The females hang in the shallows, the males are out deeper.

A few of us still scull for them in the deep water- you can't see the bottom- Galloway and Bulloway.

Turtle- anytime- tell which is fat and which is poor
Pull out the tripe- put in hot rocks

Dugong hunting-but not babies- this is traditional.

When I want a turtle or dugong I go to the right place. I've told people- we're going to be gone now, they're not listening.

Telling people not to go to these areas because we're hunting now.

You don't have to scull, you can drift with the tide.

Barragan tide comes in - in that area sit on the beach- when the tide covers the rocks then look where the dugong feed. Then he comes along- dirty water where he's feeding- then you go and kill it.

The face tells us if they're fat, old, good

If you see dugong- try it out- elderly people wanted season- when you see married turtle- that's the season.

KEEP CULTURE STRONG

Aboriginal people don't let anything go to waste

Old people like it better when you do it the traditional way.

In our culture, nothing goes to waste.

Tradition, right way, people need to be told. It should be done the right way, with respect. Not going out and taking five or six at a time. They are beautiful creatures.

Knowing the right tides is a matter for survival- it's very handy if your motor breaks down and you need to get to the next island- which current will take you back in.
I hope that my kids and grandkids can still hunt turtle, and still show respect.

The mating season is the main hunting season

Married turtle season starts October- November but they're not really laying until the wet season starts.

Dugong come in winter time then people start chasing them
Experts would know the right times

There are seasons, at some times they are many, they move around a lot
Now is the time for mating, it' getting later and later every year, not with the month.

Seasons are important you have to hunt in the right time. This applies to other things too, like oysters and fish.

Last year in November-December there were turtles out there. In 2000 it was October- November that is the normal time for mating. in late July there were mating turtle- that was very early. The old people are saying that this year is very strange, we wonder what i happening- it's Lalin, there should turtles out there.

Seasons- people used to know the seasons by the tree's flowering- it t you what time of year for turtles, stingrays.

People didn't used to have calend there were two main seasons, La and Southeast

The white gum, when it's bark falling off- that means the rain coming soon-the married turtles out there, when the rain comes t turtle hunting is poor.
Also when the big paperbark is flowering, the turtles mate and floo with the tide.

It's all to do with the reefs, ecosyste the water colour changes. Not blu creamy, greeny-blue it should b crystal clear The wind changes.

When I was growing up with the o man looking after me he taught n ceremony, Law, hunting- when to about the flowering tree's.

There are seasons for hunting, you for fish in the right season, then to o fish- it is a good way to look after country.

When Married turtle season starts- w they lay eggs. It's the right time. T spring tide starts, go through to th neap tides, Jellyfish time. Januar March April. Eggs are rare- maybe turtle island

Two seasons we hunt them.
Clouds mean its lalin time, laying t

In March, the jellyfish are spawning and there are turtles everywhere, people scull then.

We have to keep in that one line, that one culture. No arguments with the elders, pass it down

Knowledge is going, some turtle was wasted- someone else ended up eating that turtle but the young fellas left it for waste

Law tells you about hunting and sharing and what you can and can't eat. You learn to respect your elders, even if they are only one year older. You go through grades, like in school. You learn to not think you're better than anybody else, look over your shoulder and there is someone who is better than you.

If you're sculling for turtle, you wave a fast boat down, so they turn off their motor. When they see you sculling, they'll go in another direction. If he's there first, even if its not his country. We do the same thing for turtle or dugong. People have all been taught the same way.

You have to respect the turtle, can't chuck away food. We've lived with it for all our lives, we need to preserve it.

I hope that my kids and grandkids can still hunt turtle, and still show respect Dugong, should be hunted in season. Some young fellas hunt outside season- this shouldn't be

We can't go back to the traditional way- people don't want to go out and back with nothing. I will support the traditional ways but I don't think its going to happen.
Tradition, right way, people need to be told. It should be done the right way,

with respect. Not going out taking
or six at a time. They are beautif
creatures.

There has been talk of some child
being cruel to dugong, turtle an
shark. They might be bored, an
angry, we need to teach them t
right way- if you kill it you should e
In other parts of the world people
starving.

Certain flowers, the flowering sea
tells you when the fish are fat, w
the turtles are fat, when their eggs
in season.

Stingray season- they're fat now,
same time as married turtle. There
no seabirds around- that's bec
they're nesting now, Twin Islands
the main two islands for seabirds. G
swallows.

Deepsea mullet are fat now. Surg
fish-their season is now.

The whales come in- showing us
turtle season. Certain trees have s
and flowers- this tells us a lot of thi
wattle seeds.

Red fruit for the dugong season- this
medicine for us- if you eat that fr
stablises your stomach for diarrh
Everything has a meaning to it.

There is a certain shark- Lulul. If
have bad luck, if we miss that turtl
the spear comes out the shark m
bring it back for a feed. It's happe
to me, and a few other people- it's
God's helper, god's gift.

Boys go out in the mangroves,
spears to catch a feed. Some of
boys go out walking on the be
looking for stingray.

We travel most of the islands, camping, holiday for the kids.

I've studied most of everything with my old people. We used to come here with mum and dad, and we used to walk- no flash road or anything- we used to get where we wanted to go, Djarindjin Kooljaman.

Certain season for different fish and that you know.

Seasons: 12 months, mainland fruits and that. Remind people that we do have seasonal hunting and these are what they are

We should be teaching culture back to the young kids, working on country, looking after our food supply.

Mayal- hardly any fruit that time, now, not much, people used to be in season, taking notice for bush food. Hard times. Cultural things- kept things plentiful. Now people don't share, there is less food. The proper ways makes things go plentiful.

There are 6 seasons, people don't use them any more.

Oyster in the right season. Still know what's been happening. In the early days, we knew the right seasons, even when we used to get fish- cook all the small fish, no stink on the beach.

We used to cut up sea slugs, put them in rock pools
Floating fish traps, made of branches, Spinifex grass, leaves. The mainland mob used to pull them. Ayin. In fish trap bay.

Monkey fish- all gone. People only go for mullet, bluebone now.

Barrgan- cold season, we used to them in the seaweed, we'd block hole, then when the tide went out pull the rocks away and dig them We used to trap things.

New generation- think they k everything- they don't. We are the mob who know- everything is g now. You go to the young people- don't know. We mob, came Sunday Island.

Families used to be close knit, stic their own groups, everything used t shared. Share, share, then give to kids- we have too much. All th gone.

If you look after the land, the land look after you.

If you waste from the sea- it will b gone.

Radio, disco, all these other things away from that good food. If pe eat these fish they call 'rubbish' they would get healthy. The old food has all those trace elements people need.

We can rebuild the fishtraps and b in the mullet. No-one does it.

There's a special red mangrove tree

I've given up now because no-one wants to do it.

August- Married turtle, Febru Dugong, Stingray in between- g grows after rain, Southeast- Oysters Winter- Stingrays
4 different turtles: we eat all types o and turtle- it's recent that people a eat loggerheads/hawksbill

Stingray- once a year at the right tir

Oyster- when the rain drops it's finished- after that you might get 1-3 good ones but the rest have been affected by the rain drop

Cockles- are not Bardi food We eat hermit crabs- we know how to eat them

Clam shells- three types
Bendy ones- Kangala)
Miginana, Ween small ones- initiat
the second stage can eat these

PAST HUNTING

In the old days people would scull out in a dinghy, that was harder work people appreciated the catch more

In the old days, people prevented the killing of male turtles.

In the old days people would hunt kangaroos, goannas, fish, turtle, at different times we would hunt different things

In the early days people would sing for turtle- they would come up. Old fellas would swim out and grab a turtle- didn't grab it, made a line out.

We used to hunt during the breeding season, not the same numbers as now

In the 1970's people learnt about outboards and chasing the turtle Before that it was sculling.

Married turtle- people would swim for them, hunt them
Come up with the tide, swim for it. First man gets the turtle, divide it up traditionally. Hold it by the shoulders- it can't get away.

Hunting has changed, up to the 50's it was mangrove rafts, then sculling till the outboard came in the 1970's. Before the outboard you would go the whole day, depending on the wind and the current, you might not be successful, there were loads of turtles.

It used to be a sacred thing- we couldn't make any noise or we'd get belted by our uncles. Now it's like fun, there was more respect before.

Sometimes young people are annoying on turtle trips- not much respect, but nothing stays the same

Married turtle song- sing every afternoon around 5pm-8pm, turtle come the next morning.

Running water time- walk along, 4-5 men, talk to lalin rock, sit on rock all day- singing the married turtle.

Dugong- got a song. White rock, break it- easy for them.
There was two ways on the island: Dugong season-cold time, south east wind- sang for them too.

In the old times- there was less transport-couldn't get everywhere, places were close.

Everybody camped on the beach to look for eggs at the right time

In the old days, at the back of Sunday Island, in moonlight in dugong time.

On the edge of the reef, one woman would throw rocks. They come over the reef, run into the men, they caught them with their hands, drowned them. Told the women –we got them, take them back to camp, light fire, wrap them in bark. People were really quiet, no noise when they got dugong.

Married turtle season- people used to sit on a certain island, on top of a rock. They could see them come

up already- they could go out and get them.

Kalwa- makes a nest sort of raft- used to go right out from One Arm Point to the twin Islands. Now we've got fancy boats.

On Sunday Island we went by season, people would hunt only in dugong season. Things used to be plentiful, we knew when to catch them. When the season was over, we didn't hunt.

We got turtle in married turtle time, and now and then when we saw them on the reef. Just enough for 3 or 4 families, that's all.

In the old days people would send smoke signals. Big fire was a dugong, small fire was a turtle. If you signal with crossed arms, it means you've caught a dugong.

Might be children being cruel to dugong, turtle, sharks. Boredom, no-one to work with the kids, anger, how to teach the right way. If you kill it, eat it. Other parts of the world people are starving.

Meat is life- turtle meat, bush tucker on the island

When the tide used to go out women would go out and spear fish and bring them in for breakfast.

Dugong- hunting
February- elderlies would get up- look to see if the dugong are there
Maamabul -red painted man sat down to get married

Monkey fish- on the reef. Light fire, dig a hole, put in stones for each fish, cover up with paperbark leaves. Mangrove wood, after half an hour, smells for miles, a beautiful smell.

On the islands my brothers and I used the same dry oven, always leave it and reuse the same one.

Bush food- no-one does it anymore. Sugar bags , red fruit white berry. All types, blackberry what we can eat.

Turtle Island in King sound- sacred island. We have to stand up to CALM. Young people don't respect the Law.

PAST EATING AND SHARING

Food has changed, in the old days people used to salt up the dugong on bough sheds. They would drop off the head and tail to other people, sometimes they'd paddle from Hunters creek to Lombadina to do this.

There are salt pans in the marsh in which you can collect rock salt from the tide. People used to use this to salt fish, turtle and dugong so they would last a long time. Beef too.

If you salt the meat you don't need to worry about catching another one, when it's all finished up then you catch another one. The meat would last for a week.

First they used to roast the tail and then salt it up, they used to smoke the meat in paperbark and mangrove leaves.

Smoking doesn't last as long as salt. People still cook meat in a loog, a ground oven.

People didn't have to worry about getting dugong too often.

Turtle would last for two days, then you could go for other food, like cockles, fish and crabs. Maybe they would catch a turtle once a fortnight, but they would share it with a big mob of people, cooking it whole with rocks in the belly.

Dugong was the same, the more that were salted, the less needed to be killed. But fridge means it only lasts for a little while, the taste goes after two days to a week.

In the old days people used to share out the turtle, leave some for everybody to take a piece

Now people only take half of the eggs, not all of them, not like before. This was the natural tucker for survival in the old days, there would be no tucker for a month, stingray and turtle, few fish bluebone biting.

Eggs we ate them as kids, as well as rations

One group used to get turtle- 3 or 4, everyone used to share. Now, people don't share, they not thinking, even now- there's not much bush food.

Cut im up on the beach, chuck im away. Before- At One Arm Point, in Lalin, we would camp at one spot, used to get Goorlil- never waste. Put all the bones, dugong- in pyramids, turtle too. Not chuck em back. They don't know this time.

We used to bury the bones of the fish so the tide could come and take it back.

In those days people were healthy, no Gardiya food, no diabetes, heart problems.

Go for turtle, night fishing.

EATING AND SHARING NOW

Eggs are mainly eaten before are laid, by catching the females

Flatback and loggerhead (eggs?) smell very strong, people don't like to eat them.

You can't live off turtle and dugong everyday, although some people try

We only go to the shop for vegies, tea and sugar, the rest comes from the land and sea

There are heaps of dugong and turtle out there, you can get them whenever you feel like it, there is no need to keep them in the fridge or freezer.

Small turtles are more tender, you can finish them in one day, with no waste.

now there are so many other things to get, there is no need to go hunting

Now people only take half of the eggs, not all of them, not like before. This was the natural tucker for survival in the old days, there would be no tucker for a month, stingray and turtle, few fish bluebone biting.

People still cook turtle in the ground,

People give meat to town people- why? They've got cow, sheep, pigs… Should be here only. People should share turtle here, not to town. They have everything there.

It's for Bardi people to eat, not those people that eat bullock. Broome-some people from stations, taking our turtle and dugong.

It's the cheapest meat, the main source at One Arm Point

Older people like the younger turtles, less fatty, tender like veal.

Relatives in town- haven't got hunting skill but they love the food. Come here and ask us with the skill and knowledge to hunt- say we want a good feed. So our own intake is given to others.

Our lifestyle is about sharing, generosity and hospitality.

Bard people, other tribes have tasted the food and like it. They don't have the skills- use people who hunt and who will always give.

Turtles are a delicacy, and food for the family.

Need to eat fresh- not from fridge

A hunter gives the meat to his uncle first- the man who brings him through law, His Mum and Dad wait for last.

Your Jawal brings you through law, he is your boss in real Law, he gives the meat to his brothers first. There aren't many people who still

follow this practice, but some people do.

Fish, turtle, dugong, are always part of us, the main source for us.

It is important to cut up the dugong the right way, and share it with the community

People used to cut it up the proper way, some people get the head, the chest, guts to the right people. Now they freeze the meat and send it to town.

There are lots of people without a boat who would like to have a share of the meat.

Living off the sea is very important to people economically as well as other reasons- people can't afford to buy things from the shops

Turtle and dugong- we used to share it, Now a couple of persons they don't give out, they keep for self.

I used to eat turtle every morning before school, it keeps me going all day.

People come here, from Broome and trade meat- kangaroo, emu and beef for turtle. It's good to have a change sometimes.

We've got to let it go, don't keep everything for self, keep a bit, share it out to other relatives.

I see people, they kill 3-4 married turtles, usually they just go for waste- they get left in the fridge.

Some people, if the turtle's not fat, they take it to the dump. Some people, they'll cut the neck, if it's green, they'll kill it, if not they'll just leave it- the blood attracts sharks, that turtles got no chance.

People waste food, fish. Fish not too little, no rubbish food. People are too picky nowadays, they throw away good food.

Cutting up the right way- share it around the community
To Broome, Beagle Bay as well.

Don't eat other turtle- mainly go for green turtle

Married turtle- eat the yolk inside the turtle

Cooking- light fire get stove hot, put meat and fat and yolk together in a pot and we eat it

When we're in town we buy meat

Jawal gets the first meat- but not anymore

Sharing has stopped. Jawal is out of the question now.

Don't cut the dugong straight away- leave it overnight when you cut it the next day there will be a beautiful smell, cut it open and it's ready to fall apart- beautiful.

Turtle- stand it up on the bottom flipper- cut it the next morning and it will be beautiful.

Got to cut it the right way. It's not done anymore, they don't know the right way.

Since the 1970's there's been no sharing.

Salting the meat hasn't been done since I was a teenager- used to go to the beagle bay salt marsh.

Soak the meat in a bucket of salt water- dry it in the rock. Saucepan of water boil it.

HOW TURTLE LIVE

Different turtles are found in different areas. There are loggerhead, hawksbill flatback and green back, as well as a cross between hawksbill and loggerhead which is found only around Mudnunn.

There are no male loggerheads, but they do breed around this area.

Hawksbill eggs are the smallest, followed by loggerhead, then green back and finally the biggest are flatback eggs.

On the west coast the greenback nests, the loggerhead and the hawksbill nest on the east coast

The flat back nests on the high islands. The greenbacks nest past Swan point on the east side

Turtles take a long time to breed and grow

There are greenback, hawksbill and loggerhead turtles, they breed in the rain season up here, there isn't much on the other side.

They breed on Long Island in king sound and in Goodenough bay you can see the tracks coming up, there are 5-6 nests.

. they can be brown, dark blue, some with spots- patterned like hands, some with dots- all of these are greenbacks.

How big is the neck, is it a small head or a big head, if it is a small head and a big neck it is a fat turtle. The greener the neck, the fatter it is. turtle fat can be dark green or yellowish green.

When you are hunting you need to know when the tide is in or out, what time of day.

There are a lot of smaller turtles around, but they're not breeding yet. They move in certain seasons, like whales- you can't tell how many there are because of this migration.

At some reefs there is nothing, at another there will be heaps of them. It has always been this way.

if you don't know the movements where do they go? then you would have to row around looking for turtle. The old people knew the right spots

Fire on an island will keep away turtles, it affects them somehow we don't know why-this would be good education

Every year the turtles go back and their families to the same nesting beaches. It's like the eagles, they always nest in the same place, generation after generation, same family on the same rock. If you ruin the nest there will be no more eagles.

Why are they on some reefs and not others? the old people know where they should be.

One day in November, there are no tides, the fish come up and die- this has always happened in a certain area and might still happen. you would have to be in the right place at the right time. No-one knows why.

Turtles been around for millions of years, always our food.

Sometimes there's a lot of turtle, sometimes not, like fishing- there's not always fish around.
Turtles come from all over Australia, Thursday Island, Karratha, Exmouth, Carnavon.

Survival rates are so low from nests

Turtle's migrating don't stay in one area for too long

There are more turtles at night (less motors)
Different kinds (of turtle) – greenback- the only ones we eat

Turtle aren't as smart as dugong, they wander all over the place, if you chase him away he'll be back next tide.

There are a lot of dingos around, which eat turtle eggs.

At night turtle come in to the shallow water, close up.

There's a lot on the other side- mayala country, no-one hunts there- it's too far for a small dinghy.

Married turtle-everybody gets that, running water time- season for married turtle

Turtles lay eggs on the islands, mainly Lacepede Islands for turtle. One tree Island is a Leatherback breeding area.

Jellyfish season- turtles eat that, it's a season for hunting. They float up with their eyes closed, because the jellyfish stings their eyes- they are easy to catch.

Ooodoord (married turtle) There's nothing in the turtles- empty stomach, they float for days, you can go and touch it on the back

3-4 turtles climb up between Kooljaman and Booljoon
Minayri all gone. When the white man took over the beaches. Cable beach- too many cars and people.

Turtle- three types that nest up here,
You can tell which is the loggerhead- banmagalla) -1/2 size head, rallal- smaller- shape of head – loggerhead

Goordimilli- greenback- big eggs
Flatback- bigger one- good eating
Loggerhead- small eggs- can eat it
Hawksbill- small one

Loggerhead- there is a mark on the egg, like a stamp, the plain ones are greenback eggs.

Smell of human kills the eggs so you don't leave half in there- you're not allowed to they will die anyway- this is my culture from the ancestors.

Sometimes two mothers will lay eggs in the same hole- on the same night/day.
Never a row of sand between the eggs- what happens? So many eggs must be more than one turtle. Loggerheads only.

Every reef- should be a turtle. They're smart like people. They won't go there if they are going to be hunted.

HOW DUGONG LIVE

Dugong usually breed around Roebuck bay, but the cyclone ripped away a lot of the seagrass. They now breed between Beagle bay and Talbot bay.

Dugong migrate up from Broome up to dugong bay, people chase dugong around, they get messages from all over telling where the dugong are, people know country in more than one area

Dugongs are not too bad this year, their numbers fluctuate, Between Pender Bay and deepwater point they are there all year round. The cold season is the hunting season

If a big cyclone comes it covers the seagrass with sand- so there are less turtle and dugong. Broome was hard hit this year so blokes come up here to hunt

In 1997 there were dugongs everywhere- this happens every now and then.

Winter time- dugong time. Can't hunt out of season- not much fat, they're fat in season. People can't get them, married turtle- too quick.

Some dugongs are travellers- they have tender meat because they move a lot. The locals are more tough. The old people knew this.

The dugong is a very smart, thinking animal- if they have that feeling… if there's danger around he'll move away, get very touchy.

Some years are good for dugong, some years there are none, some years a big mob just show up. This year is good.

Dugong breeding season is March-April –May, they stay until August and then move on.

Dugong move past Djarindjin, but quite a few hang out off One Arm Point. There's not much seagrass out off Djarindjin.

You can see where they have fed- they leave a plough in the seagrass- you can come back later and it will be there. If they find a good patch they will come back everyday until it's gone.

If you chase them they won't come back, but if you hunt in the traditional way they will.

Dugong have very sharp ears, every little noise you make- they're gone. Outboard motors make them really wild.

With this southeast wind, biggest mob dugong come in.

Dugong migrate up past Bidydanga, not too many are hunted down there.

You find dugong when the tide is big, they come up and feed.

Dugong are also easy to find when the tides are neap- they stay in one place feeding as the tide doesn't change too much.

The dugong down on the main reef are pretty wild, when I paddle for them they circle around.

The dugong are so wild now, people have started going over to the other side to get them. We have a feeding ground here- they've been here for years and years- the dugong will come back in here if they feel safe.

In the old days when I was growing up with my uncles there were lots of dugong around. Now they are there but they're hard to get- they're nervous.

In the past, every year was a good year for dugong.

The dugong are pretty touchy now, they are worried for boats.

Moonlight is a good time for dugong but at the moment they are moving around in the deep, not coming up onto the reef.

Dugong move past Djarindjin. Quite a few hang out off One Arm Point. Migrate up past Bidydanga- not too many hunted down there.

They are really big and fat a this time of year.

Spear them, then go for a while then you have to hold the tail, turn them over, tie them with rope and drown them.

Chasing dugong is a concern
Find dugong when the tide is big- they come up and feed.

Sculling not motoring. Knowing the tides, survival- handy if your motor breaks down. Next island, which currents take you back in.

Now is the best time for eating dugong.

Dugong: after august- start to get tough. Season-is meat for us
Travels right down to Karratha- shouldn't travel that far.

Dugongs are really sensitive to sound- one little bang and they're gone.

Dugong by itself- in shallow near the rocks, playing. When the tide goes down to just it's back is showing- goes to a pool that's where it sits. Tide comes in and out, plays around aware of the birth coming. Tide turns same way, same area, movements fins- then –bag of water, then a baby. Mother drags baby to the rocks, tide turns mother on the outside in a calm place, baby near the rocks, push it up to get air. Couple of days after, goes same way, come back 2-3 weeks out further to a calm place, not a deep place closer to shore.
When the baby is big enough- not feeding- We can get the mother one- but do not do this much. Mothers are very important. Mothers and daughters travel together. Male ones come in to make love. Innadillar. We know which is male/female.
Males try to cut out young one from the mother one, the male wants an older wife. So we have to go after the young one. Life is so beautiful.

OTHER MOBS

CALM wants to press laws on people this is not good

It's hard to work for people who don't understand culture, like CALM.

Pearl Farmers used to kill loggerheads because they eat pearl shells, they offered people $20 a head for the turtles. This was wrong, people don't eat loggerheads so it was a waste and only for money.

At the Lacepedes they got them up on the beach and did some tagging

There was turtle tagging- that tells how turtle travel and migrate.

Native title is really slow, it seems people are trying to stall the process, so they can make other things happen- open the roads up and get everybody and their cats and dogs up here.

People don't listen to communities- they are not consulted.

CALM was here so many years ago and nothing happened.

We went to Gove, to see Dhimurru, we wanted to know how can we go about this? we wanted to leave a couple of guys there to learn about it. But nothing happened.

KLC gave us the money to travel up there, but there's no money now.

We need Native Title to look after the land.

People were growing turtles in tanks- they were growing well, but the funding ran out. we need funding to keep things going.

Tagging turtles- research- that happened in the past.

CALM can't stop us from hunting- that's part of our life

Talking about the Lacepede Island trips- we weren't allowed to eat any turtle or dugong on those trips. Maybe because the islands were nature reserves. We were busy measuring and tagging- we should have been able to take one at least.

Office people need to come out, see how some people scull, some people motor, some are unlucky

Long time ago when I was a little boy- whiteman came here, killing dugong in dugong season- killed lots for oil. Jackson Island, sent drums, boiled dugong for oil, into bottles- Darwin way too. They still getting more this time.

The old turtle farm was run with old technologies. In the Northern Territory they're breeding hawksbill, they grow really fast. It was too much hard work for the old farm, feeding them by hand, changing the water by hand.

There was a turtle Farm, little ones at OAP, grow them up. Profit as well as conservation

Camp- go back to old mission time, running water time- camp there. When the mission finished all went back

Indonesians and Gadiya- keep away from nesting, we should leave some eggs

There are tourists everywhere, we need people to control them.

How many boats there are- worried about lots of people coming and camping, bringing their boats in and out.

Concern about poachers and overfishing, and too many pearl farms which stop people from going over their boundaries.

People feel they can't use their hunting areas, they are being taken over by pearl farms, commercial fisheries- long line fishing.

Netting kills turtles but some fishermen use TED's to let them go- Olive Ridleys

People see changes, but outside people don't listen. Why don't they listen? Will they ever listen in the future- what difference will this new plan make?

Cable beach used to be a big nesting beach, but not anymore- tourists are ruinng the beaches.

Ore carrying boats fill up with water, then flush it out into King Sound: what will this mean for our turtle and dugong?

Near Derby the boat club camping n Turtle Island chased away all the turtles. People should avoid turtle beaches because turtle avoid people.

We should work and learn about turtles. Bardi mob should have more say on what goes on. We should work together, Bardi people know what's going on. If we agree we should work together. No head butting, just everybody working together.

Indonesians kill too many they let them get thin- they don't eat them straight away, they are stored to be sold- it's a waste

Native title might give the communities control over the sea- the Bardi are salt water people.

Monitoring- the money dried up.

We did the coast care thing, monitoring turtles with John Silver, Patrolling, measuring checking tags which he sent to fisheries in Karratha.

The funding ran out, but it worked well. It's been proven, done- one year coastcare..

They did tagging at the Lacepedes You can't spear the ones with a tag.

The turtle farm/aquaculture tanks should never have been built.

HOW MANY ARE THERE?

Nowadays people are chasing turtle with motors- there are less turtle on the reef- even when you are just fishing this chases the turtle away. It might be the smell of the petrol causing pollution.

Young people don't realise their chasing them away, that turtles know about people.

More boats, means there's fewer turtles, too much noise. They move to another area. Dinghy, outboards make too much noise.

Someone came out 20 years ago- talking about a decline in numbers, but I haven't seen that- they seem to be increasing around here at least.

It's not the same there's still turtle around but not as much as before- any turtles.

Turtle numbers have decreased around here

This time, turtle and dugong- there's not much. Before, there was lots

Turtle stocks are getting low- there has been a huge decline, because of the motor, outboards, tinnie dinghies

90% of them are female, fat and rich, lately though it seems there's more males- we've taken too many females.

The stock is dwindling, we don't see them any more.

There has been a decrease in numbers over the past few years

There might be more around One Arm Point, on the shallow reefs at night

There's not as much as there used to be.

Not as much married turtle last few years, people used to look forward to this, now we haven't been getting it.
Now is the season, but no-one has got any this time

Might be losing numbers, scared away

Concerns about the future- will there be any left?

Both turtle and Dugong numbers have declined there were lots in 1997.

Some kids, they kill it just to find out if it's fat- if they do this they should take it back and cook it up anyway, and not waste it.

Some people kill just for the fun of it- we should respect it and preserve hunting

Some people kill for the fun of it- that shouldn't happen.

In the old days people used to catch few dugong. Now, much more.

People are worrying about if there are any left, motor boats. In the moonlight, kill many, when the

moon comes- get plenty- too much.

Old people are saying- it's too much.
Old people worry- they've been living more than young people.
They kill too much.

In married turtle time, maybe ten, that's all. Same as dugong, But they killing over, because they have outboard motors.

Killing too many- no need for that

While it is custom, we might be taking too many now.

Worry about taking too many females

When I was a kid we went out with our uncles- there were turtles everywhere, that's changed. We used to go out on a full moon at night.

Turtle, they're alright, everywhere, like rubbish.

There are plenty of turtle round here at night.

This year there's not much- it's like that, like the weather, some years you get more rain, sometimes it's a drought.

Dugong- there was lots last year.

Monitoring is hard- some turtles migrate- some stay in the same area. Greenbacks- are getting hard to find… not laying enough eggs?
Plenty flatbacks and loggerheads.

Old days, growing up with our uncles, there were lots around. Now they're hard to get- nervous.

In Koori bay there's dugong like rubbish, if we got the outboard out they'd be back there.

There were turtles on every reef until young people started chasing

TOO MUCH RUBBISH

Concerns about rubbish, plastic bags in the fishing areas.

Plastic is blowing over the fishing areas

We need research into the mining boats in King Sound, to find out what is going on, what effect the spilling of ore might have on the reef.

It's like the chemical run off from the cotton farms- that didn't happen in the end, but we were worried.

In the United States, at the Boyen Islands they are worried about growths they are finding on the faces of the turtles. We haven't seen that here although some turtles carry old wounds and barnacles.

We caught a big Greenback with a really soft shell, like it was cooked. we wondered who to see about that, we wondered what happened to that turtle.

There are big tides in the King sound, that could pull up the zinc and lead to this area.
are there any contaminants in aquaculture. They are grown in Broome and put them out on these reefs, we need to ask what's happening, -people use trochus for bait to catch bluebone, snapper and cod

There are less fish and crabs- because of plastic and rubbish

Worried about rubbish from ships. Plastic bags in the water and on the beach

Mining barges- zinc and lead

Blue-green algae pollution- why? There's too much rubbish From boats

The number of turtles laying has decreased around Djarindjin

We worry about the mining, and pearling leases- how far do they extend?

Some people feel worried for turtle eggs

Cyclones demolish feeding grounds-this affects hunting, nothing is around when the seagrass is gone

Coral bleaching- global warming
Fish dying in Pender and Beagle Bay

The stingrays are going- why? maybe the cygnet bay pearl farms

We need to keep the place clean- no rubbish on the beach.

Even humans get sick of the noise (motor engines)

There is too much plastic in the water

WE NEED RANGERS

Rangers should be trained up this happened before, long time ago but there hasn't been any rangers

We should train young blokes it's hard work, tell them how important it is to look after the reefs

Community rangers

We should have rangers to look after bushfires too.

We need community people looking after country- it doesn't matter if they're rangers or fisheries officers

We need feedback on the rules- more information from CALM, we'd like to know about any changes.

The people who are making the rules in the office need to come out on-the-ground- and see what we're doing here.

There should be an office, someone based here at one of the communities to see how things are done.

Rangers could take old people back to country, walk through the old places, tell where the sacred sites are so we can signpost them off.

We should have community rangers but we need funding for this.

Keep country clean

You would have to monitor things on a full time basis if you put in a quota system.

We need rangers from the traditional owners to protect them when they're nesting. People already know this- don't need whitefella qualifications, guys would love it, the jobs.

Traditional owners should monitor how many people are going out.

In a strategy of management we need to have something about visitors

Teach school kids not to kill small turtle and other things-rays

Protect beaches at laying time

We need vehicles and a boat for rangers.

We could have old blokes and young blokes working together to be rangers

There are tourists everywhere we need people to control them

The Lacepedes are a nesting ground, nature reserve, people Indonesians go and help themselves. Someone needs to be there in the nesting season to protect it.

We need rangers quick as we can, before the road is finished.

Women could be rangers too.

Training is no promise for a job. Education is not needed- we've got the skill within the community.

Rangers- we need control of country, young blokes need the opportunity.

We need to make sure there's no rubbish

There's too many people fishing

We need community people to be tour guides and rangers. There are a lot of tour groups going up, messing up people's fishing spots, walking on the beach. We need rangers, to control where these people are walking, to give the right information for tourism.
Tourist boats ought to have permits for fishing, we need someone to keep an eye on them. They need the power to take the catch, take their nets or their car- like fisheries officers.

There are too many tourist boats- we should get revenue back- we are claiming for sea. Money from the trawlers and the little dinghies too. Drag nest are a concern- few people go out with nets, they chuck them away, then the nets catch other things.

Tourists- how many fish do they get? Kooljaman, come up the boat ramp with big chillers- we should record how many. Locals should have more control.
We should run rangers through the CDEP program with top up wages. They'll need a vehicle, maybe a four wheeler (bike) something based at the main launching beach.

Each community should run their own operations- self control, not relying on someone else.

Rangers will need the power of endorsement, we need national recognition of rangers. Kakadu is a good example. We will need funding- could it be profitable- how do the shires operate their rangers- maybe have fines?

The cultural centre could be the point of contact.

Some outstations are close to the ocean, they could also be access points, with the community as the centre, the program could spread to the outstations.

MORE RESEARCH IDEAS

What right do pearl farms have to exclude people

What happens if you disturb the nest? Change temperatures?

How many times do females nest?

We should check out how many are laying monitor the populations

We should know how many married turtle are killed because those with eggs are lost from the breeding stock.

People should tag them when they're laying, and let the little ones come back- people take the eggs

we need to know how many are killed in a season

we need to tag them to find out how far do they travel. we need to find out how many there are and what else kills them.

Turtle research you can do it yourself, we can learn through the ranger course- that would be a good way.

We need to know- why does the season get later? How far do they travel?

We need to be careful about what people are doing- we need to live off the land, fish from the sea- we need to be aware of the research that has been done in these areas- particularly we need to be aware of the research don on trochus.

We need to have a look at these mining barges, and have a look at nesting and feeding grounds.

Lacepedes- Researchers and kids should go there and have a look, we're hoping that next year something like this will happen. As well as turtle there are birds, fish, crab stingray dugong and big reefs.

We should keep records of how many are killed, we have been catching turtle from all over- Vanuatu, Karratha.

There should be money for Aboriginal people to look after and study the numbers of turtles

There should be information going back and forth.

We should keep track of the numbers taken like they do up at Dhimurru, since no one really knows how many are being caught.

No-one really knows how many are taken, we don't need to know.

Should be research on how many turtles there are

Some of the reefs are getting covered by white sand- there's more sand than the reef itself. I wonder why so much sand has been shifted around. Washed down from the beach maybe?

How far do dugong travel in a day? Maybe from here to Carnot bay?

How far do dugong travel- where do they come from, where do they go?

We should record how many are caught each year.

Why are some reefs dead?
How many ships are out there? How close to shore do they come?

Worried about pollution from trawlers and tankers- on neap tides turtles stay out in the deeper cooler waters.

Worried about growing trochus in tanks- people are putting new trochus on reefs that never had this kind before. Are these tank grown trochus healthy? some turtles, hawksbill and loggerhead eat crustaceans, eat trochus, even the blue bone- do they put any chemicals in the trochus?

Greenhouse- water temperature changing, seasons changing.

We had a good system with CALM for a while- a paper to say if the turtle was male or female, to take it's measurements.

It would be good to do some satellite tagging of dugong. Dugongs are either trackers- with tender meat, or hard- local's. late February early march through to end July/August.
Then turtle- we still see dugong at that time.

Why are the reefs dying? Coral bleaching- the main bit is dead. Feeding places have been damaged by the cyclone- it moved the sand.

MORE IDEAS

We should talk to CALM go to the Lacepedes get hatchlings, get eggs, incubate them.
Have discussions about getting funds to sell them (grown turtles) for economical gains and consumption, or restock and consumption.

Ecotourism is a good idea, we can take tourists out to see dugong, or have night tours to see nesting turtle.
We should make it commercial.

We would need to have a gain from incubating them.
Another turtle farm might be a good idea.

Turtle farm could grow hatchlings from eggs collected from the Lacepedes

If you move eggs you need to be very careful, they die easily.

Get eggs from the Lacepedes and restock

We need information on how we can restock the turtle
We could get some turtles from the Lacepedes and release them from here

There was a turtle farm , little ones at One Arm Point, grow them up. Profit as well as conservation.

The old turtle farm was run with old technologies. It was too much hard work for the old farm, feeding them by hand, changing the water by hand.
We need more involvement at Kooljaman, the communities need to work together on tourism issues.

We should go to Melville Island to see how their management works there.
For the future I hope that the right to hunt and fish is still there- it should be the old ways, not the government putting down rules.

if you put them back in the ocean, seagulls, crabs will eat the hatchlings. A turtle farm could help build up the industry for this area.

One Arm Point needs an ongoing commitment to monitoring, dugong consumption needs monitoring.

A spotter plane would be good, we could go out on the islands, supporting other society.

School : it's important to include this education into the curriculum, get young kids involved. Bring back old cultural practices- communal unity, sharing, simple practices of respect. Put it into policy and practice.

Land and sea management requires a concerted effort, we need to include the islands.

We need to formulate from A-Z: what steps do we need to put in place.
Now until January is the turtle egg laying season. They have to beat the birds- seagulls, 1000's die every year.
A turtle hatchery or farm could take them back, fix them up

We should keep track of the turtle eggs, take half and leave half, keep track of the nests.

HUNTING MANAGEMENT

The tide comes in, they feed on top of the reef, you can catch them before they go into the deep water. We don't like that- we old people.

modern technology- the modern tinny, almost guarantees a successful hunt. If you go out in the moonlight you can come back with three big turtles.

Dugong should be hunted in season. Some young fellas hunt outside season- this shouldn't be.

Now with motors we can be too successful.

You need to think about the next generation and go fishing instead, go for beef or turkey- but not now while they're breeding..

When hunting people should take it easy and hunt only at certain times, not always

Get turtle for a community, get half a dozen for a community, not for one individual.

Don't over hunt, share the meat. Only hunt fat ones. Preserve for the next generation.

Every time I go out, I don't just spear the first one- I look for the healthy one. Some blokes spear the first one, next one…. People shouldn't be doing that.

We can't go back to the traditional way- people don't want to go out and come back with nothing. I will support the traditional ways but I don't think its going to happen.

People should leave the calves with their mothers alone
If people take eggs they should leave some behind to hatch.

we need to stay in season

people should only collect eggs from below the high tide level- these will be killed anyway.

People have been stopped from taking eggs near Kooljaman, so the turtles can nest here.

There should be quotas per family, we need rangers, we've been fighting for that for a long time now

Limits on hunting?

The old blokes think we should scull, not motor, which is a good idea

We could have a quota system

We should have sanctuaries, a couple of places where you can't hunt, a moratorium for five years on an area.

Mayala country is a haven. We should also keep the Lacepedes as a sanctuary, no poaching there.
We could restrict numbers, do this per family, but make it fair so people without boats get a share- they can borrow a boat and fuel from others.

During the year- give some main reefs a break- like trochus

Have a time when no-one can hunt. Break during wet season

Limit on take per day.

Shouldn't sell them in town

People with big boats should stay away from the main hunting reefs.

In the mating season is when people can get turtles easily- there should be a limit on the number you can take

I've been hunting all my life, we need drastic methods, led by families, outstations if not the community as a whole.

We need to do a deal with CALM.

If we got the government to buy a big boat we could go pick up eggs, and hunt on the other side, get enough for every house, give this area a rest.

if you explain about the importance of eggs people might stop taking them

when people go out they should only get one or two.

What can you say to the young boys- stop chasing the dugong all the time. Mainly it is the old guys doing the old ways

Its hard for young blokes but I'd like to see it go back to the old ways

For dugong, we need to slow down, paddle for them, its hard but its good fun paddling.

We should go back to the traditional ways, rather than hunting the modern way with motor boats.

If the young guys tried sculling, they'd see how easy it is to catch dugong in the old way- less wild.

If we went back to the old ways we might have good dugong seasons every year. The dugong head up further north or down south if there's too much chasing.

Young blokes don't worry about it, chasing with the outboard motor, dugong are very wild now.

There has been talk of people shooting dugong at another community. This is a concern.

Make a policy and put it into every house- so everyone is aware of it, with fines where the money goes back to fund the project. There's got to be control.

Per boat- there should be a quota per weekend, and a ranger program would be perfect to police it.

We need a management committee- who should this be. Other organisations need to be involved- CALM, Fisheries, KLC.

We should stop young people hurting young turtles- they should be left for the future.
Don't kill 2-3 every week- preserve so there will be more in the future, for the next generation.

We should hunt in the traditional way, without chasing. Noise chases the others away.

When you hear big mobs of people, they usually stop the turtles and stuff from coming in.

The smaller kids, 12-16, they go for spears, too many. When the big kids are not around they don't behave, they go for a kill and then leave it floating to rot. They've got too be taught the right way. If you kill it, eat it straight away.
We could have a big Notice down on the beach- if you're going to kill, cut it up, eat it right there.

We got to talk to the young ones, tell the young ones.

If young people are going out with old people, it should be just one or two, not 5 or 6. There's too many kids, too much ropes and stuff, someone could drown. There's too many kids at once, they all want to kill something at once. We should go in two's or three's.

Some people take a lot of kids, too dangerous something could happen at sea. People see silly ways, they are trained in silly ways.

If you kill a turtle- don't throw it away- give it to someone else if you don't want it. Share it out with people.

We should be sculling for turtle- turning the motor off- then you get more numbers of turtle on the reef. We have to wait for the full tide now.
The boys are running, chasing them away. Dugong dive down, right away- we should be sculling for it.

Full turtle-left it, not given to someone else- chase em, gone

We should ban outboards and get clinker builts