Ningaloo Marine Turtle Conference Exmouth

13 September 2003, Recreation Centre Exmouth

Proceedings and Presentations by Speakers

Convened and compiled by Raquel Carter, WWF

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This conference was convened for the purpose of bringing together interest groups, the community and individuals to share information and stimulate increased interest in the Ningaloo Community Turtle Monitoring Program. WWF is working in partnership with CCG, MU and CALM on a Turtle Conservation Program, drawing together a collaborative approach to turtle conservation in the Ningaloo Region.

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Background

In September 2003, World Wide Fund for Nature (WWF), Cape Conservation Group (CCG) and the Department of Conservation and Land Management (CALM) drew together turtle interest groups from all over Western Australia to share information and work towards a collaborative approach to turtle conservation in the Ningaloo Region.

Three of the world's seven species of marine turtles nest on the beaches of Ningaloo Reef. In this region, turtles are under threat from habitat loss and disturbance (nesting, feeding/foraging and breeding), increasing recreational activity, increasing tourism, and from the introduction of feral species, particularly the European red fox.

Green turtles *(Chelonia mydas),* loggerhead turtles *(Caretta caretta)* and hawksbill turtles *(Eretmochelys imbricata)* are threatened species under the IUCN Redlist and the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999.*

Species	IUCN Redlist	EPBC Act
Green turtles	Endangered	Vulnerable
Loggerhead Turtles	Endangered	Endangered
Hawksbill turtles	Critically Endangered	Vulnerable

Globally, marine turtles are under threat from fishing practises such as trawling and netting (by-catch), unsustainable harvest and habitat degradation. As turtles are migratory species, a concerted and collaborative effort is required to ensure that turtles and their habitat requirements throughout all stages of their lifecycles are conserved and protected and that these values are retained for future generations. This conference represents one step towards turtle conservation. We must think globally and act locally empowering a local community to address a global conservation issue.

These proceedings provide an overview of the conference, including a summary of presentations and a record of questions and comments throughout the conference.

Contact details for all presenters are listed.

Acronyms

CALM	(Department of Conservation and Land Management)
CCG	(Cape Conservation Group)
EPBC	(Environment Protection and Biodiversity Conservation Act)
FED	(Fox Exclusion Device)
IUCN	(World Conservation Union)
MU	(Murdoch University)
NHT	(Natural Heritage Trust)
NMP	(Ningaloo Marine Park)
NWC	(North West Cape)
QLD	(Queensland)
SA	(South Australia)
TIF	(Turtle Interpretation Facility)
TSN	(Threatened Species Network, joint program between NHT and WWF)
WA	(Western Australia)
WAMTP	(Western Australian Marine Turtle Project)
WTOMM	(Wildlife Tourism Optimisation Management Model)
WWF	(World Wide Fund for Nature)

1. Introduction and Welcome

1.1 Purpose of Conference

Donna Shepherd
Director Creating Communities
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Donna Shepherd donated her time as facilitator of the Conference to the Turtle Team (CCG, WWF, CALM, MU). Donna provided an overview of the purpose of the conference and emphasised the following intended outcomes. These are as follows:

- Share information/knowledge
- Bring together key stakeholders and community
- Increase community's understanding of turtle conservation issues in the region
- Stimulate increase community interest in participation in Ningaloo Community Turtle Monitoring Program

1.2 Welcome to Country

Anne Preest on behalf of Syd Dale

An explanation of the Gnulli Native Title Claim was provided. Anne emphasised that Gnulli is the name of native title claim not the people. There were originally five different language groups within the claim and now only three, which are the Biayungu, Talandji and Jinigudirie. Anne provided "Welcome to Country" on behalf of Syd Dale, Biayungu Elder.

2. Session One

2.1 Turtle Conservation Through Collaboration

Presented by Raquel Carter
State Coordinator – Threatened Species Network
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WWF has identified 200 Global "Ecoregions" which are regions of global biodiversity significance. The identification process was based on the level of biodiversity value overlaid with the level of threat and the potential for WWF to make a difference. In the Western Region, the WA Tropical Marine has been identified as key Ecoregion in northern Australia and Western Australia based largely on species endemism.

WWF's work is focused around themes. Turtles fall under "species" conservation thematic. This assists in taking a strategic approach to work.

Six of the seven species of marine turtle are listed as threatened and it is now obvious that there are some species that are in decline on a global scale.

Turtles are a flagship species. A flagship species is a species whose conservation can benefit broader biodiversity and other values. Turtles are a flagship species as they cross over coastal and marine environments – their lifecycles cross over different habitats (e.g. sea grass, open water, coral reefs, beaches, estuaries). Additionally, turtles can provide social and economic benefits such as eco- tourism, and also hold a strong cultural connection for many indigenous communities and a high level of intrinsic value for members of the general community. An example of a project in which turtles have been used as a flagship species is WWF's Arafura Program's Marine Debris project which uses the conservation of turtles as a purpose in cleaning up and preventing marine debris. Managing and preventing the impacts of marine debris has benefits for other marine species e.g. sharks, bony fish, birds.

Some of WWF's work on marine turtles in Australia includes:

- Arafura Program– working with Dhimmuru Land Management, floating turtles, Olive Ridley satellite tracking program
- Ningaloo – Initial contact made with Cape Conservation Group regarding funding for long-term turtle monitoring program. Initial funding provided by the Threatened Species Network (a joint program between WWF and the Commonwealth Government's Natural Heritage Trust). WWF is currently helping to establish a long-term community monitoring program in the region and have employed a turtle conservation officer to work with CCG to achieve this.
- WWF are looking to link work in Western Australia to the WWF international network through the proposed Asia Pacific Action Plan. Additionally, WWF will ensure that this work is consistent with the recommended actions in the National Recovery Plan for Sea Turtles.

Partnerships are an integral component of WWF's work. This project fosters the partnership of the local community, the managing agency and links to current research. Partnerships and support from the local community have proven to reap the best conservation outcomes.

The long-term objective is to have a self-sustained monitoring program that's community driven and the implementation of a Turtle Action Plan that incorporates the values of all turtle conservation stakeholders and interest groups in the Ningaloo Region.

2.2 Western Australian Marine Turtle Project

Presented by Dr R I T (Bob) Prince
Leader, Western Australian Marine Turtle Project
Wildlife Research Centre, Dept CALM
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Many of the turtles that breed on the Ningaloo coast don't even live within the boundaries of Ningaloo Marine Park (NMP). WWF's Ecoregion approach is supported for the purposes of turtle conservation. The Western Australian Marine Turtle Project (See slides) set out to address regional conservation and land management issues for turtles– turtles are now seen as icon or keystone species.

In the context of Exmouth Ningaloo region (NMP established in 1983; prior to this there was no marine conservation reserve in WA), sea turtles are an important resource. Fisheries interactions with marine turtles are a key to their management at sea. Green turtles were an initial focus of the WAMTP, and the project was aimed at establishing what species populations were found in Western Australia, where they were and how they were functioning. Little was then known about the region's sea turtles, except for the fact that the herbivorous green turtles were reasonably abundant and could thus provide the core focus for gaining knowledge of other species as well.

The WAMTP set out to acquire the long-term data needed to understand demographics of these long-lived slow maturing animals. To properly understand sea turtles, we must understand that they are ectotherms – they cannot readily regulate their own body heat – so core body temperatures are seldom different from the environment by one or two degrees at the most for the Cheloniid (hard-shelled species) – they are essentially tropical animals. Green turtles breeding at Ningaloo are also at the southern breeding limits in Western Australia. The fact that they are herbivorous means that they have very rigorous habitat quality and physiological constraints affecting their breeding. The fact that they are ectotherms as well as migratory in habit must be taken into account when looking at the management requirements for sea turtles. There needs to be a science project approach taken in this sense.

If sustainable eco-tourism with nesting sea turtles is the be taken into account in the Ningaloo Region – the relevant questions are: do we have a product, in what supply might that be available, and can we deliver the experience that people are wanting? People tend to forget that economics is an important component of any turtle conservation and management programme; e.g in Jurabi there are economics involved in setting up community programs and in providing interaction opportunities. There is a need to fit the biology of the turtles into the management scenario.

Understanding of population dynamics can help understand what is going on as the driver of on beach observations, and with forward planning and marketing. Work programs that incorporate tagging or marking of turtles because we need to be able to identify individuals to gain the necessary information for these purposes. A program that includes marking / tagging of turtles can also improve the interaction experience for visitors to the conservation estate. This means that anyone that comes across a tagged turtle can report it and potentially receive some further history of that turtle in return. This information from tagged animals can helps us understand the migration patterns and also why however many are coming back to breed from year to year– it can help to establish in the long-term whether there is any decline/changes in abundance, and possibly why this might be so. The population of adult green turtles visiting Ningaloo beaches for breeding has probably not changed much in recent years, however, they have had several 'droughts in the sea' within the last decade. It is a large metabolic and physiological cost for a green turtle ready to mate which can be reflected in their absences from nesting beaches during some seasons.

One of their main problems is establishing population trends is the generation length for turtles in the wild, which in good-mid range habitat is around 20 years. Animal populations don't just have a single level abundance – they commonly have long-term temporal generation length changes in abundance driven by environmental factors. In the case of the IUCN Red List process – they use three generations to understand threatened species conservation status and trends in populations. Most sea turtle population studies lack such data.

WA Marine Turtle Project with common integrating logo was developed, (right).

There was a huge investment in the WAMPT from very early on. This included investment from the community in both filed labour and also in material support.

Raw data sets can show the number of turtles that have turned up and that there was some decrease in recent times. There were three seasons where very few green turtles turned up to attempt nesting. Tagging commenced 1988/1989 with data soon showing that from year to year the abundance of nesting turtles can change markedly. In the second year there was a relatively good abundance of green turtles and in the third year hardly any green turtles turned up at all.

The maps provided on the slides show some connected stock distribution information – green turtles that breed at North West Cape migrate to the Kimberley Region, with the Lacepede Islands supporting the larger green turtle rookery in northern WA region. This latter population is shared in a joint fishery by the salt water Aboriginal people that go right across northern coast Australia, and extends into the Aru Islands (Indonesia) representing an international shared stock.

Loggerheads nest in high abundance off Dirk Hartog Island near Shark Bay, and many of these do live within Shark Bay. However, others of these Shark Bay resident loggerheads have migrated to and from the Muiron Islands breeding. This resident stock information was provided by a trawl fishery by-catch before by-catch reduction device's were implemented. Tagged loggerhead turtles that nest at the Muiron Islands and North West Cape have also ended up in the Java Sea off the coast of Indonesia and within the Gulf of Carpentaria. Loggerhead turtles from the main breeding sites in the eastern states intermix with WA breeding turtles in the Gulf of Carpentaria

Dr Prince concluded by emphasising that 80% of the resources that had contributed to the WAMTP had been the work of unpaid volunteers of the community and emphasised the importance and value of volunteers in the conservation and research of marine turtles.

2.3 Conservation and Management – The Nesting Turtles of Ningaloo

Presented by Roland Mau
Coordinator – Nature Conservation
Department of Conservation and Land Management
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The Department of Conservation and Land Management Exmouth District is responsible for the management of the Ningaloo Marine Park, Cape Range National Park and island reserves. CALM also conducts work under the *WA Wildlife Conservation Act 1950* and has a bilateral agreement with the Commonwealth to administer the *Environment Protection and Biodiversity Conservation Act 1999.* A recent WA Act, the *Animal Welfare Act,* needs to be considered for all research with turtles approved by the Department.

The Ningaloo area is significant for a number of reasons. The area that covers Shark Bay, Dirk Hartog Island, Ningaloo Region to Barrow Island makes up the world's third largest known loggerhead rookery – Ningaloo is right in the middle.

The species that come to the area include the hawksbill, loggerhead (endangered) and green turtles. Turtles have a very high mortality rate – only 1 in every 1000 hatchlings survive to adulthood. They also have a delayed sexual maturity at approximately 20 – 40 years and are not annual breeders. They may breed up to seven times each breeding season which is related to food availability. Turtles follow migratory paths and females return to the same beaches to nest. It is not well understood what males do during migration.

The turtles that nest on the coast of Ningaloo nest along hundreds of kilometres of coastline and it is important to determine relevant rookeries. CALM have worked with David Waayers, PhD Student at Murdoch University, to conduct aerial surveys which has allowed us to identify rookeries and ground truth them via track monitoring. Results have shown that there are quite large numbers of significant rookeries throughout the NMP. The Muiron Islands is a very significant area and the most significant for green turtles.

Threats to marine turtles in the Ningaloo area

Natural variation in nesting environment e.g. sand temperature, can lead to annual changes in nesting success of turtles. Predation from birds such as gannets and silvergulls and from ghost crabs, goannas and fish also make up natural threats to hatchlings. During adulthood sharks pose the greatest threat as the main natural predator of turtles. There are also diseases that affect turtles that are currently poorly understood for this area.

From historical records we have established in late-1950s through1970s around 50,000 green turtles were commercially harvested which is significant amount for the Ningaloo /Pilbara area.

Fox predation surfaced as a threat in 1950s. Peter Mack worked on protecting nests and results from the community monitoring program has shown that foxes are active in many areas - up to 70% at Jane's Bay, Ningaloo Station.

Other threats include vehicles and vessels – wheel ruts can lead to hatchling disorientation, exposure to predation and dehydration. They can also lead to significant changes to the nesting habitat over time. Vessel strikes are also a threat to turtles when surfacing for air.

Human interactions through increased visitation in the past few years has become a threat to turtles. Nesting turtles abandon their nesting attempt when disturbed. Although they often re-emerge there is less success when there is a high number of visitation. There used to be up to 1000 people on the beaches to observe the turtle nesting process at Mon Repos (Bundaberg QLD) before an approach similar to what we are undertaking here – Turtle Interpretation Facility (see presentation by Arvid Hogstrom) was utilised.

What has been the response to these threats?

CALM have conducted a risk assessment leading to an extension of the existing Western Shield Program, and increased community involvement through community monitoring.

The future of managing turtle interaction impacts will include education and signage, drawing on external advice, licensing tour operators, constructing a Turtle Interpretation Facility (TIF) and community involvement in these activities. CALM have also been involved in a track rationalisation program focussed on the closure of access tracks and beaches and this year infringement notice for breaches of CALM Regulation have been put in place.

CALM are also looking at a collaborative program, including the development of TAFE accredited turtle tour course as a proactive measure to manage potential tourism impacts.

The Commonwealth Department of Defence have funded a Fox Control Education Program and an animal handling course will be developed to ensure that all data in future tagging programs are useful and the method is standardised.

Stranding forms are also available to allow the community to report back with information which helps CALM with good management decisions.

Future directions

This year a National Recovery Plan was released in an attempt to address turtle conservation and management on a national level. The aims of the National Recovery Plan include reducing mortality, developing programs to monitor population status, identification and protection of critical habitats and community involvement and education.

The Ningaloo Marine Park Management Plan is also under review and it's important that the community has input into this proposal as it will guide the Department's management for turtles. The plan will aim to have no loss of turtles nesting abundance and target status quo or better. Public consultation is a major part of this and it is important that community does become involved in planning for the future of this area.

So are we on track?

2.4 Introduction to the Ningaloo Marine Turtle Community Monitoring Program

Presented by Susie Bedford
Cape Conservation Group
Email: chaetodon@dodo.com.au

Background to the Community Monitoring Program.

David Waayers put CCG in touch with WWF. This resulted in CCG applying for a Threatened Species Network (TSN) grant in 2002 which was successful. This grant provided funding for a part-time coordinator, Sharon McKinna Jones, who did an excellent job in kick starting the program and developing the Community Monitoring Field Guide. The next step in the program was the development of competency assessments to ensure that all volunteers were undertaking the monitoring and data recording accurately. A workshop was held to introduce the program and undertake training. A community education week was also conducted with help from WWF and David Waayers. In November 2002 volunteers commenced the monitoring which were a combination of local volunteers, CCG members and Murdoch University volunteers. All volunteers registered as CALM volunteers for liability purposes.

Because it was the first year, there were bound to be teething problems. Some of these problems included getting volunteers to and from monitoring beaches (transport, work commitments), the length of beaches, 5.30 am starts, flies, heat and Christmas festivities (for about a week there was barely any monitoring).

Since the TSN Grant, WWF and CCG have developed a very strong partnership. This season, WWF have sourced funding to aid CCG in the coordination of the community monitoring program. Kim McGrath was appointed in mid 2002 to take on this role (refer to presentation by Kim McGrath)

For the community monitoring program to survive in the long-term it needs to be independent of which organisations are involved and the community needs to take ownership and stewardship to ensure that long-term monitoring regardless of which individuals are involved.

Why do we do it? The shear pleasure of monitoring tracks – it's exciting to work out what the next track will be and whether there's a nest. There are also opportunities to save stranded turtles which is very rewarding. Ultimately, we do it for the turtles and the conservation of our unique region.

2.5 Discussion – Panel 1

Raquel Carter, Bob Prince, Roland Mau, Susie Bedford

Comment: Dr Keith Morris (CALM)
From a CALM perspective biggest gaps in knowledge is a handle on the population trends on North West Cape. CALM is in process of developing standardised repeatable census techniques across beaches and that will involve combination of tagging, beach track counts and aerial surveys. These programs need to be complemented and compatible.

Question: Donna Shepherd
Do we want to expand on the efforts of community groups and science?

Response: Susie Bedford
Programs that are developed with the local community have been developed in consultation with David Waayers and CALM and are based on science. It is not just us as a group – it is collaborative.

Response: Roland Mau
A tagging program needs to be established by a steering committee. It will be developed by CALM primarily; however, volunteers can be involved if conducted under appropriate supervision with a qualified supervisor. Index beach monitoring with tags will be the way to go. It is difficult to use volunteers to tag turtles because of the training and licensing requirements.

Comment: Dr Bob Prince
Track counting is good but only if there is relatively small numbers of turtles on the beach. Track counts don't work in high density such as on the Lacapede Islands. When greens are abundant it can block out tracks for other turtles. A crawl on the beach is not equivalent to the number of turtles.

Response: Roland Mau
It is not just track counts, it is nesting abundance. We survey beaches and record the number of nests, which are the successful nesting attempts that have been conducted. We are trying to look at high use beaches and compare them with low use beaches. The aim is to determine beaches that may be under threat from tourism and fox predation. Without his data we are not able to discourage people away from beaches that are critical. This program is broader and has other focuses and involves the community – it also helps to manage up.

Response: Raquel Carter
We are talking about threats pertaining to this region and this program is actually going about managing processes so as to inform and strategically plan for the region. We are not just talking about population dynamics, we are talking about ensuring that these habitat areas are safeguarded so we can get as many turtles recruited into the marine environment as possible.

Question: Roger Bailye (Independent Turtle Interest/Peter Mack Foundation)
Are WWF working with indigenous communities?

Response: Raquel Carter
Currently, most of our turtle work in Australia that is focused on indigenous involvement is the Arafura Program in the NT.

Question: Unknown – how does WWF intend to control indigenous harvest – that's not for us to say?

Response: Raquel Carter
It is not about "controlling it" – it is about engaging with Traditional Owners and working with them to determine how they want to manage their resources given that turtle populations are in decline. It is not a confrontation approach. We are already doing this in other countries and in the Arafura Sea and in many cases it has been welcomed.

Question: Unknown – our turtles disperse widely – do ours turn up in Africa?

Response: Dr Bob Prince
No but a loggerhead has turned up in Brazil – it is the only case that is known where a turtle has crossed two oceans. It most likely travelled the Indian Ocean, past the Cape of Good Hope and has crossed the Atlantic.

Loggerheads that breed in Queensland genotypes turn up in Eastern Pacific.
Loggerhead turtles that breed in this very location here end up in the Java Sea. Loggerheads that breed in California have ended up in Japan.

Question: Unknown – How do you achieve no loss in the abundance of turtles? How do you determine between natural fluctuations and human induced impacts?

Response: Roland Mau
You need to focus on managing human activity – anything from boat strikes to fishing.

Response: Dr Keith Morris
Another way of doing it is having a census technique in place at several nesting populations throughout a stock – you may have one coming up and one coming down. If this process was in place over a long-term you can get trends.

Response: Dr Bob Prince
You need to understand the biology. Within two months there was eight green turtles, 18 loggerheads and 3 hawksbills on the Jurabi coast – close to 100% sampling in 1991. Droughts in the sea may have impacted on greens ability to breed. This site has a good abundance – up to 3000 in a good year. We've had a few low years

Question: Unknown – what are the boundaries of "North West Cape"?

Response: Roland Mau
There are no defined boundary at the moment I would say it would include Ningaloo Station – it wouldn't be appropriate to define a boundary

Session Two

3. Past and Current Activities in the Ningaloo Area

3.1 Turtle Conservation work at Gnaraloo Bay

Presented by Peter Mack
Peter Mack Foundation

I started off to write a talk about Gnaraloo but I ended up with a talk about loggerhead turtles.

We don't have that many turtles nesting down at Gnaraloo. I have reached the stage where I think I know all the answers but no one asks the questions. Turtles have been my passion since I retired.

I first came up there from Carnarvon in 1956 – my brother said to me that the foxes were digging up turtle nests. Then we came up to North West Cape and I didn't see any fox or people tracks. At that time I believe there were so many turtles around that fox predation made little difference. Then the fishing boats came along and killed about 58,000 -60,000 between here and Barrow Islands and since then the foxes have had major impacts on the turtles that were left and their nests. I have published and printed a book – Stories about Ningaloo – a lot about turtles in general. I have never seen a beach where fox predation was low enough so that large numbers of turtles survive. I have been concerned about the survival of turtle nests for some time.

I can't tell you about Gnaraloo without giving you some history – I retired and joining the ranks of the grey nomads I came to Coral Bay to live in 1991. The first thing I did was go to Mauds Landing and when I walked the beaches, there was a nest dug up by foxes. That evening the fish weren't the only thing that got hooked, I got hooked on turtles and saving their nests.

I tried to stop the foxes digging out turtle nests down in Coral Bay. We had 25 turtles (mainly loggerheads) nesting each year and 60-90 nests were dug out with the majority dug out on the first night. Just two foxes digging out 1 nest a week could eat all the nests at Coral Bay. In one year, I killed 66 foxes there so what would have been the chances of them surviving without me doing so? I decided that I had to kill the foxes otherwise I couldn't save turtles. I started throwing corpses in piles so people would believe how many there were. I killed them with methods that were not exactly humane but there was no other way. I spent years walking endless miles trying to save nests. I even painted shoe dye to try to deter them, this didn't work. In 1996 and 1997 the foxes dug up the first eleven nests laid on beaches and this made me decide I had to kill foxes and I did. Then there were thousands of turtle hatchlings. I started to take tourists up to see them, tourist operators started and hence the turtle tourism industry. Everyone was pleased. Other tourist operators were complaining that no one was coming out because I was deterring tourists. In summer of 2000 and 2001 – there were 79 nests and I saw 6683 hatchlings make to the sea, from mid January to end of March I took a turtle tour almost every night – 2500 tourists which is good for Coral Bay in off season and tour operators got about $100,000 out of it.

I split 20 nests that year when they were laid and whether what I did was good or bad that was around 6000 turtles that would not have been there if it wasn't for me.

Gnaraloo Bay

Last year I worked at Coral Bay. I discovered a bigger colony of turtles there so I went to Gnaraloo to eradicate the foxes. The station welcomed me. More importantly they had a new manager who just moved in. He had good environmental ethic – he put down 3000 1080 baits and wiped out the whole fox population before I got there – there were no fox populations. This was the first beach that I had been to in 50 years between Cape Arid and North West Cape where there were no foxes. I spent 70 days At Gnaraloo and counted nests. I sent copies to CALM – I always send these reports to CALM. I saw 100 nests there (colony of 60 nesting loggerheads and 1 green), the bad news was that at Gnaraloo there was thousands of ghost crabs. I don't know how even one hatchling could even make it to the sea – they dig the nests out – what we need is more hatchlings in the area although you may say that predation by ghost crabs is a natural process.

Main discoveries at Gnaraloo:

- There were at least 360 nests there last summer (2002-03) – good news is that they're possibly a total of 500 loggerhead nests in this particular colony. I found out what happened to each nest and that about 25% were predated. There may have been about 30% that reached the water – it could have been a lot less. Nearly all hatchlings are eaten by crabs and washed away – there's only a tiny spot where they survive. Gnaraloo has beach access severely restricted by locked gaits, hardly any tourists and 4WD are not a threat
- I found an account of the Aboriginals hunting turtles in 1875 and wrote another report last year. Next summer I wont be doing anything without funding. I wanted to go the Blow Holes but I don't think I will get this funding.

3.2. Ningaloo Fox Control Project

Presented by Josie Dean
Department of Conservation and Land Management
Phone: 08 9949 1676

Foxes were introduced about 200 years ago for the purposes of recreational hunting. They have few natural predators and are opportunist feeders. They are one of the most wide spread introduced pests that we've had. It took 50 years for foxes to cross the Nullarbor from Victoria and they arrived in WA in 1930's. They are found in urban areas, arid regions and here today in the Ningaloo Region.

Foxes have been implicated in the extinction of 18 Australian animals and 10 in WA. Predation of foxes on turtle nests was discovered 25 years ago in Commonwealth land area by Yardie Creek by rangers. They prey on eggs and hatchlings and impact by exposing the nest increasing vulnerability to new predators.

Predation varies significantly in North West Cape. In Jurabi Coastal Park the northern beaches are not significantly affected but further south, on pastoral leases and stations, fox predation on nests is as high as 70% according to recent research. This is concerning because impacts that are above 5% of natural level of mortality is likely to have impacts on the population.

There are numerous control methods that could be used:

- Trapping – results in issues of public concern and is additionally labour intensive as traps need to be checked within a few days. There are also concerns over non-target species
- Shooting is usually done at night. Shooting also creates light pollution due to driving through coastal areas and dunes
- Fox Exclusion Devices (FEDs) are barriers that are put over the nests to stop immediate predation of the eggs. FEDs are labour intense and are difficult to use as you need a strong knowledge of how to place these FEDs. Inappropriately place ones can impede on the ability for hatchlings to make it out of the nest
- 1080 (sodium fluoroacetate) done with dried meat baits (sodium fluoro acetate) are distributed by hand or mechanically. Because it is versatile system it is ideal for either large or small areas. It is also effective that can be used over a 24 hour period. 1080 poison occurs naturally and 49 species of plant have this toxin of which 39 are found in WA Australia. Because it's natural it breaks down readily in the environment and animals have evolved with it over thousands of years and have a level of tolerance. Dog/fox requires less than 1 bait, wedgetails and perenties have to consume a much larger number of baits. Monitor lizards have to consume 33-41 baits which would logistically mean that they would have to find every single bait in an area double their territorial range.

Use of 1080 baiting to control foxes.
Because 1080 (Sodium Flouroacetate) is strong poison it may pose a threat to domestic animals and humans. There is a suite of legislation and policies that the Department and anyone who uses poison must be followed. All baits that are handled or used must be done by a trained and authorised person. Every single bait is recorded and there are regular audits both independently and by the Department of Agriculture. Strict protocols on where 1080 can be placed apply e.g. near roads. Assessments must be undertaken.

In 2002, a pilot project was undertaken on significant rookeries. At Bateman's Bay 80 nests in this area were laid with baits and predation of 60-70% resulted. Every bait station was audited, marked. and a GPS reading was taken. As a result of this 6 month survey period only 6 % predation occurred. This program is likely to be extended and the public will be involved. This project was supported by Commonwealth Department of Defence and CALM.

Summary
1080 decreased the impacts of foxes on rookeries and thereby aided in protecting significant rookery areas. 1080 is the most effective currently available fox control mechanism and will not be applied to this region haphazardly. Regions that are identified to have significant fox issues include Bateman's Bay and Jane's Bay which will be baited once leaseholders are informed.

The purpose of this approach is to ultimately protect hatchlings

3.3 Jurabi Turtle Interpretation Facility (TIF)

Presented by Arvid Hogstrom
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Jurabi Turtle Interpretive Facility has been in the pipeline for a number of years.

What is proposed.

There has been a large number of sponsors. There has been extensive consultation with Traditional Owners of the Gnulli Native Title Claim over Gnulli lands and Gnulli sites so that where we decide to put this facility won't offend and upset anyone culturally.

This proposal was discussed in 1984, however the project was launched only three years ago. The Exmouth Visitors Centre was able to attract funding which kick started the program. This facility will not be just a lookout platform, it will be a key tool for the turtle monitoring program in North West Cape with information brought in from Mon Repos such as ideas from Dr Colin Limpus. We aim to make this a world class facility that will be a key management tool for turtle tourism and turtle management and offer a base for the Community Monitoring Program. It can also offer a focus for turtle tourism in the area and a basis for future community involvement and a sustainable development of turtle industry. This facility is aimed at managing current and future tourism impacts on turtles.

Where to build?
Because we have a whole stretch of the Jurabi Coastline there was some debate over the site selection for this facility. A location near the Northern tip of the Cape was one proposal because visitors are directed to this site at the Hunters Beach carpark. Another suggestion was the "walk over" 700m south of Hunters Beach carpark. Because this is a heavily disturbed (mainly due to 4WD access), it was a preferred site. More consultation with the public and Traditional Owners occurred. There was a lot of public support for this site as it was already significantly disturbed and there is a blowout of the dunes that is constantly increasing. The chosen site is a cross section of the dune system protected by swale from the road and dune swale from beach. If facility and turtle tourism did take off there is also potential to expand facility to cater for increasing visitor numbers.

The construction of the facility will be underway later this year.

3.4 Wildlife Tourism Optimisation Management Model (WTOMM) – Integrating the Community, Tourism and Conservation

David Waayers
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Visitation to the area has doubled since 1989. Tourism has increased during off peak season (October – March) by seven fold. Watching turtles was ranked the third most important reason for visiting region in summer through tourist questionaries. There are currently negative impacts on turtles. Disturbance to nesting processes from unguided activities and beach traffic are some examples. The study has also recognised the opportunities for managed Turtle Based Tourism and despite the negative affects of wildlife tourism there are actually other ways to gain positive results such as the provision of revenue for conservation.

The generation of funds through tourism can be put back into conservation including the community monitoring program. This needs to be further developed in this region, put back into the community and maintain community monitoring needs to be looked at and developed further. Education of visitors, protection of turtles from unguided tours and increased support of local communities are priorities.

WTOMM is an innovative management system focusing mainly on specific wildlife whereas other models focus on tourism as a whole. This is good for looking at a particular species – it focuses on managing and monitoring the impacts of tourist activity as opposed to managing the wildlife. It takes a holistic approach to monitoring and looks at aspects of environment, social and economic implications over a multitude of activities. It requires a high level of community and stakeholder involvement and because turtles are migratory species it can have a broad application. and be used on a regional scale. It can also be a stand alone document that has the ability to be integrated into existing management plans and policies, and strategies.

WTOMM creates desirable conditions or objectives and allows the community to set these parameters and is about going into the community and asking the community what they want to get out of this framework.

WTOMM is based on the Tourism Optimisation Management Model, which was developed on Kangaroo Island in 1995. TOMM stood out from the crowd compared to other models (refer to table in representation) mainly as a result of stakeholder involvement. WTOMM contains 4 main components:

- Contents analysis
- Monitoring program
- Management response
- Implementation plan

Contents analysis

The contents analysis is the collection of all information relevant to turtle based tourism and describes the current situation. Current policies and plans which need to be identified to ensure the WTOMM can be consistent with existing plans. This section also provides information on the biology and ecology of marine turtles identifying the threats and opportunities. Community values and fundamental attributes of the region are also identified e.g. expansive undeveloped landscape, unpretentious and relaxed lifestyle, the wildlife, Cape Range, the reef etc. The WTOMM identifies what people value in their region.

The graph provided in the presentation shows the number of tourists visiting the Jurabi coast to watch turtles 2001 and 2002 nesting season. It shows a trend in relation to when people are arriving. This information is important so we can manage for tourism population trends and predict what may

happen on an annual basis. Marketing is also another important consideration of the WTOMM i.e. how you want your industry perceived (you might want a strong eco-tourism and conservation ethic). WTOMM also offers alternative scenarios / contingency plans e.g. no few turtles turn up one year – there should be guidelines in place to manage this situation.

Monitoring and reporting

This is where major community input is required. An example would be generating optimal conditions from the community e.g. we want to maintain nesting and hatching processes in areas where nesting occurs. What would be the most appropriate way to measure this? An example could be the proportion of turtles disturbed by turtle activities where acceptable ranges for disturbance are identified – how many turtles are we prepared to be disturbed? e.g. If 0-5% of the turtles disturbed is the acceptable range then we can monitor to see whether it remains in acceptable ranges. If 30% of turtles are destroyed then this is not in the acceptable range and action must be taken. This monitoring could be done with volunteers conducting surveys at night.

Report chart (after monitoring)

The next step is devising benchmarks to look at predictive performance and historical trends. Trends should identify where nesting abundance is moving and any changes in the overall distribution. It provides the predictive ability to show us how much resource to put into the industry over the seasons and how much monitoring is required. An example has been provided from Kangaroo Island in SA where tourism impacts have not fallen within the acceptable range. This triggers a management response.

3. Management response

Using the turtle disturbance example, we found over the 2002/2003 nesting season 13% of turtles where disturbed on the beaches when nesting at night. This percentage does not fit into the hypothetical acceptable range as it is out by about 8%. The next step would be to determine the cause of the disturbance falling outside of the acceptable range. For example the lack of guidance for tourist wanting to observe the turtle nesting process. In this case, a management response would need to be formed around the developing turtle guiding options. Perhaps projects such as the TIF can provide some solutions.

4. Implementation

Implementation is the final stage in the WTOMM. An implementation plan would be developed which would make specific recommendations about the management responses and then determine the necessary costs. To road test the WTOMM, we may need a coordinator dedicated to it's development and implementation.

Conclusion

There is a need to manage the impacts and realise the opportunities of turtle based tourism for the entire region. The social, economic and environmental impacts must also be monitored. WTOMM offers a framework that can manage all the impacts. It requires considerable consultation with all stakeholders in order to achieve sustainable tourism. The bottom line is that this model is based on the community developing the framework, which in return, provides the community with ownership and stewardship over then resource. It is an exciting innovative way of managing tourism and it's impacts.

3.5 The Effects of Beach Topography on Turtle Hatchling Movements: By Tracking

Martin Randall BSc. and Asc. Prof. J. Stuart Bradley BSc, Phd Liv.
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Volunteer work in the 2002/2003 turtle nesting season initiated an interest in a turtle hatchling research project on the Jurabi coast. The project examined the effects of beach topography on turtle hatchling movements and mortality using non-invasive tracking methods to test the hypothesis that, beach topography can affect hatchling mortality during the sea finding stage of hatchling emergence.

Natural factors that influence dune formation such as storms, vegetation and adult nesting turtles can alter beach topography and create barriers to emerging turtle hatchlings. Anthropogenic factors that alter beach topography include beach renourishment programs (typically seen in the US) vehicle activity and the creation of sea walls and breakwaters that alter sand drift and beach topography. Light levels from natural and human sources also impact on hatchling success at sea finding. Predation impacts were the primary cause of mortality in this study.

Methods
Five Mile and Trisel beaches on the Jurabi Coast were surveyed every morning for 6 weeks. Some data was also collected from Graveyards and Jacobsz beaches. Hatchling tracks were located in the sand at sunrise to maximise the revealing shadow effects of a low morning sun. Tracks were followed to the emerging nest, a bowl shaped depression in the sand. The number of tracks leaving a nest was recorded along with the number of successful hatchling tracks reaching the high tide mark. Predation events were recorded by observing the predator's activity through tracking techniques *i.e.* the disappearance of a hatchling track in association with a fox or ghost crab track. The angle of radiation of hatchling tracks on emergence from a nest was also recorded to build a picture of hatchling response to topographical obstacles.

Total variables recorded included

- Nest distance from sea
- Beach slope
- Predation type
- Number hatching
- Number surviving
- Presence or absence of obstacles

Results
A total of thirty nest were studied, divided further into obstacle and non-obstacle nests
Obstacles can be divided into two types: Visual and non visual obstacles

Visual obstacles - dunes, vegetation belts and body pit ridges all act to block the horizon and disorientate hatchlings by interrupting their normal photic sea finding process. Visual obstacles constituted 80% of barriers.

Non-visual obstacles – lines of boulders that act to trap hatchlings and patchy vegetation fall into this category. Non-visual obstacles accounted for 20% of barriers.

Mean number of emerging hatchling from the non-obstacle nest was 35, which showed an 82% success rate at reaching high tide mark. For non-obstacle nests the mean number of emerging hatchlings was 44, with a 52% success rate at reaching high tide mark.

- 992 hatchlings hatched out over a 6 week period
- 723 successfully achieved the high tide mark
- Fox predation accounted for 126 predation events
- Foxes present at 23% of nests, crabs 46% of nests, birds at 33%

- Mean proportion of hatchlings surviving predation is 52% with no predation resulting in 92% survival to the high tide line

The mean angle of hatchling radiation for obstacle nests was 200˚ and for non- obstacle nests 60˚ a significant difference, but under closer statistical analysis it was shown to be unrelated to hatchling mortality.

Conclusion
Statistical analysis of covariance and regression analysis suggest that the distance that hatchling turtles have to travel from nest to sea is the most important factor in increasing the probability of mortality from predation during their above ground journey. Although the angle of radiation was significantly different between obstacle and non-obstacle nests, analysis of covariance for source of variation showed no significant difference between angle and the other variables in the proportion of hatchlings surviving to the high tide line. Closer inspection of the angles produced by hatchlings under the effects of visual and non-visual obstacles reveal the need for further studies involving a larger number of samples to incorporate the wide range of cause and effect variables associated with hatchling movements from nest to sea.

These different dynamics are all intrinsically linked to time spent on the beach, ever increased by distance from the high tide line or in fact obstacles that require more time to navigate a way around ultimately resulting in increased distance travelled by the hatchlings. As is consistent with the findings of this study the distance a hatchling has to travel from nest to sea increases the possibility of predation by a number of native and feral animals.

Although predation is still a chance event with detection and predation by sea birds heavily dependent on the amount of light present from the moon or setting sun at the time of emergence. Similarly fox predation requires that a fox is present at the time of emergence, moreover, it was observed that such a fox would return over following nights to check for subsequent hatchlings emerging in the second and third wave of emergence. Predation by ghost crabs is more prevalent on wide beaches that contain a high number of ghost crabs.

The angle of radiation emergent hatchlings create when leaving a nest could be predicted under a variety of topographical forms, however, there are also more variables and types of obstacles to consider when undertaking a study on the effects of beach topography on hatchling movements. Sample sizes for the various categories of obstacles should be increased to allow a more thorough statistical analysis of the source of variation, and variables such as ambient light levels, time of emergence, types of predation, hatching success ratio and soil temperature could be included as part of a multidimensional (MDS) scaling project.

Other related research ideas
Hatchling activity runs concurrent to nesting activity for a considerable time. Research possibilities could include nest marking and limits of approach to avoid trampling during peak tourist season, what increased distance from the sea could justifies nest re-location, ambient temperature at the time of peak emergence could also be incorporated into further study.

3.6 Key Findings from the 2002/2003 Nesting Season (Community Monitoring Program Results)

Presented by David Waayers on behalf of the Turtle Team
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Limpus and Limpus quoted last year, the biology of marine turtles is still poorly understood. This enforces the need for long-term monitoring.

Nest monitoring on coastal areas such as the Jurabi Coast is a good method due to lower abundance in turtle tracks. Nest or track monitoring on high density beaches such as those of the North and South Muiron Islands may not be appropriate. Track monitoirng is an excellent way of incorporating communities in marine turtle conservation.

What did we do?

Four aerial surveys were undertaken in the 2001/2002 and 2002/2003 nesting seasons to identify high-density sites in the region. The region was divided into 4 aerial survey sections and a digital camera was used from a plane to capture tracks left from the previous nights. The footage was analysed in a lab and from still shots, species were identified from some tracks. These tracks were represented in a GIS. This was the first step as it identifies critical habitats and reaches areas that are not accessible by vehicles. It highlights areas for ground truthing. Ground truth surveys conducted between December and March in both seasons were undertaken to understand the temporal and spatial distribution of species on the Jurabi Coast. Therefore the Jurabi Coast was used as a sub-sample to get a better understanding of the big picture. Objectives were to test the accuracy of the aerial surveys, to assess fox issues, times of crawls and body pits and to rescue any stranded turtles. I will be focusing mainly on nesting populations.

Overall results

There were some errors with the aerial surveys. A comparison between the aerial surveys and ground surveys based at Jurabi showed that in both years 95% of nesting abundance in both seasons were captured correctly from aerial surveys. In 1st year, we only identified 23% of tracks, but with further knowledge and know how, 76% of tracks were identified in the 2002/2003 season.

With a combination of aerial surveys and ground surveys it was estimated that overall 3461 turtles +/- 764 individual females nested on beaches of Ningaloo Region. 1700 +/- 370 green turtles, 600 +/- 76 loggerhead turtles and 1168 unidentified turtles nested in the 2002/2003 nesting season.

Where are the green turtles?

The highest densities of green turtles occurred at the Muiron Islands, Jurabi Coast, Jane's Bay, Red Bluff. There were smaller pockets of nesting abundance at Turquoise Bay, Blood Wood and Bundera Coastal Protection Area.

Where are the loggerhead turtles?

Major rookeries were found on north and south Muiron Islands, Jurabi Coast, Turquoise Bay, Jane's Bay, Bateman's Bay, Maggies, the Cove, Gnaraloo, Red Bluff other surprise locations at Bundera, Blow Holes and on the Islands.

Green turtle monitoring program results

Maps in the presentation indicate the nesting density of green turtles on Jurabi Coast 2002 and 2003 and the contours represent the density of nests within a 1-km radius. It can be seen that there are significantly dense population areas in the southern areas of the Jurabi coast. Most green turtles nesting between Hunters and Jacobsz Sections. 5 Mile, Triselle, Graveyards and Jacobsz have also

high densities. By comparing this data over the years, we can determine the spatial distribution between beaches and shifts over time, which may be attributed to tourism activity or changes to environmental conditions.

Demographics - 2001/02 season. 852 green turtle tracks were recorded, which equated to 57 individuals. The nest success was higher for loggerheads.

Loggerhead turtle monitoring program results

There were high densities at Jacobsz access in 2001/2002 but seems that Hunters Beach had a higher density to following year.

Loggerheads seems the have remained stable over the last couple of years, however, there is no consistency with historical data.

Last season (2002/2003) there were 586 loggerhead tracks equating to 44 females, 6721 green turtle tracks equating to 500 individuals which gives the total of 7461 tracks recorded by volunteers. Congratulations to volunteers.

Hawksbill turtles have high success rate compared to green or loggerheads. The nesting success for the past two season were similar, 24% in 2001/2002 and 23% in 2002/2003.

In 2002/2003 90% of turtles nesting were green turtles. Green and loggerhead turtles are known to nest all year around, however, there is a peak between December and March. Results have indicated that green turtles peak around mid January where are loggerheads have less sudden peak and remain relatively stable throughout the season (refer to graphs in presentation). Other analysis indicated that 50% of turtles nesting in the months of January.

How can we apply the data?

Aerial surveys are essential for base line information useful for designing tagging programs, assessing future developments on the coast and for the identification of areas for onground nest monitoring. Ground surveys provided a better understanding of the temporal and spatial distribution of nesting turtles and this information can provide indicators in spotting potential threats, provide predictive capacity to manage threats and tourism, and allow a strategic approach to funnelling funds. This project represents a long-term monitoring method that is easily adapted in other regions of the state and can provide information necessary for the management of the TIF and current and future turtle tourism activity in the region.

Why long-term?

Due to the biological characteristics, monitoring must be carried out over the long-term. Turtles are long-lived species, slow growing and don't reach sexual maturity for up to 40 years. In addition, this program is an excellent tool in raising the community's interest and awareness of turtles conservation and in creating the community's desire to take stewardship to protect turtles and their habitats.

Conclusion

Over the two seasons, the Ningaloo Community Turtle Monitoring Program has successfully identified rookeries in the Ningaloo region and has provided detailed information about nesting turtles in Jurabi Coastal Park. The refinement of methods based on learning experiences from the previous season, coupled with a better understanding of environmental factors (sand characteristics, predictive ability of southern oscillation index for green turtles) will provide more useful data that will assist in understanding the long-term trends and management issues for turtles in the Ningaloo region.

3.7 Discussion - Panel 2

Peter Mack, Josie Dean, Arvid Hogstrom, David Waayers, Martin Randall.

Comment: Dr Keith Morris (CALM)
The number of times a female nests depends on age as well – older turtles nest more over the season and younger turtles nest less over the season, it is too difficult to apply the averages, it is good to estimate, however we have to be aware of limitations.

Response: David Waayers
Limitations as far as estimating individual nesting turtles is agreed, but when assessing all methodologies that were available to achieve the objectives, the nesting method came up as most suitable. For a community driven program, tagging is often not suitable in terms of resourcing and continuing the enthusiasm.

Comment: Dr Keith Morris
It would be good to add an intense tagging program to the area – the framework has been established here and other modules can be added on to complement the monitoring program here.

Response: David Waayers
I agree and would like to get together with Bob Prince to incorporate a tagging program as well and if we can find out what the actual figures are such as the inter-nesting variability, then the aerial surveys, track monitoring and tagging will allow us to understand the whole biological and ecological picture.

Roland Mau
We've looked at tagging on the Jurabi coast (different to islands where they are enclosed systems, coasts are continuous) and we were finding that during morning patrols, some turtles hadn't returned by the morning. Turtles with tags that had been tagged during Bob Prince's program, had moved quite a few kilometres from the tagging beach. Dave's data shows that there is an obvious shift as to which ones become the more intense beaches and it is important that this work shows that there is variability in tagging. This work provides you some closer estimates even than tagging would. During this program, we cover a large area of coast it only takes 8 teams two or three hours each day. We record data for every turtle that nesting during the previous night in this time. To catch and tag a loggerhead you only have a 40 minute window of opportunity. How many teams would you need to capture all of the turtles that nest in the area this program covers? We must remember that the coast is not a closed system like an island – it is open, there are shifts occurring. A lot of tagging has occurred on islands and more isolated systems, even if you look at Mon Repos, you will find that is a quite distinct closed system due to rocky outcrops to the north and south and therefore could have a high level of concentration due to the physical confines.

Comment: Dr Bob Prince
But there's limitations to your methodolgy

Response: David Waayers
There are limitations in every methodology the difference between tagging and track monitoring is that track monitoring accounts for every single turtle within the area monitored whereas during tagging, they could be coming up to nest behind you as you walk the section of beach.

Comment: Dr Bob Prince
This afternoon has characterised the rediscovery of the already known. No one that spoke on fox baiting has recognised that Peter Mack has done all that work and had researched the enhancement and productivity of turtles. We have sustained a recovery experience on the Batemans Bay coast and have estimated that loggerhead population had been depleted on the mainland over 60 years of fox beach combing. For that duration, adult turtles from site had gone to Northern Australian prawn fisheries, through the North West Shelf long-line fisheries and into tuna fisheries. In terms of using the track identification method, Dave hasn't even used local provenance to provide his inter-nesting information.

Comment: Donna Shepherd
Today has been really good at demonstrating different approaches and a really important way of stepping forward into the future an acknowledging everyone's work.

Session Three

4. Community Monitoring Program for 20003/04

4.1 Importance of Community Involvement

Kim McGrath (WWF/CCG) Community Monitoring Coordinator
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www.wwf.org.au

Kim informed the forum that there was a workshop to follow that would be the first step in formally getting stakeholders together to work on turtle conservation as a whole in the region.

Kim summarised her role as a WWF employee and her role in working with CCG to further develop and implement the community monitoring program in the long-term.

It was emphasised that the more volunteers the better even with low levels of commitment.

Important to emphasise that this program needs to be long-term over a number of years. There is also potential for volunteers to be involved in a TAFE accredited turtle guiding program in years to come.

On behalf of WWF and CCG Kim thanked Donna Shepherd for donating her time.

4.2 Discussion – Panel 3

Question: Unknown
How many volunteers needed per day?

Response: Kim McGrath
A minimum of 8

Question: Unknown
Are you promoting non-regional volunteers?

Response: Kim McGrath
Local community is the first priority as it is very much a local capacity building project, although overseas visitors and non-regional are welcome and can often take the pressure of the local volunteers. Today was part of trying to encourage people come along for next season.

Question: Unknown
Is there are minimum age?

Response: Kim McGrath
You must be 16 years of age or be accompanied by a parent for liability reasons.

Comment: Dr Bob Prince
Raised concerns over the program's methods again

Response: Kim McGrath
We must reinforce that it is one program that is part of providing information for the big picture?

Response: Susie Bedford
Bob Prince's tagging program has stopped because it was not community driven and became difficult to maintain. That's why this program needs to be community driven. It is also about education, not just about monitoring tracks, it is about giving responsibilities and ownership back to this region. Environmental education is perhaps one of the biggest keys to it. It's not just CCG, anyone can be involved.

Comment: Unknown
It would be fantastic to have more tourists involved – you can attract swarms to this program

Response: Susie Bedford
Yes it is great if they will be here for a month, otherwise it is a major problem with training. It can take up to a week to train someone. It may take up to three weeks before they can see a hawksbill track

Comment: Kim McGrath
Emphasised that people will come a long way – we need to promote people to come back

Comment: Roland Mau
There is also a pretty large tourism component that this program will provide – the opportunities to identify beaches appropriate for tourism and those that are not.

5. Conclusion

Donna Shepherd
Creating Communities

Have we achieved what we wanted?

- To share information on a whole range of turtle conservation issues related to the region? Yes
- Encouraged you to get involved? Yes
- Learnt about different approaches to turtle conservation, past and present? Yes
- Education efforts that have been undertaken? Yes
- Learnt about threat abatement from Josie and Peter? Yes
- A model that incorporated tourism with conservation and the local community? Yes

We have also learnt that the Turtle Interpretation Facility can potentially provide a focal point for activities and the ongoing sustainability of initiatives and coming up with ways to generate income for the program.

It seems to me that we are at a pivotal point where previously there has been a lot of individuals that have worked through government bodies and other groups. As a result of this past work we are now at a point where we need to take a holistic coordinated approach. Its not unusual that at this point the community's evolving to take this on. We have become a community of interest, a "community of interest" in Turtle Conservation. What we have heard today is that there is a common aspiration which is about turtle conservation. We must go forward and remind ourselves that we are a community of interest however diverse we may be.

Clearly the time has come where we need to realise this and cooperate with each other to clearly articulate the outcomes that we are trying to achieve. Some of this will be brought to the surface at tomorrow's workshop. It is important to remember that although we have different approaches, we need to move in the same direction. The caveat today is that we need to respect each others work. Today we have taken an important step and have spoken about some different conflicts that should be resolved through developing an understanding of whose doing what. So the challenge is now how to maintain our enthusiasm beyond today and keep sharing ideas and experiences. Today has been innovative and the key thing is communication. I look forward to hearing how you all go in coming years.

For more information on the conference or to register your interest in the following turtle conference, please contact:
WWF Australia Perth Panda Cottage Herdsman Lake Selby (corner Flynn) Street PO Box 4010 Wembley WA 6014