

LEGISLATIVE ASSEMBLY OF THE NORTHERN TERRITORY

Sessional Committee on Environment and Sustainable Development

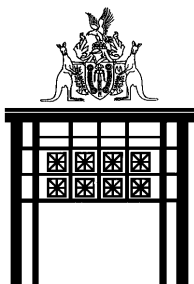
*Issues associated with the progressive entry
into the Northern Territory of cane toads*

Volume 4

HANSARD TRANSCRIPTS-BRIEFINGS

October 2003

Presented and Ordered to
be Printed by the
Legislative Assembly of
the Northern Territory on
16 October 2003



LEGISLATIVE ASSEMBLY OF THE NORTHERN TERRITORY

Sessional Committee on Environment and Sustainable Development

*Issues associated with the progressive entry
into the Northern Territory of cane toads*

Volume 4

HANSARD TRANSCRIPTS-BRIEFINGS

October 2003

MEMBERS OF THE COMMITTEE

Membership of the Committee:

Ms Delia Lawrie, MLA (Chair)

Mr T Baldwin, MLA

Mr M Bonson, MLA

Mr S Dunham, MLA

Mr E McAdam, MLA

Mr G Wood, MLA

Committee Secretariat:

Executive Officer: Mr Rick Gray

Administrative/Research Assistant: Ms Maria Viegas

Committee Support Officer: Ms Kim Cowcher

Administration Support Officer: Ms Anna-Maria Socci

TABLE OF CONTENTS

VOLUME 1

CANE TOAD INQUIRY FINAL REPORT, OCTOBER 2003

VOLUME 2

WRITTEN SUBMISSIONS RECEIVED

(Submissions No. 1-25)

1. DEPARTMENT OF INFRASTRUCTURE PLANNING AND ENVIRONMENT, PARKS AND WILDLIFE COMMISSION OF THE NORTHERN TERRITORY
 - A. DR DAVID LAWSON, DIRECTOR AND DR JOHN WOINARSKI, BIOREGIONAL ASSESSMENT UNIT, ORAL SUBMISSION (15 APRIL 2003)
 - B. WRITTEN SUBMISSION (30 MAY 2003) Ms JAILEE WILSON
2. MICK'S WHIPS, MR MICHAEL DENIGAN
3. ENVIRONMENTAL RESEARCH INSTITUTE OF THE SUPERVISING SCIENTIST
 - A. REPORT-ERISS/ PAN-CANE TOAD RISK ASSESSMENT-KATHERINE/ MATARANKA AND BORROLOOLA
 - B. PRELIMINARY RISK ASSESSMENT OF CANE TOADS IN KAKADU NATIONAL PARK
 - C. PRESENTATION TO PUBLIC HEARING 12 MAY 2003 WITH DR C M FINLAYSON AND DR DAVE WALDEN
4. MR DAVE LINDNER, PRIVATE CITIZEN
5. MR JOHN CHRISTOPHERSEN, CHAIRMAN OF COBOURG PENINSULA MARINE PARK BOARD OF MANAGEMENT
6. DARWIN CITY COUNCIL, MR DAVE THIELE, - OPERATIONS ENGINEER AND MR BRENDAN DOWD - DIRECTOR TECHNICAL SERVICES
7. MR DAN BASCHIERA, PRIVATE CITIZEN
8. NORTHERN LAND COUNCIL, CARING FOR COUNTRY UNIT, Ms ROBIN KNOX - ABORIGINAL WOMEN'S LAND MANAGEMENT FACILITATOR
9. WORLD WIDE FUND FOR NATURE AUSTRALIA INCORPORATED, MR STAN ORCHARD - NATIONAL CO-ORDINATOR FROGS! PROGRAMME
10. KEEP AUSTRALIA BEAUTIFUL COUNCIL, Ms LORNA WOODS
11. ECOLOGICAL SOCIETY OF AUSTRALIA, DR CRAIG JAMES - PRESIDENT
12. DEPARTMENT OF ZOOLOGY AND ENTOMOLOGY, UNIVERSITY OF QUEENSLAND, PROFESSOR GORDON GRIGG
13. NORTHERN TERRITORY CHAMBER OF COMMERCE AND INDUSTRY, Ms CAROLE FROST - CHIEF EXECUTIVE OFFICER
14. NORTHERN TERRITORY TOURIST COMMISSION, MR RICHARD AUSTIN - DESTINATION DEVELOPMENT NATURE-BASED
15. ENVIRONMENT AUSTRALIA/ PARKS AUSTRALIA NORTH, MR PETER COCHRANE - DIRECTOR OF NATIONAL PARKS
16. POWER AND WATER AUTHORITY, MR KIM WOOD - MANAGING DIRECTOR
17. WORLD WIDE FUND FOR NATURE ARID RANGELANDS, THREATENED SPECIES NETWORK – ALICE SPRINGS, Ms COLLEEN O'MALLEY - CO-ORDINATOR
18. SCIENTIFIC RESEARCHER - DR ROD KENNETT
19. S J REYNOLDS - PRIVATE CITIZEN
20. THE BUSH NURSERY / NT HORTICULTURAL SOCIETY – KATHERINE, Ms ELIZABETH CLARK
21. DR GREG BROWN, UNIVERSITY OF SYDNEY, SCHOOL OF BIOLOGICAL SCIENCES
22. DR BILL FREELAND - PRIVATE CITIZEN
23. DR MICHAEL MAHONY, UNIVERSITY OF NEWCASTLE
24. Ms FAITH WOODFORD, PRIVATE CITIZEN
25. TIWI LAND COUNCIL
 - A. MR FREDERICK MUNGATOPI, CHAIRMAN (22 JULY 2003)
 - B. Ms KATE HADDEN, ENVIRONMENT AND HERITAGE OFFICER (19 AUGUST 2003)

VOLUME 3

PUBLIC HEARINGS

1. BORROLOOLA, 6 MAY 2003
2. KATHERINE, 6 MAY 2003
3. JABIRU, 7 MAY 2003
4. DARWIN, 12 MAY 2003
5. LITCHFIELD, 19 MAY 2003

TRANSCRIPTS

VOLUME 4

DELIBERATIVE BRIEFINGS

1. PROFESSOR GRAHAME WEBB, 26 FEBRUARY 2003
2. DR PETER WHITEHEAD, 15 APRIL 2003
3. DR DAVID LAWSON & DR JOHN WOINARSKI, 15 APRIL 2003
4. MR GRAEME SAWYER AND MR IAN MORRIS, 15 APRIL 2003
5. ENVIRONMENT AUSTRALIA, 19 MAY 2003
6. DR BILL FREELAND, 28 MAY 2003 & 10 JUNE 2003

CONTENTS

MEMBERS OF THE COMMITTEE	III
TABLE OF CONTENTS	V
TRANSCRIPT NO. 1	1
Dr Grahame Webb	1
TRANSCRIPT NO. 2	25
Dr Peter Whitehead	25
TRANSCRIPT NO. 3	51
Dr David Lawson and Dr John Woinarski	51
TRANSCRIPT NO. 4	81
Mr Graeme Sawyer and Mr Ian Morris	81
TRANSCRIPT NO. 5	113
Environment Australia and CSIRO	113
TRANSCRIPT NO. 6A	131
Dr Bill Freeland	131
TRANSCRIPT NO. 6B	152
Dr Bill Freeland	152

TRANSCRIPT NO. 1

Dr Grahame Webb
Wildlife Management International Inc.
Wednesday, 26 February 2003

PRESENT:

Committee: Ms Delia Lawrie, MLA (Chair)
Mr Tim Baldwin, MLA
Mr Matthew Bonson, MLA
Mr Stephen Dunham, MLA
Mr Elliot McAdam, MLA
Mr Gerry Wood, MLA

Secretariat: Mr Rick Gray
Ms Maria Viegas

Note: *This transcript is a verbatim, edited proof of the proceedings.*

Madam CHAIR:

I would like to kick off the meeting by welcoming our guest presenter today Dr Grahame Webb, for many he doesn't need an introduction but he is internationally renowned as a wildlife management specialist he has resided in the Territory for a decade. Has a passion that we share with him for the Territory and the sustainability of the wildlife in the Territory, he is the Director of the Wildlife Management International Group and travels the world assisting governments and assisting the people in the Wildlife Management and sustainable management issues and also owns and operates the famous 'Crocodylus Park'.

Grahame, you are very, very welcome Thank You for coming today and I propose to ignore several matters on our agenda to lead straight in to the presentation by Dr Grahame Webb. In terms of our inquiry into issues associated with the progressive entry into the Northern Territory of Cane Toads, and Grahame we have asked you to speak today because you are recognised as someone with a great deal of knowledge on the subject. Are we ready to kick off?

Dr WEBB:

Delia, can you give me some idea of timing and things.

Madam CHAIR:

Yes, we were formed in the November sittings of the Assembly, are we timing our presentation. Tim you have got what 20 minutes, half an hour?

Mr BALDWIN:

Half an hour max, I have got to rush off sorry.

Madam CHAIR:

So half an hour and then we lose Tim.

Dr WEBB:

Okay, well it is nice to be here and it is exceptionally nice to see the Government taking an interest in this issue because I think it is a complicated and difficult one and it is not one that, unfortunately I or anyone else can come and say "Well here is the solution to the problem".

But I think there are 3 elements of this that really need to be looked at.

1. What should have happened historically is important without trying to dwell on what I consider, exceptionally bad decisions in the past, it is important from the point of view of trying to pin down the principles so we don't make the same mistakes that we made with cane toads again, if we can avoid it.
2. The next step is what are the principles that come out of this?
3. The next step is, where to from here. What can we or should we, at least start to consider to try and look after the public's interest in this whole issue not just, the public's interest, I also mean the interest of wildlife which are fundamentally public asset.

Let me state that at the start of this, there are some specific issues that are pretty dear to our heart. One is the McKinlay River crocodile population, and I will get to why that's important. We have been trying unilaterally, without any help from anybody to do this work over the last 2 years and I don't mind telling you that I estimate that our cost so far have been \$200 000, at a time when nobody in any sort of business can afford to allocate that money to anybody, and there hasn't been one cent of government assistance to it.

The other is Crocodylus Park itself. We have one tiger now there, rather than two because 1 ate a cane toad just before we were due to pick it up in Queensland. I don't know what we are going to do with all the animals we have there and the potential impact of cane toads on them, I don't even know where to go to get advice on that sort of thing.

It's a personal interest type thing, but it of course typifies a much broader range of problems. I just want to get those vested interests out the front.

My own experience with cane toads, goes back into the 60's when I used to do field work up in North Queensland, when cane toads were moving out of that coastal belt and up north. And I was mainly working on frogs, lizards and snakes not so much crocodiles, a little bit of crocodile work then. And it was simply stunning to see billabongs and waterholes with clouds of tadpoles, cane toad tadpoles that were like a metre deep completely surrounding these things,

and of course, to see them all over the road. In the 60's it was becoming immediately apparent to herpetologists around the country. Herpetology really covers amphibians, you know, frogs, salamanders but we don't have any in Australia, lizard, snakes, frogs and reptiles. We have got a pretty strong herpetology contingent. It was becoming apparent to those people that cane toads were causing a real problem, especially with goannas and some snakes. There were papers started to be written in the 60's about those impacts and there was a very pivotal paper by Mike Archer back in those times. It tried to pull all these observations together. In the 1960's the Gulf of Carpentaria didn't have cane toads and when I was over there in 1967 one of the most striking things about the Southern Gulf, was just the sheer number of big goannas around. Just everywhere you drove there was big goannas around, everywhere you drove there was big goannas walking across the road. By the mid 1970's, a chap who'd worked for me in Maningrida in 1973 and 74 went over and worked for a year in Kurumba and didn't see one goanna there at all the whole time he was there. This just simply confirms that the basic evidence has been building all the time, that goannas are one of the animals that really does get hit hard.

In the late 1970's up here, the cane toads were moving across the southern Gulf and there was no action being taken at all, and I was very vocal publicly and certainly politically within the then Conservation Commission that we needed to start working on this thing before they got to the Northern Territory, to work out whether there was anything that could be done. As a consequence they sent a researcher down, Ross Pengelly (?spelling) who started to collect some very basic data on where they were and I think he may have gone down 1 or 2 years. He disliked doing it but I can remember talking to him at the time, and which I firmly believe, that the public responsibility in this issue was very clearly in his hands and his hands alone, and he should be taking it far more than an occupational therapy point of view.

He eventually left and then the cane toad issue sort of, from memory, died a little bit. Bill Freeland came in and there was another rather large allocation of funding, from memory about \$1m over a couple of years, that went into cane toads and so he started to go down and again and monitor the rate of progress of the cane toads and started to do some ecological experiments. He drew conclusions from those experiments that the impact on, I think some of the amphibians was, was minor. For some reason then, Bill or the Department or whatever started to adopt the policy, "Look this is in the 'too hard' basket and we are not going to be able to solve it so we may as well just wear it'. I think had they said that, it would have been better, but they tried to justify inaction on the basis of a whole bunch of poorly

constructed arguments.

1. That there was no evidence that animals were going to go extinct.

There was 2 issues about that, which I think are really important.

- A. The legislation that supports the wildlife up here, clearly doesn't have extinction as the primary problem. We actually legally charge individuals and children if they have lizard and snakes without permits, we go down to the level resolution of one animal. So it's simply not realistic to turn around and say "Well we are not going to worry about this unless a species goes extinct."
- B. The other side of course, at a broader level, is the precautionary principle and I'm sure everyone is familiar with it, is in every international treaty you can look at. This is really the precautionary principle in complete reverse, its "we are not going to worry about it unless an animal goes extinct, but we are not going to look to really see whether it goes extinct". And I will be perfectly frank in this thing. No one is more disappointed than I at the performance of our Federal Government in international treaties, what I mean, the Australian delegation makes such a fool of itself every time it opens its mouth. The Territory has built itself a fine reputation in the 1980's and adopting this sort of flippant pseudo scientific mumbo jumbo, does no good at all. But I think it is more counterproductive in other ways.

So during the 1980's the NT monitored the exact rate at which cane toads took over the Northern Territory. We made no effort to get a task force together, to bring in the world's best people, to really bring in everything we could to absolutely assess in depth what was possible, or was not possible. We made no real attempt to be innovative, had we looked at those things we may have decided there is nothing we could do, but not to even look at them to me is something that I just can't wear as being professional nor appropriate to the level of the problem. During the 1980's it was starting to become apparent from helicopter pilots flying over those areas, they were reporting to me as seeing dead fresh water crocodiles. I will get to that issue later.

It was obvious they were having impacts but those impacts are difficult to measure. I just want to explain something here. When you have an ecological system up in the north it's going like this from year to year, it's changing all the time, good wet season bad wet season, good dry. It's actually very difficult to get a measure of the base line that you can then compare whether something chops and changes. And if you go and you measure something or try

to measure something with a tool that is inappropriate to the measurement, you find, the conclusion is there is no significant difference. So in other words, if you go to measure the width of atoms using a ruler, you will conclude there is no significant difference. That doesn't mean that there is no significant difference in the size of the atoms, it means that the tool you are trying to use to measure it is far too coarse for the level of variation in what is going on or the nature of the problem.

So this was where the evidence of cane toads having minimal impacts was coming from. It wasn't coming from significant findings it was coming from an inability to demonstrate significant findings. You need to interpret this very cautiously. My own professional view of those papers that establish this, is that they are pathetic in their scientific naivety, I think you can drive holes through them very, very easily because of this problem, this measurement, level of resolution problem.

In the 1980's at [Speaker's addition], CSIRO, and other people in the Federal Government level were trying to get a lot of support for cane toads, but it was very difficult. Toads don't attract the interest of the NGO's. They are not furry and not cuddly. They are not big eyes. They are ugly, they are the exact opposite to what you need to raise money and if you look around you see the NGO's have done virtually nothing with cane toads, which is another salutary lesson that comes from this.

In the 1990's, the Coronation Hill debate of all things, opened up some very interesting areas. Much of that debate was focused on very, very minor possible potential impacts on very minor and potential species that had been identified in these extensive surveys by CSIRO. Eventually when it was pointed out that this was rather ridiculous, the Coronation Hill debate went to the Resources Assessment Commission who agreed that these ecological impacts, what they were talking about were minor. However, the point should really be established that all those fine ecological base line values established in Kakadu, are going to be drastically altered now, and that has profound ramifications I think, for not only the long term monitoring of what is really happening in Kakadu but certainly for the monitoring of impacts of things like mining, within Kakadu on fauna and flora. If all of a sudden all the relationship in the fauna changed how do you really establish whether this is due to cane toads or whether it is due to genuine impacts or whatever.

So in the Coronation Hill debate, even at that time, we focused attention on the fact that the survey programs should have been kept going in order to be able to quantify the impacts of cane toads when they eventually arrived in

Kakadu.

CSIRO managed to secure something like \$3m through one of their CRCs, for Dr Tinda Biscoe to work on cane toads, and they presented their results at the World Herpetology Congress in about 1994 and 1995. Again, it was just an astounding conference where they had basically had a bunch of young Venezuelan students working on the project in Venezuela, who didn't know the difference between a fat body and a gonad. They couldn't answer what their primary objective was, whether it was to stop cane toads getting into Kakadu or eradicate cane toads. There seemed to be some general search for a virus, a control without defining a problem and at that time they said that none of their team had been to the Northern Territory and they announced publicly at that meeting that the Northern Territory didn't consider cane toads a problem and that's why they were not having any involvement up here.

At that time I really did point out clearly was that there were 2 people in the Northern Territory that didn't consider toads a problem, but the other 149,998 considered that they were a very big problem, whatever it is, it was a pathetic performance.

The part of it that's interesting, is that where we should have had key people doing that work because we have got a self interest in it, and gaining the resources to do the work and being able to build up the levels of expertise, was in the NT's interest. We lost all the opportunity, because we were basically saying, 'It's not a problem'.

So the basic \$3m that went into that, as far as I can work out, achieved very little. There are a series of workshops, those things started to develop in the 1990's. ERA had a very informative workshop, I don't know whether you have got the results of that but I can get them to you.

In the start of 2000 ERISS finally did a very thorough review, that's a good review. But again, the position coming out of the NT Parks and Wildlife Commission was just one of a sort of antagonism all the time, it was very difficult in meetings to progress the thing because there was always this, "Don't tell anyone there's a problem". Meanwhile it's my understanding that Rangers had been informed and instructed not to report losses of crocs and things like this that are occurring, due to cane toads. So, at that time the end of the 1990's, they were in Katherine. By this time, crocodiles were starting to die, but people were not reporting it. It was just that people had forgotten that they are the public service and not the secret service. That there were, I think, deliberate efforts to stop this being informed, that would possibly justify it on the basis of not wanting to

create drama or unnecessary type conservation anguish in the public. But it had, in my opinion, a disastrous result. Major changes were taking place, people weren't monitoring them and I think the government was being misinformed by the people that it allocated the responsibility for this issue to. And so they were repeating this stuff verbatim as though it was some sort of scientific fact. What has happened since then is that Herpetologists all around the place have got together, I think Rod Kennett made a list of projects, 19 projects that people had self-started in desperation to try and do something about this toad problem.

We've certainly launched a big project in the McKinlay River, which I'll explain. Rick Shine down in Sydney has just got an ARC grant for \$1m, which is going down, you know to Sydney basically. There is a lot of interest in work by professional people, there's a community group that have organised 'Frog Watch' to start telling the public what to do. But still we don't seem to, as a government, reach any real consensus on what to do.

The Katherine area. The fact is that there was a serious problem down there, certainly with crocodiles, I think goes without saying. By way of example, in the McKinlay River where there's perhaps, 1500 crocs maybe in that late 1970's and there is now around 2000 in that population. We spent all the dry season last year and the year before out there. The previous year, what we know from the work that's being done in the research, there's at least 200 animals a year die from natural causes in that area, that's their survival rate. But you very rarely find them. Tim was out there as a young man and what I mean, I suspect that he could back this up, you don't find dead crocodiles. We found none last year, we found 5 this year, and 4 of those 5 were in billabongs that subsequently salt water crocodiles had moved into, and they were covered in salt water crocodile bites. 'Salties' had moved right up the McKinlay now.

So my point is that even when there is a population of 2000 that you know from the research, at least around 200 are dying in a year, even if you are out there all the time you don't find dead crocodiles, because they just die somewhere and they might float for a day or 2 and disappear.

So when people started to report finding 8 dead crocodiles in Katherine Gorge, you say well "If you found 8, how many have really died". Then you talk to other people and you say, "Well in their section of the river they have found about 20 dead crocodiles". These figures were gross underestimates because the Parks and Wildlife Commission really wasn't reporting what was happening, there was no sort of program, at least that was made public. So the

number of animals in a much smaller population that were being found dead was appreciably higher than anything found anywhere else, which is consistent with other areas where the 'freshies' had gone. In areas of the Roper, I believe the same has occurred. But as most of you know we are not engaged to do any of the survey work now. So this year we went down and surveyed in Katherine Gorge and our estimate was that there has been at least a 30% decline from before cane toads came 'til after they came. That is one snap-shot type figure, but there's certainly been a major impact.

The McKinlay River is really perhaps the best studied and best known crocodile population in the world. When we started work out there in 1979 with the then Conservation Commission, under contract and put an enormous effort into that somewhat closed population, the series of papers and reports and books that came out of that as standard references all around the world. In recognition of the importance of that population, the government secured that land when it became available so that it would last. When that study was originally done, lots of animals were marked, a huge number were caught, marked and released and re-caught. Part of a long term objective of that was to be able to re-catch them after 20 years so you could really work out what the real population dynamics were over an appropriate time-scale.

With the impending arrival of the cane toads, it became fairly critical from a pure, scientific point of view, to re-catch those areas and basically complete that element of this study, before natural survival rates were confused with survival rates due to cane toads. By doing that we would have the added advantage being able to quantify exactly what happened when the cane toads arrived, because it was one of the only populations of long-lived reptiles in the country where you actually have a base-line that is established over an appropriate time-scale. The cold hard reality is we couldn't get one bit of support from anybody, we applied to ARC to try and get funding through the key centre, but the ARC considered it to be core business. In other words, we had used the crocodile work we were doing here as justification for getting the funds for the key centre within the university, which I am on the board of. They didn't have enough money in core budget to fund a large study like that, so we just went ahead and did it with some ??? support from the Key Centre. Now, I don't mind telling you that it's a huge job, and then again last year we did the same thing. So we've now over 2 years, we've caught and marked something like 1600 animals in that population. Maybe 25% of them were animals that were previously marked back to 1978, so that we have got a profoundly important set of data for our first objective, quantifying survival rates. We have also now got a profoundly well

established base line to be able to determine what does happen when cane toads move in. That study doesn't just deal with the crocodiles, it deals with the fish in all the billabongs from down near the mouth right up to past Mt. Douglas, so that we have got going back to 1978 records of all the fish that were caught and all the species in each of the billabongs all the way up.

I don't think there's many other studies like that in the Northern Territory and one of the things I would like somehow to be considered in all of this, is that it's recognised that this a very valid thing and it deserves support from government. It's really totally unrealistic to expect me to pay for it all out of my own pocket, when there's absolutely no benefit in it other than the fact of if you don't do it now you will never get the opportunity to do it again.

So there is really, I think a bunch of principles that we can learn from the history of this thing. That in general terms with conservation there's so many dramas everywhere and everyone's got their pet thing that they are trying to make out it is really important. The bottom line has always got to be, "If I do nothing what will happen?"

Something like cane toads, if you do nothing lots of things are going to happen. Lots of impacts on wildlife, lots of impacts on Aboriginal people that use wildlife. There's was a paper given at the board meeting at the key centre on Tuesday where they have gone back and looked at the hunting of the people at Motmetga near Maningrida over 20 years. Again they had base-line data from 20 years and it appears that the cane toads have moved in there and the reptile harvest is now starting to decline. It takes years to piece this stuff together, but goannas do form a very important food. There is also the whole thing of sleeping on the ground which gets a new dimension associated with it when you get these toads crawling under everything that is lying down.

At a pragmatic level, Government has been looking at ways of trying to make the Northern Territory a more intellectually sophisticated place, not from the desire to be sophisticated as such but the desire to generate the dollars associated with knowledge. We've missed out, with toads by taking such an idiotic unscientific approach to this problem. I think we have just missed out on tens of millions of dollars because we should have been at the front line demanding the money, demanding the investment by the Federal Government, demanding that NGOs take up this issue and we should be the centre of excellence not just for this particular problem here, but for all problems around the world that are associated with the same thing, which is

introduced amphibians. We could have been world leaders. The reason we're not and we're sitting here now talking about this without being able to turn around and say, "Here is the facts", completely, where you can feel comfortable about them and go home. It was never done because in my opinion, petty bureaucrats didn't let it get done. They didn't want to share whatever resources they had with anyone else and they adopted policies, to ensure this happened. But whatever it is, it's something that we need to be really sure it doesn't happen again with things like this. If there is something that has vast impacts, then you need to have a few checks and balances to make sure the government process, doesn't matter who is in government but the process to it is sound, or as sound as it can be on current knowledge.

The citizens in the NT, I think have been left out of the whole toad issue completely. No-one still has a clue, we get called all the time at the park about "What do we do?". Where's all the information flowing to the people?

Madam CHAIR: Public Education.

Dr WEBB: In this case the public has been misled in my opinion, I mean there have been letter-box drops that have gone out saying that these things aren't really a problem and don't be alarmed and nothing goes extinct. I think that is just so profoundly ignorant amongst other things; that it's in complete contrast to everything else we know. But at a global scale introduced species within the last 10 years have become a major issue in the forums of global conservation. Again, here are we with a major problem that we have basically walked away from. And as I said before, it's just a contradiction of legislation. You can't have legislation that's draconian at the level of resolution of individual animals and then just walk away from something where there's hundreds of thousands if not millions of units of wildlife going to be killed, it just doesn't make sense. Unless you framed it openly and honestly, like this is such a problem that it is impossible for us to deal with and that is it, so lets work out how we can lessen the impact. If you would approach it that way I think, it would have been a much more honest way. But now we are stuck with the problem. Where do we go from here? I really don't know. We've never been engaged to work on cane toads and although I have worked on amphibians there is a limit to what I can really keep up with in the latest developments. But I think you do need some form of taskforce that needs to be set up of people that are genuinely concerned about the impacts on wildlife and on people and that are not constrained by all these other pressures that come on people when budgets start to decline, everyone is trying to work out how to access it. I think you need some sort of task force.

Madam CHAIR: You mentioned the NTU, Key Centres. You've mentioned Frogwatch. Are they the sort of players you can see on the task force?

Dr WEBB: Yes, I think that Frog Watch already indicates individuals concerned about this thing are getting to the public. They should play a key role in this. The Key Centre could play a key role in this. It's a big job really because you're taking on the responsibility, but the key centre could play a role, we could play a role if there's a budget but I can't take on any more without a budget; I'm doing things all over the place for feel good reasons. But you need to get good people, what I mean you need to get good people. It's not the sort of problem that you can just say, "OK we need to send a technician down there, well here is Fred that just got replaced from Department of Law, we'll send him down with Bill from somewhere"... You can't do that with this level of problem. You are dealing with a brain surgery problem, you need good people. Imaginative people that are going to thrash the stuff around and see what can be done. There needs to be information accumulation, I'm not sure where the information that has come into the Parks and Wildlife Commission is. Whether its all in someone's personal files, or whether its all on major files, or where's all the references, or where's all the information. We need to be accumulating information of what other people have already worked out. That's a pretty big job. We need to get information to the public. We need to try to quantify real impacts of these things

1. so we know,
2. so we can take action, where there really are likely to be irreversible losses.

There certainly impacts with crocodiles. You people should know this and make no mistake about it. We've been looking primarily at fresh water crocodiles because fresh water crocodiles are more in the areas toads moving through. But these things also hit saltwater crocodiles. In the inquiries I've made, people say, "Oh in Queensland there's cane toads and there's still freshies". There's no doubt 'freshies' will survive, they're not going to go extinct. But talking to the people from Queensland, and talking to a guy in November that was working with us who went down to Katherine, found a crocodile on the bank, picked it up, it was still alive and basically died in his hands, cut it open, I have got a picture of it here, the big cane toad sticking in its stomach. Three months before, I had an e-mail from the guy in Queensland that's working on some of the surveys up in North Queensland. He said exactly the same thing, he said he'd come in on a crocodile during the night in an estuarine area, picked up a salty that had a cane toad in its mouth, a juvenile it was still alive and just died while it was

in its hands. Crocodiles are vitally important to the Northern Territory in terms of its promotion. It's not a trivial animal. There's recent research from the university that tried to put some value on crocodiles in terms of the tourist industry and our overseas promotion. It's something that we should be taking a major interest in yet we've abandoned it.

Try to quantify impacts, try to prevent irreversible losses. There still may be mechanisms for local control, I am not sure. I don't know enough about this. But I just find it hard to believe that there's not something that could be done to prevent some of the problems with cane toads. There's still maybe things that can be done to try and reduce their populations or control their populations in some areas. There certainly not going to get done while people are walking around are saying "It can't be done". You know what I mean. Unless you try these things they're not going to work, so I think we should still be looking at then I think there is a role, given the budget complexities that occur within government generally tightening budgets and things like this, I think there is a major consideration to try to put this thing one step detached from government, so that, obviously you're responsible to government, but it's not in the normal process of you know "well someone needs a new vehicle, therefore we'll take it out of that budget, and this guy is going on 6 weeks holidays so we are replacing him', this needs to be looked at I think as a very serious problem. In other words we need to get the politics out of it and get the science and hard work and dedication back into it. It's obviously going to need some sort of budget.

So really they are the main things I wanted to bring before the inquiry, they're to some degree personal impressions that I've got. As I said before with anything like this you really need to bury into the details ideally before you shoot your mouth off, but in this case the problem is so obvious it's night and day, you know you don't need a photometer to tell whether it is day time or night time you look out the window. So you don't need the precision or to couch the thing in scientifically defensible terms to say what's obvious. And when this is obvious I think the government is doing the right thing now by having an inquiry to look at this issue, and I hope they can start to move on it quickly because it's something that really just doesn't put us in a high light, nationally, locally, internationally or anything else. That is how I see it.

Madam CHAIR:

Graham thank you. Now does the committee have any questions for Dr Webb?

Mr DUNHAM:

Yeah, Queensland goes back to '32 with it and they've got a very good repository of tropical knowledge and in all sorts of areas including this, one would hope. Is there anything there which would give us some glimmer of hope that there

are remedies?

Dr WEBB:

Well, I'm not sure, like Queensland has a long history of living with cane toads and adapting to it. But they've also been, there's been a whole series of studies done in Queensland at different times. I'm not sure, at one stage there looked like there was some disease that was in some of the animals in Townsville or something, and this was mooted here as being evidence that once these things reached a certain stage they're going to get some disease and all die out, which turned out to be completely wrong, but I don't know.

Queensland is obviously a place we should be going and really finding out what the situation is. They've had a long history of it. They must know how to do certain things, how to I don't know, how to protect your backyard so your kids don't pick these things up. What I mean there must be information. I don't know whether there is anything in the eradication thing, I don't know whether people have worked on eradication in Queensland. Those sort of ... I don't know whether you could eradicate them to be quite honest, what I mean is you have got something that has so many eggs and tadpoles, so you might not be able to eradicate on a big area but you may be able to get control mechanisms, that can certainly keep numbers down.

Madam CHAIR:

That issue of local control mechanisms you keep coming back to.

Dr WEBB:

I think you might be able to. Whether it's protecting your dog and or cat or your kids you need to know what other people are doing to try to lessen the personal impact. I think Queensland must obviously have lot of, the Queensland situation is rather strange. Like with the crocs they keep saying, "Oh we've had cane toads and we've still got crocs", you know, but that's not, that doesn't mean there's going to be not a major impact and you don't know whether there is a major impact and then later on it comes back or whether there's a major impact and it stays down here, or whether they keep dying. We're in the unique position to find these things out.

I don't know what will happen with goannas, I think goannas are just going to disappear off the bark paintings, I mean they get hit unbelievably hard. And you know

Madam CHAIR:

Is there anyone you are aware of doing research on the subject of goannas?

Dr WEBB:

Yes, there are. There are people through the key centre, and the quolls evidently are another one that I think are just, we just don't know with most of these things.

-
- Mr DUNHAM:** The thing seems to be to have a sanctuary approach, certainly with quolls, whether you go an Island habitat and had at least, keep the gene pool alive in the sanctuary. I understood that wading birds had the potential to move these seeds, sorry the eggs around, on the basis that they were sort of a sticky string and they could be transported from habitat to habitat, so would that work?
- Dr WEBB:** Well 2 things, the quolls what I mean that idea, I just saw it in the paper of perhaps getting some islands and making sure there's at least some populations there, it struck me as pretty bold stuff when it comes to conservation strategies, but the meek never inherited the world. What I mean, I think we should do something like that to make sure they don't, I think we should, I think we need to make sure with goannas that we've got good representations in toad free areas and I think we need to take those actions, so I totally support that stuff. If quolls ...
- Mr DUNHAM:** Yes, what I am saying is, as a strategy it sounds good and all the rest of it, but when you read the literature it talks about them moving at 25km a year or whatever it is. Is there a potential from them to leap frog on the legs of wading birds into a toad free sanctuary?
- Dr WEBB:** I reckon that'd be highly unlikely. What I mean, maybe, you know, but I reckon that would be highly unlikely.
- Mr DUNHAM:** So it's a gradual encroachment unless they hitchhike in a car.
- Dr WEBB:** Yes, I tell you why I say that because Islands are infamous for having little cells of biodiversity that are completely different, you know the further away the island is the more different it is, it's where all the biodiversity stuff really came out of the island ecology work. OK it is always possible that something will get over there, but it's also possible that all the other species of frog that have sticky eggs, you know they would get over there too. And a lot of these islands just don't have them. The other thing is that I think there would need to be, there would need to be sufficient water, fresh water on those islands for the tadpole stages and everything, to then be able to hatch and nest and things. There would be a risk but my guess is that it would be minor, what I mean, Darwin's gone this long now with all the water birds flying around, the ducks and geese and everything flying all over the Territory and we still haven't got them here. If you took how long it's going to take to get them from here out to an island where they have literally got to get over the ocean, my, which is just an informed guess, that wouldn't be, it wouldn't be a big problem, there would be a risk of it so you would be better to pick a couple of islands not just one, put all your eggs in one basket, I'd be picking a couple of islands.
-

Mr BONSON: Grahame, one animal we haven't mentioned is frogs. I was reading some of the material about the impact on natural frogs, they wipe them out basically, do they?

Dr WEBB: Well it is unclear, there was one frog in particular that people were really interested in just recently, in terms of they thought that this was one, *Littoria dahlia*, that was wiped out, its quite a big frog with a stripe on the back and a pointy noise, but I contacted the guy and frog people are then keen to try and get some of these little colonies of these things around the place to make sure they don't go. But I contacted the guy yesterday by email to find out what happened and that and he said well that they did find another population over in Queensland somewhere where there is toads, they thought they had been eradicated over there and so that particular species may or may not be, I don't know the short answer is, that the tadpoles are poisonous, I understand that the guy in Katherine who had the barra farm lost 30% of his baby barra or something with eating cane toad tadpoles. You would think that they'd out compete, you know, there's only so many bloody tadpoles can feed in a billabong, you'd think they would, I just don't know I'm just not familiar enough with the literature.

Some of that early work I talked about, that I felt was the wrong level of resolution was to do with frogs. But that concluded that there was no significant difference, I mean, I just don't know whether anybody really knows. I would suspect it would be an area, but frogs are pretty strange. There's a whole bunch of species of frogs and it's never the same, every wet season is different, different species come out at different times depending on the amount of rain, they nest at different times, their tadpoles come at different times. So really to try to work out and there is an overall declining trend in some frogs that's occurring, I did extensive work on frogs in the 1960's, and so to get a base-line to really tell what's happening will be pretty difficult. There is a guy Gordon Grigg who's developed these monitoring systems where something switches on and records all the calls and it switches off and it switches on and records all the calls. Theoretically you are going to be able to download this and work out what frogs were around at that place at that time, but again it's probably going to take years to get the base-line data to really work out the difference. So I would put it as a high priority to look at, but I just don't know myself personally whether that's a key area.

Madam CHAIR: Elliot, do you have a question?

Mr McADAM: Yeah Grahame if I can, I mean it just seems pretty clear to me that you are obviously very concerned in respect to its impact on the wildlife and then of course the indigenous community, social impact, and then you also talked about

the economic impact, ie the crocodile industry and tourism. Can you, and again I am not too familiar with it, but the first question would be; has there been any attempt in the past to try and get those sorts of people together to represent and talk about it. Has anyone ever said "you have got the wildlife mob, you have got Aboriginal people, you have got the tourist operators, you have got the crocodile industry, business, has anyone ever got together?"

Dr WEBB:

I don't think so, not to my knowledge. There has been a number of workshops that have looked at cane toads, especially that ERA workshop which Laurie Corbet held in 1998.

But I'm really not sure whether it was really, I can see what you are saying is to get all these key players together. I am not sure that has occurred and in the past the whole thing would have been de-railed by these highly conflicting arguments that confuse everybody, so I'm not sure whether it would work I guess I am thinking, but it is certainly worth thinking about.

Mr McADAM:

And the other question I want to ask is, you also refer to the accumulation of knowledge and I guess you are referring to, also within the department in terms of that. Would that be of any use to us to approach them in terms of trying to secure or to try and determine whether there is anything of any significance?

Dr WEBB:

Institutional knowledge is one of the things that is an intangible value and there is a history of just losing this stuff and so my view would be that it would be a very good thing for this inquiry to find out where all the institutional knowledge is on all this work that was done, and make sure it is secure. Because you know it happened to all the forestry data up here, they just took it all down the dump and dumped it and papers that are now being written on crocodiles are being written with a complete loss of institutional memory, and they are getting completely cocked-up because of lost institutional memory. So I think that would be a very solid thing, because if some sort of task force is set up and people need to know where that material is I think that is an excellent point.

Mr McADAM:

My other question I have which is probably not relevant to what you referred to today, but you are obviously aware that I think reports of cane toads at Dunmurra in about late 2000/2001 down as far as Dunmurra, you know where Dunmurra is?

Dr WEBB:

No not particularly, somewhere at the top end.

Mr McADAM:

Well Dunmurra would be about 250km south of Katherine or thereabouts.

-
- Dr WEBB:** Gee wizz!
- Mr McADAM:** And I've also received evidence, I haven't seen it myself personally but 110km to the south there's a bit of a billabong system which is Longreach and then it leads into Lake Woods. Lake Woods is a southern extremity of Longreach which actually starts up near way, which is up towards the Gulf country. But in late 2000 early 2001, I personally observed large numbers of cane toads on the road and also at Dunmurra itself. Anecdotal evidence from the managers at Dunmurra over the last couple of years have indicated that again, it is only anecdotal. Yes there is having an impact. They are talking about things like geckos, where there used to be lots of geckos around, they are gone that sort of stuff.
- Dr WEBB:** They have just disappeared or something.
- Mr McADAM:** The point I am trying to say is that, Dunmurra is a pretty arid place compared to the country that you refer to. What is their likelihood of survival in country like that? They tell me that... ..
- Dr WEBB:** Probably the weak link in there
- Mr DUNHAM:** It has come right through Camooweal and all that country there, that is bloody hard country.
- Mr McADAM:** Yes but you have got the Georgina there, through Camooweal, you have got a water system you have got big billabongs there all the time. But Dunmurra is a bit different. I suspect they have come down from way up toward that Borroloola way have come down there and there are some little billabongs around Dunmurra, certainly near 'Highway Inn' there is. I mean you're talking about temperatures that get down to
- Mr DUNHAM:** Below temperature.
- Mr McADAM:** Yes that sort of stuff. But what I am saying is
- Dr WEBB:** What do the temperatures get down to?
- Mr McADAM:** Well I don't know. Probably at Dunmurra you could get down to 2 – 3, during the winter.
- Mr DUNHAM:** Elliot will hit mid to high 40's.
- Dr WEBB:** It seems to be minimum temperatures that slows them down. And at the NSW coast it seems to be minimum temperatures that slows them down there, but the weak link in their chain is of course the tadpole stage. They have got to be in water to be able to reproduce but the bad part is that they've have got so many eggs, once 1 breeds, well I
-

-
- mean... ..
- Mr McADAM:** Why I am concerned about that is, that I really wouldn't mind trying to seek some more information in respect to its.
- Madam CHAIR:** It's habit?
- Mr McADAM:** Yes its capacity to survive in a place like Dunmurra. I don't know, I need to know that. But I have got no doubt that in the Lake Wood system, the Longreach system they will survive.
- Dr WEBB:** If there's a permanent wave and the get in there, then they'll survive I would imagine.
- Mr McADAM:** I have no doubt that they would do it there.
- Dr WEBB:** Look I tell you on that issue, if my memory serves me correctly, there are some information about on like, the tolerance limits of these animals in terms of minimum temperature, maximum temperature that could probably give you some guide. In fact I seem to remember a guy in Queensland doing some work that mapped out, now this going back into the 80's somewhere, but sort of mapped out the areas in Australia that these things could inhabit. So I am sure there are some papers around somewhere that would shed light on that, on what they can and what they ...
- Mr BONSON:** I think there is a paper in here that mentioned about that NSW stuff that I read in there that talked about, they seem to be getting stopped on the NSW border just over the side of the border.
- Dr WEBB:** That's right.
- Mr BONSON:** The only other question I have and I read in here as well, is that where they come from they don't have the same amount of mass as what they, here it is like nearly paradise for them, and some to the reasons was that they were talking about parasites and ticks and things like that where they come from. Now I am not saying that we go down that way because we might open up a whole Pandora's box. But you mentioned before about those students that really there hasn't been any work done on them.
- Dr WEBB:** That would be an oversimplification. What I was really saying is when CSIRO adopted this project, to me, again, they put someone that was a non-specialist Ron Green, he was an varanid physiologist in charge of this program with frogs, I don't think he had ever seen a frog before. He went over to Venezuela and I have worked in Venezuela, and I did the singing and dancing and drinking red wine is a pretty big temptation, and lots of nice students at the university, this is the way the real world works, don't believe all that
-

stuff that scientists, you know what they make out. And the impression I got at that meeting was that they'd selected at a beauty contest before they brought the students back over to Australia to talk at the herpetology meeting, and none of them knew what they were talking about, they were not professionals. You know there is a bigger problem solving issue in this, they weren't taking the problem seriously. Now in Venezuela themselves, and I was communicating with Venezuela this morning and last night. I could find out anything from Venezuela at the drop of the hat, of what's going on there if people need to know that. But the theory that they're smaller or something in Venezuela, I don't know quite whether that's so, because I remember in 1984 when everyone was mouthing that and we went over to Venezuela and the biggest bloody cane toad I had ever seen, it was about this big, came leaping past when we were out in this place. So some of these ideas of what may happen over there, are ...

Mr BONSON: What about quantity-wise though?

Dr WEBB: They didn't seem to be in the numbers that you get on the fronts. These things seem to come in, and they've got an abundant food supply like any animal, and they just expand and expand and expand and then it goes down. But also there is a dry seasoning, in the cool dry season they tend to be under logs sitting there, and they come out when it warms up and it starts to rain and then they are active. Now there is no doubt all sorts of parasites and causes of natural mortality in Venezuela, where they come from, just as there are causes of natural mortality of frogs here. But I tell you something, mortality is an unbelievably difficult thing to pin together, it is not an easy thing even for the best of scientists to really pin together what are the factors causing mortality, it's the most difficult thing.

So their idea, which was really a bit of a 'fish-hook' thing really was, maybe, we can stumble across something, that is how I read it. That we can use some sort of viral control or some sort of other control, but to my knowledge they didn't stumble across it.

Mr DUNHAM: That Townsville thing talked about, I think it was Townsville you said where there was some disease that went through, did they do the epidemiology work on that?

Dr WEBB: I don't know Steve, I can remember somewhere back then when Freeland got on to this, that, I can remember him talking about it, but it was like the final page of a book the way he was interpreting. I don't think the disease turned out to be anything stunning, I don't know. The problem in this whole issue is that there is a lot of information around, it is being collected by all sorts of different people, students, thesis and ... Bill did get all that together and he did some

useful reviews I think, the guy from ERISS that review, do you have that amongst your papers.

Madam CHAIR: No, we have got to chase that one up.

Dr WEBB: I can e-mail it to you. I was going to bring it in. Have you got Laurie Corbett's, look I will e-mail you both of these as soon as I get out, because that is a very good review I think, a very objective review and one of things that may be a real problem is frill-necked lizards. Frill-necked lizards are pretty strange little beasts but they sit up on, when you look at their stomach, they are eating a lot of ground dwelling stuff even though they're spending all their time sitting up in the tree. So they seem to sit up in their trees and they see something popping along and they go down and grab it. So there is evidence in there, in this report that suggests fill necked lizards, which really should be another icon species for us in the north, maybe particularly heavily hit and of course blanket lizards are a big and common food item right across the top end, so that is another one that probably needs to be put on the island with the ..

Mr BONSON: With that island idea, I suppose I would say Grahame that we need to have a look at, OK we might not be able to stop them but how do we protect our species.

Dr WEBB: I think we've got today, you know, 50 years ago no-one would have worried, but today, there is a public ethic about these issue, an in fact the Northern Territory has established wonderful leadership in a lot of these areas and I think it is beholden on us to approach this sort of problem with the same sort of objectivity and pragmatism that we have approached other problems in the past and ...

Mr McADAM: Trying to build a Noah's Arc and take off.

Dr WEBB: Well maybe, it's seemly time to look at that. I was pretty impressed when I saw that in the paper after hearing 'they're not going to be a problem' for the last 15 years, I mean it is a breakthrough. And I think it has some serious ... certainly a lot of people will object to it, I think purists will object to it but ...

Mr McADAM: Grahame can I just ask one other question, and again it is to Lake Woods and I know you are not familiar with the country and that.

Dr WEBB: It is south of Katherine?

Mr McADAM: It is south of Katherine, Elliott it is about

Mr DUNHAM: It is 100km north of Elliott

Mr McADAM: No I am talking about Lake Woods, Lake Woods which is at

Longreach is permanent water hole and it is fed from way, I haven't personally seen this but I have been told and I have read I think it was Val Dwyer from Hill Station reported that there are cane toads in the Longreach system. You have got a water system there and I think there is about 20km of permanent water.

Dr WEBB: There are no crocs in there are there?

Mr McADAM: No. There are turtles and there is brim and other fish. And of course there's a lot of goannas and there is a lot of other wildlife. There is a lot of frogs and a lot of sand frogs. What I am saying is, number one is there is no possible way of destroying or eradicating what there is already in there because of it's confined space that is number 1. Any known method of

Dr WEBB: What is it, 20 kms?

Mr McADAM: It is about I don't know, I would say it is about 20 odd kilometres.

Dr WEBB: That is the sort of thing, I couldn't answer that question. That type of a problem if I was involved in this stuff, my guess would need to go and look at the whole thing and assess it and then try to work out what can be done if anything.

[Looking at map]

Mr DUNHAM: It is a bloody big system, and there is your route he is talking about

Dr WEBB: It is connected here.

Mr DUNHAM: Yes, down at Borroloola, channel country.

Mr McADAM: Down here, this here is not permanent water. It's only if its been full flowing. It was full last time

Dr WEBB: There's cane toads there now is there?

Mr McADAM: That is what I have been told. But that will dry up but this river system won't, that is why I am talking about to 18-20

Dr WEBB: Oh, so that is probably where they are coming from, right down there.

Mr DUNHAM: But there is not a river on Hayfield or Shannondale here? It's flat.

Dr WEBB: I doubt, just from my own general knowledge of this stuff, it might be certain. I just don't know.

-
- Mr BONSON:** Can you show us on the map where their at now?
- Dr WEBB:** They came across here, they were over here in the 70's and they crossed the border in the early 80's or something, and they moved up through here and then they've come over the top. So they have gone down into Maningrida and they have come down into Kakadu, once you get up on the high country here there is nothing to stop them. Now they're moving, they're in this part, here's the McKinlay River here, this whole area here is the area that we have got this whole population marked in, and they are not there yet. They might be there this season but my guess is
- Mr DUNHAM:** Well have a look, they were in Katherine gorge Eva valley, look where Snowdrop Creek is from that, that is about 20km bugger-all.
- Dr WEBB:** They have been there since about 2000.
- Mr DUNHAM:** So Snowdrop Creek is here right, here is Katherine, comes all the way up here, There's Snowdrop, look at that South Alligator. That is 20 km.
- Dr WEBB:** Yes well these things here are all in a couple of kilometres. The head waters and the East Alligator and at Katherine are all together within.
- Mr DUNHAM:** You can walk it.
- Madam CHAIR:** Members, as loathed as I am to call us up on these discussions, I am aware that we have some other agenda items that will be useful to pick and move through before we all meet our other commitments in the next 15 minutes.
- Mr McADAM:** One other question. I am still interested in that Lake Woods area. Can someone come down, would you like to come down?
- Dr WEBB:** I can't because I am just snowed-under. But really there should be rangers going back and forth.
- Madam CHAIR:** I'd just have to say Elliot, that the committee will put a little request through that Parks and Wildlife do an assessment and give us advice on the status.
- Dr WEBB:** A snapshot of what is happening, because now would be the time to find out.
- Mr DUNHAM:** There has always been a bit of water in there though, you reckon it dries out totally?
- Dr WEBB:** The impact on fish of these things is something that shouldn't be discounted, the only other thing I would say is
-

the impact on fish is something that shouldn't be discounted. That is 1 of the areas in this McKinlay where we have mapped all of these fish over all these years going back 20 years, and should be in a position to say something about it.

Madam CHAIR: I picked up on that comment of yours earlier Grahame, I thought that was a good one because it certainly opens some funding opportunities I would say in addressing this problem as well. Fishing is such a huge industry, rec fishing is such a popular pastime in the Territory, that if there were impacts, and there is obviously more imperative for action on it.

Dr WEBB: No, I think that is an important point.

Mr McADAM: Because the other point to is that, Grahame said that there might be a tendency for them go through and then they seem to maybe stabilise in terms of numbers.

Just from my observations, I don't think there is any less cane toads in Borroloola itself than 1990.

Mr DUNHAM: I reckon it is the opposite. When they came through there were bloody millions of them. And now I reckon it has dropped, the last couple of times there is not as much.

Mr McADAM: No. I reckon in Borroloola it is about the same.

Dr WEBB: Don't lose sight of the value of local people that can tell you over a long period of time what's happened. Sometimes in science you tend to measure everything precisely to find whether there is a resolution but over a short period of time, and some of those long-term observations by people that have actually been there for a long time are far more important. So they are far more scientifically valid.

Madam CHAIR: We are actually going to travel to these areas for public hearings, so we are very keen to hear from the people in the areas.

Dr WEBB: I would try to map down any of those sorts of observations, as to whether, if you can from people because they'd be important.

Madam CHAIR: A very hearty thank you Grahame for coming and sharing your knowledge with the committee, we very much appreciate.

MR DUNHAM: Thanks Grahame see you later.

Madam CHAIR: Thanks Grahame, pleasure.

Mr DUNHAM: I will get that thing to you mate. I will send it off by fax.

Dr WEBB: Ok, and I will send those student reports through to you.

TRANSCRIPT NO. 2

Dr Peter Whitehead
Key Centre for Tropical Wildlife Management
Tuesday, 15 April 2003

PRESENT:

Committee: Ms Delia Lawrie, MLA (Chair)
Mr Tim Baldwin, MLA
Mr Matthew Bonson, MLA
Mr Stephen Dunham, MLA
Mr Elliot McAdam, MLA
Mr Gerry Wood, MLA

Secretariat: Mr Rick Gray
Ms Maria Viegas

Presented by: Dr Peter Whitehead, Director, Key Centre for Tropical Wildlife Management, Northern Territory University

Note: *This transcript is a verbatim, edited proof of the proceedings.*

MADAM CHAIR:

Alright we have got 2 apologies for today from Mr Dunham and Mr McAdam, so we will get started.

Peter thank you very much for agreeing to come and address the parliamentary committee inquiry into the incursion of cane toads into the Northern Territory and we appreciate the time you have taken and without further a due would you like to kick off and give us some of your expert knowledge on the subject.

Dr WHITEHEAD:

Yes, I guess I should say first that I am not an expert on cane toads themselves, although I have worked on a lot of animals that they might affect, and I am in charge of projects that relate to what cane toads might be doing to the Northern Territory fauna. My position as Director of the key centre for Tropical Wildlife Management, and the key centre is doing a reasonable amount of work on cane toads, but primarily looking at impacts we are not in a position to do much about control. So what we are doing is trying to find out about what cane toads are doing and might do in the future to the fauna and in particular we are working on goannas because they are one large group of animals that is known to be severely affected by cane toads and also because we tend to work a lot with Aboriginal people, and Aboriginal people have a particular interest in goannas as an item of food.

And so questions arise about whether people should continue to harvest goannas once the toads get here because they could make things worse for the goannas and cause a delay in them recovering from the affects of toads. So that is our main area of work, we are also working with Graham Webb's group giving some support on the impact on toads on fresh-water crocodiles in the McKinlay River system in particular, that is one of the best known populations of crocodiles anywhere in the world, perhaps millions have been invested in it over the years and it is likely that it will be affected in some way by toads and work is being done now to find out what, by recapturing a lot of marked animals and using that information to work out the way the populations were before the toads, what the ,mortality rates were and how much they reproduced and compare that with what happens after the toads get there.

The other sort of work that is going on in the Top End at the moment, I am not sure whether you, do you want me to talk about it?

MADAM CHAIR: Absolutely, yes.

Dr WHITEHEAD: There is work also going on with quolls, as you would know because the Parks and Wildlife services are involved in doing some of that. I am associated with that indirectly through being on the Board of Kakadu National Park and Kakadu are concerned about the impact on quolls and are co-operating with the Parks and Wildlife services to get quolls on some of the islands so they will be safe from toads.

MADAM CHAIR: How is that being viewed by people working the area? The impact on quolls and the decision to relocate?

Dr WHITEHEAD: Until the recent work was done by Parks and Wildlife service working with Kakadu on the balance of quolls and toad free and areas where there were toads, the evidence about the decline was all anecdotal, so they have now got some numbers and at present it does seem as though the affect is fairly dramatic on the toads, everything points that way, it is not conclusive yet as to exactly how big the affect is and how long it will last, whether some of the animals will learn not to take toads or not. It does appear that there is quite a dramatic affect, so there is an acceptance I think, of the fact that something needs to be done.

There was some concern about putting them on islands where they weren't because there would be a reason why they are not there and it may be that that reason is that those islands are too small to support a population over the very long term, but they might be quite suitable for a stop-gap measure, so, for some decade they sustain a population.

But it does warrant careful monitoring so that people know whether it is actually working or not, whether those populations they establish on islands are reasonably stable and whether they are effecting anything else.

MADAM CHAIR: What about the suggestion by some people that you could also look at that island sanctuary idea for other faunas such as the goannas, do you think that is something worth this committee investigating or not?

Dr WHITEHEAD: It is a possibility I guess for some of the goannas, it is a 2 way thing, you would have to be very careful about the islands you chose for the quolls they chose islands where there wasn't much seabird nesting, so that you wouldn't get a risk of predation of quolls on seabirds nests, they nest on the ground, so it is vulnerable. You would have to do the same sort of thing with goannas, you wouldn't want them on islands where you have significant seabird nesting colonies and goannas weren't present and that is one of the reasons why the seabirds like them. The same with turtles, goannas are very effective turtle egg predators and if you had significant turtle augeries and islands with few goannas, or no goannas you wouldn't want to introduce them.

Also, most islands are too small to have well developed river systems, so you are not going to be able to look after some of the goannas like the murtons which is something that hangs around in fresh water, so there is limits to what you can do with that and the birds are too mobile for that to be reasonable in most cases. So it is probably a relatively narrow range of fauna that you would either consider that there was significant risk to justify the cost, or scope to do it affectively.

Mr WOOD: Is it possible to have toad free sanctuaries on the main land?

Dr WHITEHEAD: Anything is possible if you are prepared to spend enough, and I guess that is something that is not being looked at very carefully, it is how you might go about designing barriers to toads. There was a suggestion in the past that a fence should be put across the neck of the Coburg Peninsula, I have some doubts about whether that would work, it is sort of trying to create a pseudo island. It seems to me more sensible to invest your money, if you are going to do that sort of thing, in real islands and helping with quarantine there and helping people who are on those islands to monitor the presence of toads and try to prevent toads being established, rather than trying to establish a pseudo island on the main land. You have got Melville and Bathurst and Groote Eylandt and those other islands, which it would be better looking after real islands than pseudo islands.

-
- Mr WOOD:** How big is the risk of change in the ecology, I mean the islands vary in ecology enough that if you introduce something else, you mentioned the seabirds, do you take a risk of... ..
- Dr WHITEHEAD:** With the small islands, there is certainly a risk in any one. I would consider the options carefully beforehand plus monitor it carefully. Again with the quolls, in my opinion anyway, the risk was such that it justified I guess, what seemed to be a lesser risk. That is that you might change something on the islands but if you didn't do anything you would lose the quolls from Kakadu.
- Mr WOOD:** Are there different species of quolls in the Top End?
- Dr WHITEHEAD:** No, there is only one in the Top End, but there are other species in other parts in Australia and the one in Queensland is thought to have suffered fairly severely from toads and some have suggested that it is one the way out because of toads.
- Mr BALDWIN:** Has there been much work done in Queensland on statistical scientific work on what happened to the population, of native species with all the years of cane toads?
- Dr WHITEHEAD:** No very little, I think it was viewed as inevitable and there wasn't that much concern about
- Mr BALDWIN:** So no one has gone back since and tried to sort of work out whether the quoll species, for instance is sustainable in its current
- Dr WHITEHEAD:** The work that is being done now on those quolls suggests that they are in trouble and it could be due to the toads but there was no 'pre-toad' information, and that has been the problem all along, is that by the time people thought about this stuff it was too late to make quantitative comparison.
- Mr BALDWIN:** Is there any hard information that you can sort of put your hands on?
- Dr WHITEHEAD:** Not really, there was some work being done and I guess you would have heard about it, and that brought up to date the information that was available and they were struggling to find anything quantitative and there has been nothing done since. The work is now being done by Kakadu and by us and people like us, Rick Shine from the university of Sydney that is going to provide the first good quantitative assessment, unfortunately that is the way it is.
- There is no doubt that toads are going to have an effect because the anecdotal information is that there is just so much of it. Often science gets trapped into trying to prove

the bleeding obvious, but if you are going to invest a lot of money you do want to be confident that the effects are real, and in particular whether the populations are likely to recover on their own or whether they need help to recover.

Mr BALDWIN: That is obviously a very, very long term thing.

Dr WHITEHEAD: Yes.

Mr BALDWIN: So we can blame the Queenslanders that we haven't got anything substantial to lay our fingers on.

Dr WHITEHEAD: Well, predominantly because they were there since the 1930's and that was a fair time to have looked to the problem, and there were people who gave warnings at that time that introducing the toads was a very, very bad idea.

So it wasn't as if people didn't understand, woke up too late, it was that it wasn't considered such a priority to make the investment. And I guess that has been the same all the way through that the problem seems so large and the scale of investment that you might need to make so large, that the uncertainties you use to justify are not doing very much.

MADAM CHAIR: One of the things that we are obviously looking at are practical measures that an inquiry of this nature could find in terms of giving the advice to parliament and is there anything you think that we need to be focusing on, in terms of practical measures to minimise impact or at least respond to the impact appropriately?

Dr WHITEHEAD: I don't know, I don't have the expertise because I am not a frog person to say what might be the most effective approach, but we have been fairly creative in lots of other ways, as humans in dealing with animals that we didn't like, and I would suspect that if investments were made there would be various ways in dealing with toads, killing them directly or poisoning them, attracting them to certain places where the risk of poisoning other animals is reduced, but you get lots of toads.

They would all require a fair bit of work though to come up with something that you weren't worried about killing off more of the things that you were essentially trying to protect, than the toads themselves. So there is quite a lot of work, but I don't think it is impossible. There are other mitigation measures you could take, toads don't like heavily vegetated areas, so if you want to keep the density of toads down in some places don't disturb the vegetation, so you don't have fire and you don't have grazing, those sorts of mitigation measures. But they are not going to stop the toads getting in, toads are going to be less dense and that would interfere with other things that people want to do, Aboriginal people burn the flood plains for hunting and that would create a

better habitat for toads in my opinion, than if they weren't burnt, if they were left very heavily vegetated. Grazing lets the sun in, you would have more open water that is more suitable for toads than you would if you weren't grazing.

So you can't apply that across the Top End and there is plenty of feral animals out there that will go on doing their thing if you control domestic stock. But there might be places where you are just sufficiently concerned because a place is special to people, Aboriginal people, it is mainly Australians more generally who have a particular concern for a place that they would like to see toads at least kept under some sort of control, the number not as high as they might otherwise would be.

Those are sorts of things you could do. You could probably fence small areas where you could patrol the fence regularly and maintain it, but I don't know how you would do that on a very large scale and it would be very difficult to do in the habitats that are going to be worst affected by toads, those are the rocky up-stream sections of rivers, fencing in those areas is very difficult.

But I think if people who are more expert in frogs than I am come up with suggestions about ways of attracting them into places where they can be killed in large numbers, those sorts of direct approaches to control to mitigate the damage toads do while we are waiting for biological control and that seems to me to be worth considering, if the funds are available to do it. And I personally think the problem is serious enough to warrant it, and the benefits by just slowing them down would be, I guess we could warn people about the potential impact that people don't currently don't understand what might happen to their food and their appreciation of the wild.

The Western Australian Government, for instance in the past have been really 'gung-ho' about exotic animals they have adopted a much more aggressive approach to introduced animals than anywhere else in the country, they have been successful at keeping starlings and sparrows at bay for years when other governments just sort of wash across those areas. That was helped by isolation and the particular deserts they have got between them and everyone else, but they took a lot of aggressive measures and it may be that they are prepared to invest more and could persuade the Commonwealth Government perhaps to invest more. If they had time and were confident that they could get something in place before it was too late, so slowing things down seems to me to have some relevance. A lot of the fauna that is at risk in the sandstone country in the Territory has similar similarities to the fauna in parts of the escarpment country in Western Australia, so you could do some good on a national scale, if you could slow them down while you were waiting for the biological control. It is

not easy and might well fail but I think that the attempt is more than justified. The biological control side of things, I guess you have heard about that from, another 500 odd thousand from the rest of this year, but it will be at least a decade before they do the rest of the work that will be needed to actually release something, so it is a long way off.

Mr BONSON: So Peter are you saying there is a couple of options, there is an option of maybe looking at trying to slow down the process of the spread of frogs, something in the short term?

Dr WHITEHEAD: So all the normal measures about quarantine and persuading people from deliberately carrying them and all those things.

Mr BONSON: They are going to all those places, and the second one is, maybe long term ones, you are looking at some kind of biological attack on cane toads.

Dr WHITEHEAD: Yes, the sort of approach that CSIRO was taking does seem to be, to me to be something that is worth considering. Their approach is to use a fairly common virus that is already present in frogs in Australia and to use it as a vehicle to get a gene into tadpoles that will stimulate a response, it is a gene that is normally only expressed in adults by introducing it prematurely into the tadpoles and hoping to stimulate a response so that when they do start to metamorphose and express that gene then they will have been sensitised to it and they will basically attack themselves, it is sort of an induced auto immune disease.

If they are successful in identifying a very specific protein, that is very specific to toads, and is using a virus to introduce it, that is already present in the wild, it is a bit different to some of the things that are being considered before which was, gene viruses from South America and so on.

And the concern with toads in particular, was that the virus that do infect them also infect fish and so introducing something new was a lot scarier than perhaps messing about with something that is already here.

Mr BONSON: I suppose the other evidence that we have had so far, is that those viruses only contain the cane toads, it doesn't really stop them or kill them they still survive in South America with those sorts of viruses.

Dr WHITEHEAD: Well most biological control doesn't eradicate organisms, it just keep the numbers down, keeps the lid on them. Like mimosa control, it is beginning to have some effect on mimosa plants and slowing down the advance maybe but not killing them all. They don't know yet to what proportion of the population would be killed by this approach. On a smaller scale one of the things I guess is possible is to think

about what people in Darwin might want to do about keeping toads out of their individual properties.

Mr BALDWIN: Put a bounty on.

Dr WHITEHEAD: Yes that could be part of it. Trouble is that they will be coming from everywhere but the place you want them 'to be got out of'.

Mr BONSON: If you can, can you expand on that Peter, because I thought I saw in my own yard since what are the ideas?

Mr WHITEHEAD: Well I don't have any, as I said, particular expertise about frogs but I know that the toads are not a particularly agile frog. They will jump into buckets and can't get out and those sorts of things, unlike a lot of the tree frogs that will climb out of those things.

So fences, does seem to me to be a possibility and patrolling your yard reasonably regularly to remove the toads, you would need to maintain them well so just a fine mesh fence along the surrounds and something to seal the bottoms of your gates and so on, so that they wouldn't get large toads in. And the usual things you are supposed to do for mozzies anyway, to not leave too much water lying around, so they don't breed in your yard. I guess being vigilant and setting up maybe a light, and some food maybe cat food or something, that might bring insects around and then hopefully would attract the toads so you would know whether you have got toads in your yard, and being aware of the call and just being careful about keeping them out.

They are not as good at getting into hollows in elevated trees and so on as some of the native frogs do, so it would be easier to keep them out than it would be to catch if you wanted to catch the native frogs, they are a bit more vulnerable to that intervention. The reason that intervention hasn't normally been successful is that their just so damned abundant.

When it comes to physical control, I don't know that anyone else has looked at it but we did a little exercise when I was with Parks and Wildlife in the Gulf. Some years after they first invaded we had a group of rangers doing a training program out on a place that was proposed for a park, and they were doing nothing after dark so I organised for them to collect toads from these little bodies of water we were camped near each night, and collect until they couldn't find any more. We did that for 5 nights in a row and at the end of that period, and they were little water bodies some of them no bigger than this room, the largest was about 250m circumference. We collected 3500 toads and they were still coming in the water at the same pace at the end of those 5 days as they were at the beginning.

So when they were superabundant, the idea that people are going to go out and collect them and mitigate things that way is not that practical I think. They seem to be able to stay away from water long enough to keep coming after that 5 days so they are able to survive a fair bit of dehydration, then coming regularly to water bodies to re-hydrate. So anything that was involved in physically destroying them would have to be something that was there, persistent in the land scape without too many people having to deal with it for long periods. And the only things I can think of are perhaps some decoy that calls and is somehow or other presented in an environment that traps the toads or kills them, maybe with poison... ...

MADAM CHAIR:

Ditches, people have the idea of digging ditches, toad ditches, that they fall into the ditch they can't get out.

Dr WHITEHEAD:

The trouble with the ditches, it is a bit indiscriminant and children and other frogs and other things could fall in it. So I think there would need to be more sophisticated than that, but you can have relatively small openings and if you thought about it enough I am sure that there would be ways of coming up with these things, but I don't pretend to know what they are.

Officially, the idea of calls and so on seems likely to work, to attract a proportion of the population anyway. But you would definitely need something that was long acting and didn't require a lot of day to day intervention if you were going to have any serious impact except in a very small place like your own home, where I think probably you could have an impact and protect your green tree frogs and the lizards and the other things that inhabit suburban gardens.

Mr BONSON:

Just on this paper and your collaboration, how did you come about getting involved in that, was is the story behind this paper?

Dr WHITEHEAD:

We have been concerned for some time, or I have anyway and I think John was as well. The reasons that were given for not intervening were very much about white fella or cuddly conservation perspectives rather than something broader, and there was a case where I applied for money from the Commonwealth, I wrote a proposals when I was with Parks and Wildlife service seeking money to get someone, I proposed Dennis Smith, I don't know whether you know him, but a bloke that works in Queensland to look across the gradient from where toads have been for many years, across through into the Territory and talk to Aboriginal groups and pastoralists and so on, about what had been found to happen when the toads arrive, their anecdotes.

And it seemed to me if you accumulated enough of that

information in a systematic enough way from Aboriginal people who are good observers, and from pastoralists who are good observers you would get a really strong feel for what had actually happened and how quickly things recovered.

We have this natural experiment where we had got a gradient from where toads have been for 70 years through to places where they haven't got yet and I applied for Commonwealth money and the reaction was 'Yes that is a very good idea but it doesn't fit any of our boxes', and the boxes were about endangered species and threatening process and none of the ticking had been done to say that the toad was a threatening process, or about the species that was most likely to affect when in danger, so it never got up.

Even though the public servants involved acknowledged that this is something we should do, it didn't fit the template.

And I think that has been the problem that there has been a tendency for

1. To say it is too hard. But then when you have got an opportunity to find out something interesting and justify intervention, justify more expenditure than it is considered within a over specified, over rigid sort of template and that is the common problem with bureaucratic systems that was particularly frustrating with the toads.

So that was what stimulated us to think about trying to get an Aboriginal perspective on what the toads were going to do to people's livelihoods, where people are still strongly dependent on wild food. We thought we could do 2 things, but it is very hard to census goannas, to count them, they are elusive things and we thought that by working with skilled hunters we would be able to look at their 'catcher rates' before and after the invasion of toads and compare those and say something about how the abundance of goannas had changed. And at the same time say something about how people's access to food had been affected, so there were 2 purposes, one was to look at impact and the other was to provide more of a justification for seeking to intervene. So that has just started and as it happened in one of these exercises, the first toad that a lot of the people in that area it seemed rolled up while some of this work was going on and that little story is about, I guess trying to put an Aboriginal perspective on the whole problem of toads. It is a bit more than just about the cuddly side of conservation it is about the livelihood and the way you interact with the bush. So that was the motivation for it and I still think it is a valid perspective and one that I think we are going to be trying to warn other Aboriginal groups about what is likely to happen, so that they can raise their voices about perhaps the need for intervention.

Mr BONSON:

I suppose everything's gone to Queensland, up the north across to us, in Arnhem Land it is going to head over to the

Kimberley area. And then have they been sighting things like that now at the moment.

Dr WHITEHEAD: Have they had sightings?

Mr BONSON: Yes.

Dr WHITEHEAD: I am not absolutely sure, but I know there has been the odd sighting towards the Western Australia border, I am not sure how much of that is that the toad brunt has moved or whether there has just been the odd hitch hiker. Parks and Wildlife people would hope to have that sort of data but we haven't been collecting it.

MADAM CHAIR: So Peter you seem to be indicating there that one of the possible areas that this inquiry could focus on is how any response could be culturally appropriate and in language in terms of informing various indigenous communities about the toad, what it is, what it does to their food sources and what actions they can take, do you think that is part of what we need to be doing?

Dr WHITEHEAD: Absolutely there is useful work being done in terms of some posters and some efforts being made to quarantine islands, like the work that is being done with the NT Government looking at those islands on which the quolls are being introduced to try and keep toads off and as part of the arrangement with Aboriginal owners of those lands, I gather it is for them to do some of that work.
I would have thought that doing that more widely, even on islands where we haven't introduce quolls seems to me to be a valuable thing, to motivate people to be on the look out for toads, to be informed about toads in their language and to really understand the concerns and that might mean bringing Aboriginal people from areas that have been effected by toads to tell about the effects on the goannas and the short-neck turtles and other the things, so that it sinks in.
If it is too abstract people aren't going to take it seriously, I think it needs to be accessible and convincing.

MADAM CHAIR: One of the areas that I have I picked up a bit of community interest is certainly the rural areas, the member for Nelson has down in Litchfield that area where people have got industry their livelihood is horticulture based and the prime industries down there. In your discussions with any other people in the field has there been any sort of body of view formed on the likely impact around the rural areas, the agricultural areas?

Dr WHITEHEAD: I've not heard of any concerns about impacts on horticultural or other stock rearing sort of activities. I mean there were concerns raised when Bill Freeland did the original review of the impacts of toads when he was with the

Conservation Commission about disease, the spread of human disease, potential animal disease I guess, cane toads will consume faeces and so on. There was concern about toads getting into poorly maintained bores, large numbers of them falling into those things and polluting the water, that's a possibility. But I've not heard of other sorts of concerns. Did you have anything particular in mind or?

Madam CHAIR: No, no, I'm just trying to gauge the sort of the scope of impact on people and their livelihoods.

Dr WHITEHEAD: Fair enough. I guess the tourism side of things is another possibility. The people who are dependent on tourism involving wildlife may find that it's a lot less obvious than it used to be. Some of the attractions to Fogg Dam for instance, so the goannas that come up onto the dam wall, those large the flood plain goanna, they would probably be very badly affected. Some of the turtles that are also common in that area and people go out there at night to watch them cross the dam wall and so on. Tour groups, some tour groups go out there and do that sort of thing. Some of the birds will be less common, so yeah, there will be impacts and we will lose some of the conspicuous wildlife in the goannas, they won't be conspicuous anymore. And we don't have that much in the way of sort of charismatic sort of fauna, big, big animals that are out active in the day and so those losses, it's hard to judge whether they'll be significant and stop people coming but their experience will be a lot less than it otherwise would have been. And some of potentially crocodile populations might be affected too. There's no evidence from Queensland that populations are badly affected at the saltwater crocodile, the population densities of saltwater crocodiles in Queensland have been very much lower than in the Territory but it seems to be habitat related rather than the toads but it may be that in some harsher habitats further upstream that crocodiles may be more likely to take toads and some of them be affected by that. The freshwater crocodiles could be affected in quite large numbers. I think they could be suppressed for a while anyway, substantially. I'm not sure how much anyone depends on them for a tourism experience, there are people in the Mary River who certainly depend in part on freshwater crocodiles for their attractions.

Mr BONSON: So Peter, so what you're saying, on top of Ansett collapse, September 11, Bali Bombing, Iraq, SARS, now we've got cane toads might be affecting tourism as well?

Dr WHITEHEAD: Yeah I don't think it has the potential to be as dramatic as any of those things but it won't do it any good anyway. I don't know of too many people that would come to see toads.

- Mr WOOD:** Are there any natural predators of cane toads?
- Dr WHITEHEAD:** Yeah, some of the birds seem to learn to deal with them. They mention in this report for instance, anecdotes about some of the kites learning to deal with them, kick them over and feed from the other side, crows, those sorts of things but the animals that I guess that are most affected are those that feed in a way that doesn't give them too many second chances, so we goannas just grab things and gulp them, crocodiles the same, they tend not to, and the quolls appear to be highly sensitive to the toxins and don't seem to get second chances to learn.
- Mr WOOD:** And are they, are cane toads just as poisonous when it's a tadpole to being adult so birds that eat the tadpoles, are they just as likely to keel over?
- Dr WHITEHEAD:** No, they're not as poisonous but obviously because they're smaller and I think the concentration of toxins is lower but they are poisonous, other tadpoles eating cane toad tadpoles die, so they may affect some of the native frogs and a lot of tadpoles eat other tadpoles including their own species and that's part of the way they work, you know, lots of animals being deposit in a small pool and as it dries back, they do all sorts of interesting things and so if there's toads in there, you'll have less native of the frogs are bound to breed. Some insects may even be affected, so there's, yeah, the eggs are poisonous, the tadpoles are poisonous and the metamorphs, the little ones are also poisonous and they're a very attractive feed for a lot of animals, they hang around in huge numbers on the edge of streams, sometimes thousands to the tens of square metres, just lined up all the way along and any animal coming to water is going to encounter them, if they eat a few of them, they'll, if they're a small enough animal they'll be in trouble.
- Mr WOOD:** Is there an affect on macro invertebrates at all? Do they eat the tadpole, that many?
- Dr WHITEHEAD:** Yeah, there appears not to be. Most of the macro-invertebrates that are good at preying on tadpoles haven't been looked at but I don't think there'd be an effect on crustacea and that sorts of things.
- Dr WOOD:** What do tadpoles eat?
- Dr WHITEHEAD:** Tadpoles eat a range of plant and animal food, they'll eat you know each other, they'll eat other frog eggs, they'll eat algae, scrape stuff off the
- Madam CHAIR:** They like boiled lettuce.
- Dr WHITEHEAD:** Yeah, they'll eat a whole range of things and that's the cane toad tadpoles are usually indiscriminate about what they

eat.

Mr WOOD: How do you know whether their affecting the micro-environment if eating thousands of cane toad tadpoles say in a small water body, whether it has an effect?

Dr WHITEHEAD: It almost certainly would have an effect on some things. Their name, some of them are named in this report, I'm not sure whether, I meant to bring it. Barramundi, they're supposed to spit them out but, and learn fairly quickly that they must be distasteful or something but they talked in here about invertebrates. In Kakadu they will be affected, they talk about water beetles and back swimmers leeches and snails potentially affected but the work has not been done in detail. All that would have a downward effect of course. And there will be all sorts of other cascading effects, when you get animals of the density that I've described, at those waterholes in the gulf, when they are scrounging around in the rocky habitats around those water bodies, they are eating something, so they are eating ants and termites and other invertebrates that are on the ground and the volumes they eat must be extraordinary because they're in such numbers themselves and so you would think there would be effects on other animals that would normally eat those things or the prey items themselves but no-one's ever done the work. Some of it's begun to be done but the specimens were lost and never, the analysis was never done.

Madam CHAIR: By whom?

Dr WHITEHEAD: Bill Freeland was doing some of that work back in the late eighties and he was moved into other positions and it was never completed as a result. We attempted to send the stuff to him in Queensland but it arrived all (when he was working in Queensland) all broken into pieces, so he never was able to complete the work. There were people in Townsville with the CSIRO, Brian Green and other people who worked for the CSIRO then in association with the Cane Toad Research Advisory Committee, they sought to do some work with enclosure, so they tried to build cages in which they effectively cages, large cages in which toads were present, toads were absent and compared the way the animals, the native animals in those enclosures fed in the presence of toads and in the absence but so much of the problems were raised about having big fences. Up here they lost those things in the first year after the first floods, so they never really found out anything either. I think it's been one of the other contributing factors to the lack of information, it's not just that people were hung up on the rare and endangered and concerned about them but also that it was just dam difficult to do and so they, they made some attempts but they weren't well funded enough and they weren't long enough to cope with those sorts of catastrophes like the things getting washed away.

- Mr WOOD:** Our native species could be affected in two ways: one is if they were predators of the cane toad and two is if their natural food supply was being dried up or limited again there would be population control caused by that.
- Dr WHITEHEAD:** Yep, well $\frac{3}{4}$ actually. There's a direct on the predators that eat them die. There's the competition with other animals that eat similar food and then there's the things the toads themselves eat. So the tadpoles eating the tadpoles or the other frogs and the toads perhaps over exploiting some insects, some invertebrates, we know so little about the invertebrate fauna that we probably wouldn't know whether these things have disappeared or not but there's bound to be some impacts, whether they're serious or not, we just don't know. But when you get an animal that's there in such abundance, they've got to be doing something.
- Madam CHAIR:** As soon as the predators, eat the goannas, the long neck turtle, quolls, crocodiles, snakes and in the competition, the other frogs I guess?
- Dr WHITEHEAD:** Yeah well Bill Freeland's work again, he'd the only one who's spent significant time working on it, he suggested that the impacts on toad communities in the gulf wasn't strong but I think he'd acknowledge that his experiments were relatively short term and they weren't powerful in the sense that a negative result didn't mean nothing was happening, it meant that he wasn't able with the range of work he was able to do to show a major impact but could still be things going on. Those sort of things really need to go on for a long time and at a fair number of places before you can get a robust result because things vary so much naturally.
- Mr BONSON:** Do you think that people gave evidence to this committee before was that when they first arrived, they arrived in like a wave and then numbers dropped off and the second thing was, when I was in Queensland over Christmas, talking to people over there about it, they were saying because they had less rain over there, cane toad numbers were down. Now, can you support any of those anecdotal evidence?
- Dr WHITEHEAD:** Yeah well, again, Bill Freeland did some work in Townsville and he showed a decline in their relative abundance of toads through time, after the initial wave it's a common phenomena with invading organisms that they really go berserk initially and then they establish some sort of new equilibrium with predators and with disease and a few other things and their numbers decline. I guess the problem is that even when they decline that they're still one of the most abundant animals in the landscape and the most easily encountered animals in the landscape. So goannas and quolls are still going to run into them often enough to be suppressed. So it's nice that the numbers come down and

it means that you don't encounter those tens of thousands but they're still there in sufficient numbers to still have an impact because the animals we're talking about are even less abundant.

Mr BONSON: What about the rain situation, the water, do you have any further evidence about that?

Dr WHITEHEAD: I would be surprised if wasn't was the case. I've not read anything directly relating cane toad abundance to weather patterns but it would be surprising if it didn't get that effect with a frog, like the toad it appears on the evidence that is available that once the rains start and there's water available in the landscape, they just disperse almost randomly and so if you've got a lot of rain and you've got lots of water bodies, the chances of them encountering a place where they can survive through the next wet season or next wet period is higher if there's been a lot of rain than if there's been very little so it would at the very least slow them down adverse weather with not a lot of rain but it also perhaps reduces (averages ?) the populations. It would be surprising if there wasn't a fairly direct relationship.

I don't know whether you've arranged to do it but there's a person in ERISS who wasn't involved in this, Peter Bayliss, he did his PhD in Brazil, I think, somewhere in South America anyway, on toads, he would be a useful person to speak to about some of this in some greater detail about the biology of toads themselves.

Madam CHAIR: And where is he now?

Dr WHITEHEAD: He's at ERISS.

Madam CHAIR: ERISS, thank you.

Mr WOOD: Are they bound to relate I suppose rainfall contours if you want to call it that, to distribution? Can they say for instance that they would have, the cane toad won't reach Tennant Creek unless it gets a hitchhike to ride (?), is there enough dry areas between that and say Katherine?

Dr WHITEHEAD: Well there has been modeling done using climate surfaces where you know they just relate where toads are now to the sort of climatic conditions that exist there and then try to predict an envelope that matches those conditions and that does suggest they can reach down into New South Wales and reach a fair way down into the Territory including, yeah I think including as far as Tennant Creek but those models are clearly just about weather, they're not about whether there's a lot of water bodies and whether the topography is such that water hangs around for a long time. I imagine that the densities towards those sorts of edges of the distribution would be quite low.

- Mr WOOD:** How long can they survive without water?
- Dr WHITEHEAD:** I've not seen the exact figures but they can lose about 40% of their body weight before they need, before they keel over, so they can lose a lot of water and they seem to be reasonably good at hanging onto water as evidenced by the fact that these animals only seem to have to come back and re-hydrate every few days. So, I suspect that it's, it would vary a lot depending on whether it was humid and whether there was dew in the morning and those sorts of things as to how long it would be but it conceivably during the wet season they might not need to go to free water at all. During the dry season if they were in a good shelter and didn't emerge much, they could go on for weeks to months I'd imagine. And they'd absorb some water from the soil.
- Mr BALDWIN:** Do they actually burrow in the dry? What do they do in the dry? If their stuck in the middle of nowhere with no water, what do they do to survive?
- Dr WHITEHEAD:** Well even near water bodies in the day time, they'll get down into burrows. They are not burrows that they dig, they may enlarge them a little, but mostly they are burrows made by other things, so they're under rocks, they're down burrows and they'll be packed in, you'll see them packed in from something very deep right to the surface and those at the bottom obviously do quite well when it comes to not drying out. They'll get under bark, they'll use any shelter that's available in the bush.
- Mr WOOD:** Under campers too they reckon they burrow under campers if you are laying on the ground and then they try and burrow under you.
- Dr WHITEHEAD:** They'll push under anything that's lying on the ground.
- Mr WOOD:** Any short sleeps? I want to reduce their habitat chances.
- Mr BONSON:** Just one other thing you know in Darwin, you've got Rapid Creek and you've got Ludmilla Creek and you know water ways that are sort of like fresh water up the top, salt water down the bottom. Do we know anything about whether they can survive salt water or fresh water or salt water side of things?
- Dr WHITEHEAD:** Well the scientific name is *Bufo marinus* which implies that they do reasonable in coastal areas and they will persist in slightly brackish water. I've not seen anything about that in Australia but certainly in South America they are in areas where the water is slightly brackish but they do prefer fresh water. Any frog with highly permeable skin, any salt water that's too concentrated they have trouble maintaining an osmotic balance but they're pretty good.

-
- Mr BONSON:** Yeah, it's going to be a nightmare down at Rapid Creek, a beautiful area we've got down there.
- Dr WHITEHEAD:** Yeah, there will be fresh water there as well and places they can hide out and taps and god knows what else, keep them moist, if they can't dive into the tidal bits of Rapid Creek.
- Madam CHAIR:** In terms of, as you've identified the impact on various species of our fauna, do you think any particular recommendations we can make about ensuring, I just noticed that you've mentioned in your paper to us, the frilled lizards, the crocodiles – fresh water and estuarine – possibly will perish and also make a reference to the, to all fresh water crocodile up around the Liverpool River area. Is there anything that you feel that you need to say to us here in this committee about just what we could be inquiring into and possibly recommending about sustaining of species, that you've pointed out?
- Dr WHITEHEAD:** Well with, there are certainly those populations like the dwarf crocodiles that are a little unique and the efforts are being made with the quolls, where you can take those rescue sort of actions and think they ought to be considered. Another species that might be of concern would be *Carettochelys insculpta* the pig nosed turtle. The assessments that have been done so far suggest that because they eat mainly fruit and forage on, in fairly deep water, they're not likely to pick up tadpoles but they will eat carrion and they could eat dead toads which will be around in large numbers in places like the Daly River which is the stronghold for that species. So, I would have thought there would be some value in seeking some sort of consensus about what are the animals most at risk using things like your risk assessment and I guess informed opinion to work out a suite of species that might need special consideration and perhaps these rescue efforts are reasonably easy to keep in captivity, so you could set aside a population, yeah.
- Madam CHAIR:** Well, what about a ongoing mechanism to ensure that you know various people such as your key centre Parks and Wildlife, indigenous organisations are able to work collectively together to continue, obviously this committee's got a certain life time, we make recommendations to government, so if you like, our current key focus and driving force will dissipate at the end of the life of this committee. Has there been consideration of an umbrella task force where key people from indigenous through to scientific, through to the particular people like Frog Watch for example: form and continue to work together collaboratively to come up with the, if you like, lateral thinking as well as the knowledgeable thinking of various methods that could be put in train? Has there been any discussion along those

lines by anyone?

Dr WHITEHEAD: There's not been any systematic discussion that I'm aware of. Certainly people like Graham Webb have raised the idea of a task force and I think his perception of how those things work goes back to the days when we were working with salt water crocodiles and in particular the, getting them listed on appendix two, when there was national opposition to the idea that crocodiles could be managed in the Northern Territory in a way that kept crocodiles but also as an industry. That was a really major battle and the way that was dealt with was to form a small task force that was given the brief to work it out and it wasn't that expensive, there was a couple of people, I was one of them for a period and we were given reasonable resourcing and just went at it and did everything we thought was necessary to come up with a solution. And that involved everything from organising workshops where we invited people from around the world to be exposed to what was happening in the Northern Territory rather than hear distorted views of it, through to going overseas to represent the Territory at various conservation gatherings. But also a lot of local work to look at building a convincing understanding of the way crocodile populations work. And I think the same sort of approach would work here, it's one of the more effective ways of doing things. I think if you have very diffuse sort of groups that have that amongst other responsibilities then you tend to get diffuse results. If you've got people whose reputation and continued employment depends on finding solutions to things well the focus is in line and it works. And I guess your decision about whether that was worth recommending would depend on being convinced that the problem warrants it and that there is some light at the end of the tunnel. Personally I think there is, I think there's biological control will work and there is still an argument for saying: well toad's haven't done their worst yet and let's try and stop them doing their worst.

Madam CHAIR: So that minimisation role focus could

Dr WHITEHEAD: Yeah that would be part of it, slowing them down while we were also searching for some longer term control with the biological control ticking away in the background.

Madam CHAIR: With public awareness, cultural awareness, bringing in indigenous communities, targeting going out, that sort of work?

Dr WHITEHEAD: Yeah. All those sorts of connections. Yeah the crocodile thing is an example there where there was an indigenous working group formed as part of that. And I think establishing some sort of connection with the Caring For Country movement too, seems to me to be a useful thing. That's grown enormously over the last few years, I think it's

been an extraordinary achievement by the Northern Land Council and Aboriginal communities generally, to get that together but it's all funded on soft money. The NHT is looking a bit shaky now and it would be a tragedy, in my view, to see that collapse and that could be one of the vehicles for people being active in management, not to the cane toads but in other feral animals and other environmental management problems right across the Top End in isolated areas where these things can get away and you can lose things before you know it. Some connection between such a task force and the Caring For Country movement would be essential aim.

Madam CHAIR: Sure.

Mr BONSON: I'm just having a look at this brochure, 'Cane Toads, a Few Facts', it's got a sentence here under 'What has been done', it's got: while the role of cane toads is not expected to affect wildlife greatly, the information already collected will be compared with information gathered after the role of cane toads the terminal impact of native fauna'. So do you think that that sentence there, the opening part of 'while the role of cane toads is not expected to affect wildlife greatly' you know, it's a bit underestimating the situation I suppose?

Dr WHITEHEAD: Yeah, it depends on how you interpret it but 'greatly', there will be a lot of conspicuous animals that are an important part and a unique part of Australian fauna, the lizards, we've got the greatest diversity of those, especially in the Top End and they're going to be badly affected so, I think it's fair to say they, the goannas at least and the quolls, will be greatly affected but yeah, as a global statement, I think it's glossing over the thing a bit too much and that goes back to this issue of what do you think's important. People who wrote that thought that endangered species and so on were important and the fact that things wouldn't go extinct was important. Personally I think and Aboriginal people think that if you reduce the abundance of something that's sort of characterised as your land, to the point where it's no longer commonly encountered, then that's a great effect. So it's a matter of perspective.

Mr WOOD: Just on the biological control Peter, why is the reason for the ten year, is it not because of the technology but because the testing that's required?

Dr WHITEHEAD: Yeah. There'd be a lot of money, there's still, they've done most of the proof of concept but they still need to do a couple of things. This year I think, is about making sure that they can attenuate the viruses part of it I think, so that the virus that they use to get things in the tadpole doesn't kill too many native frogs, independent of the protein that they attach to it or the geneode (?) for the protein they attach to it, that that doesn't kill too many native frogs and it doesn't

kill the tadpoles you're trying to infect, so you know, you need them to stay alive long enough to get transmission and to get it into the population so that they die subsequently. You don't want to kill a portion of them at the site that you introduce your virus and then have it spread no further. So, they've got to look at that whole idea of dynamics of how that system works and how the virus gets in, how it moves from one animal to the other and how it persists on the landscape so that it can kill enough of them in the long run to make it worth doing.

Mr WOOD: It's not a case of whether they have more money, it's really just a practical aspect. It's going to take this time before we know it can work?

Madam CHAIR: It's a combination of both though isn't it? If they had more money they could

Dr WHITEHEAD: You could speed it up at the margins I think but you would still be talking lots of years I think, because you have to convince the population, I mean I don't like the idea of things that kill, viruses that are very good at killing wildlife being released without very rigid sort of testing and you would want to test a wide range of fauna and you would want to test them for a while rather than

Madam CHAIR: People are particularly worried about their impact on frogs for example.

Dr WHITEHEAD: Yeah and fish. These viruses infect fish. You would want to be absolutely convinced that the gene they produce was absolutely specific to toads and that nothing unexpected could happen and I think one of the reasons why biology is an interesting thing to be involved in is because the unexpected nearly always happens and so if, you would want to be assured that it was going to work without killing lots of things.

Madam CHAIR: What about in the ERISS report, they refer to one of the recommendations there was chemical control, was thought to be, offered the greatest probability of success in specific areas, which is your minimisation examples. They were discussing a research program to isolate chemical repellants or attractants. What are your views on that?

Dr WHITEHEAD: Well, again I'm not a frog person, so I don't know a lot about the way cane toads might be attracted to certain signals so obviously they are attracted to other calling cane toads, so that seems to me to be one possibility but Mike Tyler, who's sort of Mr Frog in Australia, has talked about pheromones but he has been talking about it since I can remember and he has had some money and as far as I know, he's not come up with anything yet but it might be worth I mean if he's in Darwin, I don't know whether he still comes to

Darwin, he used to come to Darwin a lot to collect.

Madam CHAIR: Yeah, he's coming up in May for our public hearing.

Dr WHITEHEAD: Right. Well in that case I think it would be worth trying to corner him and get some I guess fairly tough sort of questioning to get him to really be honest about what he thinks the prospects are and what it would cost. I'm not suggesting he's dishonest, I'm just suggesting there's been talk of this stuff for a long time and it warrants being pushed fairly hard to make sure that it's feasible. But I would think any of those sort of things are worth investigating if they can be done at reasonable cost without just open cheque book sort of thing.

Mr BONSON: Just getting back to the specific issue about toad, as a scientist now, dealing with the problem with and introduced animal, whatever it might be, could you sort of to relate to a person, maybe just outline you know the issues that you might have to look at when dealing with an introduced animal, how to get rid of it, how to manage it, how to minimise it, you know, briefly from first of all it's introduced, you discover you have a problem, what do you do then? That's forgetting about the cane toad for the moment. Just a scientist dealing with some foreign ...

Dr WHITEHEAD: One of the problems is that science has never been very good at dealing with feral animals. There's been a tendency to assume that because they're not native, they're bad and therefore we have to kill them and there's been a second assumption that goes with that, that if you kill a lot of them, you've done really well, without worrying too much about whether you've had any impact on the population and that's the thing that we've never done. We've not done it with buffalo, we've not done it with horses, we've not done it with very many things, is to measure the impacts and then relate that to the way you go about controlling things. So with I guess buffalo's as an example, we know that they mess up flood plains and they look ugly and they stink and some vegetation gets chewed right back and they might help introduce weeds but we've never really looked at how bad that is and whether you might not spend the money you might spend on shooting buffalo, to do something else in conservation. So we've never really come up with ways of comparing the benefits and the costs in feral animal control and we're trying to do that now with buffalo. In a contract we've got with Kakadu National Park and we're working with people like Peter Bayliss and ERISS to come up with quantitative models so that we can put in a model, details of how much it costs as the density of the feral animal changes and what effects, what benefits you could add in, in terms of mitigation of damage and also whether you can bring in commercial use of the animal as part of that control equation and get some other returns.

So the answer I guess is that we've been very bad at feral animal control. We've killed a lot of things and I was involved much to my shame in the early days of the donkey control in the VRD, I didn't design the program and I must admit when I was asked to finish it off, that I wondered why we were doing it the way we were doing it. But we killed – I can't remember the exact figures now – but some hundreds of thousands of donkeys and spent about, if you took salaries into account, about \$0.750m and three years later after we'd finished, it looked as bad as it did before, because we never looked at what is was we were actually trying to achieve and killing donkeys was seen to be the measure of success and how many bullets you used to kill them, instead of what increase in production (?) did we achieve and what reduction in environmental damage did we achieve: we still don't know that for donkeys. So, historically we've been very bad and we shouldn't repeat that mistake with toads and that's why I think it's worth, even though you might say it's too late, it's worth looking at the damage now, the things like the effects on the goannas and so on, in some detail so that we can then justify the amount that's spent on trying to get rid of them or do to reduce their numbers at least.

Does that answer you?

Mr BONSON:

Yeah, yeah, kind of, I suppose what I was looking more of a perfect model system, you know, is there a, you talked about developing a model for buffaloes, so obviously you're working out a plan of how you're going to address that, you know, this is step one, this is step two blah, blah, blah and if step three doesn't work, you go to step five, so is there that type of model with dealing with this in around the world, this type of problem coming in. Are there certain check off points that you know, we need to know about?

Dr WHITEHEAD:

I don't think there's any really hard and fast rules and as I said, in most places as, certainly in Australia, it hasn't been done very well, where we can say that this step worked better than another. I guess, if there is a rule, it's that you need to look at what your objectives are much further than killing animals, so you need to look at what you're trying to achieve in terms of reduction in damage, so you should set targets, like if you're going to control cane toads it should be I guess a target that quolls will still be found at certain densities in the Top End and that goannas will still be seen and then you should set up a system to actually monitor whether you achieve that and so you can then feed back into the system so that if your effort that you're able to put in the expenditure of \$100 000 a year or something, reduces toad abundance by this much, does that flow through to the targets you've set yourself to begin with and if it doesn't, how much more do you need to put in, so you're constantly

reviewing what you've done, what you've achieved and doing this adaptive management loop, I think that's probably one of the golden rules that any system that's designed has got to build in that accountability and constantly reviewing your success, so that you just don't measure your success in terms of: well we killed 10 million toads but we still haven't got any goannas.

Madam CHAIR: Do you think that that whole body of work could be done just internally by Parks and Wildlife or do you think it needs to be that collaborative approach with the indigenous organisations through research etc?

Dr WHITEHEAD: I think it's absolutely essential in a place like the Territory where we're sparsely populated, not bottomless resources, that we have that collaboration. Without that, we're doing it, then that's the whole ethos behind the key centre. Our partners include NLC, Aboriginal Corporation, from Cape York and Parks and Wildlife. We've got people from Fisheries as well, so we're trying to build that sort of collaboration consortium approach I guess. In the Territory we haven't got any options. We've got too few people to leave anyone out.

Mr BALDWIN: Peter, just going back to that task force for a while, and we've seen a lot of bureaucratic processes in over your working lifetime, if you were to give – and this is off the top of your head – probably haven't had a lot of time to think about it but a personal opinion on the sort of structure of that task force and who it should answer to because I mean in terms of the cane toad, you've got not only the effect on the Territory but the eventual effect on Western Australia, you've got the effect in Queensland, New South Wales, the Federal Government responsibility here and without, to make it workable and simple, who would it answer to and what would its sort of makeup be. Do you want purely scientists in there or do you want some other expertise in terms of management, administrations and also, who should be roped into funding the thing to make it work?

Dr WHITEHEAD: Yep.

Madam CHAIR: And if you need time to answer that, like I'm interested in the answer right now but if you also want to get that answer back to us after careful consideration, feel free to do that too because it's a great question.

Dr WHITEHEAD: Yeah, I'd like to do that.

Mr BALDWIN: Because you know, a lot of these things are just mouthpieces at the end of the day, they're not structured properly and if they're not answering to the right sort of authority that you know is going to take credence in what they're doing and saying. And the funding obviously is very

important, who they're tied to, how autonomous they are, all those sorts of questions because you could set up a million of those things, you've seen them, and they just don't work but the ones that are structured right do achieve a lot.

Dr WHITEHEAD: Yeah. I think there are some general principles, I wouldn't claim they are the answer.

Mr BALDWIN: No, I don't think anyone's got the answer. Personal opinion.

Madam CHAIR: Whatever principles you can give us.

Dr WHITEHEAD: One of them would be that you don't want it to get too big and you don't want, I don't think you want the Commonwealth to run it because that tends to get things too big. I would think that it might be that a relationship between Western Australian Government and the Territory Government would be a good possibility because of the Western Australian's history of not liking feral animals very much and being very aggressive about the way they go about it. They are running some of the, in answer to your question, they are running some of the few successful fox control programs in the country by being really aggressive and focused in what they do, by dropping baits and they reestablished some endangered species and so on using a really aggressive sort of approach but well thought out.

Mr BALDWIN: And their donkey approach is probably the most successful too.

Dr WHITEHEAD: Yeah, so and the other principles are I think that they ought not to be people, unless they were the right people, unless they were seconded, just seconded from an existing job that they go back to when they finish or not and it doesn't matter whether they succeed or not, they ought to be, I think they ought to be perhaps set up in such a way that their reputation depends to some extent on being successful, so that they've got a large stake in it.

Mr BALDWIN: That is the crux of it, I think there is a right, as far as yeah, exactly how you would do that I haven't thought. I don't know either.

Dr WHITEHEAD: Yeah, exactly how you would do that I haven't thought. You would certainly want people like Graham Webb involved in it somehow or other. It was his energy and his commitment that made the crocodile thing happen and he is just extraordinary, once he gets hold of something, he beats it until it's dead, I mean he just doesn't give up.

Madam CHAIR: That's right. No we were briefed by him first up. Well Peter, we've run out of time but we've left you with some food for thought, just as you've given us a lot of food for thought in your submission today.

Dr WHITEHEAD: I welcome the opportunity to think about that a little more.

Mr BALDWIN: Yeah and if you could get back to us with an honest approach to it all.

Mr BALDWIN: Lots of other structures that probably haven't been so successful.

Madam CHAIR: We're being very open minded and fair and frank and investigative with this process so I thoroughly appreciate the time you've given us today. We've all enjoyed the discussion and we look forward to hearing back from you.

Dr WHITEHEAD: Well thanks very much for the opportunity. Am I allowed to stay and listen to them?

Mr BALDWIN: You can read the Hansard when it comes out.

TRANSCRIPT NO. 3

Dr David Lawson and Dr John Woinarksi
Parks and Wildlife Commission of the Northern Territory
Tuesday, 15 April 2003

PRESENT:

Committee: Ms Delia Lawrie, MLA (Chair)
Mr Tim Baldwin, MLA
Mr Matthew Bonson, MLA
Mr Stephen Dunham, MLA
Mr Elliot McAdam, MLA
Mr Gerry Wood, MLA

Secretariat: Mr Rick Gray
Ms Maria Viegas

Presented by: Dr David Lawson, Director of Parks and Wildlife Commission of
the Northern Territory
Dr John Woinarski, Bioregional Assessment Unit, Parks and
Wildlife Commission of the Northern Territory

Note: *This transcript is a verbatim, edited and verified proof of the proceedings.*

Madam CHAIR:

All right, members of the committee, we'd like to thank Dr Dave Lawson and Dr John Woinarski for coming along today and discussing the incursion of cane toads into the Territory. Specifically as you know, our committee as you know, our committee is being tasked by the Northern Territory Government to look at, identify the problem and risks associated with the cane toads, to look at the potential extent and effects cane toads have or will have in the NT, to consider the cultural, socio-economic and other factors associated with the encroachment, identify current level of understanding and assess any need for public education and awareness programs, and then, apply ways to manage the environmental impact and discuss any community concerns and expectations in respect to the progressive entry. And it's our pleasure to have you here with us today, we're a friendly and frank committee, so you'll have plenty of opportunity to say what information you think would be useful to us but you'll also find that very quickly we don't want to start asking questions...

Madam CHAIR:

All right, so Dave, do you want to kick off for us?

Dr LAWSON:

Right, first of all, this is one of the first one of these I've ever been to so, there's a lot of interest in my department with what actually goes on with this and I think you might like to know as a general feeling of, this is a good idea and it's about time we did something like this, so congratulations on

whoever thought of it. As far as the cane toads are concerned, we brought as you can see, quite a lot of information with us and I asked John if he could supply me with some additional information because John is in charge of the bio-diversity group which looks at all the bio-surveys in the Northern Territory and I'm delighted to say that he volunteered to come along, I didn't actually have to push him at all, he actually volunteered.

Dr WOINARSKI: Keen as mustard.

Dr LAWSON: The way we would respond to this I think is to, I'll deal with the issues of perhaps the hands on wildlife management issues and John can ask the questions about the biology and the surveys and the bio-surveys that have gone on as baseline information that we've got already.

Madam CHAIR: Excellent.

Dr LAWSON: Because we are keen to give you the best picture we can. I am not a cane toad expert. While I run wildlife management I actually look after, as I'm sure you're aware, quite a lot of issues that relates to wildlife management although cane toads is on the list. My reading of the background information and my information about cane toads is that from a scientific perspective, the evidence is somewhat contradictory. And I think that is probably almost the crux of the problem that we've got.

The majority of background documentation that I have read would suggest that there seems to be an opinion that cane toads would have some immediate effects on the biota and that would probably be most extreme in the first two to three years of invasion but then that would quickly settle down. Now I think I'm going to qualify that opinion on one other observation that there seems to be a lack of substantive baseline information to compare post-changes too, in my opinion. And in a situation like that we're dealing rather with more than a little uncertainty, which is not helpful.

Now, people have asked us: why did we, if that's the background and my personal opinion, why did we go and do the quoll project? Well I think that was an exception to this uncertainty, I think that in terms of the Northern Quoll, certainly John's work in re-sampling in Kakadu National Park and I know you've got that report because Rex just said he's got it, that one, John was able to come with a pretty unequivocal statement that he was very concerned that the Northern Quoll might become extinct on the mainland in the Top End. And as far as I was concerned if someone like John says something as overt as that to me I pay attention and that's why we acted to try and move the quolls out or a population of them out to the islands. And I'm sure you've seen all the media and I know Delia was

with us when we actually put some of that media together.

Now, in line with your points in your brief here, I think the identification of the problem is actually self evident: cane toads are coming across the Top End and there's very little, in fact nothing we can do to stop them, in my opinion. The risks associated with that as I say largely unknown. There will be some effects, some species will undoubtedly suffer more than others, there is a scientific sort of difference of opinion on how severe they might be but certainly there will be some effects.

The next point, on the potential extent and effects cane toads have or will have in the Northern Territory, again very closely aligned with my first answer, they'll have some effect, I don't think we can actually predict reliably how much of an effect they will have on the biota of the Northern Territory. As I said, we will expect certain species to be affected more than others, certainly the Northern Quoll we thought about. Also getting some quite disturbing but anecdotal information about things like the large certain snake species, and even things like frilled lizards from the Katherine area. But to give you a definitive answer, I couldn't do that.

With cultural, socio-economic and other factors associated encroachment of cane toads in the Northern Territory, well Aboriginal people around Borroloola have learned to live with cane toads but that, I think is a glib answer and shouldn't be confused with the fact that they like that situation, they don't. I think there are gonna be some fall out in terms of bush foods for Aboriginal remote communities. Again we've got anecdotal evidence that some of the larger varanids when they disappear are very quickly noticed by Aboriginal communities and we might expect, although we don't know that that might lead to some socio-economic effects with greater dependency on store bought foods and the possible health effects that that might endanger in some of our more remote communities. The current level of understanding concerning cane toads is, I think, sometimes far off the mark. I think some of the public believe that cane toads are an absolute disaster and that we should be spending an awful lot of money just trying to stop them moving. I think there's a lack of understanding of how insidious this movement is and I think there's a lack of understanding of actually what we can physically do about it. There is a need for greater public education, but I also know that there are certain things, if you've got web access there is certain information on the web which is very up to date, very relevant and in pretty plain language but I think we can do better.

How to manage the environmental impact of cane toads in the Northern Territory: I think a combination of better public

education, but also I would like to see more co-ordination amongst researchers and people like ourselves in a more strategic approach to the cane toad problem and by that I don't mean necessarily looking for a magical cure, although that is very important but simply in terms of managing the situation that is inevitably going to happen, probably within the next one or two years in Darwin. I think there are ways we could more productively harness our energies to make sure the appropriate talent is used in the right way and I think there's also a need to reassure the public that the resources that we are expending, we're doing it in a strategic way to get the best bang for our buck.

We are already moving down that line, I mean it was very interesting, we had Peter in here before we came in, I think we are making greater connections with the university now. I think that's a really good positive thing, not just for cane toads but for a whole host of other things and I for instance am intimately involved now with the, I think they call it the High Level Task Force for putting the university and government together and certainly there's an absolute plethora of ways we can improve on that situation I'm sure.

The community concerns and expectations in respect to progressive entry: again tied up very much with the environmental education and just the information that the public's getting about cane toads generally, there are things we can do I think, we need to be a bit more proactive as I've said. Certainly the other problem about something like cane toad is the public tends only to react when they actually see it themselves, so if before, if you're in front of the invasion wave, you tend not to worry about it until you actually see them and I think that certainly I've seen, you can almost log the phone calls you get from the people that have actually been there, the cane toads roll over their properties and you suddenly get a phone call but the people in Darwin at the moment, they think oh the cane toad's coming yes, but what about not enough policemen and things like that, you know the public reacts to more immediate problems that they perceive I think.

So that's my quick response to your dot points. I'm sure we can expand on some of them.

Madam CHAIR: Thank you Dave. Before we go questioning Dave, John do you want to add?

Dr WOINARSKI: No, it was a reasonable review.

Madam CHAIR: Questions.

Mr BALDWIN: Co-ordination? You talked about co-ordinating all of those organisations, whether they're scientific groups or whatever, how do you see that happening?

-
- Dr WOINARSKI:** This is one good forum, surely.
- Dr LAWSON:** I think this is the start. I think, like I say, everyone I've described what's happening here, they've been very impressed with the idea. I think this is actually something you can build on. I think the actual nuts and bolts of who is involved would probably resolve around some member of Parks and Wildlife being you know sort of directed to take this on as a task, just as a co-ordinator and the reason I say that is because I think people do have an expectation that you know, governments generally should co-ordinate stuff and certainly with the improved relationships and the vastly improved communication with the university, I think that's probably the start of that sort of co-ordination. I also think that we would probably get if we could start that off, and as I say, I think we have actually started off, the difficult thing is trying to get researchers in other parts of Australia to pay attention to this. I mean we're interested in the Northern Territory obviously but obviously the toads are mostly through Queensland now and we can learn a lot from you know, bringing in people who that have faced this over there and learn from their experiences. We are tending not to do that, we've tended to sort of try and sort the problem out ourselves, so I think there's probably quite a lot of cross pollination we can do that way and I really do think it needs you know, someone somewhere is going to have to bite the bullet and say, right the co-ordination's going to be done this way and maybe if this group suggests, orders, makes an imperative, recommend, that's the word I was searching for.
- Madam CHAIR:** We recommend parliament.
- Mr BALDWIN:** You know, I mean we're a short term, the Environment Committee will probably in the foreseeable future will always be there but for it to get into the hands on stuff, it just won't happen, it needs to recommend something that goes forward so I was interested in your views of what you see that being and who might be involved given that cane toads are a bigger problem than just the Territory.
- Dr LAWSON:** Oh, yeah, most certainly.
- Madam CHAIR:** One of the things that this committee's already considering is the scope I guess of that collaboration and one of the suggestions that's been put to us is it would have to include organisations such as Caring For Country through the Northern Land Council, that they're successful on the ground models and that they could have a role, what would you think about the viability of that suggestion?
- Dr LAWSON:** I don't think you can actually do anything about cane toads unless you did involve someone like the Caring For Country unit, after all we work very closely with them on all sorts of

things like the quoll translocations we couldn't have done that without that co-ordination and I think the old idea that you know Parks and Wildlife somehow has to do the wildlife stuff on its own is gone. If it hasn't gone it certainly should have gone and I think there are a lot of people out there with very high skill levels in all sorts of different ways that could help to get the message across to communities, particularly remote communities but you know, you can actually learn to live with cane toads for instance, you might not like it but they are coming, there is nothing you can do about that, so learn to live with it and I think we can help people to understand that they can live with it.

Dr WOINARSKI:

But more so than most issues, most environmental issues, I think the research on the impacts of cane toads has been extremely fractured in the past and still currently. People have had very different agendas, very different sort of goals and very different research scopes and there hasn't really been any serious recent attempt to I guess bring them together and make sure that the research is complementary and compatible and that's probably hasn't been helped in the past by in some cases, personal antipathies, which is unfortunate.

Mr BALDWIN:

Plus they're answering to different authorities and they are bound by different funding regimes, so I think that's the point here is that if you're going to set up something that is going to be effective and workable, whether it's looking at combining the research and / or looking at developing programs for minimising the effect, whatever they may be, biological or physical or whatever then how do you structure it well so that it does become effective rather than just another fractured part of the whole equation?

Dr LAWSON:

Well I think that ...

Madam CHAIR:

People have taken that question away for further consideration as well, which you're also free to do Dave, we're on a fishing expedition, with I guess because we've been going since December we've been fortunate to gather a whole body of evidence to date and that's started to focus our minds on the next step which is the recommendations we make to parliament to drive it forward and give it a focus and a very real outcome orientated focus so that what resources are applied are applied with focus.

Dr LAWSON:

My first reaction is that, our earlier discussions about the role of this particular group here, I don't want to be misinterpreted in my answer to that. I don't think this group is necessarily the one that will actually implement anything Tim, but I really do think that certain issues in the environmental sphere need the clout of a body like this to actually go to government and say, you've got a problem here boys, let's pay attention to it and let's think of some real

practical things we can do to put it in place because to be completely blunt, it's ok for me to be the director of Wildlife Management but I'm a lone voice sometimes and it's very easy in the plethora of things you have to deal with in terms of looking after the people in the Territory, to actually get biodiversity right down the list.

So, I think that the clout of a group like this is welcomed and I also think that my initial reaction to it, to have somebody, a recommendation made that someone, somewhere takes the lead on it is probably, I'm not going to probably change that opinion but I also think that once you've done that, you've got to give that particular person or group of people room to maneuver and the resources to do it.

Madam CHAIR: And then possibly the report back mechanism to this committee.

Dr LAWSON: Yes.

Madam CHAIR: Which picks up that issue of clout I guess.

Dr LAWSON: It certainly does, I think what we're talking about here is an attention concentration really more than anything else. We've known about cane toads now for a number of years but we've been trying to do our little bits and pieces but as John said, at the moment it's very fragmented. A lot of it's got to do with personalities. This thing is too big to be you know influenced by personality, it should be that way, so I think that you know, I certainly would have no problem with this group making recommendations and really coming down saying, right, now you'll co-ordinate, this is a priority provided everybody else understood that that was the way it was and we could almost co-opt people into this sort of approach. It might be difficult with some of our interstate colleagues, particularly some of the researchers who are an interesting bunch of people to try and get to grips with sometimes. They are very strong personalities and they have very strong views.

Dr WOINARSKI: But in this case, I think with cane toads, apart from self interest, there's not the complication and different sectoral interest, I mean we all don't really like cane toads and we all want to minimise their impact on biodiversity, it's not something like feral cattle or buffalo orpasture grasses. It's something we basically, we all should be struggling towards the same goals, so you would think it would be easier to co-ordinate and collaborate without that vested interest.

Mr BONSON: Just one thing, just touching on that idea of you know, research in Queensland, getting access to that and that being in communication and opening up that network that maybe hasn't been done properly in the past. Also there's

the other side of the continent as well, Western Australia. Obviously they'd, we've had evidence to date that they've been very interested in things like donkeys and foxes and you know looking at how to deal with that and maybe bringing them on board as well. Saying you know, we've got this big area called the Kimberley, maybe there's access to resources and skills and etc that would obviously be something we could bring into this umbrella group that we're talking about?

Dr LAWSON:

Like I said Mathew, I think that if you can find out where people with the practical knowledge and the skills are based, it doesn't really matter where they are, certainly Western Australia would, you would imagine would have a vested interest in what's going on in the Territory because basically they're next. Having said that remember they might not have that, that far up there list because it's not there yet but certainly we'll have no hesitation at all about dealing with the Kimberly Land Council, the scientists from CALM, all agriculture Western Australian agriculture, whoever's most appropriate, as far as I'm concerned this is a problem. Let's see what we can do about it.

Dr WOINARSKI:

That's probably very much I guess the Territory taking the lead in that case, if you've got the research capability in the Kimberley, it's miniscule in comparison to what's available here in Darwin and similarly I think land management in the Kimberley, on Aboriginal lands and pastoral lands it's far less well resourced than it is in the Top End so it's very much the Kimberley basically taking advantage of us I think which is a fine thing to do but it's not at this stage an equitable arrangement.

Madam CHAIR:

In terms of the, some of the harm minimisation aspects on our species of fauna, the committee's heard evidence that the Northern Quoll was I guess if you like on the most critical need response position but the dwarf fresh water crocodile in the high country around the Liverpool River area was deemed to be also a species that's in the sort of high danger zone. I'd like to hear your comments on that and we've got goannas, snakes, the pig nosed turtle was discussed in terms of the Daly area, what sorts of responses do you think would be appropriate in terms of those sorts of species and one person suggested that it could be where you look at the smaller islands sanctuary for the quolls, that's worked and wouldn't work necessarily for goannas because of their perhaps impact on nesting sea birds but could the islands of Melville, Bathurst and Groote be potential for maintaining some species that are in the sort of high risk category?

Dr LAWSON:

Yes, they could, however with those larger islands you've got much more human traffic and where you've got more human traffic you've got greater danger of seeding if you

like, with cane toads through accidental movements of them. Now we have already made some signage to try and help alert people to the fact that the islands are, need special protection. I think that effort should be bolstered but some of the species you mention, for instance there's very strong anecdotal evidence that King Brown Snakes are very much affected by cane toads. Now whereas some of the Tiwi Islands might have been very happy for us to move a few quolls, it's quite something if you turn around and say ... can you go and foster a few King Browns.

Mr BONSON:

I suppose one of the things, why I'm so interested I suppose I'm hooked up now with this Western Australian concept is that a lot of the flora and fauna obviously is very similar to what we've got here in the Territory and if we were able to develop some kind of minimisation of that spread and eventually we get to the idea that we have some, you know it was mentioned here earlier this afternoon about a biological effect of minimising cane toads, not necessarily wiping them out but you know as a long term plan, then you could bring species whether they're goannas or you know King Browns, where from Western Australia, if we were able to stop the advance here, to then repopulate what's happening here, so that's why I'm sort of like interested in that idea of you know working in with Western Australia and

Dr WOINARSKI:

That's certainly could happen for some animal groups but like it wouldn't affect the crocodiles that Delia talked about, the distinctive form in the Liverpool River for example, which doesn't occur in the Kimberley so that you might be able to do that for some, perhaps but by no means all. I guess Delia, we were attempting to prioritise with the quolls, the species that we knew was highly susceptible that we thought we'd have public support for that wouldn't have the impacts where it was moved to that's why we chose that as sort of the flag ship one. The Liverpool Crocodiles, I'm not convinced that's a species anyway, the evidence for that's equivocal, I think the evidence for complete loss of fresh water crocodiles because of toads is pretty equivocal, it certainly tends to be a short term decline but in most cases it seems that that's reversed after a few years.

I guess all zoologists have their pet animals that they work with and I know that some of the scientists from ERISS who have been working on fresh water invertebrates in that stone country of Kakadu are really concerned about some of that, you know there's a whole lot of really endemic, really specialised fresh water insects that are nowhere else in the world and that's in the dry season they contract to pools which are rapidly contracting anyway and then cane toads can basically pick them off very easily as they congregate there so that you know where ever you look, there's whole facets of biodiversity that could well be affected and perhaps

far more seriously than we recognise at the moment.

So moving some things is possible but we're never going to be able move things like invertebrates or groups of species that we don't at the moment appreciate what the impact's going to be. An ideal solution is certainly to get rid of the toads or to minimise the numbers but that's not, to my way of thinking anyway, it's not going to be likely in the next few years.

Mr WOOD:

I know we're talking about taking animals to islands but the islands themselves have King Browns on, I've met them and quolls, so to some extent we should also be placing emphasis on both making sure we do keep them, toad free because they've already got animals that we can reuse I suppose. And I suppose the question I was going to ask was, it would have been easier to just let, work on maintaining the quolls on Melville and Bathurst Island than putting them on one of the smaller islands off the Arnhem Land.

Dr WOINARSKI:

Yeah, I mean prevention of toads getting to anywhere obviously is going to be the best solution if it's possible. Quolls actually aren't on Bathurst or Melville, they like rocks and there's not enough rocks there. They're on Groote ...

Mr WOOD:

Used to eat my chooks! I know they like to eat chooks.

Dr WOINARSKI:

Yeah, they certainly do. But yeah, they're on Groote at the moment and we've got to quarantine Groote from toads but I think that's going to be impossible you know, it's something which it would be great to happen but given the amount of barge traffic and boats and fishermen and yachties and stuff moving around, I just don't think that's got much security, much certainty about it. But yeah obviously the islands in this case are the most valuable conservation refuges almost that we've got and of course most of the islands in the NT are Aboriginal owned so it's very much a matter of working with the Aboriginal land owners to ensure that they appreciate those values and that the risk of toads moving to those islands is minimised.

Mr WOOD:

I think the local government associations working with you about putting the signs up on the islands or I think Dave Norton from Jabiru Council raised that a couple of years ago and I think that's where the signage started anyway and you believe that needs more emphasis.

Madam CHAIR:

Yeah, I was going to ask that question when you mentioned there needs to be a bolstering of the effort in terms of the existing islands, quarantining them to an extent. Do you have any suggestions along those lines that we could consider?

Dr LAWSON: Well we have already been just yesterday or the day before yesterday, I was informed that my new initiative project was approved so we do have some money now to engage shall we say more directly next year, in other words John and I don't have to rob other projects to get you know, to do this island work anymore, which is a bit of a relief. Certainly prior to that is to bolster this effort and we'll be working a lot closer, we're working closer with the NLC on that because there are certain needs for instance: we need, the signage was all in English. I think we need to put signage in language as well, we need to have a much more pre-emptive approach to community schools I think because some of the best people you can get to spot things out in the bush in remote areas are Aboriginal kids. So if we can get at the kids we might have a sort of mini police force there.

Madam CHAIR: Like the junior rangers over there.

Dr LAWSON: Yeah the junior rangers have been very much urban based to date but there's absolutely no reason why they couldn't be expanded out there. I think that we put the signage out on boat ramps and you know the freight companies have been very helpful to date in taking the signage and speaking to their captains and saying please do this but there's a limit to what they can do and I actually agree with John, I think in some of those large islands, it's almost inevitable that you're going to get cane toads on those islands. That's not to say we shouldn't try of course and ...

Mr BONSON: What about TV advertisements and things like that, radio etc you know lifting the profiles, I just noticed in this pamphlet here, 'Cane Toads, a Few Facts' and we're talking about you know we've had evidence that when the cane toads are coming, they come in these large numbers and they swarm and they have an effect on the area and they're still, what we're hearing from John today, there's scientific evidence up about whether or not they fight back, you know, native animals or whether or not they stay at a low number or they disappear or whatever, you know that's still up in the air I understand. And I'll just read this one paragraph here, it's got: 'While the arrival of cane toads is not expected to affect wild life greatly ...' and then it goes on blah, blah, blah, so this is you know something that was produced and here we are saying to them, well it's not going to affect your wildlife but all the evidence we're hearing is at least at the very minimum, when they first hit your area, they're going to wipe out nearly everything and we're hoping you know the evidence is still out there, whether or not they're going to fight back. So, you know I don't want to seek your comment on this I suppose but does there need to be an upgrade in all these pamphlets, in the radio stuff and ...

Dr LAWSON: Absolutely, the pamphlet that we put out for instance was a pamphlet that was designed to tell people that cane toads

were coming. I think there's a need, that's that one probably, there's a need now to tell people what to do when they actually find them in their own back yards, for instance one of the social effects is going to be, as the wave hits Darwin and the rural areas, there's going to be, I predict this, that there's going to be a pretty high wave of phone calls, letters etc with people's domestic dogs getting affected. If a dog mauls a cane toad depending on the dog, he can die within 15 minutes. There's going to be a lot of people out there that are very upset that their pets are foaming at the mouth and they die before they can get them to vets. So, yes we've thought about upgrading that and we've also thought about contacting the vets to say, look, surely we should be more preemptive now and actually have a set of posters maybe about what you can do for your domestic pets.

Madam CHAIR: Like wash their mouth out with water straight away, that sort of thing.

Dr LAWSON: Yeah, if you see any effects you know I mean there are certain breeds of dog that are more susceptible simply because they have a go at animals more, I mean if you've got a Jack Russell Terrier and you live out at Humpty Doo, you might as well change your dog breed.

Madam CHAIR: I've got a Jack Russell and a Labrador. No, no Labrador will eat anything in sight.

Dr LAWSON: Yeah well the Labrador might bring you a few presents in for before he ... on your carpet yeah so, I mean that's all a social effect you know, it is going to cause a lot of angst you know, a lot of angst. Cats as well.

Dr WOINARSKI: Yeah well I think Mathew with respect to that pamphlet, I think we've been to date, hamstrung by the lack of systematic research that was done in Queensland initially. So there wasn't a really good baseline of information from Queensland that we could work from, almost all the material was anecdotal and fairly small scale stuff so that it was possible to read the literature on the scientific impacts of cane toads on wildlife and so that basically there's nothing damning or conclusive about it. Whereas the information we're getting now from the Territory is far more systematic and compelling I think and we can state now with far more conviction that we've got a reasonable handle on what the impacts upon wildlife are likely to be, at least for the vertebrates, so that I think the very disparate views that people had about cane toads in the past which ranged from you know this is one of the worst environmental catastrophes that's ever going to happen to Australia to this is entirely benign. They're certainly going to narrow it as we are getting far more information available now.

-
- Madam CHAIR:** And just on the promotional material, it's certainly something that the public and the awareness perspective is one of the areas we've been tasked with and I'd like to actually invite you to consider any dollar figure to the cost of a promotional campaign, revamping promotional material inclusive of material in language, signage etc because if we receive expert advice in that regard we're able to put that into the range of considerations that this committee then makes in terms of recommendations to parliament. Because at the end of the day, we all know people's ability to respond is often a resource driven issue and we need to, as a committee, start to very, consider the tick tacks to resources.
- Mr BONSON:** Probably radio, TV and maybe you know information out to schools and stuff like that to be probably incorporated in that as well?
- Madam CHAIR:** So, we could be more focused in our recommendations in certainly a variety of areas, so with various people who've come before the committee, we've actually in a sense tasked them back to go and provide more information if they're able to, if you're not, not a problem but if you can and you're willing to, that would be useful information.
- Dr WOINARSKI:** I guess this is another case where it's co-ordination of the efforts of different agencies and individuals, it's really important as well, it's not sort of the direct task of Parks and Wildlife to try to address all those constituents out there and it's a matter of picking out which of the various players involved, should target particular interest groups.
- Madam CHAIR:** Absolutely. Any recommendations in line that you'd be happy to provide to us and say well you know in this area you know, these people could perform these roles and in this area well we exist in and obviously we're very clearly looking for an opportunity for a collaborative drive as well. But so from the fine detail of the expected resource requirements because Parks and Wildlife, you've already I know been as you've said wiping various other programs to meet the need right now.
- Mr BONSON:** Well one of the things I suppose Delia's leading to is that the idea might be to you know develop some kind of working group, not so it's not always you know going to go back on you guys to actually deal with the issues and do all the work I suppose by yourselves, when we develop the idea of a working group and who's supposed to be on that we can resource it properly and away we go.
- Dr WOINARSKI:** No, we recognise that some people are better co-ordinators to different groups.
- Dr LAWSON:** Oh sure.
-

- Madam CHAIR:** We're travelling throughout the Territory in May to hold public hearings as well, so certainly the evidence that we gather through that public process will be far more expansive than the expert evidence we've had to date although everyone who has appeared to date has said: I am not a cane toad expert.
- Dr LAWSON:** There is no cane toad expert
- Mr WOOD:** Ian Morris must get, well on the way to being one, I think.
- Madam CHAIR:** He's a frog expert!
- Dr LAWSON:** You know, I mean a cane toad expert, I would put that down as Alex Hyatt who's in charge of the search for the bio-control in Animal Health Division of CSIRO. I contacted him before I came here and he'd be very helpful and I tried to get a copy of their report that they just supplied to Environment Australia but I had a very strange reply which I think it is important that you hear. I tried to pre-empt Environment Australia and sort of nudge their elbow and say you know I'm still waiting for the report and I spoke to a fellow over there and he said well, there's a problem there David, he said, because this is commercial in-confidence. Now my reaction to that was, cane toad research, paid for by the federal government, commercial in-confidence? Why? Are you actually going to sell it back to us if you find the cure for cane toads?
- Mr BALDWIN:** Because CSIRO is semi-commercial.
- Dr LAWSON:** Well I know that but commercial in-confidence, that didn't seem to stick right.
- Mr WOOD:** What comes first, the state of the nation or commercial in-confidence?
- Madam CHAIR:** We've been able to access some commercial in-confidence reports already, I'm not referring to that particular one but we seem to have little luck so we'll go digging there, thank you for that.
- Dr LAWSON:** Please do that yeah, because I'd like to see that.
- Mr BALDWIN:** I wouldn't hesitate to say it's not the first reaction you've had like from Parks and Wildlife talking to Environment Australia or even CSIRO, it's an ongoing debate.
- Dr LAWSON:** That's true.
- Mr BALDWIN:** It also points to the factors that aren't evident in this whole thing.

-
- Mr BONSON:** Just one side of things, you know when this wave comes and hits Darwin you know are greater Darwin, 90 000 people, we've got 200 000 people here, obviously it's going to affect half the population in a very short period of time, and developing up packages to deal with it, you know there was a suggestion that maybe you know, your block of land, you might be able to somehow fence that off or quarantine that off from the possibility of having cane toads in there etc and I know my partner's a bit of a frog enthusiast and you know, she's worried about you know how we can keep the green frogs inside away from exposed etc from what's going on outside. Is there a possibility of developing up little packages where people can, who have an interest in the urban areas of Darwin rural areas, that can do something?
- Dr WOINARSKI:** Can I answer that?
- Dr LAWSON:** Yeah.
- Dr WOINARSKI:** We've offered suggestions which I think the Land for Wildlife scheme published a piece ...
- Mr BONSON:** Sorry what was that?
- Dr WOINARSKI:** The Land for Wildlife Scheme operating out of Litchfield Council I think.
- Mr WOOD:** Yeah.
- Dr WOINARSKI:** Has publicised some of that and there's a series of moves that you can make to almost toad proof your block and it's things like cane toads like short grass which is sprinkled, so you're more likely to get fewer cane toads if you've got an overgrown garden with fewer water supplies. You know, some people like that, it's not my place and others don't. Cane toads
- Dr WOINARSKI:** The cane toads their sort of biggest flaw in their composition seems to be that they're not very good climbers at all, so it's impossible to have sort of perimeter fencing around your place which is solid, at least for a few inches that is. And I think that could work as well.
- Madam CHAIR:** About four inches?
- Dr WOINARSKI:** Yeah, I was trying for ten centimetres.
- Madam CHAIR:** Up to ten inches to be safe.
- Dr WOINARSKI:** Yeah, yeah, so I think that's either solid or really fine fly wire or shade cloth.
- Madam CHAIR:** Does shade cloth work as a barrier?
-

-
- Dr WOINARSKI:** I think so, it should.
- Mr WOOD:** Why does it have to be so fine?
- Dr WOINARSKI:** Oh simply because the toadlets, the baby ones are very small.
- Mr WOOD:** They wander along too. They're not just sitting in water?
- Dr WOINARSKI:** No.
- Madam CHAIR:** Once they get those little legs, they're out. They're moving around.
- Dr WOINARSKI:** So, you can reduce the chances of them actually coming into your gardens and stuff, there is no guarantee.
- Mr BONSON:** Obviously somewhere like Rapid Creek, which of course is going to be an issue in my electorate especially because it's fresh water, salt water stuff, I suppose if there's, you know, any proposals that you guys can work up, you can think of those little areas in urban Darwin that you know, I noticed ...
- Just to think about that concept because I would presume that that's going to be a perfect habitat for cane toads to go there and then suddenly everyone's walking past
- Dr WOINARSKI:** If you look outside the window and look at the landscapes of sort of this part of Darwin, it's all short lawns, irrigated and cane toads will love it, especially where there are lights overhead where the moths and other insects will congregate.
- Mr BONSON:** Actually there was some man in when I was in Queensland that because they didn't have a very good wet season, that there weren't many cane toads round because I was looking for them and I didn't see them until I got to Brisbane. You know does that the answer David or do we think that's ...
- Dr LAWSON:** Well the numbers certainly fluctuate between years and there's some hope that that might be a density dependent thing that occasionally they get too many and a lot of them starve or don't reproduce particularly well and certainly the dry periods, periods of dry wet seasons, yeah the numbers don't build up as much. I think there was some anecdotal information that numbers in Katherine over the last few months haven't been as high as they were the year before.
- Mr BALDWIN:** You don't see much in the wet because they, I assume they're dispersed more. In the dry, as soon as the wet stopped, two or three weeks ago, they were every where, everywhere.

-
- Mr WOOD:** So, Marrara Football ground is going to be an interesting place to play footie on.
- Mr BALDWIN:** Oh yeah, squish squash!
- Dr LAWSON:** I think one of the things they've done in Queensland too with constrained areas like Rapid Creek is that the local people have got together and they've actually got sort of cane toad task groups, they actually go out with buckets and collect the damn things you know. Now, you could argue well that's just a drop in the ocean, it's not going to really do anything in the big picture but I think you know, we shouldn't denigrate that sort of community effort and sort of encourage it, you know because there are certain places where if you did have a physical collection, you probably could keep them reasonably toad free and it might be places like Marrara Stadium where you say, do things for the footie, let's get in there and collect the cane toads and certainly I mean, it might actually act as a little bit of a magnet for cane toads if you've got a nice irrigated footie pitch you know.
- Mr WOOD:** And lights.
- Dr LAWSON:** That's right.
- Mr BALDWIN:** That is where they love it. on my lawn every night.
- Madam CHAIR:** They don't like astro-turf though, so I'll be fine.
- Mr WOOD:** Lawn bowls too.
- Mr BALDWIN:** Oh well that raises the question obviously in the whole information campaign thing, is that you won't stop people from trying to get rid of them and there's that humane aspect of how you should dispose of them. And it's going to have to be, we are going to have to say something on it in terms of public relations. You don't want to encourage kids going round with golf sticks and you know, beating the hell out of them. It's not only how they're dispatched, it's what you do with them then.
- Madam CHAIR:** I was told freeze bags.
- Mr BALDWIN:** That's what they promote in Queensland, in a big hurry.
- Dr LAWSON:** Yeah well I mean, the humane treatment of feral animals I think is sometimes overlooked and it shouldn't be, after all, if you look at it plainly, it's not the cane toad's fault it's a pest, is it? And it is actually a sentient animal, it can feel pain so I think that, I agree with you Tim, I think there's a very large responsibility on all of us to say, yes they are a pest, no we don't want them but don't be cruel to them. And certainly I think the most innocuous way to actually kill them is to use
-

-
- the freezer method. If you really want to be gentle, put them in the refrigerator first.
- Mr BALDWIN:** Get's the mothers and wives really hopping, I tell you, when you suggest that you've got all these live jumping things in these plastic bags and you just throw them in your freezer they go, 'Oh, whaaaa!' They'll just freak out.
- Mr BONSON:** One thing is the evidence we've got about the fox and donkey stuff and they're talking about the fox and they use baits. Now, you know we're talking about a disease, biological effect, you know has there been any development of a bait situation you know, a food product that these toads might eat? That you know they first invade into a water area, we go and drop ten baits around it and they'd come out and they'd feed on it and they go to sleep.
- Dr LAWSON:** Not to my knowledge. I think the problem with cane toads is they'll eat more or less anything they can catch, so a cane toad specific bait would be I think almost impossible to find.
- Madam CHAIR:** It would kill every other species around that's eat anything like it, yeah.
- Dr LAWSON:** There are probable things we can try like the one thing we've been tossing around through my unit is that the one thing we noticed in the last two dry seasons in Darwin when we had the cane toads brought in, we think on removal vans, it was striking that in every instance they had these self watering pot plants in their possession and that's where we found the cane toads, so we've been toying with the idea of some sort of plastic thing that cane toads can get into so they can get refuge in it and then you could just pick it up and shove it in your freezer. And I'm sure if an entrepreneur there's a sort of couple of million dollars to be made there somewhere. We are still sort of toying with that but how effective it would be, we're not so actually certain but maybe we should have a play with that too.
- Mr BONSON:** Maybe something the NT Government can develop and fund the project.
- Mr WOOD:** Commercial in-confidence.
- Dr LAWSON:** We've already got a patented fox bait delivery thing that Glenn Edwards, our scientist in Alice Springs has just invented and that's, we've had great interest in that from Tasmania for obvious reasons, they've got foxes there, they want to get rid of them but they don't want to kill all their dogs, so we've got this bait delivery system which only foxes can access which is pretty normal, so it's not beyond us to actually think of ...
- Mr BALDWIN:** How does it stop dogs from ...
-

-
- Dr LAWSON:** Well it all came about when we were sitting and having a cup of coffee one day and we were tossing the ideas of foxes, dogs around and Glenn was actually holding a dogs skull and I picked up a fox skull and we looked at this and Glenn went 'Ah!' and he just literally sketched this little thing out and said I'm sure this would work. Basically it's just a narrow bait delivery funnel and a counter-weight that they can get their nose in and dogs can't. Now obviously if you've got a very small dogs, tough. As far as dingoes are concerned you see, dingoes can't get at these baits delivery devises whereas foxes can and we've done some field tests and there are some goannas that get pretty smart and try and get the bait out of there and cats can't get at them because they're counterbalanced so, I mean you can think of things like this it is perfectly possible, you know you talk ofyou've got enough talent around, enough people who know what they're doing and you stick them in a room and say invent something, they'll probably come out with some idea. But this all comes back to this you know consolidation and getting the right people in the group you know.
- Madam CHAIR:** Which is where we're very keen to have any suggestions you have on that come back to us because I know it's something that you want to take some contemplation about. Getting back to humane ways of disposals, some people have said that a popular thing has been Dettol in a watering spray. What's your opinion?
- Dr WOINARSKI:** Very painful.
- Dr LAWSON:** Yeah we actually did some searching around for that and the consensus from the people that had looked at that was that it was an extremely painful way to kill the toads.
- Dr WOINARSKI:** If they had a voice you could hear them.
- Dr LAWSON:** And in fact we recommended just a few weeks ago, someone sent us a letter saying would we advocate this and we said: no we would not.
- Madam CHAIR:** So you'd advocate the freezer option, the fridge/freezer option and that's it?
- Dr LAWSON:** More or less, yeah.
- Mr BALDWIN:** Or an injection by a vet.
- Madam CHAIR:** The vets are already going to make a packet out of the dogs and cats.
- Dr LAWSON:** And if you did that you'd have an influx of vets to the Territory, I tell you, very quickly.
-

Mr BALDWIN: Can I get back to baseline data? Taking the discussion back a little bit, that's one of the things that's missing in the whole sort of debate on cane toads, you know, Queensland, 70 years of cane toads never did much in the early days. You're saying that we'll have a much better picture but are we doing scientific type baseline observations so that we can go back and post observations then and the pre-observations and post toad, so that we can go back and do the counts on the ground and all that sort of thing to see which animals have been affected? Or are we just doing from our general quantum of information in the Territory that we'll have a look afterwards and see if it's changed. How are we doing it, what are we scientifically?

Dr LAWSON: That's yours.

Dr WOINARSKI: We've, over the last decade or so developed a very systematic way of counting terrestrial wildlife in the Territory and we've got probably five to ten thousand hectare quadrats spread across the Top End in which we've censused, over a three night period basically all the wildlife, the vertebrate wildlife that occurs in those and that's extraordinarily detailed and comprehensive baseline from which we can monitor any change that's occurred or that occurs henceforth. And we've used that system Kakadu in that report that's just gave where we, two years ago we sampled I think it was 110 odd quadrants in exactly that same way in the bottom of Kakadu and almost or a bit over half of those were invaded by cane toads in the six months after we'd sampled them and then we went back last year and re-sampled them all again both the ones that were impacted by toads and the ones that hadn't and that gave us a very clear picture of basically what the changes in the fauna had been. It's a very powerful way of doing it, from that basically it was evident that the quoll was by far the most affected of that group of animals that we could sample.

So that's a terrific amount of information that we've got for pretty well all the vertebrate fauna that lives on the land, however we haven't done similar stuff for the aquatic fauna so the fish, the aquatic goannas and we haven't got anywhere near the same, almost no information about the invertebrates. So that's basically the work that Parks and Wildlife's done which can be used to assess quite precisely the effect of toads and we ...

Mr BALDWIN: Are we going to get those quadrats down Borroloola way?

Dr WOINARSKI: They were a bit shy in the Gulf country but we got some, yeah.

Mr BALDWIN: So, were, they've obviously got some pre and post data that's sort of three years now since cane toads or whatever compared to the Kakadu ones which are ...

- Dr WOINARSKI:** Yeah the best stuff for that part of the world and that's not entirely Borroloola but there's a good study by CSIRO on the Roper River area which was published, in 1999 and that used the same sort of approach. And that basically was, I can't remember, about 150 odd species and there are only three which seemed to show serious cane toad effects, the dingo, one dragon lizard and one frog I think. Basically that was the first evidence from the Territory that fauna on the whole aren't going to be hugely affected by cane toads.
- As well as the work that we've done, there's work currently underway in Kakadu which is looking at radio tracking quolls and that's shown very much the same results that we've got: that quolls are can't handle the toads. And there's also radio tracking work going on goannas, work being done on snakes by other agencies, so that you know the sum of the effort here is pretty substantial and should in a year or two give a very clear picture across most elements of biodiversity and far better than whatever we got out of Queensland. But there are still things like invertebrates which no-one's looking at.
- Mr BALDWIN:** Yes, and aquatic as well.
- Dr WOINARSKI:** Yeah.
- Madam CHAIR:** Is fisheries looking at aquatic, have they got research areas in fisheries?
- Dr WOINARSKI:** Not that I know of, Arthur George from the University of Canberra's doing some work on pig-nosed turtles and some other ...
- Mr BONSON:** What about barramundi and, we've had evidence of this thing that barramundi could be something affected as well?
- Madam CHAIR:** But we've also heard that it spits it out, doesn't like it.
- Mr BONSON:** Yeah exactly, so I'm just trying to get a clarification so obviously there is still a lot of contradictory information.
- Dr WOINARSKI:** We certainly don't work on fish, only on recreational. No, it is Fisheries responsibility.
- Madam CHAIR:** The fisheries in the NT, you're not aware of anything they are doing in that area?
- Dr LAWSON:** No, I spoke to Richard Sellers (?) just the other day about it and he seemed to be rather unconcerned about the barramundi question. He seemed to be convinced that barramundi just sort of spit the things out and certainly didn't seem to be any over concerned there at all, for the game fish, no.

- Mr BONSON:** And where's he getting that information from, is it anecdotal or is he getting it from Queensland or ...
- Madam CHAIR:** We'll have to ask him.
- Dr LAWSON:** I don't know, that's all the told me.
- Mr BONSON:** I suppose there's another one of the issues that the Kimberleys, we've had evidence here that they're doing some large identification of crocodiles and stuff like that there, are you guys involved with that at all?
- Dr WOINARSKI:** No, that's Graham Webb.
- Dr LAWSON:** We're involved in it, just doing the permits and the regulation of it, but no, that is Graham's research.
- Mr WOOD:** Have you tried to list how many organisations have been working on cane toads? I mean if we were to go ...
- Dr LAWSON:** That was a good question.
- Dr WOINARSKI:** There was a Dr Rod Kennett from Kakadu, Parks Australia actually compiled a list of current projects that are going on in the Territory, looking at the impacts of cane toads.
- Mr WOOD:** Just in the Territory yeah?
- Dr WOINARSKI:** Yeah.
- Mr WOOD:** And has anyone compiled it nation wide?
- Dr WOINARSKI:** Negative.
- Dr LAWSON:** Not to my knowledge.
- Mr WOOD:** If you're working at trying to bring a collaborative approach, we'd need to know who's working, to get the best value for money I suppose. There's money being put here, there and everywhere, it would be nice to know where it's going.
- Dr LAWSON:** The largest funding of course is, that we know of, is the federal initiative to look for the bio-control and that's what CSIRO and Animal Health in Geelong.
- Dr WOINARSKI:** Actually, no, Rick Shine's got more money than that.
- Dr LAWSON:** Has he?
- Dr WOINARSKI:** Yeah.
- Dr LAWSON:** I didn't know that. What has he got more than half a million?

-
- Dr WOINARSKI:** Oh yeah!
- Dr LAWSON:** Good old Rick, well there you go, I stand corrected.
- Mr BALDWIN:** What's he doing?
- Dr WOINARSKI:** He's looking at the ... up here at Fogg Dam basically, looking at the impacts of toads on snakes and goannas to an extent and I think he's got several million dollars over a couple of years to do that.
- Mr BALDWIN:** Everyone else might know but who's he work for?
- Dr WOINARSKI:** He's University of Sydney. And they've got one of the world's best data sets on water pythons, they've marked every individual basically for the last 15 years. That's extraordinary and he's trying to demonstrate that there's rapid evolution in terms of adaptation to cane toads.
- Mr BONSON:** I take it that you guys would be interested maybe in sitting in a big round table having all the people that's presenting evidence to us, having big brainstorm session about where we could go from here? Rather than at the moment, we're individually getting piece meal evidence from different organisations. I always find that sometimes it's good to get everyone in the same room as well, that'd be interesting.
- Dr WOINARSKI:** It would be great to bring all the parts together I think.
- Mr WOOD:** Has there been a cane toad conference at all?
- Dr WOINARSKI:** There was this one at Jabiru that you've got ...
- Madam CHAIR:** The ERISS report, the workshop?
- Dr WOINARSKI:** The workshop from about three years ago.
- Madam CHAIR:** The cane toad workshop, 8th September '98?
- Mr WOOD:** Was that the first one or has there been some before that?
- Dr WOINARSKI:** No, that's the only one.....
- Dr LAWSON:** Just one point about the Mathew's idea about a package, an information package, the one thing that I would also strongly urge that when we actually produce our public outreach material, very often there's this is put together by scientific staff and although I'd like to think that we're very erudite sort of citizens, we tend to sort of be a product of our training and I think it really is important to have more professional help in how that's presented. I mean you were talking Mathew about TV. Well we could probably give the relevant information about a TV type approach but I would hesitate
-

that you put any of us on camera to actually do it. I'm trying to explain that you know the presentation of this stuff sometimes is perhaps not as catchy as it could be and we tend not to go for that sort of professional help simply because it is relatively expensive to do it that way. But I've often thought that that might be not to do it that way might be a false economy and to certainly on the occasions when we have actually gone out and said to professionals, there's the information, now get it out, they come out with some quite remarkable ideas that we wouldn't have even dreamt of and I think that's really important to bear that in mind too, that you don't just need scientists, you don't just need people from the NLC, you need people that are experts in getting the message across, you know, we tend to often ignore that.

Mr WOOD: Do you still have a media, or did you ever have a media branch at Parks and Wildlife at one stage?

Dr LAWSON: We've got a, we always had a media officer because there's always been intense public interest in Parks and Wildlife per se, now we're part of the bigger department, there is a media unit and they're pretty professional and they do a good job, I think I contact them probably an average of two or three times a week for instance. As far as I know, there is only one professional journalist actually on that staff though, that's we've got on staff and we rely on them to see well, we'll sort of say well what about this for a media release and they'll say fine, they tailor it but I'm actually talking more than that. I'm actually talking about some really serious professional ...

Madam CHAIR: Production.

Mr BONSON: Yeah I agree because you know unfortunately the way modern society is you know the examples of how the MBA market themselves all around the world with cross-culturally, it doesn't matter, South America, North America you know Africa, Asia, they are able to sell their product which is their MBA guarantee Michael Jordan, you know, Gator Ade whatever and I'm not saying obviously we go down that, we don't have the money probably to go down that path but we certainly need to be smart in certainly our concepts and I think yeah the younger generation unfortunately the medium is TV, you know radio to and extent but certainly TV and you know the people I know you know they'd get this and they'd have a look at it and maybe not digest information in it maybe not as quickly as they possibly TV with you. So I agree.

Dr WOINARSKI: Are you taking outreach material like that with you when you are travelling?

Madam CHAIR: Well there has been some debate about the quality of that

-
- one.
- Dr WOINARSKI:** Well yeah, no not that one in particular. But you're not taking literature with you and disseminating it?
- Madam CHAIR:** No, it's a fact finding, listening, absorbing tour de force of our highly entertaining committee.
- Mr BONSON:** That might be an idea to look at. Maybe we can take, we can talk about
- Madam CHAIR:** If the department has any information that you think is useful.
- Dr WOINARSKI:** What you're saying that pamphlet's not?
- Dr LAWSON:** Can we get something together for your next travelogue?
- Madam CHAIR:** We're travelling in May, what's the first date. Tuesday 6th May to Borroloola.
- Mr BALDWIN:** Half the places we are going have experienced cane toads.
- Madam CHAIR:** That's what I'm saying. That information is not relevant to the cane toad areas because they're living them I guess. It's that next stage of promotional material you are talking about. So it's a tight time frame. If you want to do a one page fact sheet, you know contact Parks and Wildlife on this number or whatever, however you as a department already deal with incoming queries, what's a good process to advise people of, whether those local ranger stations that you want to give that, we're going to Tennant Creek, Katherine, Jabiru and then Palmerston, Darwin and Litchfield.
- Dr LAWSON:** If you're after something succinct, there's a briefing note here that was done for our executive director and conservation and natural resources group which you can have a look at. I think there's some, that's pretty succinct and it was written by an expert. ...And I think that's the sort of very brief stuff that you need to get a grip on. There is a practical consideration here though also because as I said earlier ...
- Mr BONSON:** Well I don't have a real problem with this except for maybe that one sentence you know which say, apart from that it's all right.
- Dr LAWSON:** Already we're looking to upgrade that and turn it, now depending on what your group's going to do, I'm not going to waste effort. I mean if we are going to go and get this package together then there's no point in me doing that but I do need to do that if the process that we're talking about is going to take too long and the toad's actually get here, so we're really in a catch 22 situation.
-

-
- Madam CHAIR:** Yeah, we're fast tracking our body of information as a committee so that we can aim to give something to parliament hopefully by mid-year, at the latest because of the rate of impact and the ability for us to provide the advice to parliament then, speeds up the process of parliament making decisions on that.
- Dr WOINARSKI:** Get the report in before the toads get here.
- Mr BALDWIN:** As you know, that's going to leave a problem because whatever recommendations are concerning resources, which means money and then wait for another budget rounder, all that sort of stuff and consideration by government and so, a thing like a pamphlet or an information package, really as a committee we're going to have to give consideration to how do you get it out there, what resources can be provided to get it out there far quicker than the whole government process and that's something I was going to raise later when we were in closed sessions because you could be waiting, we all could be waiting as we know government works any government, for another round of budget before you get the resources to go and produce the TV or the radio or the, and really it needs to happen quicker than that because the cane toads are, the first wave will be well and truly through by then. Pine Creek and beyond now, it's not going to take much longer.
- Madam CHAIR:** But if we get some advice on some promotional information out of say Parks and Wildlife on some estimates and costings, there's nothing to stop us from giving that information as preliminary advice to the minister responsible.
- Mr BALDWIN:** Oh no, that's what I was going to talk to you about, there needs to be a recommendation to government before the whole sort of finalisation on this group.
- Dr LAWSON:** So I'll just put the letters ASAP on all I've written here then.
- Madam CHAIR:** That would be a good one.
- Dr LAWSON:** Ok.
- Madam CHAIR:** Any other questions Committee members?
- Mr BONSON:** I'd just like to thank you guys just on behalf of myself for coming, it's been fantastic and you know you've been very informative for me. There's a lot of things I've found out that I didn't know before. That's all I wanted to say.
- Dr WOINARSKI:** Thanks.
- Mr WOOD:** I'll let the Chair do that.
-

Dr WOINARSKI: Can I just push a barrow?

All: Yeah.

Dr WOINARSKI: It's slightly tangential to this and that's that it's easy to identify the toad problem retrospectively but we're making the same mistakes consistently now and our descendents are going to have to pay for them. Toads they're obvious, you know they look ugly, nobody likes them and they're conspicuous but at the moment much of the Top End, much of the Territory has been degraded by things which are far less obvious, things like gamba grass, para grass and in some cases buffel grass and were still allowing these problems to be introduced to our environment and probably their effects on our bio-diversity are going to be far worse than cane toads. So it's fine, we've realised that cane toads are a problem, 60 years, 70 years after their introduction and we should be using the cane toad as an example of not to fall into that same trap again and now we're still, five years ago, ten years ago we were proselytizing about these pasture grasses and saying that you know they should be spread everywhere in the Territory almost and it's going to be our sons and daughters that are going to be, going to have to deal with the problem that will come from those in years to come and to me cane toad's just a classic example of the lesson we should be learning is that we shouldn't be so stupid again. That one vested interest shouldn't introduce something which is going to affect all our lives. Anyway, that's just a bit of a tangent but I think to me, I mean that's what we should be getting out of this cane toad thing. We're not going to solve the cane toad problem itself but we should be looking more broadly from it.

Mr WOOD: I support that 100%. I looked at the weed list they sent out for comment and they had the yellow oleander, I've forgotten its proper name now, has a possible weed but they didn't have Gamba grass, I mean the difference is just like chalk and cheese. I know it's a pasture species but it's just everywhere. Because I've got a block of land at Adelaide River, it's just changing the landscape and it's just, I know they're spraying it but I just think ...

Dr WOINARSKI: It's escaping far more quickly than they are spraying it.

Dr LAWSON: Just to add on to what John said for instance in the Territory, we don't have a process for actually reviewing any species that people might want to bring into the Territory and I think that's to our detriment. I think we should have some process in place that if people want to bring new varieties or new species into the Territory that there is actually a very clinical look at not only the potential economic benefits that that might accrue but also the possible harmful effects and in the past, I think I'm right in

saying that for instance in so called improved pasture species have been brought in by agronomists and certainly in the six years I've been here Parks and Wildlife has very little if any, been involved in actually being asked an opinion on that when it's happened. I think that that is an insidious environmental problem, as John said, and I totally agree with that but we just don't even have the most basic processes you talking about the introduction rather than for actually trying to stop that at the moment.

Mr BALDWIN:

A noxious weed list.

Mr WOOD:

Madam Chair?

Madam CHAIR:

I was going to say, what are the protocols elsewhere?

Dr LAWSON:

Well in Western Australia they have a system whereby there is a 'weediness' index put onto a particular variety or plant before it's introduced and it's my understanding that anything that comes in has to go through this process of being assessed by this independent committee of experts, I hate that word but you know what I mean, people with experience in that respect but it includes people with and expertise in bio-diversity, it includes agronomists, it includes pasture scientists but what I'm trying to say, the process is not just one sided and I think John's predictions are actually unfortunately going to come true: that we are going to bear the effects of some of these introductions in a way that makes cane toads look like a walk in the park.

Mr WOOD:

And I think just to back up that, look how long it takes to bring on a biological control insect into attack mimosa, takes years, yet you can walk in with gamba grass, that's it, I mean it was a classic example where it might be a good species but if some work had been done on it for instance perhaps to hybridize it so it didn't have viable seed as is done with some of the millets, it could have been just a use that old phrase, win/win situation but at the moment it certainly shows the so called theory of sustainable agriculture is a laugh, is a joke because someone else is now paying for the control of that particular species outside of where it was originally meant to grow.

Madam CHAIR:

Well I'll raise this issue with the Minister for the Environment who also has primary industries. It's not in our terms of reference, so it can't be included in the recommendations but because it's been raised today I'll take it up.

Mr WOOD:

Not so much Gamba grass but the introduction of species into the Territory. There should be some perhaps go ...

Madam CHAIR:

That's what I'm going to raise, the issue of we don't have any separate authority that looks at the introduction in the first instance, can something be introduced?

-
- Dr WOINARSKI:** That's certainly always far cheaper to solve the problem before it happens.
- Madam CHAIR:** And I'll, if by raising that, I'll suggest they look at the WA example but we can't formally recommend because it's not within our terms of reference but I will as the Chair of this committee because it's come up in this discussion, take it up with the Environment Minister.
- Dr LAWSON:** Well one thing I would draw attention to, related to cane toads and we touched on this in our conversation this afternoon, I think that John said, it's because they are warty and ugly, no body cares if they get controlled and you know everybody would like to see them controlled. We have a very invasive species which are very attractive to some people and one of our most pressing problems at the moment are cats and in fact you might be interested to know that myself and Glenn Edwards have just motivated to bring the cat issue back to the Vertebrate Pest Committee who have in my experience and my opinion put this into the too hard basket and certainly this where politics comes into it because there are very powerful lobby groups that say, they wouldn't like to see a bio-control on cats for instance and yet the people in the Animal Health Division in Geelong tell me that it's perfectly feasible to work on a bio-control for cats but no-one's doing it because it's one thing to kill cane toads with a bio-control, it's another thing to kill you know your friendly moggie sort of thing.
- Mr BALDWIN:** I'll support you 100%.
- Dr WOINARSKI:** I know you would and that is a very important point about these sorts of controls.
- Mr WOOD:** George Brown tried to introduce it to the Australian Local Government Association, he wanted a levy on, and the big cities wouldn't support him at all.
- Mr BALDWIN:** No, the populations won't support it.
- Madam CHAIR:** There's a lot of cat voters out there.
- Mr BALDWIN:** Well there's a lot of urban people who don't see the damage that cats do because they physically don't live in rural areas and that's basically the bottom line, that's where your population is and where the sway is and where the vote is so it's unfortunate.
- Dr LAWSON:** That's right, the conundrum of your voting population, 90% think milk comes out of a bottle and that's your problem.
- Madam CHAIR:** Well this committee's not about to change the world folks.
-

Madam CHAIR: John and David on behalf of the entire Environment Committee and Environment and Sustainable Development Committee we want to thank you for your time here today, we found your information provided to us knowledgeable, and interesting and thought provoking. We hope that our recommendations will go some way to making your jobs a lot easier and we certainly appreciate the great body of work that yourself and the staff at Parks and Wildlife have been doing for Territorians for years now and into the future. Thank you.

Dr WOINARSKI: Thank you.

Dr LAWSON: Thank you.

Madam CHAIR: And thanks for saving the quolls.

TRANSCRIPT NO. 4**Mr Graeme Sawyer and Mr Ian Morris**

Frogwatch Northern Territory

Tuesday, 15 April 2003

PRESENT:

Committee: Ms Delia Lawrie, MLA (Chair)
Mr Tim Baldwin, MLA
Mr Matthew Bonson, MLA
Mr Stephen Dunham, MLA
Mr Elliot McAdam, MLA
Mr Gerry Wood, MLA

Secretariat: Mr Rick Gray
Ms Maria Viegas

Presented by: Mr Graeme Sawyer and Mr Ian Morris, Frogwatch Northern Territory

Note: *This transcript is a verbatim, edited proof of the proceedings.*

Madam CHAIR:

Ian Morris and Graham Sawyer thank you very much for accepting the invitation to come and address the Environment and Sustainable Development Committee or the Northern Territory Legislative Assembly. Specifically in relation to our enquiry into incursion of cane toads into the Territory. The terms of reference which the committee is addressing include: the identification of the problem and risks associated with the cane toads in the NT; the potential extent and effects cane toads have or will have here; the cultural, socio-economic and other factors associated with encroachment; identifying the current level of understanding concerning cane toads to date and assessing the need for public education and awareness programs; identifying ways to manage the environmental impact of cane toads and community concerns and expectations in respect of their progressive entry. It may be that you want to comment on all the terms of reference, how we normally operate is, you give us a presentation, your views in relation to those terms of reference and we then have a very open and friendly exchange of questions and conversation and discussion about it. And feel free to at any time seek clarification if a question's asked, anything or where's that coming from?

So, if you want to kick off with any information you could provide the committee.

Mr MORRIS:

Well we thought we'd just give you a background on Frog Watch and where it came from and sort of what we're trying to achieve. Did you want to kick off Graham?

Mr SAWYER: No, you can do that. I didn't bring you along for nothing.

Mr MORRIS: Goes back to 1990 and most other states in Australia had a Frog Watch up and running and they're basically voluntary organisations to generate information for the community on frogs and as the toads were sort of across the border at that stage and of course all the information we have had previous to that were that the Gulf of Carpentaria would be a natural barrier to toad migration, so I mean the Territory really wasn't all that concerned and then suddenly people on stations right round our border area, Queensland side and our side let us know that there were toads hopping through their places. So this kind of put some sort of urgency on the development of A Frog Watch program for the Northern Territory, the only state without one and it was actually Mike Tyler who is basically Captain Frog for Australia, based at Adelaide University who contacted Graham and I and asked us or he didn't ask us, he sort of told us and he was, go and do it sort of thing.

And so that was the genesis of it and we just do it in our spare time but our objective has been to tie in with the other states and we've had some opportunities to go and meet with people from the other Frog Watch state organisations to generate as much public information as we can on the frogs of the Northern Territory and the toads and the impact they might have on frogs and then other life forms including us. So yeah, we've been sort of madly trying in our spare time which neither of us have very much of, to generate information: firstly on what the Northern Territory has in terms of frog species. Queensland got caught out badly biologically because the toads swarmed all over the place before they had time to find out what their bottom line was and they don't know whether they lost other frog species in the process or not and therefore they weren't able to give us in the Northern Territory a lot of information on what to expect and it appears that in some ways our monsoon climate over here might be even more conducive to cane toads than it is in Queensland because we have this very predictable wet period when they seem to surge and then they have a time when they can have a rest in the dry season and tuck out of the way and some of the interesting things that we've found while we've put together a program for schools and for general public information on the native frogs in the Northern Territory and we've just managed after many years to get a CD out on the market now, where people can actually, we hope will save them ten years. They can hear all the calls of our native frogs and they can follow up information and see pictures and learn about their breeding biology of where they like to live and so forth and that will hopefully give them information that they can follow up about their own living space here in the Territory and then try and measure what impact the toads might have

when they get to them if they haven't already.

And we've made a bit of an effort to get the information out into the community. We go on radio whenever we can and TV and we've worked on a lot of documentaries even with David Attenborough which hasn't quite been released yet but it's a very good one. As many ways as we can to get the public involved with our native frogs and wildlife in general so that when the toads come here, well then we've got a way of measuring their impact. It's a very difficult problem. Nobody elsewhere has been able to really give us a lot of information on what to expect on what sort of effects toads are going to have on the native animals or on our other species of frogs and it's going to be different in every case. I imagine that John Woinarski and Dave Lawson probably said the same thing, that it's very hard to measure until it happens, what's going to go on.

Our other aim to with this Frog Watch program is to try and get enough information to supply Western Australia with some advanced knowledge. Their turn's coming probably faster than we think and at least we want to be in a position to be able to tell them what to expect because they have similar systems to us, the Kimberley and Arnhem Land Top End are sister zones really, so we're hopefully going to be of some use to them, if we do it right.

Mr SAWYER:

Yeah, I think one of the big issues with Frog Watch is our community education function that we're trying to fulfill. We do a lot of work aimed at supporting community groups and we've done a lot of work with people like Landcare groups and we do a lot of work with Junior Rangers and community education through Parks and Wildlife and other groups that are interested, schools and so forth and we've developed a web system which carries a lot of that burden now thank goodness which makes it a bit easier on Ian and myself and the others that are involved directly and one of the big success stories I guess at Frog Watch has been the model of community communication and collaboration that's supported through that web site and the way it actually takes the load off but our main aim there was to try and build a better environmental awareness based around the enthusiasm, interest in frogs and cane toads have really become an enormous part of that focus in the last couple of years in particular and the community interest in them is just staggering. We had a meeting at the museum a few Tuesdays ago, we had 120 people turn up on the back of virtually no advertising, which I think, to me gives a really good indication of the level of interest and concern out there and I think that's one of the big things that the government missed out on in relation to cane toads, was the opportunity to really make big progress on community education about environmental issues and try and use that as a positive force and there aren't going to be any other positives I can

see coming out of this problem, is to try and see what options there are for community education and awareness raising out of something like this and try and make sure it doesn't happen again.

Mr BONSON: That's one of the evidence we've had from different groups so far that there needs to be that communication process going on, so I'm just interested, you say you had 120, so it was a diverse cross section of the Darwin community?

Mr SAWYER: There was huge diversity, there was kids right through to 60 year olds, I mean everybody, I was amazed and Kate Smith from the museum who put out the actual one ad that was in the paper and the email that went through to some of the areas of her department and from lunch time on that day, she was actually telling people not to come because the theatre at the museum wouldn't hold of them. So I would have said you know if we got 30 people we would have been doing really well.

Mr BONSON: is great. One of the things we've been hearing is that there's been a diverse opinion of scientific effect on areas where cane toads come in, so we're hearing that it's from a disaster to, well it's not going to be much effect or it's going to be effect for a certain period of time and they'll come back and etc and I think it's pretty much up in the air as to what's really happening.

Mr MORRIS: I guess that's what you're trying to do is to try and work out where the truth is and I would imagine there's a bit of both. Some, we can see that there are some species in the NT which learn to cope with them and in a few instances in Queensland they've told us that a particular species will bounce back eventually. And yet in the Northern Territory experience it's not happened. One of those is the common yellow spotted goanna, monitor and in the Gulf country, we've heard that their populations had slowly clawed their way back up, not to previous levels but were on the way sort of thing but talking with Aboriginal communities, we've kept in touch with every Aboriginal outstation and community that communicates with us and they are all deadly interested. So there's no indication that that's happening on the Northern Territory side of the border with anything, the goannas they notice particularly because they are a food source they depend on and they ...

Mr BONSON: That's interesting you mention that your communication with Aboriginal communities, you know access to these places, do you guys get to travel out there or do

Mr MORRIS: Well we fund it ourselves.

Mr SAWYER: Ian gets around a few of those places in travels and I don't get to many, I get to a few but nothing formal but we've

certainly had a lot of communication with those sort of groups. Places like and other places that are sort of way out in the middle of nowhere, have been reporting in developments with the toad, I mean, I think that's probably the thing that's staggered me most about this. I mean when we're doing things like the web site and stuff and you know, you're out there researching what you can and gathering information and putting it out there so people can track it through and find out information, I was absolutely staggered at how little information is actually available about cane toads. I mean one of the things that really gets me, is I can't find any reference, I mean there's one reference in the Queensland James Cook University site, to a person there who did some research on fresh water ecology in cane toads a long time ago but none of it's accessible online and that's the only piece of information I've been able to find about the actual impacts of cane toads on fresh water ecology and yet all of the sort of background training I've got would make me think that that impact's going to be absolutely staggering because the, you know the egg and the larval stage being venomous and also aquatic, and you know the numbers of fish we've got up here and stuff that eat tadpoles and eggs and stuff like that, I mean the whole check and balance that goes on top of our frog population seems to be driven through that mechanism.

Mr BONSON:

So, it's interesting when you say that about the fish side of stuff because we've heard from one person which is, it's going to have a great effect on fish like barramundi and other game fishing and then from another person we've heard 'oh, well anecdotal evidence is the frog will eat it and spit it out', I mean the fish will eat it and spit it out, so what's your opinion on that or you don't have an opinion or there's not enough information ...

Mr SAWYER:

I don't have a real, I mean this is the problem, there is no scientific research to back it up but my expectation is that the whole ecology of the fresh water habitat is going to be reduced in diversity and numbers, the bio-mass is going to drop and that the impact on that will be that things like barramundi and stuff, numbers will reduce. I mean the barramundi themselves, the film that Ian's talking about that the BBC Natural History Unit did, has got video in it of cane toad tadpoles being fed to barramundi and the barra swim up and grab them and spit them out but when you look at the more sophisticated view of the habitat, I mean the ecosystems and all the inter-dynamics, you know all those barramundi and stuff are supported by smaller fish populations and you know right down the eco-system and Gerry was talking about macro-invertebrates before, all the way down that line you've got things that are in fresh water habitats up here that spend part of their time eating tadpoles and frog spawn and stuff like that at certain times of the year. Now the impact on those I would think is going to

have to be something significant. I mean I've again, not been able to find any sort of scientific evidence that backs this up but I've heard lots of anecdotal stuff and people talk about the case in Queensland where all the barramundi fishing in the river systems and stuff up there is pretty hopeless. And they say, oh it was over fishing, netting and all those sorts of stuff but some people say well if you look at it, it coincides pretty closely with the cane toad migrations and stuff as well and that's the thing that really gets me, I mean we've had cane toads in this country for so long and we don't know. I think that's one of the things that we've, even in the Northern Territory we've got half a dozen monitoring programs around in place that I'm aware of that are going to tell us some sort of fairly definitive impact of the cane toad on populations of things like the snakes around Fogg Dam and the water monitors that the guys at the uni. have been monitoring and so forth and they will finally tell us you know, some true figures I guess in a scientific sense but that's the very last place.

Mr BONSON:

Yeah, we've heard evidence about in the McKinlay (?) River as well where they affect crocodiles and stuff like that

Mr SAWYER:

Yeah the crocs on the Kimberley and they should hit there any day soon but you know we're hearing anecdotal reports from places like Mt Isa where the water monitors went extinct at Mt Isa. The initial reports were that the numbers just dropped off but over a period of time they died right out and I guess this is one of the big issues, I'm not sure what the life span of a goanna is but one of the issues is, if you're looking at populations and stuff like that you've got to look at them in a long term, you know if there's a certain stage in their juvenile period when they're feeding on frogs like cane toads then you're really going to have a devastating problem and I guess that from my point of view that would be one of the things it would be really good to try and get some research done on and cleared up is, what is the impact on fresh water ecology. Now I know ERISS were looking at that sort of stuff and the labs here in Darwin would be an ideal place to get it done but I don't know how we go about getting that triggered off. We'd actually brought Stan Orchard up here. Stan's the World Wide Fund for Nature frogs program co-ordinator, he's a Canadian who's out here, I think is time's just about up actually, he's due to go back to Canada in the not too distant future but he was brought over here to co-ordinate the Rio-Tinto funded frogs program for WWF and he's pretty firmly of the opinion that there's things that can done and need to be done but a lot of it's basic biological research. He's worked on salamanders and it actually looks like he's going back from here to Canada to start work on eradicating bullfrogs in Canada, American Bullfrogs and also possibly a program in France to look at the same sort of stuff. This is you know, ecologically a very similar problem that we've got with cane toads and he thinks

that even the basic biological research hasn't been done, we don't know if there's a lure or a mechanism that you can attract cane toads to, whether there's some way of using the call or pheromones or whatever or just even analyzing their inability to get out of certain types of structures and stuff.

Mr BONSON:

So I suppose what you're saying Graeme that the diagnosis at the moment is, it could be a disaster but the good news about it is no-one's actually done the work so it could come up with a thousand different things to attack the problem. Is that what you're saying is that we haven't done the research to really look into the problem and maybe there's a thousand things we could do to address it.

Mr SAWYER:

I think it's interesting too because when Stan was up here we had a meeting at the university with Keith Christian and a couple of other people there involved with frog research out there and when Stan asked them why they hadn't done any research on cane toads they basically said because of Bill Freeland and if they did research on cane toads they'd take their funding away and Stan was pretty floored. I mean I was pretty surprised too to hear that, but that was the response that they gave to why you know the Northern Territory University and the research institutions hadn't actually been studying cane toads. I mean I've been doing quite a bit of work with students from the university that were studying frog stuff and yet none of them had been studying any cane toad stuff and it just seemed to me to be as pretty ludicrous situation when you had a looming disaster. I mean the big problem I guess was, a lot of people didn't think it was a disaster, there was people saying oh you know it might be this or it might be that because we didn't have that background information but from an ecological point of view it's very hard to see how it could be anything but. Now we've got the research in Kakadu and stuff which sort of backs up at least some species, there's pretty clear evidence now that it's a potential disaster. I mean the program that Ian was talking about getting quolls off to offshore islands is a response to that but you know there's a lot of other species out there, there's no even likelihood of a response to yet.

Mr BONSON:

Well one of the things that came up was an idea of getting an information package together, I see you guys have done a lot of work on your own information and how you disseminate your material to your members or interested parties and you know, what do you think about that idea about informing the public

Mr SAWYER:

The more the merrier. In Arnhem Land the Aboriginal communities were terrified of cane toads. They thought they were going to be hiding behind trees and leap out at them and grab them by the jugular vein and through them back and venomate you. They were really frightened of

these toads you know and

Madam CHAIR: We talked about the need for it to be in language as well, indigenous language, promotional material.

Mr MORRIS: Yeah, well that would certainly help. I mean there's always enough people in the communities out there now who are quite articulate with English for that not to be a critical part of it, as long as they get the right story that's all, they wanted, nobody had told them really, they'd heard that these toads were coming through from Queensland and that they were poisonous and they just had no idea what effect that was going to have on their lives you know. We kind of capitalised on that a little bit, especially the island communities by saying: look, you guys have got to actually approach the barge companies and the people who transport stuff on and off shore islands, try and get something in place so your islands don't get infested with toads and your islands are a good place to keep toad free, if you're vigilant and I mean Aboriginal people's eyesight is phenomenal. I mean they will spot things that aren't supposed to be there much quicker than we do.

So we've tried to at least maximise that concern they've got by saying, look there's time to do something about it for you guys. The mainlanders, well they've just got infested whether they liked it or not. Opeavilla out there in the middle of East Arnhem Land was a classic one, they just turned up one day in their community, they found a few hopping round the town, they contacted us and then somebody went over to the sewerage ponds and saw 50 or 60 and they'd been there for a couple of weeks and they'd laid eggs in the water they've got there and then it's got a lake, the town's got a permanent lake beside it and you can hear cane toad breeding in that place any night of the year wet or dry season, doesn't matter, they're just churning out millions of cane toads and it's a scary sort of scenario. All of those little froggies hopping around are going to be eating things and they're going to be, I mean they've got to be fed you know, it's a massive bio-mass you're talking about, so I mean, we know that will have an impact on the fairly delicate little natural systems we've got in Arnhem Land but it's a very hard thing to measure. They certainly will, our native things have got to make room for all this large amount of toads that are going to be living all around them, even if they don't feed each other or whatever, so, what we're trying to do is see if we can use the community to feed us information, just observations on what they're seeing happening around them and then once we find something new we'll follow it up and try and alert the scientific fraternity to have a look at it if possible and that's working really well.

We put together or Graham put together, or Graham did most of the work, on our web site, I don't know whether you

folks have had a look at the Frog Watch web site, well that's been a great community facility. Graham mentioned we had a bit of trouble with Bill Freeland, he was an old friend from sort of way back, but he had this kind of mental barrier about cane toads and he didn't want to know about them. I mean we just couldn't get any dialogue going with Parks and Wildlife for a long time because of Bill's sort of attitude and now we've got David Lawson, who's a totally different person, he's open to ideas and I mean that quoll program was excellent, it really was a good thing to do and it was something that Queenslanders sat up and paid attention to because they never, ever did anything like that and it's a positive step and it was a, I mean Dave Lawson I think put his neck on the block a little bit by doing that because if it was, if it failed for one reason or another and there are a number of reasons why it might have failed, you could look a bit silly but in fact it's gone the other way, it's turned out to be a really useful exercise. That a government can do, in anticipation of, it involved the Aboriginal community quite heavily and they felt good that they're doing something to help. The island people are helping the mainland people by housing their quolls for 10 to 20 years till the scientists can work out a way to solve the toad problem. Well that's great stuff.

I think, if the public are aware of the fact that we're all in the same boat, then we are going to learn really fast on how to deal with this.

Madam CHAIR:

Frogwatch, you operate on volunteers, you rely on volunteers, one of the people who've given evidence to the committee already suggests that, don't discount any type of community reaction for example having teams of people go down and you know, gather up toads and things like that, is there any mechanism that Frog Watch has been considering in terms of, you know, be akin to your little Landcare groups, you know, is there any kind of community volunteer base or mechanism that you've got under consideration that we ought to be aware of?

Mr MORRIS:

Well the only one that we've been really looking at is this issue of whether or not it's feasible for people to toad bust their local areas to minimise the impact of the toads.

Madam CHAIR:

The toad busters?

Mr MORRIS:

Yeah, I mean we've been talking to people, proposing the idea that things like attacking the egg, point strings of egg that are easy to get out of the water. They're very identifiable.

Madam CHAIR:

Ok, so you can clearly see them and they're easy to scoop up?

-
- Mr SAWYER:** Yeah, and they're usually seen from what I understand stitch through to sort of stream type vegetation the billabong, the edges of the billabong, so you know if that's the case, people are able to pull out at that stage eggs out of the water, that has a massive impact on numbers of frogs rather than try and do anything at the other end of the scale.
- Madam CHAIR:** Because they lay what 10 000 twice a year?
- Mr SAWYER:** Up to 35 000 potentially, so huge numbers of eggs and they are in a very strong string of jelly like substance which is quite strong.
- Mr MORRIS:** You can wind the whole lot up on a stick and chuck it out of your fish pond or whatever.
- Madam CHAIR:** Wind it on a stick!
- Mr MORRIS:** Wind it up like fairy floss and throw it away.
- Mr SAWYER:** One of the things that really struck me when we went away to the first of these national frog conferences with the WWF Frogs! Program was all of the other states were really focused on this micro-management of tiny remaining pockets of habitat and trying to make remnant frog species survive and I mean it's huge, in New South Wales, Victoria, South Australia and even in Queensland now, and you know people talk about the frog friendly back yards and frog things for this and that and it was a bit weird to us because we've got frogs everywhere ...
- Madam CHAIR:** That's right, you can't talk on the phone at certain times of night.
- Mr SAWYER:** Exactly, you certainly can't watch TV but and we were talking to the people about the fact that we were still trying to identify what species we had and where they were, I mean Frog Watch itself in the last few years had identified a couple of new species for the NT, one of which was a new species full stop that arrived here and actually lives in Darwin, so it shows how poor our knowledge is of frogs and a lot of the stuff too at the museum and the stuff that's been done on research over the last years is wrong. I mean we had, Ian found that even though Dynasty species out at Keith River which solved the mystery of where that whole dilemma between the two different species, one was thought to have come up from South Australia, Tasmaniensus (?) and Depressasus (?) the one that was up here that was all uncovered due to them primarily, but when we went to the museum, they've got this big bottle full of lost (?) Depressus (?) and it is all labeled as Tasmaniensus (?) and so with the Upalay(?) and other species, the same thing, I mean our scientists really haven't been paying much attention to frogs at all, they've just been

sort of taking it for granted at a background level in the echo system. And their numbers are huge but talking to some of the people like Stan Orchard again, when some of the diseases hit in America, he said on the downwind side of the big lake systems, there were dead bullfrogs a metre and a half deep, that's how quickly it wiped out frog species and you know, it's only got to take something like that in the NT and I mean, apart from cane toads there's that big issue with Frog Watch of frog diseases like Chytrid (?) fungus and the river viruses and the other stuff that are wiping out populations on the east coast and all around the world, now we really don't know that much about that either but that in conjunction with the cane toads, really we take all our frogs for granted and lots of them, that's something we really need to think about and people really need to start thinking about that issue of you know frog friendly back yards and if you're a Landcarer in a billabong or a wetland area which most of them tend to be, then maybe there are things that we can do to minimise the impact of frogs around those wetlands.

Madam CHAIR: So Mathew Bonson's idea of a care group for Rapid Creek freshwater area there, you think actually a feasible local micro-approach?

Mr SAWYER: We've already done, not this year but last year we did Frog Watch night with the Rapid Creek Landcare group in that area there behind Richardson Park, that group there,

Mr WOOD: Ludmilla group.

Mr SAWYER: Yeah, Ludmilla Landcare group, and those sort of groups I think are part of that because you know if there's a wetland area like that where cane toads do come in, well it's going to be quite interesting to see how feasible that is to pull the toads out of there both by having someone maybe on a rostered basis doing a walk around there and pulling the eggs out and also just pick up any adults and just get rid of them. I mean Ian tells a story of a guy in Queensland who was a ranger in a park who was a fanatic and basically kept cane toads out of that park on his own. For how long?

Mr MORRIS: Ten or twelve years.

Mr SAWYER: I mean when he retired or moved on the new guys took over and weren't bothered and the cane toads invaded the place in no time flat. And that's one of the points that Stan Orchard's on about, he believes that if you've done the basic biological research and you know how cane toads move through different areas and you know whether you can set light traps or coil traps or some other device that cane toads can get into but can't get out of but other species can, or just something that's going to attract them to a given point, I think it may be possible to shut off things like mouths

of gorges and stuff like that where you keep the cane toads out. I mean we may be able to with, not a lot of work, you know, you take somewhere like Litchfield, with the habitats we've got in Litchfield and the escarpment country and a lot of those sort of things, it may well be possible to devise things and processes and support that with the labour that's required to you know minimise the likelihood of cane toads getting into some of those kinds of spots or if they do get into them to, stopping there build up in numbers to the point where they really are not going to knock the eco-system around.

Mr MORRIS: Places like Cairns have big frog groups, big proportion of the population loves their green frogs and they have cane toads and they've had them for 70 years and I've done some sort of preliminary interviewing of people around Cairns and they've developed strategies for keeping toads out of their backyards and encouraging the native frogs to breed in their backyards and there's quite a few things going there.

Madam CHAIR: What sort of strategies, what sort of strategies, we're interested.

Mr MORRIS: Oh well I mean, toads don't climb, so if you're going to put in a pond, make it a bit more than a foot high and then your green frogs can get in and breed and have a good lifestyle and the cane toads can't reach it, really just little things, you know, fences to

Mr SAWYER: Yeah, we've got to look at some of those things too on a broader scale with some of the other frog species. The Townsville Frog Group were doing a big project with schools and they were running into problems on that ground with cane toads getting into their school frog ponds and also mosquitoes, so they have done a bit of research on them and they came up with a fencing model that seems to stop cane toads in their tracks.

Madam CHAIR: What sort of model's that?

Mr SAWYER: Basically all it is, is just 45cm rolls of chicken mesh and just peg it at 30cm and let the top 15cm hang over, it seems to stop them.

Mr BONSON: This type of stuff that you are bringing to us now, you know, might be practical solutions we haven't heard so far ...

Mr SAWYER: Well nobody's gathered it really, that's the thing but it's there to be put together.

Madam CHAIR: That's what we're trying to do.

Mr BONSON: And one of the things that I find interesting, you know, the

idea is that, I should have probably asked earlier is that, you know this concept of: so there's these areas where these frogs have invaded in Cairns but there's still these green frogs still living in those areas. So, they're living side by side are they?

Mr MORRIS:

They are living side by side and there are some smaller native frogs that have gone down the gurgler it looks like in the suburban regions and again, they can't say directly if that's the fault of the toads but everybody knows that it is sort of thing and when the toads move in, these particular little fellas are in big trouble or disappear completely. But there are people now who rescued their tadpoles and put them into special ponds and raised them up and knocked toads on the head at the same time and, I mean they are having an effect in the suburbs ...

Mr BONSON:

Freezing, they should be freezing ...

Mr SAWYER:

The other thing with native frogs, like the Green Tree Frog in particular which is the one that most people refer to, I mean from my limited experience in Cairns, the numbers of Green Tree Frogs aren't anything like what they are in Darwin, so there's probably been a bit of an impact there but the other thing you've got to remember is most of those tree frog species spend a lot of their time up in the trees, off the ground where cane toads can't get them anyway, so it's really at that larval stage when they're competing in the water systems and when they're maybe first out on the ground that they're at real risk.

Madam CHAIR:

So they need protection yeah.

Mr SAWYER:

And that's where people breeding them in ponds, keeping the cane toads away and getting them through to the stage where they're a young adult and letting them go, may well have a beneficial impact and I mean, I don't really know how successful that's going to be in say the Litchfield Shire level where you've got a Landcare group that's you know got a wetland area they look after or whether or not they can actually minimise the impact of toads in those sort of places. But it can only be worth a try and I mean I certainly think that is part of that participation in that sort of process and stuff is a really valuable community education process.

Madam CHAIR:

That's right, so for example in the rural area people who've got you know a pond or what have you in their rural garden, the fencing idea because they've already built their pond and it's already ground level, so that that small mesh fence because it's harder for them to keep something out of a larger two hectare property, there in the suburban householder who might be able to completely fence off their property and you know obviously in and out of the gate, knock any toads on the head who try to jump in, that's an

idea.

Mr SAWYER: I think the other one too is breeding spaces in town are fairly limited, I mean we know what they're going to be and what they're going to be and to get people to go and you know pull toad eggs and stuff out of them, might be quite feasible and if you've got a, you know, people that live on a block have got a little pond down the back somewhere, you know, get up early in the morning and go for a walk and that's probably what they do now anyway to listen to the birds or just enjoy the atmosphere, so if they make that sort of a bit of a focus to go and have a look at cane toad eggs and if there's any there to just pull them out and just chuck them in the sun.

Madam CHAIR: a few media releases out of that one already!

Mr WOOD: I'm just doing the maths on how much it costs to build the fence. It wouldn't be that dear actually. Probably about under \$200. You can buy the mesh in 50 metre rolls about 300mm high, so it's feasible and they're the sort of things probably that we should be telling people, look you can do it for this much money

Mr MORRIS: Well we intend to, with out sort of media outlets we're hoping to publicise successful projects, if we've got a school group or individuals out in the rural area or whatever who are doing something that's working, and we want to get that out so everybody can see it and the ABC have been fantastic with us, they put us on radio anytime that there's anything interesting happening and it's been, Darwin's a great town for getting the story out, it really is, nice and easy, everybody's interested so

Madam CHAIR: What about the areas for example where they've already had the cane toads like Katherine, we've heard a fair amount of information about how things have changed down there.

Mr MORRIS: We have, it's been really hard to get a rep down there. We've tried to cultivate people. The rangers were keen but they were frightened of being sacked because of the certain regime they had in place a little while ago, so they didn't want to put their name to stuff but they'd ring up over that phone and say, look we've got 12 dead freshies in Katherine Gorge this morning and two of them had toads in their mouth and you know, we don't want this to get to the boss but you know it's definitely cane toads that's doing it sort of thing. Nowadays it's a little different, we don't, we really need somebody in Katherine who can generate, we keep in touch with ...

Mr SAWYER: They've got a Landcare group down there.

Mr MORRIS: They have got a Landcare group and the rangers down there get us down with the Junior Ranger Program from time to time and we've done quite a few Frog Watch exercises in Katherine now with the kids, we need somebody there, fulltime, just a community education person.

Mr SAWYER: I don't know where it got to either but that issue of having community co-ordination resources is one of the ones I think Parks and Wildlife through their community ed. or someone like that really needs to take on board, I mean, 12 months ago that probably wouldn't have been able to happen through Parks and Wildlife but it certainly could now, if people with the time and the resources to follow up on a lot of this stuff can achieve a lot more than we can, even with the web technology and stuff that's there, it still doesn't quite make it the same as that contact in helping people go through that. I mean, I just think at the Katherine level also, there's been a lot of anecdotal reports come out of the Katherine area there that would be worth following up on with some of the research stuff too. I mean the Lavender Beetles have killed the toads. I don't know whether that's been followed through and what the actual finding of that is and whether there's a

Mr WOOD: They kill them, my daughter put one in her mouth one time, and it nearly killed her.

Mr SAWYER: Yeah! At the lights at the weigh stations Katherinebut you know, I don't know if that's a chink in their armor at all but just, there's obviously some toxins and stuff in our natural environment that aren't cane toad friendly either. There's been reports this year that cane toad numbers in Katherine are really low for some reason.

Mr BONSON: One of the ideas that came out was that in Western Australia, to do with the fox issue, they've had, they've developed bait and we've heard evidence about Tasmania etc. and you're talking about this Lavender Beetle, you know is there the possibility of a way that we can breed them and get them in large numbers and put them in an areas where frogs might eat them and you know, which is a natural thing. So what do you think about that?

Mr SAWYER: I don't know whether our native frog species eat them are they immune or what. Some of the toxins up here pandanus, not pandanus, the little zanier plant, cycads, a friend of mine was doing research on cycads at NTU and she was collecting the nuts and she was finding these little piles of nuts out in the bush where some of the native rats had been eating them and when she brought them home in her garden the black rat, introduced ones couldn't get from here to the coffee pot from the pile that were dead, it's that toxic and yet native rats eat them, so it may be the same

-
- sort of situation with frogs.
- Madam CHAIR:** The cycad nuts?
- Mr SAWYER:** Poisonous, hugely poisonous.
- Mr BALDWIN:** Poisonous.
- Madam CHAIR:** Really?
- Mr WOOD:** I knew they were poisonous but I didn't know they were going to kill rats though. Commercial in-confidence again.
- Mr SAWYER:** Yeah, just sprinkle them around and you get rid of your rats and the native rats will be fine. You know, that's one of the problems, there's no research there on cane toads to know whether those sorts of things are there. I mean Stan Orchard again, his issue with that is, even if you can develop up a lure that attracts cane toads, whether it's a call for the Grabat (?) females or something like that, if you can get them to come to something, then you've got an opportunity to apply something to them that's going to sterilize them or it's going to do something, some biological control agents but even when they develop the biological control agent, how are they going to apply it, if they can't find some sort of virus to carry it.
- Madam CHAIR:** We're hearing ten years for that.
- Mr SAWYER:** Exactly, yeah, it's a long time coming but you know, what are the minimisation impacts you can have on them? The point here about Katherine is it's because people hit them on the head with golf clubs and if it is
- Mr BALDWIN:** I think though Graham in Katherine it's partly the way it's moved through, you know, we're in our third year of bigger numbers now and I think the wave is, you know, they're experiencing it from Pine Creek north in the bigger numbers now whereas we're getting back to the sort of the second wave, the sustainable sort of numbers now.
- Mr SAWYER:** People are saying in Mataranka they are still everywhere.
- Mr BALDWIN:** See what tends to happen, in the wet you don't see them because they just disperse everywhere and as soon as the rain stops and it's happened, I was just saying before to some others that, three weeks ago you would see one a night for the wet. Now, 15, 20 a night at my place.
- Mr SAWYER:** So that's probably the time to start collecting them and getting rid of them. If they're coming in on the lights and the wet spots this time of year,
- Mr BALDWIN:** Well if you start sprinkling your lawn, they love the open
-

spaces and the wet lawn and there they are and you've got the lights on at night and the bugs are out and the frogs are out, everybody's out and you find them, so you get out there with the old ...

Madam CHAIR: With the freezer bag!

Mr BALDWIN: Oh freezer bag, that's right. Katherine.

Mr SAWYER: That was essentially Stan Orchard's argument, he was saying if you were to put a solar powered light system out in the bush, you know cane toads are attracted to light to get the insects and if you've got some sort of chemical there that you can apply to whatever comes into that light, that's going to knock cane toads or sterilize cane toads not affect native frogs, he said, you might have a mechanism you can use to protect certain areas of the environment but he said nobody's got the research work. He actually, and I haven't heard how it went, they were talking to Rio Tinto again this year and they were going to put a proposal for funding for cane toad stuff in with that proposal from WWF, so I don't know where that's got to yet.

Mr BONSON: That's the World Wildlife Fund is that right?

Mr SAWYER: Yeah.

Mr BONSON: Sorry just the acronym, I just, is there access to funds there, you know, are they interested in this?

Mr SAWYER: Well there was, Rio Tinto funded the WWF Frogs Program, I think it was \$1.4m over three years. That three year period is up September I think, this year, they've done quite a bit of work but they were going back to Rio Tinto for additional funding but I don't know where that's got.

Mr BONSON: Because I suppose we could say to them, look we've got all these fabulous you know natural environment with all these fantastic frogs still to be uncovered and we're in danger of getting attacked.

Mr SAWYER: Well I mean this is the place we are doing the research, that's my point too, I mean, especially when you want to look at the impact on the you know the fresh water ecology and stuff like that, ours is still pretty much intact. Not like other places but we haven't got a lot of time to muck around.

Mr WOOD: You'd wonder if there are some simple answers, I mean solar lights are now available at quite a cheap price, you can buy them for your garden with a little solar panel, we've got a Lavender Bug which obviously kills them, surely it wouldn't take a lot to research what toxin is in the Lavender Bug, that's not a

-
- Mr SAWYER:** Well a certain ranger who shall remain nameless from Kakadu National Park, very tall chap with a beard, suggested that we get the pheromone that the male, no, the female. Mix it with the white paint that they use to paint the centre line on the highways that was his solution, anyway ...
- Mr MORRIS:** I raised the ire of the environmental officer at AdRail one day because I suggested that somebody at the NT News used the day after Christmas, or something asked me how the toads are going to come to Darwin and I said, well they use natural corridors or man made corridors, natural corridors being river systems and man made corridors, anyway AdRail got very upset with you know somebody saying that their corridor would be a toad highway. And I said well, look, how about we go and have a look, you can probably get something good out of this and the chap, he was a nice fellow actually, took me down there and started telling me about the problems they do have with toads and he said well we've got this big pole thin dams and we fill them up with water and then we draw all the water out to wet down the, and he said and the toads keep sliding down the pole see and get stuck and the next day there's 200 toads there and the sun comes out and they all cook and the water goes rotten and nobody wants to pump the water. I said well, there you go, I mean you've just invented a ...
- Mr WOOD:** Cane toad trap.
- Mr MORRIS:** ...situation and then he said if we put the big lights up at night to work, it brings the toads in and then we get 400 dead toads in the morning instead of 200. And I said, well, there's something you can promote to the public, you can say AdRail has actually developed, at a certain angle, this pole thing will be too slippery for toads so you can make a little miniature one in your backyard, put a light over it and collect all the toads in the morning.
- Mr BONSON:** So what we're talking about maybe is traps, like the possibility of developing a trap using a simple light, maybe a ditch
- Mr MORRIS:** Maybe just getting your angles right so that cane toads can't climb out and the native species can.
- Mr SAWYER:** The hole only needs to be a metre square under a garden light and something with some water in it
- Mr BONSON:** And the capability of maybe leaving it for three weeks where it can get a thousand cane toads
- Mr WOOD:** Except you'll probably have a few dead wallabies, you've got to watch it's not too deep.
-

-
- Mr MORRIS:** It doesn't have to be more than 10 centremetres, it's just a way of collecting toads.
- Mr BONSON:** Because you know business has been very interested in talking to you guys because we're coming up with possible, practical solutions of how we can develop things and all the other evidence before is well we need to go away and do the research and do this and it hasn't been done in the past and there's you know it's going to be diabolical blah, blah, blah but you know at the end of the day everyone wants to get on and get on with the job.
- Mr MORRIS:** Well I think you're right, there's lots of solutions. As I said, I had a preliminary run around Cairns recently and I was very encouraged. I didn't have much time but I'm thinking of asking the ABC if they'll do a link-up and I'll try and get myself over there again for about a week and run round and meet all these people who are doing interesting things in Cairns, there's loads of them, who are saving their native frogs, they've been doing it for many, many years and just broadcasting live on the ABC from Cairns and interview these people and find out what they do, because they've got the experience that we need to have over here and just look at all the positive ways people are counteracting toads in a place like Cairns. So, I'm hoping later on in the dry season if I can
- Mr BALDWIN:** Kakadu by night.
- Mr MORRIS:** Kakadu by night, yeah well this is the problem. As soon as you get outside the built up area and into the open bush areas, the problem becomes a bit different.
- Madam CHAIR:** Therefore you need a range of reactions to the problem I guess.
- Mr MORRIS:** Yeah, you do, the rural scene's a lot trickier.
- Mr BONSON:** The other one I suppose I wanted to ask was a frog sanctuary. You know, we're talking about the quolls, what about the frogs? Anyone's come up with an idea of putting them in you know Noah's Ark type situation?
- Mr SAWYER:** Yeah. There's been a lot of discussion on that. The quolls were easy in that sense. Because we'd already run the fauna surveys out there in '91 with John Woinarski's crowd and we knew what was there and there were quolls on some of the islands, I suppose the guys gave you the background to that and so that was an easy one really. Just get a whole, a couple of plane loads of quolls and release them and then everything's happy and that worked well. Other species like Mertons's Water Monitor which are just as vulnerable to toads as the quolls are, you can't, those environmental circumstances aren't anywhere else except
-

on the mainland so you know that's a much more difficult solution. And there are many animals like that. Many animals we just don't know. The ghost bat was a very common large carnivorous bat in Queensland and then when the toads went through Queensland they disappeared. Now nobody in Queensland again can tell me whether that's attributable to the toads or other things, they just don't know, but the strange coincidence is that when the toads invaded an area the ghost bats disappeared.

Mr BALDWIN: We also know that ghost bats eat frogs while the cane toads sit out in the open and look pretty obvious targets so you get suspicious about it.

Mr MORRIS: Well the Territory now has the only decent ghost bat populations left and they eat frogs, they are frog eaters and they catch them, they swoop down, they are a big bat, their wing span is about that wide, and pick up not just frogs, they eat grass hoppers and sleeping birds and they'll find all sorts of things, they are carnivorous but a lot of their diet is frogs and they pick them up by the head, crunch them while they are flying along and then go and land somewhere, feeding table where they land every night, eat their tucker and then go back to the colony in a cave somewhere and I'm trying to get Parks Australia who have big colonies in Kakadu to fund a little bit of simple research to find out what we've got first and then measure those colonies just to see if there is a reduction in their numbers as the toads move in.

Mr BALDWIN: Have you had any talk about them in the caves south of Katherine, Mataranka sorry?

Mr MORRIS: Pine Creek, that old mine at Pine Creek, that's a famous one.

Madam CHAIR: Pine Creek as well? I was just about to ask you apart from Kakadu, where's another colony?

Mr MORRIS: There's ghost bats all over really.

Mr SAWYER: I've talked Cutter (?) I'll ask, I know the bloke for the last umpteen years and I'll ask him what the go is.

Mr MORRIS (?): Yeah, because they could easily keep an eye on things.

Mr BALDWIN: Well he's been there for a bloody long time as the franchisee so ...

Mr MORRIS: Ghost bats move around, they spend some months here and then they spend some months there and they have an annual circuit.

Mr BALDWIN: Yeah but they've disappeared in the last few years.

-
- Mr MORRIS:** Have they?
- Mr BALDWIN:** Well no, if they have.
- Mr MORRIS (?):** It will be interesting to know if they've got enough data there to measure anything like that as well.
- Madam CHAIR:** What's been the response so far from Parks Australia to your request Ian?
- Mr MORRIS:** Oh, they've been good. When we were thinking of developing this web site for the public to interact, we went to Parks and Wildlife here first and that was Bill Freeland in those days and I actually asked him for \$5 000 to develop a \$10 000 web site for him and I said when we finish it's yours and we'll put all the information in, images, sounds, everything goes in free, that's ten years worth of work, you people should have it but we'll build it, Graham had a young technological genius who had just left school who was prepared to do it so the \$5 000 was basically to cover his wages to put this thing together, well Bill wasn't very interested because it was outside his domain, even though we wanted to give it to him. Went to Parks Australia and they said, no worries, we'll fund that. RSS (?) people said yeah we'll fund it, the university here was really keen, they wanted to do something, everybody could see a need there but – anyway, so we didn't have too much trouble getting the funding to do that and of course now, things have changed right around in and Parks and Wildlife and it's really fantastic and they're looking for solutions the same as us and very open to things so in that sense it's become a whole lot better since the change in government.
- Mr BALDWIN:** Actually it's change in departmental head
- Mr SAWYER:** Whatever happened it was good.
- Mr BALDWIN:** So in terms of information in the near future, how do you guys see the best way of it happening. I mean dollars is one thing but there's all of these disparate groups that are doing bits and pieces including yourselves who are doing a good job with nothing,
- Mr SAWYER:** I would really love to get that process investigated through to say community ed. or one of those groups in Parks and Wildlife and just see how far it can be extended in terms of that whole issue of public education, public awareness. I mean it's a sort of a loose collaboration of environmental groups that hang around the Frog Watch and Water Watch and all these people are all sort of interact with each other but there's nothing sort of formal. Environmental education
- Madam CHAIR:** No one co-ordinating it?
-

Mr SAWYER: Well the Environmental Education Association sort of plays a loose role at that level in terms of co-ordinating those sort of things but it's very much an ad hoc type process and I'm sure, I mean I've seen the Alcoa (?) Frog Watch Program in WA which we have a bit to do with, they don't do anything in the top half of WA, they're all based around Perth and they've got full time staff based at the museum in Perth that are funded by Alcoa (?) and that's been able to give them amazing ability to work with people on a range of issues and I think it would be interesting to look at whether community ed. inside government's got the resources and the wherewithal to help co-ordinate some of those sort of things or whether it's better off being done by seeding you know, those existing community groups and leaving government as what government does now. I mean there's some issues there that need to be looked at. I mean one of the things that I'd like to mention to you guys and I'll send you a proper written submission about later is that the Environmental Education Association's going into a push at the moment to try and get a sustainability education centre built and we see this as part of the same sort of community education process and sustainability education being a really big issue. I've spoken to people from primary industries and a number of other government departments, the Minerals Council and they've all got similar problems, they've got information and resources and you know stories to tell but they've got no conduit to put it into the education, the public arena and we've done a lot of work in the last few years around web technologies and stuff to facilitate that sort of active participation rather than that sort of static brochure type pushing of information at people as having some really interesting effects and we're doing one at the moment through work on bush fires for Greening Australia and CSIRO (?) and CRC, so I'm interested in pursuing those sort of technologies to you know just lift the whole level of public awareness and everyone's said to me that I've spoken to have the same problem that I've had. You want to find out information about cane toads and you just run into brick walls. There isn't any and yet you hear all this doom and gloom and all the stuff coming at you but you can't get your head around what you can do. So I think there's a whole issue there about how we can get that information out to people that needs to be explored.

Mr BONSON: Specifically on cane toads that you're talking about?

Mr SAWYER: Yeah.

Mr MORRIS: And the public feels a little bit responsible for cane toads, it's, nobody blames the government which is you know a pretty common sort of a thing, if there's a problem

Mr BONSON: Blame the government.

Mr MORRIS: Yeah. And we've noticed that people want to do something. Everybody wants to do something, schools want to do something positive towards toads and it's coming at us from all directions. It's really good you know that people like their frogs, their native frogs and they feel you know this is no good.

Madam CHAIR: And their goannas and their frilled neck lizards and yeah, yeah.

Mr WOOD: I think there should be a bounty on sugar. Get them to help pay for it, I mean that's where it all came from.

Mr MORRIS: Well, yeah, that's right. In fact the old chap who imported them, was alive up until a few years ago, I don't know whether he's since died or not but he stood by his, I kid you not, 'I think ultimately it was a good thing we did', you know.

Mr WOOD: Is there any beetles left?

Mr MORRIS: Yeah, heaps of beetles, didn't make an impact on them.

Mr BALDWIN: So Graham, just getting back to that information stuff, I mean, information is one of the terms of reference of this committee and we have to make some fairly practical immediate I would think recommendations, immediate in terms of you know in the next couple of years of the frogs getting here and impacting in a big way up in the north of the Top End and you need to facilitate that information in a practical way and Parks guys who were with us before you, said they can do so much, you know their pamphlets and that sort of things but they haven't got the expertise either in the media realm to co-ordinate it and do all that so, we're going to have to grapple with the recommendation at the end of the day of what's the best way of doing it. So, your view is ...

Mr SAWYER: I personally have no doubt, I mean I've been involved with education and with my professional background I mean we've been pushing this wildlife stuff for ten years and one of the things that's really struck me that's come out of this sort of work we've done on the Frog Watch web site, I mean we had another Frog Watch web site prior to the current one, built on older web technologies and the dynamics around the information flows were totally different to what they are with this new one and the thing from my point of view is there is this sort of two way aspect to communication which seems to get left out of a lot of the communication governments and other people have, you know, they produce pamphlets which is sort of a one way communication flow, here's your information but there's no sort of genuine dialogue and no sense of engagement and involvement with the process and I think that's one of the

things that we're seeing with these new technologies now, where you can have a feel of a two way communication flow and people posting questions to the web site and having answers within a couple of days and I mean because of the web technology, whenever someone goes in and puts a question on the web site, I get an email on my desk and so does Ian and so does a couple of other people and the point is we get an answer back onto the site, now having community ed. involved in that process I think would help as long as they're you know prepared to be open and honest about the answer to the question and not try and poke a government line down people's throats but there is a model there I'm sure which is worth exploring because just with the Frog Watch site itself, we've got over 200 registered users on that site now without doing anything other than just putting it up there and word of mouth and other things, getting people aware. I don't know what the, I haven't had a look at it recently but the numbers of people that have come to the site are quite staggering, given what it is and where it's been put and how it works and I think there's a real issue there in terms of understanding community want or community thirst for information and giving them that information in a format that's you know useful to them and also makes them feel like they're a part of the project. I mean ...

Mr BALDWIN:

Have you got any scientific data coming on there yet or I mean ...

Mr SAWYER:

Yeah, we're trying to load up all that. I mean one of our briefs for this and Ian and I have been working on this not just with frogs but with wildlife in general: is to try and bridge that gap we see and it's quite stark often between the scientists and the general public, try and get information in that format where schools and Landcare groups and other people can actually interpret it and use it. I mean that's the challenge we've just been given with this fire web site, is to try and take all the research work of and others have done about fire and put it in a format where they can actually use it as an education process within schools and you know I think there's a lot of resources there now which we can use to do that which you can't use with brochures and stuff like that and when you look at how pervasive web technologies are becoming, I mean, most of the stations and stuff I'm visiting now have reasonable web connections, you know, satellite dishes to get into it and they're all checking the weather and the storms and all sorts of other stuff online, all the schools are online, when the ladder (?) system's working. And all the general community response through that avenue's very good but the other one that I found that really strong on is supporting groups. I mean if you've got a Landcare group or some other one like that, that's wanting to do stuff, they can get at the resources and use it to support their activities and I mean we

Madam CHAIR: That Landcare group X is having a such and such day out on X day.

Mr SAWYER: Yeah and they can download things like identification kits and other bits and pieces off the web when they want them and they can point people to them. We were invited over to Kunanurra last year to do a Frog Watch night over there and that was sort of all on the back of that type of stuff and we've done it in at Keep (?) River which was actually a ranger training exercise, an awareness issue we had to look at too and I mean a lot of our rangers wouldn't know one frog from another. So, there's a whole set of issues there that flow down the spectrum, from the scientists at the top through to the sort of quasi professionals in the field through to the interested amateurs through to the school and everybody.

Madam CHAIR: One of the considerations for this committee obviously in terms of our recommendations to parliament is, how can this be driven forward from here, certainly one of the issues we've discussed is a small but talented and tasked task force to pull together and push the focus on cane toads harm minimisation through to bio-destruction I guess. What would your views be on that and certainly a few other people have said that any task force of that nature would have to include a strong connection with Caring For Country for example. Have you got any views on something like that?

Mr MORRIS: It could only be good, yeah. I mean I guess it would be an opportunity to have Aboriginal representation from places like Arnhem Land where they're normally left out of everything and yet they've got heaps and heaps of knowledge. I mean our programs, we work on are enhanced hugely by connections with bush communities, Aboriginal outstations and things like that which is where all the good stuff comes from basically, so yeah, to have a committee that had representation from that side of life would be excellent and yeah, I mean really that would be a more up market version of what we do. I think it would be a great thing, I mean we, I was looking at the brief and I mean it's hard for us to kind of recommend to you what sort of impact toads are going to have on rural Northern Territory, I mean it's, they're going to have a greater or lesser impact on every other life form just by being there, whether they're poison or not is another issue but just being there is going to change the dynamics of our natural systems. Just being able to kind of assess ahead of time what that's going to actually mean for farmers or mean for any member of the community it's very difficult you know.

Mr WOOD: I think the lifestyle.

Mr BALDWIN: I think the point at the end of the day though is that with all

the bits and pieces of work that has either been done, which is not a great deal, and will be done in the future and all of the anecdotal evidence, people need the information, don't they?

Mr MORRIS: Yeah.

Mr BALDWIN: Because as you say, and everyone else has said it, to go and actually put your hands on everything that you can about the cane toads, we're slowly gathering it, we've probably got a better collection than you've got, I mean a month or two I guess with the papers but the access to that information is going to be, so when things develop and a farmer has a problem or when AdRail finds they've built a trap that they didn't know about, you've got to be able to share it, so others can actually build on it and do things with it.

Mr SAWYER: Exactly! I think that's really important.

Mr BALDWIN: Yeah, that's the sort of crux of it, while we're waiting for biological controls and minimisation, we're doing minimisation stuff and all the rest of it.

Mr SAWYER: One of the big things that I really worry about is the impact on just the Territory lifestyle. People, that attitudinal thing. I mean just the very thought of going camping next weekend over Easter and sort of sitting round the campfire at night along the river and relaxing and enjoying it and next you're doing it with bloody cane toads is not a nice thought and I think one of the issues is that information will help alleviate that impact on people because you know Territorians in general seem to have this much greater affinity with the outdoor environment and the bush and the wildlife than you see in a lot of places and I really think that that's you know a big issue and I think it's also a big opportunity to just raise the level of environmental awareness up another couple of notches which is one of my pet issues. And I think that's an opportunity that we really should be looking at on the back of this disaster and see what we can get out of it.

Mr SAWYER: One of the other issues I guess to is the cane toads colonize the islands off the mouth of the MacArthur (?) River, across the sea. Their fairly closethere's a dead one we heard about washed up on the beach at Milingimbi just recently as well, it came across probably out of the mouth of the Goyder (?).

Mr BALDWIN: That toad was lucky he was dead that it wasn't up on the beach there.

Mr SAWYER: But, I mean they are fairly salt tolerant but just how far they can travel in salt water and that, nobody really knows.

-
- Mr BALDWIN:** Fraser Island was colonized from the River at Maryborough Mary I think it is.
- Mr BALDWIN:** Mary, yeah.
- Mr SAWYER:** And yeah, that was just a natural, they rafted out there and swarmed all over the they're still all over Fraser. So I mean it's going to happen to the nearby islands, the English companies is rather fortunate because it's well away from anywhere there, where Mr Hilbour lives?
- Mr BONSON:** When you say well away, how many kilometres?
- Madam CHAIR:** Oh about an hour by boat.
- Mr SAWYER:** The nearest river to him is the Peter John (?) which is
- Mr BONSON:** But how far off the coast?
- Madam CHAIR:** An hour's boat.
- Mr BONSON:** So what 30 kilometres, 40 kilometres?
- Mr MORRIS:** What before an island's safe from toads?
- Mr BONSON:** Yeah.
- Mr MORRIS:** From rafting.
- Mr BONSON:** See I'm thinking of Tiwi Islands, Melville you know islands.
- Mr MORRIS:** No, I think the Tiwi Islands will be fine. I don't think they'll get there by natural means, I think they'd have to be mechanical means like a barge or something.
- Madam CHAIR:** That's one of the matters we've discussed is how you bolster quarantine measures on the Tiwi Island for example.
- Mr SAWYER:** One of the things that we talked about with several of the groups on Elcho and this week actually we were contacted by someone from the Tiwi Islands who, I left a message at Elcho Island about this issue, we were suggesting that maybe with the barge landing areas they could put a toad proof fence around it and maybe loop it back and because those areas are fairly heavily lit, I would imagine any cane toads that land in those sort of areas on the barges, I mean obviously they need to do inspections of barges and try and stop them getting on there in the first place but I would think also at the other end if they did get there, being vigilant, keeping an eye on the place would show them up fairly quickly because knowing cane toad behavior as we do, which isn't very detailed but what we do know of them, they tend to like open areas with light, so if they do land in a barge landing area, they are going to come out under that
-

- lights at night feeding I'd reckon, they'd be very obvious especially to Aboriginal people, so ...
- Mr WOOD:** The one place they can get on the barges this side because they're all lit up Perkins and ...
- Mr MORRIS:** They're dealing with containers these days and that's a problem because you know if the toads are already in there well the staff at Perkins or Barge express what's that new company called? Whatever, they won't even see them. They'll just transport them but at the other end where we're suggesting if the community has the unloading area with a half a metre wall around their unloading area and just check their gear there, I think they'll probably get most toads that way. And the kids I mean the kids in those communities are so sharp on stuff, that I'm sure they'll, if they're aware that you've got to locate these things and you know make sure you check an area after barge unloading or during barge unloading, that they'll ...
- Mr WOOD:** Pity the toad when seen by the kids.
- Madam CHAIR:** I don't think there'll be any freezers handy.
- Mr MORRIS:** Yeah well, lesser of two evils I guess.
- Madam CHAIR:** Yes. Are there any other questions? All right. Ian, Tim?
- Mr BALDWIN:** Just going back to that media stuff again and your web site is worthy of some more thought but there's got to be more general media awareness too and you guys do it as you say on ABC but ...
- Madam CHAIR:** Sunday Territorian.
- Mr BALDWIN:** Yeah, all of that but ...
- Mr MORRIS:** We go through a number of places, the Kimberley radio mob, the other radio mob...down the east coast. The 'FM', there has got to be a strategy for that.
- Mr BALDWIN:** But one of the things we talked about already to those making the Darwin community aware fairly quickly about these things coming, and the impact it's going to have on their pets and their homes and all of that sort of thing, so there's got to be more immediate media in terms of TV and newspaper and all of that. That's going to be another issue that we are going to have to discuss and who runs that, I mean is that a government role again or ...
- Mr MORRIS:** The BBC have just saved you a huge expense, they have just produced, have you seen it?
- Mr BALDWIN:** No.

-
- Mr MORRIS:** It's marvelous. It's an Attenborough narrated program which finishes in Darwin, starts in Venezuela and it tracks the story of the toads right round the Kakadu and Darwin.
- Mr BALDWIN:** Great stuff.
- Mr MORRIS:** And it's, I've got an advanced copy to see if there's any errors in it and it is fantastic and it'll be on air sometime on ABC television this year, I guess they could probably tell you if you rang them up but I mean it's going to be more use to us in Darwin I think than anywhere else in the world.
- Mr SAWYER:** If that timing's right, that might be a good catalyst to launch this off.
- Mr MORRIS:** Yeah.
- Mr BALDWIN:** Madam Chair, we need to follow that because it could be the catalyst for a much more intensive media
- Madam CHAIR:** I've just written it down.
- Mr MORRIS:** It's called *Citizen Cane Toad*.
- Mr BALDWIN:** Very good, very good. But it's obviously needed ...
- Madam CHAIR:** Have you got a contact person Ian through the BBC ...
- Mr BALDWIN:** No, ABC, it's sold to the ABC isn't it?
- Mr MORRIS:** It's done through the ABC, yeah, Emma Rigney is the producer, she's an Aussie who's been working in Bristol. Dioni Gilmore at Natural History Unit in Melbourne, she'll tell you all about it's screening whatever in Australia.
- Madam CHAIR:** Yeah, we'll chase that one up.
- Mr WOOD:** Have an opening night in Darwin.
- Mr MORRIS:** Should, I mean it really does, it's almost our film this one, it's a beauty.
- Madam CHAIR:** You're starring in it aren't you Ian?
- Mr MORRIS:** No, I kept behind the cameras.
- Madam CHAIR:** Who's starring in it, from the Territory?
- Mr MORRIS:** The star is the cane toads actually, it's filmed at ground level, I don't know whether many years ago, you saw a film called *The Cane Toads Are Coming* which was made in Queensland by a fellow called Jim Fraser, a very clever man and it's a comedy, it's a fantastic biological
-

documentary but it's done from a cane toad's perspective travelling to Australia in a crate and then looking out through the back and they follow the toads all through, it is very funny and it was a masterpiece really and the BBC really tried to replicate that with modern technology and they've done an excellent job, theirs is a half hour one but really you ought to see *The Cane Toads Are Coming*, I have an old pirated copy from 1984 or something if anybody ...

Madam CHAIR: Oh, well we don't break the law. We do have Hansard records.

Mr MORRIS: If in fact it should have been played a lot more than it was because it is very relevant to today *The Cane Toads Are Coming*.

Madam CHAIR: I saw it in Melbourne years ago, it's hilarious.

Mr MORRIS: Very funny, they had the German tourists running over them in a Kombi van and things like that.

Mr BALDWIN: So the BBC one, does it go into the possible effects it's going to have on the urban environment and all that sort of thing.

Mr SAWYER: Yes, oh, to some degree.

Mr MORRIS: It talks about it, it brings it up, that's why I say it could be a really good lead. We actually filmed the young barramundi, grabbing cane toad tadpoles and then spitting them out straight away and looking at all sorts of effects there ...

Madam CHAIR: What about the crocodiles, goannas, frogs, much filming?

Mr SAWYER: Well it makes reference to those things but they came and researched it really thoroughly and it was at a time when Mr Freeland was running Parks and Wildlife, so they then moved around and visited all the people who were somewhat suppressed and had no means of divulging their observations and information and so they spat it all out to the BBC. I just sent them around to this one and that one and they got a brilliant, in fact they got so much information that they couldn't fit it all in, they had an amazing scene of an Aboriginal family way out in Arnhem Land in the bush discovering it's first toad, you know and discussing it and that was excellent, they couldn't fit it in, in the half hour program so that was unfortunate.

Madam CHAIR: We might ask for the off cuts too.

Mr MORRIS: Yeah, that'd be the other thing is ask them to do a re-cut of it if for the Territory.

Madam CHAIR: Any other questions? Ok Ian and Graham, thank you very,

very much for your highly informative and honest discussion today here with our committee and I want to thank you on behalf of the committee for your attendance here today. I want to thank you for the work that you are doing at Frog Watch NT, for Territorians and I hope that the body of work that this enquiry is able to put to parliament will assist you in your endeavors and will assist all Territorians to battle the cane toad.

Mr MORRIS: Thank you.

Madam CHAIR: And any additional thoughts you have on structures of task force, who should be on it, costings that you think we should be factoring in terms of promotional information, suggested time lines, that sort of thing, we're moving through the Territory in May for public hearings so you still certainly have that time line of May to get information to us for our consideration. Anything that as a result of discussions today: you've gone away, you think about and you think, look they really need to be told X, feel free.

Mr SAWYER: It would be worth seeing if we can try and get hold of Stan Orchard somehow, I might see if I can get hold of his submission that he put to Rio Tinto if it wasn't successful.

Madam CHAIR: That would be great.

Mr SAWYER: I don't know whether he's, he was talking about trying to fit a fly in visit up here before he goes back to Canada, he would be really worth talking to if you can, because he's one of the few sort of scientific people that I've spoken to that thinks there's got to be a chink in the armor there somewhere that we can use.

Madam CHAIR: We've got a public hearing on 12th May.

It could be any of those 12th, 13th or the 19th of May. That's Darwin, Palmerston, Litchfield.

Madam CHAIR: If you could send those dates and places to Frog Watch NT, so you can contact Stan.

Mr BALDWIN: When's he going back?

Mr MORRIS: I'm not 100% sure, I had a quick conversation with him week before last and he sort of indicated that his time had run out and his visa had run out and he wasn't sure, I think he said he was due to go back to Canada, was it early June or something?

Mr BALDWIN: I was just interested in the fact also that he was, what he was probably going back to was an eradication program.

Mr MORRIS: Yeah, we heard that.

- Madam CHAIR:** All right, you'll get the dates of our movement. As a parliamentary committee, we obviously rely on being able to gather in our numbers to have a quorum and which we've done today, so we're somewhat restricted in our ability to meet by members commitments with sittings and their electorates etc.
- Mr MORRIS:** Would it be possible like on those meeting days to do a 15 minute phone link up with him from Sydney or something?
- Mr SAWYER:** Absolutely.
- Madam CHAIR:** Yes. That's exactly right.
- Mr BALDWIN:** I mean how's his budget, I mean if he really wanted to come up here?
- Madam CHAIR:** Not that healthy, we got the tail across (?)
- Mr MORRIS:** Mike Tyler. Is the other one.
- Madam CHAIR:** Mike's coming up here, he's coming to Darwin, yeah.

TRANSCRIPT NO. 5

Environment Australia and CSIRO

Monday, 19 May 2003

PRESENT:

Committee: Ms Delia Lawrie, MLA (Chair)
Mr Tim Baldwin, MLA
Mr Matthew Bonson, MLA
Mr Stephen Dunham, MLA
Mr Elliot McAdam, MLA
Mr Gerry Wood, MLA

Secretariat: Mr Rick Gray
Ms Maria Viegas

Presented by: Dr Rhondda Dickson
Mr Damian McRae
Mr Robert Moore
Dr Tony Robinson
Ms Sue Rymer

Note: *This transcript is a verbatim, edited and verified proof of the proceedings.*

Madam CHAIR: I will just introduce the Darwin end and then you can introduce yourselves and we'll get started. I am Delia Lawrie. I am the member for Karama and Chair of the environment committee inquiry into the incursion of cane toads into the Northern Territory. With me is Mr Matthew Bonson, member for Millner and Mr Gerry Wood, member for Nelson. We may have two further members of the committee join us in person, and on the end of the telephone, based in Tennant Creek, is the member for Barkly, Mr Elliot McAdam. Elliot, are you with us?

Mr McADAM: Yes I am.

Madam CHAIR: Thank you. Also with us is the secretary of our committee, Mr Rick Gray, and his very able assistant Maria, who is doing all the audio and typing for us. Could we just have you go around the table there and introduce yourselves?

Dr ROBINSON: I'll start off. Tony Robinson from CSIRO.

Dr DICKSON: Rhondda Dickson, Environment Australia.

Mr MOORE: Robert Moore, Environment Australia.

Ms RYMER: Sue Rymer, Environment Australia.

Mr McRAE: Damian McRae, Environment Australia.

Madam CHAIR: Lovely. For the purposes of Hansard recording, what I would ask for each of you is when you speak at this inquiry, even though it might seem repetitive, you repeat your name each time you speak so that we can accurately record what was said. The inquiry has parliamentary privilege, as is accorded to parliamentary inquiries, so you can feel free to have a fair and frank discussion under the protection of parliamentary privilege. We have already travelled throughout parts of the Territory. We have been to Borroloola, Jabiru, Katherine, Darwin, Palmerston, we were out to the rural areas of Bees Creek this evening. We have received how many submissions to date, Rick?

Mr GRAY: Close to 14, 12 was it?

Madam CHAIR: 12 submissions to date. We have the ERISS assessments of the impact on Kakadu as well as other relevant documentation from throughout Australia. I might kick off, Dr Robinson, with you if I may, with your submission from CSIRO, and what you have to say.

Dr ROBINSON: Yes OK, Delia, I am a program leader in the division of Sustainable Ecosystems, CSIRO's Sustainable Ecosystems. In my program we have running a project funded by Environment Australia on the search for a biological control agent for the cane toad. Currently, we have been working on that project for just over two years, two years and three or four months. We have recently received a second grant from Environment Australia and another year's worth of funding to continue that work. I don't know, at this stage, do you want me to actually go into the details of that work.

Madam CHAIR: Yes, Dr Robinson, I will just pause for a moment and introduce other members of the committee who have joined us. We have Mr Tim Baldwin, the member for Daly, and Mr Stephen Dunham, the member for Drysdale. Now, Dr Robinson has only just started his presentation. He has informed us that he is the CSIRO program leader in the CSIRO's sustainable ecosystems section, who have received Environment Australia funding for a project which is a search for a biological control agent for the cane toad. That project has been running for some two years and three months? Yes, Dr Robinson if you could go into the actual project itself that would be useful.

Dr ROBINSON: Yes, to start, historically there has been some work done in the United States to show that you could interfere with metamorphosis in bullfrogs by exposing them by injection, with the tadpoles anyway, to certain adult protein, and the adult protein they chose was haemoglobin, and this was work done back in the 60s. When we were working on the toads on previous funding a few years ago, we found this bit

of information and we thought that we could explore the possibility of using that finding to interfere with cane toad metamorphosis. And that's the project that we have been funded for two years and we have got a further year of funding. As you can imagine, it is starting off at a very early stage, it is fairly exploratory at the moment. Currently we have had some reasonable progress with that project but it is a long term project. What we have been able to do is to show that if you inoculate cane toad tadpoles with haemoglobin, basically we are producing a similar phenomenon as was shown for the bullfrogs. The toads do go through metamorphosis, but they end up not producing any adult haemoglobin. So what we have been able to show is that yes, indeed, you can interfere with one of the processes of these animals going through metamorphosis.

Now, of course, you can't go around catching tadpoles and injecting them with haemoglobin, it's not practical, and also haemoglobin is unlikely to be cane toad specific. All frogs and toads will have haemoglobin and are probably reasonably closely related. So there are two things that we are doing at the moment. One is to find genes, other genes that are expressed in adults but not in tadpoles, which we could use as a target for this approach. The second thing is that we need to have some mechanism of getting that protein, or the gene for that protein, to toads on a huge scale. So we are looking at a virus which affects a number of amphibians to act as a taxi, in other words, to take that gene into cane toads.

Again, you can understand that it is important that the virus does not affect other species so it is important to consider the pathogenicity of that virus. So what we are doing is attenuating that virus, and we have got to the stage where we have shown that you can attenuate the virus so that it doesn't produce any disease, but still is able to affect the cane toad. Now, we have then also shown that you can actually engineer this virus to contain genes. So we have got the sort of building blocks, as it were, for the project in place, to really show in principle that you can interfere with metamorphosis in a cane toad using a virus as a taxi. Now, you can imagine, there is still a lot of steps to go and obviously, this is being done in a contained environment. There is no suggestion that we are going to be releasing this virus in the near future, and of course we would have to go through, we would have to show that it was not affecting other species, that it only affected the cane toad, that it was transmissible, and we would have to convince the regulatory authorities of that fact. And so that is where we were up to.

The biggest problem we have got with the cane toads, though, is the problem of scale, the scale at which the cane toad operates across. So if you are thinking of something that didn't disseminate as a possibility down the track, then

you could use this virus if it didn't disseminate. It was just a dead ended in the tadpole, but it produced an effect on the tadpole that we want. You can imagine that's a possibility. But you have to realise that then you are using something that could only be used in a small regional area. That still might be okay if you are trying to protect particular parts of a park, for instance, and that might still be a possibility. But to operate on that large scale that the cane toads cover at the moment, any sort of toxin or viral product that would not disseminate, I think we are probably going to have a very minor effect in some areas. So that's the sort of way we're progressing. We are also obviously keeping an eye on the literature, for anything that comes up that might be cane toad specific, but there is not a lot of work being done on cane toads in the rest of the world. And so one thing in my view then would be for someone to...

Madam CHAIR:

Sorry, you just broke up then. Could you repeat that?

Dr ROBINSON:

Okay. It would be ideal if someone reported on an agent, an infectious agent of cane toads, which was absolutely species specific without any modification. Currently we don't have that, have such a virus or some other infectious agent, they are not out there. Earlier when we had, when we worked on cane toads in Venezuela, one of the projects was to try and find a cane toad specific virus, or a cane toad's other infectious agent. We weren't able to do that. Whether such a thing exists, we don't know. So that is currently our project and we really haven't got any other solution for you at the moment, when it comes to biological control ideas. But we are not working currently on any on ground action. And so we are very careful to let people know that this is not something that we can offer anyone within the next couple of years. It is probably going to take at least 10 years to get to the point where you have something to use here. So that is basically the summary of what we are doing.

Madam CHAIR:

Thank you, Dr Robinson. Members of the inquiry, have you got questions?

Mr DUNHAM:

Yes, I have got three. First, what happened to the research that the Americans did with the bullfrog, which is now some decades old. Did it come to a dead end? The second is, what is the vector for this virus, I mean, how is it transmitted? If the recipient is to be a tadpole, by what means is this, the word you used was taxi, how does the virus get to the tadpole? And the third question is a bit similar to the first one, you said that there were not many other places doing much work. I am very surprised that in other places where the cane toad is present, that there isn't more work being done. Is this because there is a belief in the scientific community that it is fairly futile and much of the work that has been done thus far has really come to

nought?

Dr ROBINSON:

OK, thanks very much, Tony Robinson speaking again. To start with the first question, what happened with the American research. As far as I know, there was just one publication and no further publications. I think the purpose of that work was academic and I think, to you say what would happen, basically, depending who is asking the question, what would happen if you did this? And they published in their paper, that the bullfrogs did not reach metamorphosis, because a lot of them died. We found that that wasn't the case with the cane toad. But because in the paper you can't tell what the bullfrogs died of, it might have been something else. There was no pathology done on those bullfrogs. So in answer to your question, as far as I know the work was not continued. What is the vector? The particular type of virus that we are looking for, which is an iridovirus, in the group called a ranavirus, RANA virus. These viruses tend to infect the host and they remain infected. There seems to be a sort of a latent infection in adults. And so once it is in the population it will remain in the population. In the case of the tadpoles, the infection would spread through the water. Now, that is as much as we know about it. There's not a lot of work been done on the transmission or the epidemiology of this particular virus. In answer to the third question, I think you might just have to repeat that one.

Mr DUNHAM:

It was why, you said that there wasn't much scientific work being done anywhere else in the world, and I was wondering why, given the prevalence of this particular beast and it's in countries that have reasonable scientific programs and are reasonably well funded, why there is no work being done. Is it a sign that the scientific community has a belief that this is not money well spent and it is pretty much a dead end?

Dr ROBINSON:

Ah yes, Tony Robinson speaking again. I'm not sure what the reason is but I suspect that cane toads are not considered a problem in other countries where they exist. I have heard that some small pacific islands have got cane toad problems, currently, but they are probably not in much of a position to do much about that. In South America and Central America and in Florida, where the cane toads exist naturally, they seem to have created, or maintained some balance, where they are not a problem; in fact, they are considered to be part of the natural fauna, and cause no problem. In Hawaii, I am not sure, and in the Caribbean islands where they were originally introduced to control the cane beetle, which was the reason in the 30s for them to bring it to Australia, as far as I know, they are not a particular problem. Not anything I have read, anyway, that says they are a problem. So I think the reason why there is not a lot of work going on is that probably it is fairly low

down on the list of priorities for research.

Madam CHAIR: Any other questions?

Mr BONSON: Yes, Tony, it's Matthew Bonson speaking. Would Western Australia be interested in any work, possibly scientific work or any other type of work being done around Australia, because we have evidence that the cane toads are travelling north west and that they are going to have a huge effect on the animal life, I suppose like goannas and frillneck lizards and other reptiles, snakes, etc., to the point in places like Borroloola where cane toads first hit in the late 80s, where they haven't seen goannas and bluetongue lizards and things like that since. Is there any opinion from yourself, what the Commonwealth or Western Australia might be interested in doing? And we have also heard evidence that one of the major reasons why cane toads, and you touched on that not being a problem, or seen to be a problem, around the world, is they are considered a pest here, not a menace. Do you have any opinion to offer on the reason why it is considered a pest, not a menace?

Dr ROBINSON: Tony Robinson speaking. Would WA be interested? I would suspect so. I don't know for certain, and nobody has contacted us to pursue that but from what I can understand from talking to some of the ecologists in WA they've obviously been aware that the cane toads will be spreading across the top part of Western Australia. But I am not familiar with any other information on that. Why are they considered a pest rather than a menace? I am not sure, I'm not sure what the difference between a menace and a pest is. Is there a particular definition for that?

Mr BONSON: Yeah, well we have heard scientifically, around for introduced species, that "pest" is a lower ranking in order of problems than what a "menace" might be. But the evidence that we are hearing about cane toads is that they are going to have a real effect on some of our icon species up here, from eating and consuming these cane toads, and possibly, you know, wiping them all out. Also, another question I suppose follows this. Do you think that the scientific world would be interested in putting some of these animals away in the event that we might find a, not a cure but a way of dealing with these cane toads in the future, and would it be worth investing some money into doing that.

Madam CHAIR: We are talking about quarantining or relocation of species. Quarantining islands or relocation of species have been suggestions that have come before the inquiry in the past.

Dr ROBINSON: Tony Robinson speaking. My background is biology, molecular biology, I am not an ecologist so I might have to defer that question to maybe some of the other people around the table to answer that one. I understand that there

has been some removal of quolls to an island off the coast so that would seem a sensible thing to do, but I will have to defer to someone who is a bit more familiar with the ecological work.

Madam CHAIR: Any more questions on the biological aspects of Dr Robinson's expertise.

Mr BALDWIN: Yeah Tony, Tim Baldwin. You mentioned that your work to come to a conclusion might be somewhere between two and ten years, and you say that you have been given funding again for this coming year. Guarantee of funding to continue your work, is there any guarantee that you are funded to continue to a conclusion.

Dr ROBINSON: No I guess, we applied to Environment Australia to fund this work. They have been funding it for the last two years and there is another years worth of funding. I think you will have to ask Environment Australia as to whether we can get longer term funding. The only thing I can say there is that Minister Kemp has in a public statement recognised this as long term research and so we are always hopeful of long term funding, and we will provide the research if the funding is available.

Madam CHAIR: What is the dollar cost of the funding per annum, at this stage?

Dr ROBINSON: I think roughly \$0.5m from the Commonwealth across the first two years and this year I think it is similar. CSIRO is putting in a similar amount, one for one.

Mr BALDWIN: Just a follow up question Tony, Tim Baldwin again, in these sorts of projects, I am not sure, I have never been involved in them myself, but could one assume that with extra funding you can reach conclusion quicker? I mean, if you had more money, and therefore more resources can you speed this work up or is there just a natural progression you have to go through and money is not really the issue.

Dr ROBINSON: I think obviously with more funding we could go a bit faster particularly in genes, the search for genes which is reasonably time consuming and the more people you have the more genes you can analyse, so from that point of view yes, I think more funding would speed it up. When we get to a point where we could say 'yes this is still worth pursuing' so we could probably contract the time frame a bit by increased funding, but it is a fairly preliminary project at the moment in terms of what we can promise and I think if it got to the point of having a virus which did what we wanted it to do and was species specific then certainly there would have to be quite a lot of funding coming in to distribute the virus. For the research, yes more funding would be welcome.

-
- Mr BALDWIN:** Thank you.
- Mr WOOD:** Tony, Gerry Wood here. Do you see opportunities for more than one approach to trying to control cane toads. There was some discussion about using female attractants to basically trap cane toads and whilst that might be a bit more difficult than spreading a virus, do you think it has a role to play in a sort of multi-pronged attack against the cane toad?
- Dr ROBINSON:** Yes, I think that is quite right. I think we should be. I will give you an example of rabbits for instance which are probably not a big problem up in the Northern Territory, but certainly down this way they are, and a range of tools in the tool box is always a useful thing because it is likely that there is not going to be one solution to this problem. In particular there will be immediate actions that probably could be taken around key areas and I imagine the Parks people up there are certainly thinking of those things at the moment and maybe involve other approaches. I have heard of the pheromone approach to maybe control toads in a particular area. I guess the advantage we see in what we are trying to do is that you can probably, if it works, have an effect over a large area, a bit like myxomatosis of rabbits or rabbit haemorrhagic disease in rabbits where you have a virus which works while you sleep as they say. And that is an ideal situation, but of course it has to be shown to be completely safe.
- Mr WOOD:** Tony, Gerry Wood again. Would the use of a virus similar like the Calisi virus which seems to have its problems depending on whether the climate is wet or dry, is that also a possibility with this virus, that it could have some restrictions that are caused by climate?
- Dr ROBINSON:** It is a possibility. I can not comment any more than that, but the cane toad probably operates over a perhaps more consistently climate than maybe the rabbit. The rabbit can survive in more Mediterranean climates as well the arid areas whereas cane toads are restricted to wetter areas particularly with the summer rainfall areas, but experience with other biological control agents would say your right that probably there maybe some areas where it would work better than others.
- Madam CHAIR:** Thank you. Any more questions?
- Mr DUNHAM:** I am a bit concerned about the field trialling of a virus that would be spread through the waterways. We have got quite an extensive range flora and fauna that could be impacted. How long do you think it would take you to test such a virus, particularly for species specificity across the flora and fauna habitats up here in the Territory?
- Dr ROBINSON:** Again on the rabbit haemorrhagic disease virus, the species
-

testing there took three years and I think then when the report was released the minister asked for some other species to be tested and so I think that took another year, so maybe four years, maybe five years to do species specificity testing. Now as for rabbit haemorrhagic disease virus, a number of workshops were held to produce a list because you can't test every species on the planet and the way that was approached was to look at a number of factors one being taxonomic groupings so you would take a representative of each of these groupings. You would then take a look at the opportunities of becoming exposed to the virus. You would then look at the rarity of the species, maybe the value that people put on the species. There would be a range of things that you would have to look at, but obviously you probably could not look at every species. That was the case with the rabbit haemorrhagic disease virus. I guess currently that is proving to be a useful exercise as it seems to be remaining in rabbits and so that would be the process that we have to go through. And you are quite right, it is a long and time consuming process. You may have to, I think most species that you would look at would be fish and the amphibian species, maybe you would want to go to insects, I suspect not, but that is, those are the sorts of decision that would have to be made in some sort of consensus work shop.

Mr WOOD:

What is the life of the virus. In other words, if you had a programme ways to spread this over the waterways, would it have to be redone every year or so, or if there were no, if you had wiped out all the cane toads, does this virus therefore stay in the environment for ever, or what?

Dr ROBINSON:

It could do that. If it infected other species but did not affect them, in other words produce any disease or any effect on them, then it is possible that it could persist in that case. As far as its survival outside the animal, the Australian Animal Health Lab, Alex Hyatt and his group which is part of our project, and I should have said that before that the Australian Animal Health Lab, CSIRO Livestock Industries is the other half of this project, they are doing the viral work down there at Geelong, they have done some studies on how long the virus survives under certain conditions and unfortunately I can not tell you what they are. I can not remember what the results were, but certainly the virus would persist at room temperature for some weeks, some days anyway. So it would persist in the environment a little bit but as the temperature goes up the survival of the virus goes down. But you would have to find out from Geelong what those actual numbers for that are. Does that answer your question?

Mr WOOD:

Yes thanks.

Madam CHAIR:

Any further questions for Dr Robinson? Dr Robinson thank

you very much for your very interesting and informative presentation to our inquiry. We really appreciate the information you have provided us. It certainly gives us some direction and food for thought with our recommendations to parliament. And next I will ask Rhondda Dickson from Environment Australia to make a submission if you do not mind.

Dr DICKSON:

Thank you very much. My name is Rhondda Dickson. I am the Manager of the Natural Resource Management Branch in Environment Australia which has the responsibility for threatened species recovery actions and threat abatement plans and that is why we have the responsibility for the national level actions that help with combatting threats process options including cane toads. I would just like to say at the outset that our submission covers a range of things to do with the research and the impact of cane toads and also some actions in Kakadu. Any further questions you might have on other aspects of the submissions would probably be better to follow up with Parks Australia. We do not have any one here to follow up the details of that. So I hopefully cover all the rest of this submission.

I take it you all have now read the submission. I will first refer to what the submission covers and I must say we are very pleased to be able to provide the information to the inquiry and to assist in any way we can on this very significant issue. I will just run through briefly what our submission covers, it outlines the potential impacts on native species, the work that has been done to date, the current research as well as far as we are aware and it also details some of the work that is being done by Parks Australia North and others in Kakadu itself. It also sets out some of the social and economic factors that has been sought by the inquiry and particularly the issues for Aboriginal people social and economic. It also points out the need for public education. Probably one of the most significant parts of the submission in terms of where you go next is, see page 5, our assessment of the main ways of managing the environmental impact. You can see listed there at 1 to 6, so we have the biological control, approach assessing impacts on native species and understanding medium term protection measures. You mentioned before, the value of quarantine measures for particular areas, islands or pensinsulars, so that you can create areas to keep toad free. These are important measures, particularly interim, and keeping monitorary control. The education of people to reduce the likelihood of transporting toads is very critical.

People can increase the rate of movement and that is something that is important to avoid. It is important too, to look at a worst case last resort scenario of maintaining captive breeding populations of threatened species, if it

comes to that. And as I think you mentioned earlier too, it is important to get more information about the environmental, social and cultural impacts so that we can guide some of the right approaches for future measures. So it will be quite critical to get a better picture of those impacts there. And along those lines, also improving the coordination of our management, research and control measures. The NT Inquiry is looking at the key area.

A couple of other things that we spent time on the submission, along with the environment protection by the EPBC Act are Threat Abatement Plans for addressing threatening processes. These are useful mechanisms for coordinating the approach. The other thing that I mention is the value of biological control and particularly, what our role is in that sort of research. We have set out also, our views of the proposed task force to coordinate approaches. We are concerned to make any approach national and bring it in Queensland and Western Australia and New South Wales into a national approach.

Madam CHAIR: Just on that point Rhondda, can I just interrupt for a moment. We have actually received a submission that there is the possibility of the cane toad getting as far down as the Murray Darling river basin, so it could affect South Australia, is one of the submissions that we have received.

Dr DICKSON: Okay, Rhondda Dickson again. No, we haven't seen that submission at all. But certainly would expand the scale even more. I have almost finished my introduction then, so there is quite a lot in the submission, and I am very happy to elaborate or expand on some of those points according to your questions.

Mr BONSON: Matthew Bonson. I might ask a question and forgive me for my ignorance, but could you give me some previous history about the roles and responsibilities of the environmental, department of environment and heritage? Just to put it record and just for my own poor understanding.

Dr DICKSON: Rhondda Dickson again. In relation to cane toads?

Mr BONSON: In relation to, the role and responsibilities with feral, I notice you have mentioned some feral animals. Listing of cane toads is a threatening process, I suppose. I mean, you have got, this is on page 7 of your submission, and I notice that foxes, rabbits, feral cats, feral goats, are examples of current threatening animals, but cane toads aren't. So what is the, how, what is your role and responsibility to that, I suppose, just to put it on the record, to those types of animals.

Dr DICKSON: Okay. Well under the Environment Protection and Conservation Act, which has now been in place for three

years. Before that the major legislation was the EP(IP) Act and the Endangered Species Act that is relevant to feral issues. Under the Act, anyone can nominate a threatening process. You know, the Northern Territory Government could, and an individual could, effectively nominate cane toad as a threatening process. And then that would have to be assessed by the Threatened Species Scientific Committee, which has to assess the significance of the threatening process and its implications on native species. And then they make recommendations to the Commonwealth minister, whether or not to list the cane toad as threatening process, under the Act. If the minister decides to list on the basis of the advice, there is another process whereby whether or not a Threat Abatement Plan, from his point of view, is a useful way of addressing this threatening process. These other feral animals listed, have gone through such a process or are in the process of completing the process. That can have a, what I was saying in the beginning, there is some value in having a Threat Abatement Plan that it can bring together the actions needed to address the threat, to have some strategy and coordination of those actions. That's the value. But it is important to note that these are national plans, not Commonwealth plans, and that they involve input and activities by all the states that have a threatening process on their land. So does that clarify it for you?

Mr BONSON: So very much so, thank you very much. I suppose, raising my next question, so in the last three years, foxes, rabbits, feral cats, and other animals listed, have been registered as a threatening process, is that right?

Dr DICKSON: That's right.

Mr BONSON: The other one is, I noticed that you make a recommendation on page 80 about getting the Northern Territory government, Western Australia government, and Commonwealth in the research. Has Queensland shown any interest in the present or past, and as Delia said about South Australia, we have heard South Australia could be affected by cane toads as well. Is there any contact you have made with those, or would that be a line of thought, do you think, to head down that path?

Dr DICKSON: Rhondda Dickson speaking. I am not aware of Queensland in the past and I would say you will have to ask Robert to answer that one, but at the present there doesn't seem to be a lot of interest on the part of Queensland. And that New South Wales, of course, as you noted there, cane toads are beginning to edge into New South Wales so that would be important, they need to be involved as well. But I might just ask if Robert, could tell you a bit more about some of the facts around the interaction of those states?

-
- Mr MOORE:** Robert Moore speaking. Queensland has been approached in the past, to determine the level of work done on cane toads and any impact on native species throughout the state. It appeared that not much had been done in that area. They considered that most of the problems had basically gone through the state and therefore it was of a lower priority concern in relation to other species impacting on native species.
- Mr DUNHAM:** Following on from that, have any species in Queensland gone extinct as a result of the cane toad, at all?
- Mr MOORE:** Robert Moore again. I couldn't advise you on that, and neither could Queensland.
- Mr DUNHAM:** Right-o. And the other question I have got, the very problem of the cane toad is one of translocation of a species to an inappropriate area, and the devastating impact it had. I note that there are strict protocols relating to translocation that are in your submission, Rhondda, on pages 6 and 7, and that it is a very formal process to go through, to actually get approval to translocate a species. But at the same time, the submission talks about the quollaree... having been moved to offshore islands, which I assume are currently quoll-free areas. Why wasn't this work done prior to the quoll being transferred?
- Dr DICKSON:** Rhondda Dickson speaking. Can you elaborate a bit more please?
- Mr DUNHAM:** On page 7 of your report you talk about the process under your Act which requires a species being listed, nominated, assessed by the threatened species committee, etc. etc. But earlier, on page 6, you talk about the quoll having already been translocated to a different area. And if I am reading your submission right, where it says that the northern quoll is currently not listed, it would appear that the quoll has been translocated without all of those protocols being satisfied.
- Dr DICKSON:** Rhondda Dickson speaking. OK I understand your question now. The Commonwealth undertakes a whole range of activities to address biodiversity conservation or threatening processes which are not ever listed on a Commonwealth list or on a national list or on a state list. The funding of the cane toad research, is an example of Commonwealth support and work for addressing threatened processes that aren't listed. There isn't a requirement to do the listing either of a species or of a threatening process, before the Commonwealth can take any action. And the work that was done, the project that was done for the quolls, was you know, in the knowledge of the significant risks that were posed to quolls coming from the research, and the importance of taking this early action. There was no need
-

for any of the other strategy processes that have been met to take that sort of action.

Mr DUNHAM:

We did receive some evidence from a gentleman who had quite a heritage in environmental protection and was very knowledgeable about the quoll, and he had concerns about its impact on other native species in areas which were quoll-free, particularly nesting birds. It is a particularly voracious animal and if introduced to an area where native species had grown accustomed to not having the quoll around, they would have to adapt pretty quickly. And in talking to him informally, he also said that they would deplete the area of food sources, one would think, and would have to be therefore supplement fed in a sanctuary type situation rather than in a natural ecosystem. So are those analyses been done or have we just taken this animal to an island and we are going to suck it and see?

Ms RYMER:

Sue Rymer, from Environment Australia speaking. The quolls translocation project was actually a project of the Northern Territory Government, of the Parks & Wildlife Commission. As far as I understand, before they actually moved the quolls they did do survey work on the islands that the quolls were being moved to. I understand one of the islands they were proposing to use did have nesting birds and they were concerned about the possible impacts so they didn't move the quolls to that island. They are undertaking ongoing monitoring of the impacts of the quolls on the islands that they are being moved to, and the impacts that you mentioned. But I think probably the Northern Territory government could provide some more information on that, the Parks & Wildlife Commission.

Mr DUNHAM:

But they are they not obliged to seek that requirement under the Act? They can do it without having to do that series of things that you have listed at page 7 under the environmental protection, and BP Act, whatever that is.

Dr DICKSON:

Rhondda Dickson speaking. On page 7, we have just listed a couple of the processes under the Act. I think that you are referring to a different one where if there was an impact from an action, on a matter of national environment significance, that would need, if it was seen to be a significant impact, that would need to be referred to the Commonwealth for a decision. You might have to ask Sue again, but the process would be that if there were any nationally listed species on the island where the translocation was happening, that may have been significant in impact by the movement of the quolls, then that would be required to be referred to by the minister. I understand, and Sue can correct me on this if I'm wrong, that the NT assessment conducted wasn't going to be any significant impact on any nationally listed species and therefore there was no need for it to be referred to the

Commonwealth. Is that right?

Ms RYMER: Yes that's my understanding.

Mr BONSON: Rhondda, it's Matthew Bonson again. I've just read here under research into cane toads, impacts, and you've just clarified again all the evidence that we're hearing. You've said although they have been present in Australia for 70 years, there is still very limited information about the impacts of cane toads on native species and ecosystems. The evidence that we've been hearing in public meetings have been, well, it's just a horror story, what type of effect they're going to have on the natural ecosystems and animals around the Northern Territory, in particular; and also effects on the social, economical living efforts of some indigenous people in remote areas, particularly bush tucker. How do you compare that research, the level of research, to the foxes, rabbits, feral cats and feral goats? Is it quite, you know, a long way behind, or is it up to the stats to what has been happening in that area?

Dr DICKSON: Rhondda Dickson speaking. To give you an accurate picture of that, I think we're going to have a little bit of homework I think it could be, a fairly true thing to say that, as for any of the threatening processes that we have, been discussing and impacts of feral animals and pests and weeds are, is relatively little known most of the evidence we have is often circumstantial. The amount of research that has been done on these things I think is relatively small, on the scale of research, that we do in the country. But the research evidence that is used by the threatened species committee, in their decisions is such that they take a precautionary approach to the evidence provided by the research. The details of the research where you would be absolutely certain that the detail of the impact, it would take so long to do and it would cost so much that by the time you get it, the species being affected might be gone. So I guess they take a precautionary approach, using the evidence that they have at the moment, to see whether, to make a judgement on whether there is an impact or not. If you want us to provide you some more detailed information we could do so.

Madam CHAIR: Rhondda Dickson, I've got a question on issue of the precautionary approach. It appears, through information throughout this inquiry that there hasn't been, in the past, a precautionary approach taken in respect of cane toads, which certainly to me, has been intriguing. In hearing the range of species that they affect, and hearing the sheer numbers that they move through our ecological systems in, why would not there have been in the past, a precautionary approach taken?

Dr DICKSON: Well I guess that's a question you need to ask really in

every state where the cane toads have invaded. We can talk about the approach that was taken on Commonwealth land, in Kakadu. There's the work that the CSIRO has done that the Commonwealth has funded going back to the early 90s, when the threat of cane toads expanding was becoming evident. From the Commonwealth point of view, we have been very keen to take up our role in funding the research that is going to develop long term solutions, and act in areas where we have responsibility for our own lands. I think it's a question of how land managers across the country approach this and the decisions they make, it should be one for them rather than for the Commonwealth.

Madam CHAIR: I'm not sure of the accuracy of this, but certainly it has been said to me that in the past, in the early 90s, the Commonwealth offered the then Northern Territory government some dollars in terms of research on the cane toad, and that was rejected. Are you aware of anything like that?

Dr DICKSON: Rhondda Dickson speaking. We don't have any details of that. If you wanted us to brief you again, just let us know, we can.

Madam CHAIR: I would be interested in terms of past funding offers from the Commonwealth to the Territory in terms of cane toad research that had not been taken up or accepted. I would appreciate that information.

Mr BONSON: And it's Matthew Bonson again. I would be interested in that comparison between research of other feral animals and cane toads, too, thanks, Rhondda.

Dr DICKSON: Rhondda Dickson speaking. We will get some more information on that and get it to you.

Mr WOOD: Rhondda, Gerry Wood. On page 4 of your report, you mention the cultural socio-economic and other factors that are associated with the encroachment of cane toads, and you talk about Kakadu National Park. As Kakadu National Park as a World Heritage listing, do you see cane toads as threatening that listing and if so, is that a reason for perhaps some leverage with the Commonwealth to increase funding to try and find ways of controlling the cane toad?

Dr DICKSON: I have not heard about any concerns that this might threaten the listing of Kakadu National Park. I guess the Commonwealth concerns for the cane toads in Kakadu National Park have dated back some, quite some time which is why the Parks Service has been extremely active in trying to measure the impacts, and monitor them and look at it, and that is part of the reasons why we of course support the national approach in looking at good biological controls, but it is not something or the only reason of course, we are

looking for that across the whole country. But I guess my point is that there are plenty of reasons why we need to be concerned about cane toads in Kakadu National Park and take action for them, before you need to look at the potential for our world heritage listing, when the impacts on the native species and the impacts on the social and economic factors and concerns of Aboriginal people is significant in themselves.

Mr WOOD: And you would not think the loss of species and the loss of some Aboriginal ceremonies caused by the invasion of cane toads would be diminish you might say the world listing and perhaps make it a little bit more urgent as to why, from a Commonwealth point of view, of hurrying up the process of trying to find a solution.

Dr DICKSON: I can only reiterate what I said in that the concerns about the impact on Kakadu and what is going to diminish Heritage listing. Both those aspects, environmental and cultural impacts on cane toads motivate the Commonwealth to undertake the action we are already taking and if we do not need the concerns of the world heritage on top of that.

Mr WOOD: Thank you.

Madam CHAIR: Rhondda it is Delia Lawrie. One of the consistent themes we have received in submissions is the need for greater public awareness and public education programmes. Do you see an opportunity, certainly when we are in Jabiru we saw some good information that had been provided by EA in terms of the cane toad, and do you see an opportunity for cooperation between jurisdictions on producing a public awareness campaign and a range of information.

Dr DICKSON: We are always seeking opportunities and see advantage in having cooperation across jurisdictions for this sort of thing. It is a very valuable and an efficient way of doing things. So yes I certainly support that.

Madam CHAIR: Thank you.

Mr MCADAM: Delia, I am going to have to leave this meeting.

Madam CHAIR: Alright, thank you. Any other questions from Committee members. We have no further questions here. Is there any other information that before we finish you would like to provide anyone there that wants to say anything at this stage.

Mr MOORE: Robert Moore. Just one qualification. That Murray Darling River prediction that South Australia put in its submission to you, what was that based on?

Madam CHAIR: No, it was not South Australia submission, it was a

submission from a South Australian academic. It was his analysis of how far south the cane toads will possibly go.

Mr MOORE: Thank you.

Madam CHAIR: Professor Mike Tyler provided that information to our inquiry.

Mr MOORE: Right.

Madam CHAIR: Adelaide University.

Dr DICKSON: I think we are all done here but we will follow up on those two matters for you and anything else you might subsequently ask.

Madam CHAIR: Look, on behalf of the Committee I want to thank you for your time and certainly I acknowledge the good work Environment Australia is doing in the Territory to combat the cane toad and CSIRO the tremendous research that is occurring , so thank you very much. Excellent submissions.

MEETING CLOSED

TRANSCRIPT NO. 6A

Dr Bill Freeland

Wednesday, 28 May 2003

PRESENT:

Committee: Ms Delia Lawrie, MLA (Chair)
Mr Tim Baldwin, MLA
Mr Matthew Bonson, MLA
Mr Stephen Dunham, MLA
Mr Elliot M^cAdam, MLA
Mr Gerry Wood, MLA

Secretariat: Mr Rick Gray
Ms Maria Viegas

Also Present: Dr Richard Lim, MLA
Ms Freeland

Presented by: Dr Bill Freeland

Note: *This transcript is a verbatim, edited proof of the proceedings.*

Madam CHAIR: Members of the Legislative Assembly Sessional Committee on Environmental Sustainable Development, meeting 28 May 2003.

We welcome to the Public Hearing aspect of the committee Dr Bill Freeland and he is going to provide us with an oral submission as well as a written submission.

Dr FREELAND: Well, I sat down to work it out and I realised that it was quite a bit and I have got to, actually this is a 2 hour presentation if I did it all and I didn't think you'd particularly want to listen. So, I have abbreviated it and I have also got the written material so you have got everything in full.

There should be a couple of amendments made.

Madam CHAIR: And the committee welcomes Dr Freeland's daughter Ms Freeland. We are very tight for time so we will just move straight into it.

Dr FREELAND: I will do whatever I can to speed things up, but basically what I am here to do is not repeat the evidence you have already received from people like ERISS and so forth. I don't think there is any major discontent there with the agreement among those sorts of things, other than trivia.

What I would really like to do is focus on particularly the last 20 years of Northern Territory involvement. The details of

that are in the submission but I will run through a few of the highlights, I want to evaluate the overall state of knowledge put it in some sort of a perspective. I want to describe the types of research that we could be doing and more importantly I think what they would contribute to our understanding and on top of that how they would or would not contribute to our capacity to manage cane toads in any way.

And finally, I would like to look at the priority for cane toad research and management relative to other nature conservation and things that are impacting in the Northern Territory. We have got to get a couple of things clear I guess, nobody wants cane toads in the Northern Territory, no one ever did but other than that the second one is we have to start from a premise which is probably very accurate, and that is all organisms including introduced organism impact on our environment. Introduced organisms tend to have more noticeable effects and they can even have social effects, the problem is one of scale and what the hell do you do about it when you've got it.

Territory involvement began in 1980, following the scare in the late 1970's with a school teacher and his toads, and it began with the very simple surveys of the then distribution and rate of progress of cane toad colonisation in the Northern Territory.

In 1984 I was asked and given 2 weeks notice to produce a review on all that was known about cane toads, I flew to Griffith University and produced it in 2 weeks. It was designed to go CONCOM then the Council of Nature Conservation of Ministers in an effort to illicit interstate and Commonwealth support for a joint program of cane toad research to see what could be done.

The review that was written was based on the hypothesis that cane toads have a significant negative impact on the Territory fauna. Scientists can't deal with that, there is no way of proving it, you can only disprove things. So what scientists do is they a null hypothesis and a null hypothesis to be disproved is that cane toads have no significant effect on the Northern Territory.

At that stage there were no data, that would allow you in any sense to validly get rid of that null hypothesis. There was simply no information at all, there was a series of anecdotes and more interestingly there was a myriad of ecological myths, things believed but for which there are absolutely substandard data whatsoever, although for some of them there were some very interesting suggestive pieces of information.

The option was to choose to take a risk of adverse

approach and we developed a structured research and management program. During the first phase the management steps were simply removal of accidentals from Darwin and other places so that we didn't get colonised too soon, this has proved very successful it is still going. And to produce brochures providing information to the public, asking them to call if they see a toad and keeping them informed. That has been updated repeatedly and I believe it is still going.

We did manage to quantify their range of spread and make some pretty good predictions on how fast they would come, those predictions were good to the Roper River. Unfortunately, from then people have taken a big hand in it. Inadvertently, I'm sure. For example, we predicted Katherine in 2003 they got there in 1999. The only way that can happen is people helping them along the way, which is unfortunate because we did our best to let people know to be careful and all the rest of it.

The other thing we did was examine some of the ecological myths. One of them is that when cane toads invade, they have huge population sizes composed of extraordinarily large toads and over a relatively short period of time these populations, theoretically are supposed to crash and the toads get smaller. We studied them across a 19 year time-frame and in fact none of that is true for the areas that we studies around the Gulf it is simply a myth.

Mr BONSON: What was the time-frame?

Dr FREELAND: 19 years.

Mr BONSON: But you are saying that was a myth?

Dr FREELAND: No, the myth was that the populations erupted and when they get to Darwin there is going to be toads everywhere, it is not true Ok. We did later work following a single population through a time-frame period of 12 years and the myth revived itself not at all, it just doesn't happen.

Cane toad populations fluctuate dramatically in a random fashion, there is no temporal trend. What dictates the population in the dry season, is how much rain fall there was in the previous wet, in particular the December rainfall. I think the December rainfall is important because that is when toads get their eggs, in late November or early December with the first rains, and that first batch that comes through, 2 things happen 1; if it keeps raining their probably the only batch that really succeeds because they eat each other for the rest of the season. And the other thing that happens is there is no rain and this batch comes out of the water, they simply de-hydrate and die.

So they had this big prediction of population size, and the body size is depended on rain May/June. So this time pattern just doesn't exist, it is a complete myth. We found yes, toads in east coast Queensland are very skinny, no it wasn't due to food availability of parasitism, although some people have since said that it was food availability, actually the evidence is insufficient they are wrong for a variety of reasons I won't go into here.

And we also found that the urban toads on the east coast were skinny just like their country cousins. CONCOM actually got together after many years of pushing and shoving and this research, as I just described was actually part of the motivation to get that going and it was used by the people involved that actually designed the program.

The biggest concern people had was the only notion they could think of that might work, would be biological control and that is scary at the best of times, particularly with something like an amphibian. We were very cautious about it and so they decided they wanted to build a population model, so that they could work out what life history phase was the best one to target, to achieve the most control. That actually is the adult phase, contrary to what CSIRO is doing at the moment with tadpoles undergoing metamorphosis, that is not going to have a huge impact mathematically, nor are toads likely to be responding very well.

And the other thing was that if you have a model you can actually test whether or not your pathogen is going to have the impact you are looking for after you have released it. Before you release it, you can sit there do the modelling and have a better appreciation of what the problems are. That CONCOM research also covered the pathology of parasites of cane toads in Australia, including virus. Those 2 pieces of work were done by James Cook University, we also did more work on impacts...

Mr BONSON: What year?

Dr FREELAND: Look I can't remember, I wasn't high up I was just a grunt.

Madam CHAIR: Eighties?

Dr FREELAND: It would have been in the mid-eighties some time. I've actually tried to look it up, but I don't have the resources at the moment.

That was done by James Cook University, at the same time the Territory undertook, looking more at the impacts, because it's a bit embarrassing if you are employed to do something and you don't know why you are doing it.

And also we worked with the University of Queensland and documented the protozoan on parasites which James Cook wasn't doing.

Mr BONSON:

And what year, again, was that?

Dr FREELAND:

Well it was about the same time. Yes, probably from about 1986 on.

The research that we undertook was quite wide in it's scope. We couldn't find any impact of cane toads on frogs, communities in the Gulf during the dry season and that's is the time when the impacts should be greatest because that is when they are all congregated in the highest densities and food availability is likely to be least.

The reason is simple, cane toads have an ecological niche', a place in life, if you like, which is simply not present in Australia before the toads arrival. They have no way of going about dealing with life and it is very different and their resource for uses are very minimally over-lapping with the native frogs, so they don't have any impacts.

The next thing that we did was to look at the tadpoles, to see whether the niche's were again different and basically if you take a sample up and down the road, essentially, is what we did from West Moreland Station all the way through the Borroloola and we inspected every water body along the way and did samples. And basically cane toad and native frog tadpoles occur far less than you would expect by chance I mean it is almost non-existent. The occurrence is very, very rare and it is highly improbable.

Mr BALDWIN:

Bill, in the same waterhole or in the same area of the waterhole?

Dr FREELAND:

Well if it's a big waterhole, you can have them in the same thing but their really separate, quite different habitats and that is because they select different areas. The local frogs down there prefer relatively shallow areas on clay sub-strait, no, on sandy lonely sub-straits with lots of grass whereas the toads prefer more open deep water and less shade, no grass and particularly important for Kakadu they just will not go anywhere near aquatic micrified water weeds. They don't like water weeds and they don't like grass coming out of the water, so what happens in Kakadu is going to be interesting because, I am just describing their behaviour, and they don't like those sorts of habitats.

Madam CHAIR:

Bill, just on that ERISS information we have received, I know you said you couldn't find any impact on frogs species yet. The threat to the frog species in Kakadu National Park are being reached, their saying that there is a notable impact on the Mask Rock Frog, notable on the Carpenter

Frog, notable on the ...

Dr FREELAND: Who?

Madam CHAIR: This is the ERISS report.

Dr FREELAND: The ERISS are predicting.

Madam CHAIR: So you are contesting what they are predicting?

Dr FREELAND: I certainly will. Because they are saying that on no evidence, there is no actual physical evidence from the ground that that is happening, Ok.

Now what we will do is, later on I will deal with those questions about what research can tell us what the limitations are and what we do and don't know, Ok.

Ok, so that is the frogs and the tadpoles, we actually started work or tried to do work on the Northern Quoll impacts which have become important. We are aware of the difficulty that could occur, we worked and worked and worked and we set traps all up and down the Gulf and there aren't any. Whether there is toads or not, you have got to remember that species was in decline and rapidly shrinking on its own long before the toads got to the Territory. And they were gone from the Gulf before the toad got there so we simply had no way in which to pursue that study.

We found that a species of tapeworm, that was described from Queensland has gone extinct, it is present in the Gulf and within 12 months of the toads presence it is down to 10%, and then it is virtually gone within years. And associated with that there is a destabilisation of the frog community, by that I mean, usually when you go down the Gulf you can say this species will be the most abundant and you can tick em off, with a high level of confidence, the total numbers might change, but you can at least say that there is a high level of similarity from one year to the next.

With the tapeworm gone the whole thing is destabilised and what you get is a species that used to be fairly rare, suddenly abundant one year, you are not losing anything just the patterns of relative abundance change.

There is an attachment in there with a paper which describes that.

Ok, next one. I conducted a 4 year long study over 3 rivers looking at 3 habitats on each of the rivers, looking at ants and other arthropods crawling around on the ground that is a lot of effort. We got a preliminary sorting of 1 year of impact on 1 year, 1 river done and it was done for 1 habitat which was right besides the river where the toads are most

abundant. We found no impact...

Mr BONSON: So all this information that you are talking now is all based around that 1986 work?

Dr FREELAND: It is all before 1997 so far pretty much.

Ok, we found no impact on the number of species of ants nor did we find an impact on the abundance of ants. I, in 1992 moved to Queensland, so it might have been around 1990 Matthew I can't give you precise dates.

Madam CHAIR: Mid to late eighties.

Dr FREELAND: Late eighties early nineties, because it is a 4 year period anyway. I got a job out of Queensland with the Goss government for 2 years, I came back and once I got there, there was no one to sort those things so I asked them to be shipped down. Somebody packed them and they arrive and there wasn't a vile left so I ended up with a big box full of bits of boat glass and dead ends, so we lost that study which is actually fairly sad.

Ok, we did study goannas, with help of a Annie Currakine, Annie Isaacs some of you may know her. She was the only person in Borroloola who still maintained goanna-dogs, we studied them over a 3 or 4 year period and there is an attachment again in the review which gives data on the time it takes to catch a goanna or find a goanna and it went from, I think before the toads it was about ½ an hour then it went to about 1 ½ hour then about 57 minutes then it was back to about ½ an hour.

So you are getting a very rapid recovery in the goanna population.

Mr BONSON: Where did this all happen?

Dr FREELAND: Along the edge, near the McArthur River.

Mr McADAM: We heard some evidence on the cane toads. The goannas hadn't returned or their numbers had not come back to...

Dr FREELAND: Yes it's hard, the trouble is people don't bloody look. And I know that sounds silly but I know that when we first went down there and we went looking without any and the dogs, we found one every 3 days. It was in the middle of the wet mind you, and then you suddenly get 2 dogs and a lady who knows what she is doing and you are getting one every ½ hour.

And nobody in Borroloola now has goanna-dogs, they just don't do it any more. And even Annie, after the toads arrive we asked Annie, 'are they going for toads are they getting

them', she said 'don't be silly there is none left they are going for goannas and there is none left', and we go out down there and there they were.
And the next year she said the same thing.

One thing that did happen in the Gulf was all the Aboriginal communities, be it down the Nicholson River all those areas Eagle Creek. Somebody went through and speared the hell out of them about toads, and they had the best stories before the toad even got there they were expecting these things and those things then happened, this is part of the problem I think.

Madam CHAIR: Has there been anything? I have just got to view the chart on the goanna study in the Gulf country. Anything post 1992?

Dr FREELAND: No, that's when I went to Queensland. April 1st, talked to them when I came back it was April 1st 1994.

Madam CHAIR: There are no goannas nothing, there are no problems up there?

Dr FREELAND: With the goannas, no. The problem was that Annie was so old she could hardly get through the bush and she no longer had any dogs, you just couldn't do it.

Ok, we looked at 'freshies', we force fed some, and they die on average in about 3 hours if you force feed them, I mean you have really got to force feed them, a lot of them got shredded. We also put 12 very hungry 'freshies' that had been starved for 3 weeks, with tadpoles in a pond, these 'freshies' all of them were once destined for slaughter at the croc farm, we got a bit of co-operation.

At the end of a week all of the crocodiles were fine. But we were down to 5 toads and what the crocs seem to be doing was shredding them and eating bits of them, now what that means I don't know but that is just what happened. The other thing I did was undertake literature review and look at Queensland records looking for snakes including, frog eating snakes living on the islands off the coast of Queensland, islands are important because they are small. Small population sizes of things like snakes, and whether you anticipate that you are going to have an impact there, you are going to have it there that's for sure. Even if you don't get one on the mainland, you might expect it there.

We actually found that of all the snakes that were on islands, that live with and without cane toads didn't seem to matter, there were only 2 or 3, that is in there and there is a little table showing all the snakes species on the islands with and without cane toads in the attachments. And basically, all the snakes in Queensland are intact, all the frog eating

species except for 2 or 3 were living on islands with cane toads. And in fact if you want to go and see this lady in Katherine catch frogs in amongst the cane toads you can do it anytime you like.

Madam CHAIR: Is it true that the King Brown's are vulnerable?

Dr FREELAND: Well they are saying King Brown's are vulnerable and if a King Brown eats a cane toad it dies. But I know, and they were on these islands as well and they do survive the invasion. I mean we come back to how you evaluate all this different

Madam CHAIR: About the King Brown, sorry I don't understand Latin.

Dr FREELAND: *Pseudechis Australis* is the King Brown. Sorry.

How you evaluate all this kind of information of what I want to get to, because I think it is really, really important.

But at this stage at the rate, 1980's early 90's everything started to fall apart with the CONCOM thing, it really was the most frustrating and difficult thing I have ever had to do. We had a lot of support for one year and then for the rest of it, it was just chasing the money chasing the money chasing the money and in the end some of them just refused, you know you are dealing with less money and you can't run research that way.

Even if the research being provided is better than they actually ask for. Managing something like that is not very smart, and then CSIRO took over I have written down 1999 that is clearly not correct, it was about, look it's gone! Whenever CSIRO took over, they took over and did a formal study down the Gulf which was Cat Luns??? which I believe you have been referred to, they looked at population and pathology studies in South America and they also looked at biological control of using some of the virus' in particular they have been found by the Townsville group.

I think that is right. CSIRO has a responsibility this isn't just a Territory problem. If it is a problem it is an Australian problem. And lets face it, biological control and genetic manipulations and microbial stuff is outside our budget capabilities and we don't even have the facilities. So to me that whole hassle of it really does belong to the CONCOM they are equipped to do it. Ok, when CSIRO took over, we didn't stop. This is since I got back from 1995 on, we started monitoring in our parks including 'freshies' spot light surveys in Nitmiluk and Elsey, we cooperated with the Land Councils and we managed to get signage developed and then handed out for barge landings to get them off islands.

And in some time from 1998 to 2000, I can't remember, I

place the Coburg Board with 2 proposals. One was doing with with their proposals. One was to put in a was down facility for all vehicles entering the park to prevent weed invasions, hopefully gamba because it is disastrous. They thought this was a wonderful idea except we were unable to get them to agree on a practical location that turned out to be all sorts of problems with that and the TO's refused the, they said 'Oh well all of the visitors and all parks people and everybody else has to use it but we don't'. So there is not much point in having it, but we did cost it out. I don't know how the proposal has gone since I left Parks and Wildlife.

Madam CHAIR: What was the costing of that?

Dr FREELAND: Look I don't have it. I mean you would have to ask Parks and Wildlife, it is on file somewhere.

Mr DUNHAM: Was it fully manned so they would have a person there as well?

Dr FREELAND: Well that is why you have...

Mr DUNHAM: Fully manned...

Dr FREELAND: And I though the best place to have it was Murganella because it is at Crossroads. And there is people there and it is a centre anyway, it is a ideal spot. But boy, Murganella has got more problems than a, the politics are out of my league.

The next one was to put a toad exclusion fence across the neck of the peninsula. And of course, it would need an inspection facility as well which is where it meets in with the plant proposal.

We actually did a whole lot of work on this, on looking at bits and pieces of the design including the trial I did on cattle grids to see if they were capable of stoping cane toads hopping across.

They are. If you put 2 grids across with a system of I reckon it would work but I do believe you would need more work. I don't know what has been happening since but there are a whole bunch of needs about what needs to be done to determine whether or not it is even feasible. I mean it is just an idea and you need to go through there, there is a list in the paper I have provided saying you have got to do this these are the important things you need to check to see if you can in fact do it.

We, I know Parks Australia likes to talk about their Kakadu Monitoring Program, well we funded it just about 50/50 or better. And, so we funded the Watson Woinarski report, and went to Parks Australia recently on the impacts with the

quolls and we also jointly funded the work on the quolls with the radio transmitter showing deaths of quolls.

In the 90's it was discovered in Queensland there was fungus, there was a *Kitrad* fungus that infected frogs, it is probably alien and it is responsible for quite a significant number of frog extinctions and species in Queensland. It also infects cane toads and I actually reckon that is why you have the skinny cane toads on the coast.

That terrified me because I thought if the toads have brought it all the way from Queensland, there might be things going on in a more slower and more insidious fashion than I ever anticipated.

So I and various staff, at various times went out and collected samples of toads samples of frogs within the toads range and frog ahead of the toads range and sent them over to James Cook, and thank God they didn't have any. So that is very nice.

Ok, most recently, of course we have got the Parks and Wildlife Commission staff cooperated with the NLC and TO's and Parks Australia and God knows who else, to get the quolls on the island. I think they are to be commended and I know, I am sure I don't know, I am sure they did a highly professional job. There are some accountability problems with it and transparency problems, I don't want to go through it know but they are in the report I have given you. And I think, really over 20 years the Territory has made a huge contribution to looking at cane toads, certainly it is greater than any other state affected or unaffected and if you look at it dollar for dollar compared to the Commonwealth, in terms of our budget capacity versus theirs, I would say we are miles ahead. As simple as that.

All this information, you know, you have got all this stuff what do you do with it and how good is it and all the rest of it?

Well first of all in 1984 when I did my review I quoted 200 papers on cane toads, that is an awful lot. That wasn't anywhere near the total available then, since then Vandam and his report for ERRIS added 52 post 1984 and I know that he didn't quote a lot of stuff that had no bearing on Kakadu, things on the virus and the pathology and lots of other stuff as well.

In essence you are talking a minimum of 300, I would say in excess of 500 papers written on cane toads, now if you look at that objectively that is more information than as present on any other terrestrial vertebrate species or even invertebrate in the Northern Territory except perhaps rabbits, horse, cattle, cats, dogs including dingoes.

The only species that is native that might come close would be the red kangaroo.

I mean our threatened species in comparison don't even get a look in, we know a hell of a lot about the toad. Now, what I am going to say isn't controversial I don't think and it's just a quick summary of what we do know about the toad. We believe it is going to impact heavily and the evidence suggests it is going to impact heavily on the quoll.

Madam CHAIR: Are you saying, significant or nearly. Is there a scientific ...

Dr FREELAND: No, I am saying perhaps extinction. You can call it significant or heavily whatever you like, I mean that is heavy.

Madam CHAIR: I am just trying to clarify something.

Dr FREELAND: Yes, fair enough. The next thing we know is that cane toads do kill a lot of native animals. The next thing we know is that they eat lots of prey items, insects. The next thing we know is that they may reduce the size of some native population and I will talk about that in a bit. But the evidence is really difficult unequivocal and hard to assess and I will talk a bit about that.

It will cause the extinction I believe of a species of tapeworm, and there are likely to be de-stabilisations of some frog communities.

They will severely impact on species on goanna which have got large body sizes, I would fully anticipate according to the information we have from both my study, and what is happening in Queensland that they will recover.

Cane toads will kill some freshwater crocodiles, we also know they persist in large populations with toads, we know they can successfully consume toads and I will talk a bit more about that later as well.

The most important thing, and I believe it is critical for people to know and understand, is that the vast majority of the Territory species will persist following a cane toad invasion. It doesn't mean everything is going to be the same, but the vast majority will persist.

And there is no evidence to the contrary to that, and certainly it hasn't happened in Queensland.

Lets look at what we could do in way of a research, and again you have got to be really cautious. It doesn't matter how much money and how much time and how much effort you put into it, or anything for that matter. It is actually impossible to know the past or the future impacts of cane

toads on the vast majority of Territory species. We will never, never, never know.

So really what happens?, it comes down to a point where, when do we know enough? and what are we prepared to accept and what do we actually get if we did some more research anyway? So they are very important questions we have got to start to address.

Lets look at investigating impacts, this is a tough one. There are 2 big studies Cat Ling? and Watson & Woinarski one in Kakadu. It essentially broad scales survey based monitoring programs, based on fixed quadrants where they went and ticked everything off and caught things and recorded things, fantastic.

They have got major difficulties with those sorts of studies and in fact if you look at Watson & Woinarskis' paper, John has made sure that there is an excellent discussion in there about the limitations of those kinds of studies and I will just add a couple but we will go through it.

First of all you have got a problem and that is that you don't know what your sampling, you catch 5 of species X here and you have got 2 there, but the spatial and temporal pattern of variation you can't account for. One population might naturally be going up another might naturally be going down, so we have got all this variability going on out there and you know nothing about it and you can't control for it.

The second thing is there is a huge confounding influence from weather, both within a year in different areas and also between years. On top of that you have got patchy space and time occurrences of fire, some of ----- are burnt some didn't can you have got no control over that. You have got weeds that are patchily distributed, you have got feral animals that are patchily distributed and the impacts are patchily distributed.

Again you have got no control over those things and on top of that you don't know what it is doing to you there. So you have got all this confounding influences going on as well as the natural variability.

The next problem is you get very, very small sample sizes for the most of the species you are looking at. Very few of the species, you actually end up with enough data to know anything, it makes it very hard.

The next one is a statistical problem, if you have got 50 or more species on a species list and there all on the one data set, it is inevitable that you are going to make mistakes in your analyses. It is a simple statistical trick. You get what they call a type 1 error and that is falsely accepted there is

an impact when there isn't one, it is inevitable it will happen, you get 50 things 1 of them is going to be wrong.

If it is the same data set, caught at the same time, it is inevitable that it's going to happen so you have got that problem as well.

The other thing is when you are dealing with fixed quadrants and you have to, well, we have had to so far because we haven't found the way around it, it is the most practical cost effective way of doing it. But what you end up with is a lot of data about all this quadrants, all these quadrants in Kakadu you have got a lot of data on quadrants with and without toads. You don't have, this is what is happening to Kakadu, the big area. So you can't make an inference necessarily, you do because it is practical and necessary but in truth you shouldn't do it. So have got that problem as well, so you can't strap extrapolate globally from these little islands, it is just not on, but we do I mean we have got no choice.

To give you an idea of how this actually works, the CSIRO people did not find a little gecko called *Goharranana?* down in their study on the Roper River. Watson and Woinarski got a negative impact, now the reason they didn't have *Goharranana?* was because it was probably never there it was probably outside the range, so you have got that problem you do a study one place and another place, there are going to be different species and you are always never certain which species you are going to end up dealing with.

Both studies found negative impacts on Gilbert's Dragon, that is that striped lizard with the long stripe that runs around the edge of the creeks, they found a negative impact. But 10 years after the toad, you go down the Gulf and there the area is that long and they are still running around quite commonly, so again you have got a problem with how you deal with the information you are getting? Cat Ling recorded the frogs *Litoria Rubella*, a ruby tree frog, and the *Litoria Rothii*, the ones that have got that crazy laugh and lives in our eaves, found negative impacts on that. Watson & Woinarski didn't, they reckon they analysed they didn't find them and nor did I when we did our more detailed study down there looking at the impacts as the toads came through on the communities and the niches' and so forth. Again, how the hell do you interpret this?

Watson & Woinarski got a very weak suggestion of a decline in the 2 line dragon. Cat Ling didn't find any, I don't know why but they're down there nine or so years more after the cane toad invasion. I mean you can actually go there and not have much problem finding them.

The other problem is most of Vandam's species, that is the ERRIS study and all those species at risk, I mean you can

quibble about it right. I mean who would put a leave eating brush-tail possum, which is super abundant all through Queensland would never be interested in a toad in it's life, why would you put it on a list of things possibly at risk?

You have got black ducks, there is a whole, there are a few things in here that shouldn't be there.

Madam CHAIR: What about water monitors?

Dr FREELAND: Water monitors I have seen down the Gulf 10 more years after toads, that's all I can say I mean I haven't studied water monitors, but I can say that yes, they are present.

But the thing about Vandam's list is irrespective of that, I mean if you look at that list either the Watson or Woinarski or the Cat Ling study, either one the other or both studies either didn't find them the species, or there insufficient records.

So when you do a study you're actually looking at remarkably few compared to what the total number of species or species the pool says.

Mr BONSON: What about a study on Fogg Dam, do you think that would have an impact?

Dr FREELAND: Yes I will come to that, Ok.

Next one. Those kinds of equivocal data, the ones that really don't allow you to renunciative that null hypothesis that cane toads have no effect. Doesn't mean they don't have an effect, a effect, it just says you can't prove it, alright.

A good example actually, of the effect of weather and other variables actually is the Parks Australia funded study looking at the frog call monitoring project, they have got nice declines in frog calls, but hey the rainfall has been going down, you can distinguish that from the toad data at the moment. So hopefully that will get better, but it is the sort of thing that you can't plan for but it happens and it makes it hard. It is just one of the kinks you get in trying to do science.

If you look at Watson and Woinarski and their disappearing quolls from the quadrants, I honestly believe that it's clear, it's unequivocal. It is circumstantial but there is a very, very, very, very important impact on the quoll. It might well go extinct. They haven't in Queensland yet so there is hope I suppose, but I am taking a pessimistic view on that one.

But if you take the extra work they have done on the radio transmitters and actually documented toads dying from

quolls, I mean quolls dying from toads, then you can actually reject a null hypotheses you have got something really solid and really firm. We have got an issue and that issue is really important and they have been able to do something about it.

So really the 2 things that you end up with that are really unequivocal from these kings of data these survey, community board monitoring things, the unequivocal things are; it's gone or it's still there. Anything in between is just appallingly difficult to assess at this stage, unless you get a long string of data so you show a consistent decline or you get that reported from other localities. And at the moment it is very difficult to interpret.

Ok, but if you use that in measure, really at the moment all we can say is that Queensland is the only, the quoll is the only thing we have got that may be unable to persist with the toad other than my tapeworm, nobody else cares about it I reckon it's important.

Mr BONSON:

Just one thing with, I looked through it the other night, I suppose you come back, I find that really stretches to say when these issues and the data out there, do we actually scientifically refer to that. So at the moment it is only a proposition and the only scientific data we have is that quolls are going to go missing, but everyones knows that there is this ----- and data problem right across the board, respectively.

Dr FREELAND:

Well what I am trying to say is, and I was about to say it, is that if you actually put in more of these surveys and monitoring style projects you are not going to learn that much.

I would suggest that the best thing we can do is keep that one in Kakadu going, to see if we do get this long term trend, but spending heaps and heaps of money setting up more and more and more of them is not going to help you, Ok.

And even if you found something totally unexpected, what are you going to do?

Madam CHAIR:

I am sorry, I am just conscious of the time, we have only got 15 minutes left.

Dr FREELAND:

Well I have got heaps more to go.

Madam CHAIR:

Ok, we will find another point in time.

Dr FREELAND:

Well, basically the capture -----at Fogg Dam...

Mr BONSON:

Chair, do we want to ask some questions at some stage though?

Madam CHAIR: Yes, but as the time is moving on, could we finish the submission quickly.

Dr FREELAND: To hear the rest of it is going to take a fair bit. I will keep going and you can just tell me to stop.

Mr DUNHAM: We don't have to hear it all in one day.

Madam CHAIR: No we don't.

Dr FREELAND: Ok, now what I am saying is those sorts of studies aren't going to help us know what the impacts are, except very rare things like the quoll which goes down the tubes, the rest of it you won't know about, Ok, and that is an important limitation on funding those sorts of studies.

The other thing to look at perhaps is looking at an individual population. Can you monitor a population, like say the freshwater crocodile population to see whether it goes down hill. We actually put in place spotlight surveys at Elsey, Nitmuluk, crocodiles died seemingly from toads, re-surveyed and re-surveyed and up to the time since I was fired, up to that time you could not detect a downward trend in the populations.

Now the reasons for that is very simple, and it is the variability in the data, so wide that you would never predict that it would. You wouldn't know what was going on except there is still some 'freshies' in the pond, Ok. The data is too variable to be able to allow you to detect anything, we had the same problem with helicopter surveys of 'salties', we ran the helicopter surveys for years and years and years. Masses of data and we got CSIRO to help us with the analyses and what we found was, that the data was useless. It was absolutely impossible to use that information to predict or detect a change in the population, so you can lose 99.9% of the population with a helicopter survey you would never bloody know.

So there is not much point in keeping it going, so we turned it around and we went back, and on those rivers we did the helicopter work we turned it around and we put in spotlight surveys which would tell you within a quarter of a generation, is it quarter of a generation? half a generation. Which is pretty good.

If we were monitoring a threatened mouse that would be having to be able to predict for 3 weeks or something, so it actually is a fairly sensitive sort of stuff.

Ok, somebody actually proposed that we do a capture, re-capture study marking the crocs out at McKinlay, there is a lot of old data there, I thought it was a great proposal. A

couple of problems, you know 'freshies' die, some die not many, some die. But major populations exist, we know they actually eat toads successfully in nature I have seen it, they get flushed out of 'freshies' stomachs in Queensland and they did that when that study was being done on the McKinlay, there was an equivalent study being done in Queensland, with 'freshies' and with cane toads. So there is plenty of 'freshies', 'freshies' aren't to be worried about, but nonetheless, you could do a really good study, I mean it would be great science it would be really exciting. So why don't we just take that information you can create a good study.

How come 'freshies', not only just survive but they stop dying and they start eating toads, they don't eat them often but they do eat them. It is reasonable that they are actually evolving to get better at it, you could study it with no problem. All you would have to do is get out and collect clutches of 'freshies' eggs from a variety of rivers around the Territory coast starting from, say, down the Gulf somewhere where they have had toads for 20 years at various times up and include a few rivers where there aren't any cane toads, no one you would need a few.

Collect the bunch of clutches from each river, incubate them out you have got the hatchlings, put them through some sort of toxicity test or impact test from cane toad toxins, and what that would give you is a handle on the variation within a clutch, the variation among clutches within the region and the differences between regions and the toads ability to deal with toxins. In other words you could see whether evolution had happened and if you did that, what you should do for science this is all science! don't think there is any practical merit in this, in terms of looking after the problem called cane toads for conservation.

What you could then do, is study it as the toads whip through the McKinlay or something, and you would know what you looking for and you would have double, double proof. In that context, that going back and re-sampling of the McKinlay would be really good, but on it's own it is just going to tell us 'hey some 'freshies' die, most survive', we already know that so you have got to be careful about what you fund.

The Ecological Society proposing lots of replicated X closure so they can study competition, again, great science, should be funded but it should go through the ARC or something like that which is interested in the scientific merit of things, and not through a nature conservation agency. It is inappropriate, it is not going to help the management of the toad, end of story.

Ok, let's look at toad control. In the document...

-
- Madam CHAIR:** Before we do go on to toad control, because it is a step in your submission. Why don't I propose at this stage that there is an opportunity to meet again on the 10th June at midday, the Secretary of the committee has identified that a possible date, members are available...
- Mr DUNHAM:** That's next sittings?
- Mr BONSON:** It would be Thursday week I think.
- Dr FREELAND:** 2 weeks on a Tuesday.
- Mr GRAY:** Tuesday 10th June. Everybody is available but I could not a response back from your office Tony. It is a Tuesday.
- Madam CHAIR:** Could we organise a phone connection or will we just...
- Dr FREELAND:** Well if we can I will.
- Madam CHAIR:** so the committee.....
- Dr FREELAND:** No, I can't get with the committee, I will let you find that. I don't know what the timetable is, I know today it has been so long I will have to check it out, I'll get back to you.
- Mr DUNHAM:** Everybody else is available on Tuesday.
- Madam CHAIR:** Great to hear.
- Dr FREELAND:** So which date is it?
- Mr DUNHAM:** 10th.
- Madam CHAIR:** It is the 10th of June.
- Mr GRAY:** Sure.
- Dr FREELAND:** And confirm it, that it's here, Ok?
- Mr DUNHAM:** Can I just ask 2 things. First is I think it is very important that the closer we are getting is as much knowledge as we do have, is there a reason why this would be open next time, on the next occasion would it be a public meeting?
- Madam CHAIR:** No, no the Submission would continue in the public hearing.
- Mr GRAY:** Madam Chair can I just explain something. Because of, I mean the reason why part of this was a deliberative meeting, it wasn't meant to be for the purpose of trying to not have a public meeting. So next time ...
- Madam CHAIR:** I would obviously, at the outset rule that the oral submission aspects of Dr Freeland are a public, some of the matters
-

that we haven't intended to deal with are deliberative, that is all. When we come and someone wants to sit in and listen to what everyone is saying...

Dr FREELAND: I am not concerned.

Madam CHAIR: Everyone viewed this as a public.

Dr FREELAND: Yes, not concerned.

Madam CHAIR: I am just conscious of the time, we have got a few minutes before our meeting is due to finish and there are intended matters that we just need to quickly go through. So Dr Freeland if you don't mind, is there a time and place to cut your submission in terms of, if I just keep that shifting to some other aspects of your submission, it might be easier to...

Dr FREELAND: Yes, we just felt that the sorts of data you can have, and how you interpret it, for looking at impacts now I am trying...

Mr DUNHAM: What are we doing?

Madam CHAIR: Now you are about to move on to the, right.

Dr FREELAND: And I can do that or we can terminate it when we...

Madam CHAIR: No I just think if we get into that we won't cover that in 10 minutes.

Dr FREELAND: No, you won't.

Madam CHAIR: It's an estimate of timing...

Dr FREELAND: It's not too bad.

Madam CHAIR: Fifteen minutes to half and hour and then we need to go on to questions as well ...

Mr DUNHAM: Did Parks and Wildlife get back to you?

Madam CHAIR: I just think it is a logical point which is to break the submission into partsm ...

Dr FREELAND: That is alright, I have got no problem.

Madam CHAIR: And we will look at some confirmation of the period on the 10th, Tuesday 10th at noon, confirmation from Dr Freeland's availability and Mr McAdam.

If, Rick you can give me confirmation on Dr Freeland and Mr McAdam that would be great.

Mr GRAY: Sure.

Madam CHAIR: Sorry we have to break it ...

Dr FREELAND: No, that is alright.

Madam CHAIR: But I have many commitments outside of this committee.

Dr FREELAND: Plenty of time these days, most days.

Madam CHAIR: Thank-you very much for coming in today and we appreciate your submission.

Members can just wait for a few more minutes, we will kick through the rest of the agenda.

TRANSCRIPT NO. 6B

Dr Bill Freeland

Tuesday, 10 June 2003

PRESENT:

Committee: Ms Delia Lawrie, MLA (Chair)
Mr Tim Baldwin, MLA
Mr Matthew Bonson, MLA
Mr Stephen Dunham, MLA
Mr Elliot McAdam, MLA
Mr Gerry Wood, MLA

Secretariat: Mr Rick Gray
Ms Maria Viegas

Also Present: Ms Freeland

Presented by: Dr Bill Freeland

Note: *This transcript is a verbatim, edited proof of the proceedings.*

Madam CHAIR:

Alright I call to order the meeting of the Legislative Assembly's Sessional Committee on Environment and Sustainable Development. We are continuing a public hearing into the inquiry into the incursion of cane toads into the Northern Territory and specifically we are hearing from Dr Bill Freeland. Dr Freeland thank-you for being available again and we finished at a very interesting part of your submission.

Dr FREELAND:

Yes, it got a bit rushed towards the end there. So I thought what I would do I have got a couple of things I need to add and then I will just do a quick re-cap, very briefly of where we got to.

The first thing is, in the goannas, I gave you the graph in that attachment of the recovery of goannas, it was all very rushed and I didn't say something that is very important.

What seems to be going on is natural selection and when you get natural selection at that extent, the recovery that is there need not be indicative of all future behaviour of the populations. It depends on the genetics of the situation and for a long time, hence you get further unpredictable fluctuations in that population through time, simply because of things like, this equilibrium. Epistatic effects in the gene's dominance and recessive relationships and so forth.

So I don't want anyone to go away with the mistaken impression that that recovery is necessarily firm. It could

fluctuate quite dramatically, Ok.

The next one is, I talked about skinny toads in Townsville and I pointed out that I thought a good hypothesis for it would be the kitrid, but I didn't actually explain why, Ok. I did point out that the foods were the same the parasites were the same and I did point out that taking a sick toad into the lab and feeding it, in the best of circumstances doesn't necessarily mean a thing.

I put in a photocopy of the paper concerned, and I will just explain it, there should be copies here for everyone, it is the second page that is important, thanks Tim. And if you look at the second page there is one of those horrible things called graphs. Now, the dots on the left of the graph refer to the populations of toad data that we got from the Gulf of Carpentaria level.

And if you look at the bottom here, you have got something like a little 'A' that is small toads, medium sized toads and large toads if you like. Now around that you are talking about the body weight of those toads in those 3 categories and you have got the average, which is the nice round dot in the middle. Around it you have got what they call a standard deviation, that is the measure of the very ability within the population.

Now if you just go to the next one over, you have got rural toads around Townsville and clearly there is a big difference in that average, they're much thinner for the given sizes that they have got to. But the important thing is not only that, you have got a much larger variability around those averages, it is about 3 ½ times the variability as a fraction of the mean, in other words it is much, much more variable and it is that variability that says to me 'look this isn't a population that is starving where everybody gets skinny, this is a population where many have got something and many don't.'

In other words you get an excessive amount of variation occurring in that population and starvation simply doesn't account for that, or I wouldn't expect it to account for that. Ok, so those 2 pieces of information are important, I talk a lot about Territory involvement in cane toad research and management in the past 20 years. I pointed out, we've done a hell of a lot, and I thought the Territory should be proud of us having done that.

I am aware there are some unfortunate things that have come across to this committee, stories about a CSIRO scientist Fred Whine and young women, I don't think that is evidence. If the person concerned had bothered to talk about the research, they might have said something different, they never did talk about the research and I give

you another quote from that same set of urbans. You can't have legislation that is draconian at the level of resolution of individual animals and then just walk away from something where there is hundreds of thousands, if not millions of units of wildlife going to be killed, it just doesn't make sense. I need to point out that that is in fact the logical fallacy, complete nonsense, it is to say 'don't paint your house to protect it from the elements because one day there might be a tornado, in other words it is complete nonsense what has been given.

And regulation of trade in while, life is appropriate even though we don't have way of controlling cane toads, I mean there are just totally different issues and they can't be put together in the manner they have. I would also like to point out that that evidence said Parks and Wildlife said that there wasn't a problem with toads that is completely fallacious, inaccurate and not very helpful to the deliberation of the committee, if we are serious there never was 1 million dollars over 2 years that I have spent, I can assure you of that. I don't know where anyone would get the notion that Parks and Wildlife research group has given 1 million dollars over 2 years for any project, I mean it is just not on.

There was also a comment about the paper I did, and I discussed here and I think it is important that we talk about it. In the paper, it talks about the impact of competition from cane toads onto frogs in the dry season around waterfall. Now, that time of year was chosen because that is the time when you get massive congregations of huge densities and maybe frogs, huge densities of cane toads and if you are going to have competition in some form, that is where it is most likely going to be expressed.

So we did 2 actual things, and it is very important. One was an experiment where we literally over a 250 metre length billabong we move all the frogs, that is a pretty savage thing to do, and we did it in 5 areas with toads and 5 areas without cane toads, and we came back and we monitored the recovery of those populations.

Statistically, those recoveries were the same, Ok, in other words the cane toads weren't shown to have an impact. In my paper I actually point out that one of the issues that you have working in the top end, is the fact that the variability in what is going on naturally is huge.

You have got fires and particularly cattle, if you want and impact on frog communities pick a cattle don't pick cane toads. And you can actually go in and the whole place is being grazed and you lose a whole bunch of frogs.

So the naturally variability that is going on besides the cane toad is very huge, I actually pointed that out in my paper

which was, I believe Dr Webb's comment. It was actually written in the paper so you did actually read it and that was good.

The thing that is missing in the comment is that we did something else that is very important and that is to be examined, the niche' relationships of the toad versus the frogs. In other words we use the patterns that resource use overload, amongst the frogs and compared it with the cane toad.

And again he found that there is absolutely no reason to suspect that any resource or related issue was going to result in competition between the native frogs and cane toads.

In other words we have got 2 things going on. One is a highly variable system where we weren't able to demonstrate anything and actually I don't think anything happened, but you can't dismiss.

Because you can't dismiss a null hypothesis, where does it leave you?

The other one is the niche', and that was clear there is not likely to be any competition.

Now looking at a hypothesis concerning competition amongst the frogs is a totally different question from looking at a hypothesis that says, 'because of cane toads coming in do frog communities in some way get disturbed'. In other words is there an impact?

We went out and we actually did a lot more data we analysed it in a very different way, just straight off the cuff data and what we found was that this equilibrium causing the local communities, and it is in that paper I gave you as an attachment, associated with the loss of the tapeworm.

So you have got to be very careful about what it is that you are talking about. If you are talking about competition that is one thing, if you are talking about something else it is a different thing and you have to be very, very clear and I don't think those comments were clear, and I needed to bring that to somebody's attention.

And finally, this notion that Parks and Wildlife walked away and did nothing for the last 10 – 12 years, as per that evidence and as per Mr Lewis' letter approximately 9, 10 months ago are completely erroneous and fallacious and it is unfortunate that people haven't checked the veracity of these things. Those things, getting currency does nothing for the moral and confidence of the of Parks and

Wildlife and I think it is a real shame that that hasn't been defended.

Okay, I then state and knowledge about the cane toad and we pointed out that we have actually more scientific research and more knowledge than we have on anything on the Territory, except perhaps rabbits, horses, cows, cats and dogs with the possible exception of the kangaroo but I don't believe it.

Okay, we don't know everything, can't know everything but we do know one thing and that is the majority of the Territory's terrestrial species are going to persist and that is experienced both in the Gulf and from Queensland.

Mr BONSON:

That was persist, not go extinct?

Dr FREELAND:

No matter how many resources we have got, we are never going to know everything, simply can't be done and so I went on to look at how you might go about looking at impacts and will I discuss different survey methodology, the difficulties that produces and the types of data you get in terms of sample sizes only a few of the species you actually find anything out about on and on and on. And the only thing you get out of it is really either presence or absence like we got the quoll, but for nothing else.

And the other one is that if you do it many, many times from 1 to 2 species you are sampling you may get a trend, Ok. But it is very, very difficult to do things that way.

And that brings me, because Matthew right at the end brought in the question of I think it was base-line information and it is a very, very important thing and the data that we have been gathering over the past however many years it is, 10 years say, particularly with Dr Woinarski is designed for a particular purpose, it is supposed to be quick it is supposed to be because we are not over endowed with resources and it is supposed to get results designed for a particular outcome. And that particular outcome in the design was 'we don't know anything about where anything is and we need more data'.

Until you get more data you can't plan where you need a new park, and you can't do lots of things, so that is what the data was really designed from that is what that methodology achieves admirably. You learn which animals are in which parks and which catchment, do they live in the rocks or do they live in the swamps, but you don't get the sensitivity in the data that allows you to say 'yes this species has gone up' or 'gone down'. And we will come back to that right at the end because it is a very, very important question.

The next step is to look at species that are actually amendable to close monitoring individual species like, monitoring crocodiles and so forth. And the example I

talked to them a fair bit about was the McKinlay proposal and again back to Dr Webb I think it is fair to say that at no stage was there an official directive from me or to my knowledge anybody else that rangers at Nitmiluk not report on the In fact, I was tearing my hair out trying to get the information on a regular basis, again we have got a fallacious statement about something that actually knows nothing about what was going on.

Ok, the other problem with the proposal I pointed out, was that it doesn't make use of the knowledge we have, it doesn't acknowledge an extensive piece of similar work was done in Queensland with cane toads, doesn't acknowledge that crook 'freshies' actually supply the invasion, 'freshies' can in fact at times eat cane toads.

In other words, the thing at McKinlay wasn't a study of the impact of the cane toad, it was a proposal to study one component of the impact without actually taking into consideration what the total impact in the longer term would be. We can't even say 'look we have lost 10, 30 percent of whatever might be of the freshies' doesn't help us. But if you go and say 'look we have lost 10-20 percent of the freshies but we know that it evolves and something happens and we get back' the story you are telling is very different. And I think the motivations are very different and certainly one is a lot better science than the other.

Madam CHAIR: Just on the McKilay, we have received a submission that it is the only long term study of freshwater crocodiles.

Dr FREELAND: Yes there is one in Queensland. I think you will find that it qualifies it in the Top End. And that is true he is the only person... ..

Madam CHAIR: That is the only one in the Northern Territory?

Dr FREELAND: That I am aware of, certainly.

Alright, those studies and some with Rick Shine's stuff and the stuff been done on goannas out at Kakadu and some of the stuff being done by the ARC Wildlife Research Centre out at the university are all fantastic, they are really good. Really scientifically interesting, beneficial that way, worth doing but let's face it they are not going to help us do anything about cane toads, the major beneficiary of science and it is not going to help us solve our problems, we simply spend a lot more money watching what happens and we don't do anything.

So which brings us, I believe to where we stopped, which was looking at what is actually happening or has happened with cane toad control. I was thinking about it again and the thing that fascinates me is that there is so few options, and I

rack my brains for 20 years about it and I know a lot of good people have, we had the big CONCOM group with all the top frog people and everything from Australia meeting regularly every so many months and there has just never been good, which there probably aren't any options really, in terms of thoughts or ideas, I don't know.

Some of them are crazy, I had one guy who came into my office and he said 'all I need is \$350 000' and I said 'what do you want that for' and I said 'I will get rid of all the toads' and I thought 'gee this is alright I can do this, I will find the money somehow if you can do that'.

And what he wanted to do was collect a whole big mob of toads, a tonne of toads or something, he was going to grind them into a thin paste and he is going to suspend them in water and he is going to hire 'croc busters' and he was going to spray the whole of the Top End with toad juice. And I said, 'what is that going to do' and he said 'they will all go away'.

So that is one level you get, and you get an awful lot of people with silly ideas no sense but they can take up an awful lot of time, it would be very difficult. Then you have got the people who look at traps, I have had 2 trap proposals, none I have tried desperately to find out about. There is a guy in Mt. Isa who never responded, he reckoned he had an electric grid trap and every time toads hopped on it, they fried and they could never get any details because, I had visions of people standing on it and bandicoots fried and all sorts of things.

There was another trap person who wrote me a letter and he said 'look this thing is ready to go, it works no problems' so I went back and I said 'tell us about it, how do you keep the other animals out and stuff like that' he wrote back and said 'I need so much money, fly me up I will build it and I will show you' I don't pay holidays on spec for people down south to come up and do that kind of stuff.

Other than the stuff that we have already talked about in terms of effects, really the only intelligent option that people have come up with is biological control. People have approached the of a panacea, I know one very prominent American ecologist by the name of Dan Simbaloff, pretty famous who believe that we should never do biological control, he said it just compounds the problems you have already got. So that is a rational sort of a view point and he can defend it quite well.

I think though, that is an extreme position but I think we need to look at what is involved in the biological control and we need to be very, very careful about what is involved and we have to be very realistic in the assessment than we have on what is going to happen. Now I am not a qualified

molecular biologist, I just leave all that over the other side there for the people there to enjoy them and talk more about the ecological things. The important thing about it is you only need a few things. You need lots of transmission so it gets around quick, and often and consistently. The impacts have to be specific to what you are trying to get rid of. Preferably it just persists everywhere, you don't ever have to worry about it again, because otherwise you have got people running around the place dropping little buckets of things here and there. And that is expensive and it takes time, and obviously it has to cause a very significant mortality or militation on the organism that you are trying to expose of.

But the steps in getting to that complex and there are a whole sets of 'trip' mechanisms, if you like, or triggers or milestones that need to be looked at along the way, and I am just going to wizz through them.

And the things that I don't believe, I have tried to get it out of CSIRO and not had any real success to get the detailed research plans, I can't get them. But basically, what they are working on at the moment is disruption, Ok, and that is disruption of metamorphosis from tadpole to the adult morphology of the frog.

The problem is it hasn't worked yet and I really think CSIRO needs to tell us, everybody in fact the public, how much more do you need in the way of time and resources to be able to tell us whether or not it will possibly happen, I mean that is a fairly fundamental question.

The other thing is whatever it is that if it does work, they are going to have to check against the native species, irrespective of the vile carrier the thing itself, the chemical that causes disruption of the metamorphosis needs to be tested against natives before you go a step further.

The next one, obviously they have talked at various stages about a specific virus, now they are currently talking about a more poly-specific virus. If it is specific, obviously it needs to be really specific, Ok, and there is a problem there and that is I don't know of a single amphibian virus, I am not a biologist, but because of my interest I have covered the area fairly well and I can't think of a host specific amphibian virus, so we need to talk to them about that maybe.

Because it is not a host specific carrier, in other words it infects frogs and fish and toads and everything, there are certain advantages in this because if you have a really effective biological control on cane toads only, what happens is you are going to kill all the tadpoles and all the metamorphs that leave the water. And if it was specific,

what that means is that there is no virus left, so it is gone, you will lose your control next time a toad comes in and drops an egg, it is off again.

So if you actually have something that infects a lot of things there is that inherited advantage, if it is not pathogenic to the frogs and the virus' grow there and they can keep it in the environment.

But there is a lot of questions involved in that, in terms of if you have got a artificially mutated virus and you have got the wild type sitting out there together, then you need to know a lot about what happens between the two. We need to understand the natural virus' temporal and spatial patterns of problems, in other words how common they are. Really because it if rare or it is episodic, it surges out here one year and maybe a thousand miles away next, or it is highly pathological and the thing is not likely to survive very well in nature. I mean if it has got a really patchy distribution or it confined distribution, it is not going to spread everywhere and it may not be an effective biological control.

In competitive actions you have got the wild type and the mutated type, you have got really serious questions about rates of you have got them in different hosts, they are competing for a new host, in other words the virus out there, you need to understand the relative rates of replication of that virus and how fast they are pumping them out, you need to know how long they stay in those hosts and you need to know what happens when you get both virus in the same frog. Which one is going to win, because if the wild type is highly competitive in any of those senses then you are not going to keep your attenuated virus present in the natural world.

The other thing about that is, as I said I am not a molecular biologist, but if you have got a wild type and an attenuated undergoing natural selection, what you quite often select for under those circumstances is actually pathogenicity. So you may actually get a selection for something that is really pathogenetic.

Mr WOOD: Can I ask, could you end up with a more of a highly resistant cane toad, I was just reading an article on...

Dr FREELAND: Yes.

Mr WOOD: Are there any others, they have found, they have put in plants and the big risk they feel is eventually if the caterpillar becomes so that even the plant can become very resistant caterpillars.

Dr FREELAND: Yes it is exactly the same, if you look at a plant, if you are chewing on a it is full of cataract If you are chewing on it you are likely to die of a heart attack, if you eat

enough of it and get the right one.

But there is bugs that eat it like the wonder butterfly and stuff and they look out to the way of dealing with it. Ok, so when a cane toad a nasty toxin it doesn't matter whether it is the plant who puts in it, or whether it is a natural evolution of a plant toxin. Some will always break through that barrier and continue to feed it and it becomes what they call like an 'arms race', Ok. Between the plant and those things trying to eat it and all we are doing with the artificial cotton is just a new way of doing that, and it is the same old process yes, it will happen.

Ok, if we actually get control and we to augment it, in other words a spatial and temporal distribution, not sufficient to get any control of cane toads. It is going to cost a lot but the other thing is you really in that case better be sure that you are not wiping out the locals, because if you are going around there adding and adding virus to the environment you had better be really certain that you are not dealing with something that is a pathogen.

And the stability of the genetic modification itself is always something that concerns me, particularly in this case where you have got competition occurring within a host where you might get transfer of genetic material from one strain to another, and you may end up with something that is really pathogenic and nasty so we don't know. I mean I am not an expert in that area, but these are questions I think that CSIRO needs to look at and there are probably more, I mean they are just the ones I have come up with. And I think there are questions people need to know about.

But whatever the answers are really it is going to cost a lot, it is a huge bit of work there is a good probability that you might get a result. You get those epidemiological constraints that I have talked about, are actually quite large and unless you deal with all those questions of course, you may pose a bigger danger to the ecology of the Top End than the toad does itself.

Even if those things aren't important, and they have actually come up with this great virus, there is a real problem and I think it is a serious one, when you kill toads even if you kill lots of toads you may not get anything you are looking for, in other words what are the conservation outcomes you are trying to gain from killing a toad you have got to know what those things are.

You can't just simply go out there and spend millions of dollars on something without actually thinking about, or you can't afford to do that, just think it is all going to get better if we kill a lot of toads it may not, Ok.

And it is very simple because we don't know how many toads you have got to get rid of to get what sort of recovery what is recovery, hell we can't even measure most of the

impacts the ones that we can are either extinction or a whole change in a population from natural selection, are you going to recover from that and what does 'recovery' actually mean.

If you have got partial effects, like say, the geckos turn out to be a depressed population, they might come back. But a lot of these things may not change and think about it to, the goanna is a big beast it lives a long time so does a toad, you don't need many toads in a paddock for a goanna to find it. They are very voracious hunters they will find a toad if it is in the paddock, certainly within its lifetime I bet a lot sooner.

So there are serious problems about what it is we mean by control and what we actually may or may not be able to achieve to get the things we are looking for.

Mr BALDWIN: Bill, just on that, it is pretty important I think that, you are saying all of this work, biological is going to take a long time it is going to cost a lot of money, it is fairly and it could be dangerous in terms of...

Dr FREELAND: Unless you do all the right steps.

Mr BALDWIN: Yes and you do all the steps, I am just asking the question what are we trying to achieve in terms of the benchmark for success. Are we trying to wipe out half the cane toad population...

Dr FREELAND: And what do you get from that?

Mr BALDWIN: I realise this is the question now, of what recovery rates and all that. We have got to really set a benchmark of what we could call a success for the spending of all the dollars.

Dr FREELAND: Remember I talked about the CONCOM research, one of the things we did there, and actually it was done quite well by Ross Alford and his crew at James Cook was the development of a population model of the cane toad. Now the objective was to look at which life history stage was the most appropriate for actually focusing on in terms of biological control. In other words which life history stage, to kill it off you are going to get the biggest bang for your buck.

Now if you think about it, you have got, 1000 eggs go in alright, and by the time they leave the water you are down to less than 5%. Now by the time you get through these little metamorphs, these little vulnerable things that are eaten by ants and spiders and dry up in the sun, you are going for less than, I think it is less than .1%.

Now if you are focusing on that part of the life history, you are not going to achieve a lot because most of the mortality has occurred. If something is very rare, it is hard to get rid

of it and it is going to be very, very difficult to get a sustained impact. Where it becomes important to control things in toads is actually at the adult phase because that little .1% of what I could have that .1%, very, very few survive.

When they grow up each of those females has got such a huge capacity to lay eggs, but that is where the most effective control is actually potentially there, it is a mathematical reality.

Madam CHAIR: You don't think the focus on the CSIRO focus, is the right focus at the moment, is that what you are saying?

Dr FREELAND: I think it is assuming that if we get this virus, I believe this to be their assumption I don't know, but if we get this virus we can have it everywhere and not a toad will leave the water, alright. Because if you have got, if you do that for say 9 out of 10 breeding habitats and they are patchy, they are not consistent aerial, toads are very, very selective about...

Madam CHAIR: I thought they were in the water they just couldn't get to the breeding ground.

Dr FREELAND: No, what the idea is, is to actually disrupt metamorphosis and so that they actually die very early. They modify it now since it didn't work and they are saying 'well maybe it won't survive very well' they don't know they are just going from step to step to step.

Mr DUNHAM: The is water, it is not the actually animal.

Dr FREELAND: Yes, it is carried in the water. And basically the animal sheds the virus...

Mr DUNHAM: Into the water.

Dr FREELAND: That's right. But the thing is if you have one in one hundred even, natural sights that doesn't have the virus you are going to re-populate like that, because the important thing is the adults and they are going to be everywhere, you are not ever going to kill off all the babies, it is just not going to happen.

Mr WOOD: Should we be looking at a, more of a shotgun, using different approaches or a range of approaches. So you might be looking at something at the beginning, to follow up where you were saying at the adult stage you should be looking at another option. And then there was talk about pheromones, being a possible way of...

Dr FREELAND: I have thought a little bit about pheromones Gerry. The thing with pheromones is that, there hasn't been, you know Mike has really talked about a lot but he has never actually produced, this is what I think is happening, this is why I think

it, these are the experiments I would like to do, here is the protocols and if it works this is how you can use it to control toads. It is all up in the air somewhere and it is hard to grab, well she would right it down.

Madam CHAIR: Would you see a body of experts rather than parliamentarians that are finding experts who could assess any biological control proposals as being a step forward? And literally put it to people like you have.

Dr FREELAND: And Ross Alford and so forth? Yes I think it would be useful.

Madam CHAIR: You think it would be useful?

Dr FREELAND: Yes, just a review of what is going on...

Madam CHAIR: You keep saying CONCOM worked for the period it was there, it's focus it had some focus on the quolls?

Dr FREELAND: Yes I think what it is, is that they have given it to the molecular people, they work inside not just an air tight laboratory, one that sucks in or something, they never see the world and everything goes through a petri dish or whatever it is and they really don't go walking in the bush out there catching toads. Until you go out there catching toads and trying to look at what is really going on, you don't really appreciate the limitations of what you are doing. And if it really is like I suspect, I am not saying it is that it is confined to that little molecular group without talking to the people who have got a bit of epidemiology and a bit of ecology, then it probably would benefit Delia.

Madam CHAIR: And I was going to say, just when you started to touch on my supplementary question on that, your view of a panel of experts?

Dr FREELAND: I think you would need someone to do with, you need good epidemiologists and ecologists, you certainly need Ross Alford and his model, we can evaluate the model at the same time. You need the people from CSIRO obviously, and some independent molecular biologists, you would need to focus on what are the epidemiological constraints and what do we need to make a theoretical thing work, or are you going to say 'lets us look at the molecular biology and biology of this, they really are quite separate but they have to be overlapping.

Because these people can raise questions that these people won't have and vice versa, so you need fertilisation but when you set up a group they have got to have 'a' task, - they will around for the next 30 years mate, and scientists love it.

-
- Mr WOOD:** Would you need a devil's advocate for it to also work? I mean I basically ask you some of the questions you...
- Dr FREELAND:** Yes, it has to be that's for the budget process.
- Mr DUNHAM:** This thing will eat money hand over first and then someone says 'what is it we are trying to buy?'.

Question one is what do you want to buy with your input with your money?
- Mr BONSON:** Bill I just noticed in your paper your mention about this Commonwealth responsibility.
- Dr FREELAND:** I think that is very important, toads are everywhere. I have got a little thing I am talking about basically the Territory is a big place, 20% of Australia, it is also a it'sy bitsy little joint. Very few people, and our budget is trivial compared to other states both in conservation and in total budget. It makes anything difficult and I think it is inappropriate for the Territory to actually go into this because it really is a national responsibility and I believe if it's to be done then it is CSIRO's and it's the Commonwealth Government's responsibility.

There is a typo in my document, very subtle, but one of them was the date of the establishment of the CSIRO involvement right back, that was a Bob Hawke election promise.

Where was I? But yes, I think it is Commonwealth, the Territory just doesn't have the resources and I will get into it how you work out priorities because that is always the difficult part of it, I mean it is really hard.
- Madam CHAIR:** Well we have heard some evidence before that, the partnerships could be between the Commonwealth, CSIRO, Northern Territory Queensland, WA, NSW and South Australia being the state and territory level jurisdictions that effectively could be affected by the cane toad. Would you see that as being a viable option?
- Mr FREELAND:** I can say 2 things. We have been there done that Delia, and it is a nightmare. You get 12 months into the project because they might come willingly, you have got to cobble it together nail it down weld up the seams and you turn your back and next year you won't get any money because they have all walked out and you have got contracts on your hand with such and such set of researchers to produce such and such a results, and you have got no bloody money to pay for it. And mistakes are just,they did, repeatedly. I used to be on the farm and I didn't even get the money.
- Mr DUNHAM:** There is a bit of folklore around about Queensland then,
-

nonchalant, it wasn't just about the whole issue. Is it because they have had so long that they realise there is very little they can do, or is it just a sort of, we had some evidence that it was something that was unique to Queensland so therefore they took it on as one of their icon things.

Dr FREELAND: No, I don't think that is relevant. I think they don't believe it really had a huge impact but they are used to it, it is part of life.

I mean, give me an example there is all this stuff about world heritage and RAMSAR heritage and the status of Kakadu and the values that go with it. I know the world heritage committee is a fickle and inconsistent group of people, but you have got to remember every world heritage property, every RAMSAR property in Queensland was listed with a cane toad running rampant through it.

Mr DUNHAM: How many sites would there be?

Dr FREELAND: Oh, it's the wet tropics, RAMSAR couldn't tell you there is several RAMSAR in the wet. I think it is the wet tropics and Fraser Island to be the big ones, I am not sure if the Queensland, South east forest one got up or not, I can't remember.

Mr DUNHAM: There are a couple of them.

Mr BALDWIN: In significant areas, yes.

Dr FREELAND: Yes and they are very valuable areas. And I don't believe that they're, obviously the World Heritage didn't think the cane toad had impacts on those values, but whether, how they could then query Kakadu I don't understand, but they do that they are very strange.

So those sorts of questions get very political and difficult, mortal scientist.

Ok, let's look at priorities, because that is really what we are talking about, and in the best world of course, hey, the Commission would have had millions and millions of dollars and no other problems and we could have had the thousand rangers out there building fences half way across the Territory. Employ half the Territory, 1 every 10 metres to make sure the toads never come through and all the rest of it, life's just not like that.

So you have got all these other problems and I think it is important to put them in a perspective and that is really the only one, you have got camels and the are really having a hard time, we actually started looking at what needed to be done, we counted them and hopefully that is

going to go ahead with some sort of control program because we have put a lot of effort in that, and it is necessary. Donkeys and the and that is a program that is really working and it has had huge benefits.

But by the same token Gulf country has never been touched and it is a shambles. You have got the VTEC remnants of the buffalo that were left behind which I always thought was a big mistake, the thought it was a wonderful idea.

Mr DUNHAM: You will never win that one.

Dr FREELAND: I know, I hear that! They are coming mate!

Mr DUNHAM: They sure are. Tuberculosis

Dr FREELAND: I should have dug out the first when I got to the Territory in 1983, I drove to Katherine and I counted every dead buffalo on the road and it would blow your mind. And it really was staggering and you can go down there now and you will not see a carcass.

Mr WOOD: Not a tropical anywhere.

Dr FREELAND: I reckon a lot of people went bankrupt in the panel beating business when they got rid of mate. Fire, and we have had some huge advances of fire we have spent a lot of money on it, both research and practically, but it is still managing us, we are not managing it. A long, long way to go and it is largely a resource problem, partly a resource problem, there is an intellectual problem there but are ways to get over that, again, the grass I believe is one of the biggest issues facing the Territory particularly in the Top End.

In terms of impacts on bio-diversity and everything else, mate, cane toads is a blessing in comparison, it is really bad. *Buffalo* grass in the south although the pastoralists love it, and in conservation terms on a similar scale if you want to see *Mimosa* just go to National Park it is wall to wall, it's terrible.

The biological control might be beginning to work but I know in Costa Rica, where it grows naturally, because they work on toads in Costa Rica, you can't walk through it there either mate!

I notice that in the DPIE Annual Report last year they listed 201 species as being potentially threatened. It took us a long time to get that data, by the way, huge amount of effort.

We have only got 3 management programs for threatened species. There is 2 more out for public comment I believe. We have got recovery management on a couple like

accacia peus, accacia deliana, mulla??? and so forth, but really compared to the need it is terrifying and not one of those 201 threatened species is threatened because of cane toads, it is a bit difficult to think about it is a huge issue.

In the Annual Report last year, we over a number of years increased our accountability and transparency to try to inform the public, not just, we did this great project on weeds and we did a great project here, but to actually tell them 'hey on our parks this is where we are at with weeds, so much of the parks are covered with this much and so many weeds on the park and so forth.' Get rid of accountability and to the management, so at the end of the day you are not just spending money doing projects and having a good time, and seeming to do good but actually coming up with the goods and saying 'these are the outcomes of where our management is at'.

And I think they are the kinds of things that we need to do but that has just simply disappeared from the Annual Report and I thought that was...

- Mr DUNHAM:** Isn't there a statutory obligation, about...
- Dr FREELAND:** Yes there are statutory obligations that Parks and Wildlife introduced, 2 pages and you can't fit many in there you can't get much in...
- Mr DUNHAM:** But they have to report under the Act now...
- Dr FREELAND:** They do, but most of it is financial. Treasury was...
- Mr DUNHAM:** Don't they have to report park by park, or is that only when you do a management plan?
- Dr FREELAND:** No, that is only under a management plan. But this was just to get an overview of where the money went in terms of what you got out of it, instead of saying you have got a beaut project on whatever it was, you say 'look you know on the parks we have got so many weeds and we have got this problem', and the next year, changes, you actually see something improve.
- Mr DUNHAM:** In fact the Auditor-General has been calling for that.
- Dr FREELAND:** Yes, I have been trying to get him to do it, and we actually set up an audit system, I know, it never got completed after I expired last year and I know it is not being done this year and I just think that is criminal. So we have lost a lot of...
- Mr DUNHAM:** You are talking about an internal audit system financial, or audit system...
- Dr FREELAND:** This is not financial, this is actually an audit of the status of

the parks and it is not the best thing in the world, I mean it is very crude but it was a first step. You are introducing major council changes, it is not done over night, and the idea was to get them working and thinking about it so initially they wouldn't have any systems to even be able to do it. So you have got to get a very basic thing and then they will put some systems in place and you can push it a little bit more and more and that is the way to do it. And we are moving down that track but it has obviously died, or seems to have died anyway I am not really sure.

The next thing of course, is that under the national bio-diversity strategy.

Madam CHAIR: Why do you think they keep going?

Dr FREELAND: You would have to talk to the current Director of Parks and Wildlife.

Madam CHAIR: Do you think they received any sort of advice?

Mr BALDWIN: No, it hasn't appeared in the Annual Report.

Dr FREELAND: I have no inside information on that sort of stuff, Delia. You would have to talk to the Director of Parks and Wildlife.

The system of Parks as a whole of the nation is poorest, in terms of the national agreed criteria, comprehensiveness, adequacy, the presentiveness we made some strides and kicks, extensions reserve in Alice Springs but not a lot has been happening and we really do need to do something about that.

The turnover in rangers is frightening. It is particularly targeting the T2 and T3 levels, it is obvious when you go around the parks people are gone, they should be there, you ask where they are and they have gone. The T2 and T3 levels are very important particularly because of the actually structure of the rangers, there is a quite significant numbers of the T5, T4 levels who are getting to retirement age and basically those middle ranks have been gutted now and if it keeps going, it is going to be real strife trying to replace them. Particularly as no longer, attractive the outside appears to be and that is basically low wages, I mean a T2 in NSW Parks can pull in \$52K per year, I can't tell what ours is but I can tell you it is nothing like that.

We have got poor remote area support and I would like to correct something I wrote, if I may. What I wrote was that the recent initiative for remote support in terms of training and so forth didn't apply to rangers that was based on information, I actually phoned up DPIE and talked to HR not Parks and Wildlife, identified myself and they said 'No it doesn't apply to the rangers', so I wrote it down. A day or

so later, I got another call from DPIE saying 'Oh Bill we told you wrong', so I also checked the ACP and again identified myself in my e-mail and they said 'it does apply'. But it doesn't really change the inequities that exist, the rangers are paid compared to coppers, health workers, teachers, not only are they getting worse wages they also have to pay rent, electricity, water. Comparative the terms and conditions of service in the remote area are a disgrace compared to what, it is grossly inadequate that is all I am saying.

Mr WOOD: What is their proper qualification?

Dr FREELAND: It varies, you can be a professional or you can be a technical.

Mr WOOD: I was told some of the rangers have had Bachelors, and that they might as throw them in the rubbish bin.

I am not saying they should do it, but that was the impression, that if you were over qualified for the work...

Dr FREELAND: We have got 2 streams, well there is 1 stream but you can have different qualifications and different complimentary things. And the rolls are different, where we spent the last 15 years trying to get a higher level professionalism there. Because having good ole' boys out of the bush it really helps you make a fence and clean up the camp and the rubbish but it doesn't help you do what you are supposed to do, which is properly monitored and run by programs big programs and so forth.

So when I came to the Commission, there wasn't a single ranger with anything like a tertiary qualification, it has been a revolution over the last 15 years...

Madam CHAIR: That isn't the case throughout Australia, surely.

Dr FREELAND: It has improved across Australia but we were very behind, I think that is the problem and we have done very well to catch up.

Mr DUNHAM: As a Commission I can understand that you might not be getting exactly the same as the public service conditions, but now that it's the department, surely they will be on the same housing conditions and remunerations as any body else in that department.
So they are still treated as stand alone, DPIE?

Dr FREELAND: The Act hasn't been changed, there is still a Parks and Wildlife Commissioner...

Mr DUNHAM: They don't have an identity as a Commission that is what I am saying.

- Dr FREELAND:** No they don't.
- Mr DUNHAM:** And so the public servants there sitting at that desk in DPIE who used to be Parks and Wildlife and now indistinguishable from...
- Dr FREELAND:** No, the staff, it is a complex one the staff are higher than the public sector management Act, they are not hired under the Commission Act.
- Mr DUNHAM:** And that is how they differentiate with the Housing...
- Dr FREELAND:** No, no the Housing, I would have to go back and get my bits of paper out but I don't have them with me.
- Madam CHAIR:** I query the relevance in the cane toad discussion, but anyway.
- Dr FREELAND:** No, there is direct relevance if you don't have the people in the field who are capable, and train and competent who have the experience and knowledge, then it doesn't matter what you do. You are wasting your time.
- Madam CHAIR:** Is there any argument that people out there aren't competent, aren't trained?
- Mr DUNHAM:** There is an erosion of...
- Dr FREELAND:** No, I am saying there has been a very significant erosion of the knowledge and experience base of the Commission and it needs some of the...
- Mr BONSON:** Can I ask a question. How long has that been going on for?
- Dr FREELAND:** Pardon?
- Mr BONSON:** How long has that been going on for?
- Dr FREELAND:** The last 12 months, if you want to know the truth, it has gone through the roof.
- Mr BONSON:** Never happened before then?
- Dr FREELAND:** We have always had high turn-over rates and we thought it was good because we felt we were doing something, now it is over head.
- Mr WOOD:** Is there big cutbacks in all the time?
- Dr FREELAND:** In terms of resourcing?
- Mr WOOD:** The word I got, you went through a number of departments and they will...

Dr FREELAND: Fuller did not go through with an axe in Parks and Wildlife at all.

Madam CHAIR: Gee that is interesting.

Dr FREELAND: In any sense whatsoever, from 1995 when he came back he did not go through with an axe in any sense whatsoever.

Madam CHAIR: Prior to 1995?

Dr FREELAND: No. He was in initially when it was the Commission. And no, he never had that sort of a thing. Ok, the last one is and it is a serious issue that all around Australia the states are getting up their regional bio-diversity and nature conservation plans. Ours have been sitting on a desk, and it is reported and it is for the daily basin?? and nothing has been done except for the start of the clearing.

I think it is sad when the Territory bends the moral and instead of actually implementing something that is really very good, just lets it sit there, I think it is foolish and I think it is unfortunate to and I think if that requires money, I would rather spend it on that and you would get more conservation benefits than you would out of doing something about toads.

The thing about those things, that they are amenable of getting something done they have clear goals and objectives you can get a result and they are also in urgent need of attention.

And some of it, like are much, much worse than the toad that they will be. Particularly, when you are talking about the little, big place which is the Territory where you have got huge budget constraints, our capacity is limited we have got to really focus on what we are going to get.

Mr BONSON: What will the relationship be like with the Commonwealth, because it also is a big issue and in terms of resources, like you said we are nearly 1/6 of the whole of the Australian land mass.

Dr FREELAND: Funding that goes to the Territory Government has the same basis as they use for funding direct from say, Environment Australia of the Northern Territory, it is done on how many people you are having.

Mr WOOD: Same with the local government.

Dr FREELAND: And you are buggered before you start.

We can't look to the Commonwealth to solve all our problems either, because they are not

-
- Mr DUNHAM:** Can you recall the Commonwealth offering us money that didn't take up? We have asked the question of Parks and Wildlife service, can't remember?
- Dr FREELAND:** Usually, no I can't remember I don't think so.
- Mr DUNHAM:** Assuming we get...
- Dr FREELAND:** No, we have never been offered money from the Commonwealth that I can remember. Maybe, initially I got a little bit, no I can't remember that.
- Mr BALDWIN:** If you were offered some you never knocked it back?
- Dr FREELAND:** Not that I am aware of, I can't imagine knocking it back. Because usually what happens we set the priorities that we want, and it is hard because Commonwealth's priorities over here and ours over here, and you have got to try and find those little, little niche overlaps which can be actually very minor when you compare to the issues they are doing with the 'Saving the Murray-Darling' and so on.
- Trying to find somewhere in there you can actually fit the Territory's problems, can be very, very hard.
- To get involved in multi new scientific research just for science or multi new biological control, I don't reckon our timing or capacity is a spin on that, I reckon we are better doing things we can do, if you go and spend all your money on toads it is really a diversion of attention from all the other serious things that we need to deal with and it is absolutely critical.
- I do have some recommendations. One is we keep the public informed because we have had an ongoing thing for years, it is very important...
- Madam CHAIR:** How much have you spent in the past, in terms of Parks and Wildlife that public information on cane toads?
- Dr FREELAND:** What is the question?
- Madam CHAIR:** How much have you spent per annum in the past...
- Dr FREELAND:** I have no idea what it costs to do the but we also do, it is difficult to work out because you have got the junior rangers deregulatory toad things, the toads things at the wildlife park, but 'windows in the wetlands' I used to do school kids things go around the school sometimes...
- Madam CHAIR:** So there wasn't a defined budget for it?
- Dr FREELAND:** No, it was usually done within the operational matrix of each unit.
-

- Mr DUNHAM:** There was that thing you printed, that little brochure ...
- Dr FREELAND:** Look I can't remember the cost of the brochure.
- Madam CHAIR:** Elliot, did you have something?
- Mr McADAM:** I was just going to say it might be good to just seek some information from the Department in terms of the public educational committee, committee education and will they approve it. It would widen respect to education or keep the public informed.
- Madam CHAIR:** Ok, Rick has got that down.
- Mr BALDWIN:** Didn't you used to have a position, Education Officer or a Marketing something. I know there was somebody out there who used to do education campaigns.
- Dr FREELAND:** Over the years we sort of, to keep them from the bush, keep a range of forces up, climbing budget And those sorts of things were and our public education role was subdued into the Junior Ranger program because we just couldn't maintain everything beyond it.
- Mr BALDWIN:** It was a media unit though?
- Dr FREELAND:** Yes, we got one media person. Or we used to have. I am not sure what the situation is now.
- Mr WOOD:** I am under the impression that each education section of Parks and Wildlife has been cut quite severally.
- Dr FREELAND:** At the moment I couldn't tell you Gerry.
- Mr WOOD:** People who were doing that haven't got a job.
- Dr FREELAND:** But that is the Junior Rangers.
- Madam CHAIR:** Yes, they have got Junior Rangers, 2 positions to Junior Rangers.
- Mr WOOD:** There was also a change in the, I think, Wildlife Park. The house that was used for registration...
- Dr FREELAND:** No, that was the Education Department.
- Mr WOOD:** That is maybe where it has been cut from.
- Madam CHAIR:** Education Department.
- Mr WOOD:** Must be.
- Dr FREELAND:** Yes, that is the Education Department.
-

I think we need to keep up the signage and the effort Re: islands, I think that is very important. I think the quoll thing needs to continue but it needs accountability and transparency, so people really do know what is going on. I with glee that \$100k over 2 years was in the new budget except this is not something that is going to end in 2 years. It is something that is going to go on and on and on forever, and having a 2 year allocation doesn't help and it is going to prove difficult if they have to absorb that within their budget.

Mr BALDWIN:

So it should be added to their base-line...

Dr FREELAND:

It should be in their base-line budget, it shouldn't be a 2 year, 1 off. We need to continue examining the practicality of the cane toad fence, I am not sure, as I said, we did some work and I am not sure whether it is out. It is not just Coburg you have got Cape Hotham as a potential too and there would be others.

Madam CHAIR:

Just on that fencing work. Was there a definitive feasibility study done on it, or not?

Dr FREELAND:

No, I just called the guys up done the gate where the toads were and I said 'Look find yourself a cattle grid in the middle of bloody nowhere and put some fences up and see if you can get them to go across'. And they couldn't they kept falling through, and even when left for 48 hours they couldn't get across.

Mr WOOD:

It was mentioned before that that gentleman was saying that he did a quote and he steel mesh, which had to be imported from China, maybe you could find some figures...

Dr FREELAND:

Who ask for that to be done.

Mr WOOD:

You said the Government did, they asked for a quote with 13 kms in...

Dr FREELAND:

I asked the rangers to do it and I felt that things weren't being done which I thought were important, so I got the grid bit done and I got back some really poor stuff on how to design the fence and I sent it back so I don't know.

Mr WOOD:

One of the things was in Kakadu, if you don't do something by next wet season, it is going to be too late for Coburg. I mean there is a rationale in saying well, if someone gives an idea, lets put down a corrugated iron fence. And then if this last few years was the time for you to look it up...

Dr FREELAND:

You can put in the grid. I think that is probably fairly safe. As long as you do act, I reckon you have got to go our 50

cms because you are going to have goannas going under it.

Mr WOOD: You are going to...

Mr DUNHAM: You need a stock fence as well otherwise...

Dr FREELAND: I think you could do something...

Mr WOOD: You could trench it and it would be before you drop the corrugated iron in. They were saying 'at least we can go and get an amount of equipment and do a simple project and then maybe in time there will be something better.'

Dr FREELAND: Well that is where the Government. I will just say we do need to look at the practicalities not too much though, because the marine end of it is just horrifically difficult I suspect.

I think we need to keep the monitoring programs going in the parks that we have part funded with Parks Australia and Kakadu, I think that is the way to go. None of those things are new they have been around, but I think it is based on a fairly balanced assessment of priorities and what we can afford and what we couldn't afford.

There is one more thing, though I think it is not in my document I gave you, but thinking about it there is a very important thing, it relates to what Matthew was talking about with his base-line and that is, I gave you the history of why we started the work what Woinarksi's been doing all over the Top End. It is basically to find out what lived where and what we actually had, but that tells you what is happening in a plot and it doesn't give you the kind of information you need to say whether this species is going up or whether this species is going down.

It is that kind of information that you really need to be able to say 'Look in Litchfield Park, I am not talking about or the Mary River catchment or Kakadu or Keep River or something, some bit chunk of landscape. In this big piece of landscape, these species are going down these ones are going up these ones are Ok. Now, we currently have in the world, nowhere, has anyone actually put the effort into developing that sampling methodology. There is a lot known about how you might do it, it is a big task to get a method that would allow you to do it, it is not something one person could do you would need to hire Australia's best status, who is the best at sample design and you would need to look at it very carefully, you would need to review all the material we have got on patterns of capture of animals that Woinarksis' got and do a complete review on that work out how much effort you have got to put in.

And most important you would have to do it as part of a

whole cultural change exercise with the rangers, it is not a simple thing. I started doing it 9 months before I was fired and try and get the rangers and the scientific staff together and start to think about what it is in bio-diversity, that we actually need to preserve to make sure that we are doing the best job possible. What it is we need to do to actually get better, plans and management for the park and what it is we need in a park to be able to say 'yes we are saving the bio-diversity' that is the kind of base line data that I am talking about, this landscape level where it is good enough to say these things are going up and these things are going down.

I suspect nothing has happened since I have left, I don't know. But to me that is the biggest challenge we have and it is the reasons we can't tell you what the cane toads are doing in every infinite little detail, is because that sort of a system doesn't exist anywhere in the world.

Madam CHAIR: It doesn't exist anywhere else in the world and you expect it to be crowded in the Territory when you say...

Dr FREELAND: It is going to cost a bit but it is not that bad...

Madam CHAIR: ... respond to already the ...

Dr FREELAND: This isn't a response to toads, this is a response to...

Madam CHAIR: No, no I am not talking about toads I was about to say this is from 13 through a whole range of concerns of Parks and Wildlife, so you are saying that you create

Dr FREELAND: I don't think the is beyond the Territory's financial capacity or capacities to manage the development of it. And that model that I am talking about is the sort of thing you need to know you need, not just to know how well you are managing the parks.

Madam CHAIR: That is the Territory's responsibility not the Commonwealth's.

Dr FREELAND: This is the Territory. We actually, because of our property stricken status, I was getting together a proposal to take it and see if we can get multi-lateral support for it through the Commonwealth.

Madam CHAIR: Yes, you say it is a nightmare to get multi-lateral support on...

Dr FREELAND: We have gone to natural heritage trust and that is the easiest way around it, we went to the...

Mr DUNHAM: That would be a perfect, sort of a program NHT?? Funding.

Dr FREELAND: It is the sort of methodology not just important if we ever get another cane toad, it is important for the donkeys and camels and fire management and weed management all the things it has had...

Madam CHAIR: I am not arguing, I am questioning how you could see the for that, yet not there for a number of things do with ...

Dr FREELAND: I think most intellectual capacities are statistical and we can buy that pretty cheap, from CSIRO or what they call themselves these days. The who managed the project was there and I think the cultural wilderness on the part of the agency itself was there, but it does need a lot of work and it is going to take a lot of time that is one of the things that will come out of this that will say 'look next time that something happens we might know about it, because we might have missed the boat this time but we will move onto something else'.

Mr BALDWIN: Bill, even though the model would be developed for general use in all parks and all environments, if you were going to do it would you go and pick somewhere, where the toads hadn't been through, like say Keep for instance.

Dr FREELAND: In terms of this, you would go down Keep, that would be great, we are moving bloody fast!

Mr BALDWIN: I realise that, but it would be nice to try and work a model where you know there is going to be change.

Dr FREELAND: Yes, then you would be able to see what is going on. That makes sense than you have got some actual trial of effectiveness of your in change, and that is worth while.

I am talking about how fast they moved, I actually did some quick calculations I am not sure if I brought them, I probably didn't. On how fast toads had to hop if they left Roper Bar and went straight to Katherine and got there in the time, with their compass and backpacks, straight line.

I think it was something like 79 metres a night, that is what they would have to do, assuming they don't disperse in the dry, which they don't and they have got an 8 hour night which is much longer than their used to, so if they just keep going in a straight line every night, like I said they can't stop to breathe, they can't stop to feed. They can't stop to soak their bums in the water they have just got to keep hoping, and on that basis I would think I would be confident in saying that somebody gave them a lift.

Mr WOOD: You would?

Madam CHAIR: Yes, you would think.

-
- Mr BONSON:** Just with public awareness ...
- Dr FREELAND:** Yeah go.
- Mr BONSON:** Out at Western Australia, we have heard evidence on a record with dealing with feral animals have you? What kind of relationship have you ...
- Dr FREELAND:** It has been really good, Ned Cameron (?) is a good mate of mine. We have worked together for years on many projects, we have provided scientific support for my many projects. Our rangers have talked to them, we interact with their bush fires people but the thing about donkeys and the horse control and so forth in the Kimberley's, is the where the funding comes from pastoralist so to impose levy.
- It is not going to come and say 'come how would you like to give me \$50 000 of your dollars to work on toads', I think you might get a different sort of response.
- Mr BONSON:** So in that relationship I have seen build up over a while, you know it was cane toad I suppose, you know.
- Dr FREELAND:** Absolutely and Keran (?) was a fond supporter of the original and, no I think it was Sid what's his name, was the CEO then. And they were very supportive and interested and involved, they were the least of our problems it was Queensland and New South Wales, South Australia and you just tear you hair out.
- And they get half way through and say 'We don't want to give you the money we will spend it ourselves on toads, still stuck and it just gets worse and worse and worse. You are better just going to the Commonwealth and saying 'Commonwealth collaborate'. And on one and one it works. Or if you want to do something with Western Australia do it one on one and just do it, if you add forth and fifth parties you get varying levels of commitment and interest and you are just in trouble Matthew.
- Mr BONSON:** So just for my own piece of mind too. The issue of resources, they actually spend on the issue like the cane toad?
- Dr FREELAND:** Yes.
- Mr BONSON:** And the issue of priority, whether or not that is the...
- Dr FREELAND:** And what you can actually achieve.
- Mr BONSON:** And what the real effect is, finding out what the cane toads are.
- Mr BALDWIN:** And what the outcome is that you are looking for, that is
-

important.

Mr BONSON: So that leaves me with the last question I have, what value can you put on some of these species that we are talking about, that we don't know if they are going to be become extinct or are they going to lower, you know, we don't have that information so we don't really know what effect it can have, but what value as a nation can we put on these native species?

Dr FREELAND: I don't think you can. I know like to pretend they can and people in are really big in trying to put a value on bio-diversity, we the proof of the truth is you don't need a hell of a lot of bio-diversity on a wheat fill these or grow a mango orchard or on a freeway or on a sea. You can always grow a, you know, shade trees, you don't need *gohyronan*, the little gecko in Kakadu or around the Top End you don't need it. You are there you do it because you want to do it and you have got an almost spiritual, intellectual value place on.

Mr WOOD: Stewardship.

Dr FREELAND: Huh?

Mr WOOD: Stewardship.

Dr FREELAND: Yes, and it's a moral thing I guess in a sense. I don't believe that the models they have got for economic value for bio-diversity, they are not talking about bio-diversity they are talking about, bloody the value of having somebody to catch water to feed a city, that is really what they are talking about, and it does

Mr WOOD: Is the ...

Dr FREELAND: That is just a personal view point Matthew, it is not in any sense necessary.

Mr WOOD: We have looked at possible measures of control, should we continue that sort of work outside of what it is we are looking at, at the moment. Is that a waste of space or is there room for lateral thinking?

Dr FREELAND: Well you know, maybe there is some clever person out there who has this great idea, I don't know. And I don't think it is from lack of trying, a lot of very good brains and a lot of bright people have pondered these things. Curious, that the same ideas keep coming up again and again and it is not a huge diversity of ideas, and the practicality of some of them is yet to be demonstrated in any sensible way. I can't answer Gerry, I just don't know what the probability of coming out with something would be.

Mr WOOD: I mean we had that Professor from Canada who worked in the province of Alberta, he explained how they got rid of the Prairie after 14 years, and he believed he could do the same thing in Australia, and admittedly, whether that is a bit up in the air or whether it could happen, he would have to at least say 'well if you are going to go down that path you are going down for the long haul'. If worked for 40 years in Alberta they still haven't got rid of them all but they have got them down to a, I suppose, a manageable population. And I suppose the question to be asked is, is that also a reasonable approach, if we are not going to get rid of anything just like that, they are here and we just need to say look...

Dr FREELAND: No Alberta's geography is somewhat more manageable than ours actually. I think that is the real issue, is your density population and the way it is distributed and the nature of the they love Alberta's pretty boring, and it is all wheat fields and shit, and black rats, they are a tropical rat really and they are going to be living in barns and storage facilities and they are going to have a pretty predictable occurrence, they are much easier to deal with I would suspect. I can't promise you this because I don't know but I would suspect that it is a lot easier and more practical to do that than to deal with the toad in the middle of

Mr WOOD: Not quite as flat?

Dr FREELAND: Yes.

Madam CHAIR: Any other questions? Elliot do you have more questions?

Mr DUNHAM: Yes this committee has been given 2 terms of reference. One is about an EPA, obviously we are not looking at that and the other is this. I suspect my question to you is pretty self evident, we should be looking wider shouldn't we, as a committee we should be looking at a lot wider issues than the cane toad. For things that are going to have a big impact on our environment.

Dr FREELAND: Yes, and how we will set up to deal with things. I mean even if you take, at one minute he says there was no base-line data than he says Coronation Hill it is actually rotten data. It is not good data, I mean it is good data if you want to know what lives around Coronation Hill, and you can say 'well this one seems to be more abundant than that one, this one lives in the box and this one lives in the swamp'.

But that is pretty crude and if you are actually putting in a major mine and you are actually looking for impacts from that mine, those data won't tell you a hell of a lot. It is the same question Matthew about your base-line, they are not

sensitive and they are not capable of doing it and setting up something that is capable it is going to be difficult and you are going to have to make compromises on scale. But if you can say in this catchment on this huge national park, everything is alright even though we have a mine here and we have lost that, everything else is Ok, then you don't have to make those compromises but at the moment we can't even do that very well.

Madam CHAIR: Elliot we are just wrapping up, any more questions for Dr Freeland.

Mr McADAM: Nothing for me Dr Freeland.

Madam CHAIR: No more for Elliot. Gerry?

Mr WOOD: No.

Madam CHAIR: Tim?

Mr BALDWIN: No thanks Bill.

Madam CHAIR: Dr Freeland thank-you very much for giving us your time, on the cane toad inquiry.

Dr FREELAND: Much appreciated.