

**THE PARLIAMENTARY STANDING COMMITTEE OF PUBLIC ACCOUNTS MET
IN COMMITTEE ROOM 2, PARLIAMENT HOUSE, HOBART, ON FRIDAY 14
AUGUST 2009**

FOX ERADICATION PROGRAM

Mrs BARBARA TRIGGS WAS CALLED VIA TELEPHONE LINK AND WAS EXAMINED.

CHAIR (Mr Wilkinson) - Barbara, I will leave it to you to open with what you want to say and we will then ask you questions.

Mrs TRIGGS - I have been doing work for the fox eradication people for quite a while now and they seem to be efficient and doing a fairly comprehensive job of trying to track down these foxes. I have absolutely no doubt that there are foxes in Tasmania. I think there are some people who think that it is a possibility that it is all a conspiracy theory, but I think that is rubbish.

CHAIR - You say that you have absolutely no doubt there are foxes in Tasmania. What do you base that statement on?

Mrs TRIGGS - I base it on the fact that something like 33 scats have been found that have been positively tested for DNA to show that they came from a fox and I can't see how anybody could possibly transport fox scats from the mainland, if that is what the theory is, and spread them around so that somebody happened to find them. It just doesn't work, it just couldn't happen.

CHAIR - As I understand it, your belief is that it would be a fairly intricate conspiracy for the scats firstly to be transported to Tasmania and then placed in various parts around the countryside for people to find them.

Mrs TRIGGS - Exactly. It just doesn't make sense.

CHAIR - In relation to the testings that you have been doing, what have you been doing there?

Mrs TRIGGS - It is a variety of things. To begin with, they used to send me scats that they found and I would try to find first of all what the animal had been eating and secondly, what had produced the scat. That is quite difficult because fox, cat and quoll scats are very similar in outward appearance and also they are put together much the same way. Dogs are a little different and devils, which you also have down there, are different again but there is an overlap between fox, cat and quoll and, unless you can find a grooming hair from the animal in the scat, there is no way of being positive as to what it is. The DNA system was worked out so that they could identify foxes from the mucus on the outside of the scat, so that seemed a much more satisfactory way of going about it.

Since the DNA people took over, I have just been given hair samples from fences and people's chook houses - places like that - and carcasses that have found, some of which have been fox but mostly they are quolls, cats or dogs.

CHAIR - You have found that some of those hair samples either on fences or chook houses, as you say, did in fact come from a fox?

Mrs TRIGGS - No, I do not think there was anything from a chook house or a fence. I think there was one carcass found on a beach or near a beach somewhere in Burnie; would that be right?

Ms FORREST - Yes.

Mrs TRIGGS - I just get the material; I do not know terribly much about it or where it comes from but I do not think any positive foxes have been found in chook houses.

Mr DEAN - How many fox scats have you yourself tested from Tasmania?

Mrs TRIGGS - I have no idea, I would have to look that up. It would be some hundreds, I would say - probably 100 and so. That is scats. The positive fox scats that I have found I think were very few. Only one or two definitely had fox hair in them.

Mr DEAN - Of any tests that you have carried out on what have turned out to be fox scats have you found any appearance of, say, the Rufus wallaby in any of those scats? Are you able to determine what the animal has been eating?

Mrs TRIGGS - Apparently not and that has been publicised quite a bit, that there have not been any pademelons. I do not find that terribly surprising because foxes are opportunists; they will take anything that is around whether it is alive or dead. Pademelons are pretty zippy; they are hard to catch and they would not be the easiest prey. Rabbits are much easier; a dead sheep is much easier still and any sort of road kill, of which there is plenty of in Tasmania. I would not think pademelons would be high on their probability list. I have absolutely no doubt that if enough fox scats were found you would eventually find pademelon but there has just been so few that it is not really very surprising.

Mr DEAN - Barbara, 34 scats, as I understand it, have in fact come from foxes and, on the evidence I have, there was no pademelon in any of those 34 scats.

Mrs TRIGGS - That is not surprising, though.

Mr DEAN - Nick Mooney and people from the Department of Primary Industries are saying that is very surprising, and I just want to know why.

Mrs TRIGGS - You need a larger number than that before you could really quantify it at all.

Mr DEAN - Have you carried out analyses of any scats other than fox scats? Have you carried out analyses of devil scats from Tasmania or dog scats or cat scats?

Mrs TRIGGS - Very few here and there, but not a large batch. Sometimes people send me one or two scats from particular areas but no large numbers.

Mr DEAN - And you have carried out analyses of those scats provided from Tasmania?

Mrs TRIGGS - Yes, I have but very few.

Mr DEAN - Have you found Rufus wallaby in any of those scats?

Mrs TRIGGS - I could not tell you; I would have to look that up.

Mr DEAN - Are you able to do that, Barbara?

Mrs TRIGGS - It would take hours to go through my records from the last 20 years. Come on!

Mr DEAN - It is just that I have some evidence - and this is why I wanted to see if it was right - that you have said there was Rufus wallaby in those scats.

Mrs TRIGGS - I think, from memory, there have been. I have certainly found it in hair samples. People have put out hair traps and pademelons have been found in those. I have a feeling that they have been found in scats but I would not like to be positive without looking it up.

Mr DEAN - I was just trying to be fair and seek confirmation, that is all.

Mrs TRIGGS - If I said so at the time then it is probably true.

Mr DEAN - So that was in devil scats, dog scats and cat scats, that pademelon was in all of them. I just want to be fair to you.

Mrs TRIGGS - I would really have to look it up to be positive.

Mr DEAN - It would take too long for you to do that?

Mrs TRIGGS - It would take me too long right now. I could do it eventually.

Mr DEAN - It is an issue of some significance but -

Mrs TRIGGS - Is this in the scats that I have done for the fox people or scats for everybody?

Mr DEAN - This would be scats either provided from the Fox Eradication Program and other recent scats that might have been provided from other people within Tasmania.

Mrs TRIGGS - It would certainly be easy enough to look up the fox people's records; the others are sort of scattered through.

Mr DEAN - If you could do that it would be appreciated.

Mrs TRIGGS - I could certainly look up the fox people.

Ms FORREST - Barbara, who else besides the Fox Task Force would send them to you?

Mrs TRIGGS - There are a few from other researchers, mostly people from universities. Bob Brown sent me a couple of scats that he hoped were thylacine and they turned out to be devil. That happens a lot. It's wishful thinking that it might be a thylacine scat, but they're nearly always dog or devil.

Mr DEAN - Barbara, I refer to a document in my presence - and the other members have it as well - and it's in an e-mail that you sent to a person here in Tasmania. It is to David Obendorf and it reads:

'Most of the IDs that I made from scat analysis are based on hair ID. If identification, teeth, bones, claws et cetera are present these are also used but generally it is hair that is the main diagnostic element. I did not find any pademelon evidence in these scats and that species has been found in other predator scats - dog, cat and devil - and it is very likely to turn up in fox scats in the future.

Regards

Barbara'.

Mrs TRIGGS - As I said, I would like to check it, but if I said that at the time then I must have checked it at the time.

Mr DEAN - It is dated Friday, 8 May 2009, 12.05 p.m.

Mrs TRIGGS - I remember David's questions. He is a non-believer, I think.

Mr DEAN - Being fair to David, that's not quite right.

CHAIR - Barbara, I know your expertise but for the sake of the record would you state your position and expertise in the area we are talking about, please.

Mrs TRIGGS - I am a lone worker. I started off nearly 30 years ago - in 1980 - and it's just grown. It's not something you learn at university; it is a skill that anybody can pick up if they give it enough time and energy. It started with a man called Hans Brunner who devised a very simple method of making hair cross-sections. It used to be quite a difficult business but now it's quite easy. Hans wrote a book about it called *The Identification of Mammalian Hair*. I got hold of a copy of this in the early 1970s and was impressed with the idea. I wanted to know what animals were around where I live and one thing led to another. By now I could probably claim to be one of the experts certainly in Australia and possibly in the world on hair ID.

Mr HIDDING - Regardless of how you came about that particular talent, do you have other qualifications?

Mrs TRIGGS - A science degree.

CHAIR - As you say, you're one of the foremost experts in the world in relation to it. I suppose people request your information and expertise from all around the world at various times.

Mrs TRIGGS - Most of it comes from Australia. There has been some interest from Brazil and Israel and I have done some work for them but most of my work comes from Australia.

CHAIR - You are being very coy, Barbara. Thank you very much for giving us your time and expertise.

THE WITNESS WITHDREW.

Prof. TONY PEACOCK, CHIEF EXECUTIVE OFFICER, INVASIVE ANIMALS COOPERATIVE RESEARCH CENTRE, UNIVERSITY OF CANBERRA, AND **Dr STEPHEN SARRE**, ASSOCIATE PROFESSOR, INSTITUTE FOR APPLIED ECOLOGY, UNIVERSITY OF CANBERRA, WERE CALLED VIA TELEPHONE LINK AND EXAMINED.

CHAIR (Mr Wilkinson) - Before we start, for the sake of the record, would you please give your name and qualifications?

Prof. PEACOCK - I am Professor Anthony Peacock. My qualifications are a Bachelor of Science in Agriculture with Honours and a PhD in Veterinary Science and I am a Fellow of the Australian Institute of Company Directors.

Ms FORREST - Tony, could you outline your involvement in the research centre you are working in in the University of Canberra?

Prof. PEACOCK - I am the Chief Executive Officer of the Invasive Animals Cooperative Research Centre. CRC is a Federal program and essentially we bid for money for a seven-year life. We get our money to bring groups together and in our case we bring a lot together - 41 or 42 partners, depending on how you count them; I think it is 35 from Australia and six from overseas. We don't get money for labs, equipment and things like that; it's mainly salaries and research work so that we can make advances in applied research. We're not about fundamental work, understanding the base line of how things work, our job is to fund projects that make a difference to the industries or the groups we work with. It is probably important to say DPIPW - the Tasmanian department responsible for the fox program - is a member of the CRC and so they have received funds from it. We get a budget of around \$8 million to \$9 million a year for research projects and they go all over Australia. There are a few that involve overseas work. From time to time DPIPW has had money and the fox program has been one of the ones that has received funds.

Ms FORREST - Tony, can you give a bit more detail about what you have done in that area with the Fox Task Force?

Prof. PEACOCK - Stephen is the head of a lab here so I will get him to give his qualifications for the record as well and then we can probably run through it together.

Dr SARRE - I am an Associate Professor at the University of Canberra. I've been here since 2001. I have a PhD from the ANU and a Masters in Applied Science from the University of Canberra.

CHAIR - Ruth was asking a short time ago in relation to your involvement with the fox eradication task force in Tasmania.

Prof. PEACOCK - I will outline the whole CRC's involvement and then Steve can be a bit more specific about his role. We see it as one of the vital projects. I sit on the Fox Eradication Branch's steering committee and we have three people who are involved in the technical advisory group - Stephen Sarre is one of them; Dr Glen Saunders from the New South Wales DPI is our program leader in terrestrial projects and chairs the

technical advisory group; and Dr Steve Lapidge, who runs our Adelaide office of the CRC is on the technical group as well. They all have specific technical skills in fox work of one sort or another. Stephen's is in the genetics of foxes and detection work. The CRC has funded Steve's lab to assist in setting up a wildlife genetics laboratory. Most of the money comes from places such as the Australian Research Council. That is where most of the DNA work is done, particularly the 'fox or not' test. We also have funded projects specifically in Tasmania, the Fox in Tasmania project, where we supply a technician to the Fox Eradication Branch involved in the sampling project. We are particularly interested in the detection of foxes work, so we've been supplying some of that funding.

CHAIR - In relation to what you have already investigated and your findings, can you give us a brief summary of that, please?

Prof. PEACOCK - Again, and it's only speaking from my point of view, I am fairly pleased that it does appear that there's a very low number of foxes in the State and that they are hard to detect, and of course that is a good thing. With all the funny criticism that goes on down there sometimes it is couched as a bad thing. I am involved personally at the management level in terms of receiving reports and the strategies that they are using for trying to eradicate them. We think it is vitally important. We would deem it as probably the most important conservation project in Australia at the moment and of course in world terms because if the species that would be lost get away, they disappear from the entire world of course and so while there is a chance to eradicate we think it should be exercised and we are very, very supportive of the program.

As you will see from our submission, I have no real concerns about the efficiency or the efficacy of the group down there. I sit on an extraordinary number of committees, as I am sure you guys do, and from my point of view this is one where the committees do actually meet, they do get good papers and they do get good minutes and the management is very open to our concerns or suggestions or inquiries and that sort of thing. I do make the effort to make sure I am coming down about quarterly to Tasmania for the meetings and if at all possible, I always attend in person because I do think it is important. They are largely getting on with the job.

Whether they will eradicate the fox from the State, I am one of the optimists of the program. I think they are succeeding and they probably will succeed but of course most of the evidence is below the radar, if you like, of detection so it is very hard to make that call one way or another. All we can say is that the foxes have not taken off at this stage and it appears that we are at least holding the numbers low and should be proceeding with the eradication full steam ahead from my perspective.

Ms FORREST - There are a couple of points I would like to raise and one is do you think that we will know when we have succeeded or is it always going to be an ongoing thing because of that threat of incursion? The other thing I would like you to provide me with evidence about is the methods that are used in the DNA testing. We have heard evidence about the Chelex and the Banks et al method and I just want you to provide a bit more evidence about that.

Prof. PEACOCK - I will answer on the biosecurity question, Ruth, but I will hand over to Steve Sarre for the DNA work.

Right from the start one of the prime concerns has been if you get rid of them, could they just be reintroduced? I think one of the things that does not get much publicity or knowledge in the program is that a major review of biosecurity was undertaken. I think there is a 30-page report lodged on the web site, there has been a lot of training of people associated with the biosecurity and that includes the Port of Melbourne which is the most likely place that a fox could inadvertently come to Tasmania from. There have been reports over the years of two foxes believed to have come down in shipping containers and there have been changes. I believe they have probably done about all they can with biosecurity. Alex Schaap, the head of biosecurity for Tasmania, sits on the steering committee and is a very active member of the committee so where we have seen that there may be a leaking tap or something like that we have taken measures to shut that tap off.

If somebody wished to introduce foxes illegally, it is still a major undertaking and I think that it would be not an easy thing to do and so I am fairly confident that if they can eradicate them you can never say there is no risk of reincursion but from my perspective there has been action taken in that arena and it has been adequate to the task.

CHAIR - What is to say they've not been eradicated already, Tony?

Prof. PEACOCK - The fact that we are still finding scats. I am fairly dismissive of claims that somebody is planting scats; in fact I'm extremely dismissive of it because evidence was never presented to me that that is the case. I note in evidence to this committee that I have virtually been accused of doing it myself, and I know that's not the case. I think it is a pretty laughable claim and I can't see how it could happen without many people becoming aware of it, and we would become aware of it, and there has never been a hint that that is what is happening. I am privy now to the draft of the New Zealand Landcare report. A draft will be made available to you shortly if it hasn't been already, and they, too, are extremely dismissive of those claims and they have concluded that there are foxes in Tasmania, they are just at very low numbers.

CHAIR - One of the questions on this point, before we go around the table, was when you say they are still finding the scats, are we able to say the age of the scats? Of course some might be months old, or a year old, but are still obviously scats.

Prof. PEACOCK - I will hand over to Dr Sarre. I'm more of shit stirrer than a shit expert, so I will hand over to the one who has expertise in this matter.

Laughter.

CHAIR - That's what we're trying to find.

Dr SARRE - I might just take a step back and describe my involvement with this work. It began in 2003 when Oliver Berry, a PhD student of mine, and I got independent funding to develop these approaches, specifically with foxes in Tasmania in mind, but for more general reasons as well. I have been involved with it since that time and at the time we were able to convince the department that this was an approach they could use in their eradication program.

I am the project leader of the CRC project around this eradication which is conducting the strategic survey. As you would be aware, we are in the midst of analysing the second phase of that particular strategic survey. We still have the north-west to go and that happens next year. Until we have completed a systematic survey of the State, there is no way we can say that foxes have or have not been eradicated on the island. So it is truly the first step - determining an eradication is going to be a long-term process because it is a probabilistic-type problem. We will know with a given probability whether foxes have been eradicated or not, but not until we have done the proper survey. It is really important.

CHAIR - What will you do to ensure that they have been eradicated or not?

Dr SARRE - I am not in charge of the eradication but what we are trying to do at the moment is to determine where they are in the State because when we know where they are, we can target eradication action most effectively. If we don't have hard evidence of fox presence, that will mean there will be less efficient targeting of control like baiting and other methods. So that is what we are adding to this work.

CHAIR - Are you able to identify the age of the scats?

Dr SARRE - No, we aren't at this stage.

CHAIR - Therefore the finding of new scats doesn't mean that there are still foxes here, one may argue. But alternatively, the situation could have been they were here, they are now dead and they are the scats from the dead foxes.

Dr SARRE - It is plausible but no more plausible than the alternative. We just wouldn't know. I would say the presence of scats, given that we don't know how long they persist in the environment - but it is unlikely to be too long - is pretty good evidence that they're still here.

CHAIR - Can you state for how long scats would remain in the environment before they disintegrate?

Dr SARRE - No, those studies haven't been done in Tasmania. It would depend on where in the State they were and the conditions under which they were deposited.

CHAIR - They could have been washed anywhere at the moment. We've had a fair bit of rain.

Dr SARRE - So I believe, so you would expect the degradation rate to be very high in northern Tasmania at the moment. If there are still scats being found positive in the next few months then that would be pretty strong evidence. But, as I say, we don't know. It's an inexact science, but we do know we can detect DNA in scats up to three months after deposition under certain conditions in Canberra. What that says about northern Tasmanian, we don't know.

Prof. PEACOCK - Even the one in Canberra was done in fox pens, wasn't it?

Dr SARRE - No, they were done in outside enclosures but they were done in winter. Canberra has dry winters and the degradation rate would likely be less in the Canberra than it might be in north-west Tasmania.

Ms FORREST - So generally they wouldn't be years old if they were found?

Dr SARRE - I really wouldn't want to comment. I think it is an important point but it really needs investigation. I know that is under consideration by the department at the moment - that is trials.

Ms FORREST - Can I take you to the testing method for the DNA and get some comment about whether the most appropriate method is being used?

Dr SARRE - What we did in 2003 was test a couple of methods. One was a cheap method. We did that because there were likely to be lots of scats involved in this sort of problem. Another was more routinely used but a more expensive kit approach. That was specifically for the identification of foxes from scats, not the individual foxes but determination that there was fox DNA present. That is a far more sensitive test than DNA genotyping. DNA genotyping requires better quality DNA and all our scats for genotyping are treated in an appropriate way. It is not exactly the same method as Banks at el set out but it's similar. We use a different purification kit but they're both commercially available kits.

Ms FORREST - So do you think we're using the most appropriate method here, that we're not skimping because of cost?

Dr SARRE - Absolutely, we've tested it numerous times in the lab. We've compared them and that's the best one we can apply in our laboratory.

Mrs BUTLER - Stephen, could you expand on the strategies that minimise the risk of false positives through contamination?

Dr SARRE - That starts in the field. We've worked long and hard with the departmental field collectors to develop appropriate strategies for dealing with scats from the very first time they pick them up. There is no human handling, no exposure to outside elements. They are kept separate to each other. They are dried in specific and locked circumstances and then posted to us here at the University of Canberra. We treat them in a very strict protocol to make sure that the risk of contamination is minimised. We apply the same sorts of approaches that are used in forensic cases for humans.

Mrs BUTLER - You were talking about the 25 scats from the DNA profiling and that five produced genotype sufficient to distinguish individuals at most levels of relatedness. Would you like to expand on that?

Dr SARRE - There are up to 10 genotypes now, from 40 samples or thereabouts. Does the question relate to the proportion that we were able to genotype?

Mrs BUTLER - More so about the levels of relatedness; how concrete is that?

Dr SARRE - I think that question is best directed to Oliver Berry. Oliver has been genotyping foxes from all over Australia. I think he has genotyped several thousand and he is building up a really good picture of the way relatedness works in fox populations in Australia. He will be using that information to inform us about the relatedness of the individuals that have been genotyped in Tasmania but at this stage that is an incomplete analysis, and I would not like to speak for Oliver.

Prof. PEACOCK - Dr Berry was here finishing his PhD with Stephen and then he got a position at the University of Western Australia. That is why there is the involvement of the two universities.

Mr DEAN - In relation to the scat DNA profiling have you only profiled insofar as determining whether it is a fox scat or have you analysed the scats to determine what is in the scat, the make-up of the scat and what the foxes have been eating?

Dr SARRE - We have not done much of the latter. Part of our project for the next 12 months to 18 months is to develop methods to do that through DNA. We know we can detect prey because we have amplified and sequenced rabbit or hare DNA from predator scats and we have done some identification of other predator of species - Tasmanian devils, quolls, dogs and cats - but we have not done testing for different prey items. The identification of prey has come from analysis of the scats themselves, by people chopping the scats apart and then looking for fragments of bone or hair and being able to identify species from those fragments. We do not do that; we send the scat back to the department in Tasmania and they independently organise those analyses.

Mr DEAN - With the scats for which you have carried out some testing - the devils, dogs, cats and whatever - what are you able to say from those tests? Were they as part of the Fox Eradication Program or were they provided through another group?

Dr SARRE - No, they were collected as part of the Fox Eradication Program. The idea there is that in doing a strategic survey and in the way we are doing it we have unique resource for those scats because you can identify not just whether they are fox or not but potentially what carnivore laid the scat. You can also eventually identify what those carnivores have been eating and get a map of distribution of Tasmanian fauna across the State. That is an independent project funded by the CRC.

Mr DEAN - It has been suggested that, of the 34 scats that have been identified as fox scats, no Rufus wallaby has been found in any of those scats. The Rufus wallaby is endemic to Tasmania and some people within the Fox Eradication Program have said that is very surprising indeed. Do you wish to make any comment on that at all?

Dr SARRE - Only that when you use techniques looking for traces of fauna that have been eaten it is a very biased sample of what animals have been eating. Not a lot of it survives and gets through and what gets through is not a particularly good sample of what they have been eating. You are looking for fragments of bone that have been preserved and laid in that particular scat and that can be used to identify the species in question. It is not going to be a definitive survey at all by doing prey identification that way. It is one of the motivations for developing our DNA approaches as it is much more comprehensive.

Mr DEAN - Thank you very much for that. From your involvement with the committee, Professor, obviously you would be very familiar with the laws in Tasmania that relate to what DPIPWE members are able to do and where they are able to go. Do you believe there are inadequacies in our laws, for instance, where the officers are unable to go onto properties without permission?

Prof. PEACOCK - That has been discussed quite a number of times. Generally the operations people have not said that this is a problem for them, they have tended to say that they have very high levels of cooperation. Obviously most farmers and landowners don't want foxes around. We have asked Alan Johnson a number of times and he says it is not a big problem. He says he feels that it is a balancing act, that as long as you can bait around a property or most of an area, you are going to access most of the foxes.

I was down there last week for a meeting of the steering group and we were discussing with the consultants from Landcare research. They felt it probably would be a problem, that when you bait an area you should try for 100 per cent coverage. So it will be an issue coming out of their report.

I know that Alex Schaap felt that the laws were probably adequate to access land but obviously the committee hasn't wanted to push land-holders to the extent that you get a push back in the community of government officials coming onto land where they're not wanted. I would describe it as a balancing act. I tend to be very supportive of operations managers and if they're not screaming that it's a problem for them, then I have been in the group that is quite willing to live with the current situation.

Mr DEAN - Is that a similar position on the mainland?

Prof. PEACOCK - I would think it is. I think our very first involvement was in 2001 when I just rang up and asked them if they wanted some assistance. We hosted the first workshop where we provided them with some fox expertise from around the country - people who are working with foxes. Obviously this is a very important project to all those people. I remember the then minister, David Llewellyn - and I think he has gone around various ministries since - announced at the dinner we held that the fine was going up from a small amount to \$50 000 per offence.

The other issue that was being discussed in 2001 was that the statute of limitations on wildlife offences in Tasmania was quite short, and I am unsure whether that has been changed since that time.

Generally on the steering committee, issues of legal barriers have not come up as barriers to the fellows doing their work.

Mr DEAN - It is good to hear that and I think that coincides pretty much with what the Fox Eradication Program is telling is, albeit there are some cases where they have had some difficulties, but not insurmountable ones.

Prof. PEACOCK - I should raise one point, Mr Dean. I think there will be a point where we need to access some foxes that are living in urban parts of Tasmania. It appears from the scats that there probably are foxes around the Burnie area, and perhaps in the City of Burnie. With 1080 poisoning there are distance requirements from houses and so that is

the subject of quite a bit of discussion. There would be a legal angle to that issue of how close you are allowed to bait to somebody's house and where they may have pet dogs, but it's also an effectiveness issue as well. I know the New Zealand review has suggested that we use fox-tracking dogs more often to try to go after those foxes. It's very common for foxes to inhabit urban areas because they can live off rubbish and our wastes and access just as much food. There are instances of them living very closely with humans and people not even knowing they are there.

Mr DEAN - The issue of hydatids has recently surfaced in Tasmania in relation to fox scats. Do the fox scats here contain evidence of hydatids? Do you or can you test them for hydatids?

Dr SARRE - We don't do a test for hydatids.

Prof. PEACOCK - No. To be honest, that latest stuff I felt was a real scare campaign and just another case of reacting to anything that the Fox Eradication Branch does in a negative way. This was in relation to using them for training the dogs down there. The dogs need to be 'hotted up' with exposure to fox scat on a regular basis so that they retain their training. If you are going to get a hydatid cycle established you need it to be cycling in the environment, going from a fox or dog scat to a wallaby or a sheep and then back through in their offal to be exposed to dogs or foxes again. I have seen the guys handling these scats as forensic material, with gloves on et cetera. I know that the chief veterinary officer was consulted in relation to the use of those scats and I believe he didn't have concerns about the risk issue.

Mr HIDDING - Thank you, professors, for your input this morning. Much of our inquiry, in my view, is being hampered by discussions and evidence about how foxes might have got here but I am more interested in whether they are actually here. I have taken the strong view that they are definitely here and that we need to be working on eradication, but some simple statements that people make, and evidence to this inquiry, lead me to believe that they believe that somebody is bringing fox scats in from somewhere else and spreading them around Tasmania. Given your knowledge about these programs all around Australia and around the world, could you give me any clue as to why anybody would have a reasonable motive, other than having a screw loose?

Prof. PEACOCK - I think it has much more to do with the people making those claims having a screw or two loose, rather than anybody else doing it. Along with those claims, there has been at least a year of discussion that they were going to present you people with very clear evidence that this has been happening. The anger is associated with people from the Fox Eradication Branch and I can't understand that. If somebody knew about this and if I had the barest of hints that this was true, I would be very angry and would be assisting police because it would clearly be some sort of fraud - I'm not sure what the offences would be. That is the case for all the people I know in the Fox Eradication Branch. I am convinced that those people who are looking for fox scats, and finding them, are finding genuine evidence of foxes in Tasmania. We are really talking about one or two people and the same people make the same claims about the carcasses - and I see from your previous evidence that you've gone into that in great detail. Reading your previous evidence, it comes down to - and we are talking about Mr Ian Rist - 'My bush sense and everything about it tells me that if we have them across the place ...'. You are matching this fellow's bush sense against the expertise of a great number of

people He makes completely wrong and completely offensive remarks in regard to offshoots and commercial money trails and things that are simply not the case.

Mr HIDDING - I have asked two people who are on the inside and some of these people would say that you're part of this elaborate sting that is maintaining this story that the foxes are here. For the record, can we explore that you two, and everyone else over there - Barbara Triggs and all the people in the department - and the people working on the Fox Task Force are all able to get jobs at similar salaries elsewhere and you are not on some gravy train that requires this elaborate story to be maintained.

Prof. PEACOCK - I will address that first. I know evidence has been given to you that our CRC has built commercial offshoots, one of which is the Institute of Applied Ecology - I am reading it from the transcript. That is simply not true. The Institute of Applied Ecology is an independent part of the University of Canberra. It has millions and millions of dollars through it and the idea that I could influence what academics in that department are doing through a single project worth tens of thousands of dollars is absolutely ridiculous and deserves to be treated as a ridiculous claim.

Still from the transcript, the other offshoot company is Pestat - that is an offshoot of the previous CRC. This CRC owns no shares in Pestat. It says 'it supplies all the pheromones, the bait attractants'. Perhaps those pheromones account for \$1 000 worth of sales, and that would be the absolute most. So that is extremely offensive to a small company based in Canberra.

The other commercial offshoot is Animal Control Technologies and again that is completely wrong. Animal Control Technologies is a company in Melbourne owned by Dr Linton Staples and his family. They are an important member of this CRC but I have no ownership, nor does the CRC. We have a single licence with them on a product called PIGOUT. If you were baiting for pigs in Tasmania, I would get a very small royalty to this CRC that I then pass on to the owners of the previous CRC. Last year I wrote a cheque for \$6 for the University of Adelaide.

Ms FORREST - They would have welcomed that.

Prof. PEACOCK - I think it's important to the University of Adelaide these days.

Laughter.

Prof. PEACOCK - So I read these claims and I think, 'What is this person smoking?'

There were great claims in the media that you were going to get evidence that this was the case and if you haven't received that evidence I think it would be useful because I see the effect of these stupid claims. Obviously it gets me annoyed, but it does bring down the members of the task force - just ordinary Tasmanians doing their job.

CHAIR - If foxes did take over in Tasmania what would the cost be to the community, and especially to the agricultural community?

Prof. PEACOCK - I was on Phillip Island last week and the penguin colony there was worth \$80 million in tourism. There used to be 11 or 12 penguin colonies and now there is only

one and they spend a fortune keeping foxes away from it - not entirely successfully. That is the sort of thing that is going to happen. Penguins are particularly susceptible. You will start to lose species like that and they would be one of the first that would go. On North Head in Sydney where we have a few penguin colonies coming back we are spending a fortune to keep foxes away from them. These are the things that would start to impact.

One of the abiding memories when you go to Tasmania is the level of road kill you guys have. It is the road kill capital of the world, and that is because you have so many of these small species that we do not have on the mainland. We did have them in equal numbers to you guys and over a century and a half they have disappeared. It is anything between the level of about a mouse and a small wallaby, these critical-weight-range animals that are really susceptible to fox predation. You would have to do things like Western Australia, which is spending \$4 million a year baiting foxes to recover the tamar wallaby, the woylie and the numbat and a few other species across a project called Western Shield - and that is forever.

Yes, it is expensive. I think the Tasmanian Government has copped it in the neck a lot because they announced a 10-year program. That is actually a brilliant thing where governments announce a 10-year environmental program. That rarely happens. I wish the Commonwealth would have committed to the same program for those 10 years. This CRC puts money into the program. We do not derive money out of it and we are happy to do so. If I thought foxes were not there I would be withdrawing my money but we do not want to take that risk yet. The risk on the downside is far greater.

Mr DEAN - Fox numbers have been thrown around and I think you have indicated today that they are here in very small numbers. Are you able to say the numbers we might have? Could it only be seven or eight or could it be hundreds?

Dr SARRE - We can only say that we have identified 10 individual foxes and any more than that is really unknowable at present. It is easy to throw around numbers but they are guesstimates.

Prof. PEACOCK - Anything beyond that is a guess and I guess that it is a very small number of foxes. I know you have had some evidence about that but detection levels are so low that any population estimate really is just a guess.

Mr DEAN - The reason I asked that question is that evidence was given to us by Mr Mooney and I just quote what he said:

'So we can put a cap on it and that is why we think we cannot have any more than a few hundred foxes because they should be turning up in all sorts of ways.'

I do not disagree with that but if it is a few hundred then we have serious problems.

Prof. PEACOCK - I agree with that. If it was more than a few hundred you probably would get more detection, but we do not. Again, I am starting to speculate.

Dr SARRE - Detectability, particularly sightings, is really related to where people are. If foxes and people totally coincide, we might be getting some indication of how many foxes there are, but we don't know that at this point in time.

Prof. PEACOCK - I ask people in Canberra if they have seen a fox and most people say no or they have only ever seen road kill foxes. In Canberra, with our density, there are probably 1 300 foxes living in this city but if they were at the same density of this city in Tasmania it would have to be in excess of 3 million foxes down there. People in this city are not seeing them and we have one of the highest fox densities in the world. It's not something that you see. Even if you are a keen bushman and you're going out there, you still don't see foxes very often. This issue has blown out of all proportion, about the detection levels and the fact that one individual cannot see or hear them for several hours when they've been looking. That is not surprising at all. The much greater worry would be if they are seen.

CHAIR - Gentlemen, thank you very much indeed for giving us your time and expertise.

THE WITNESSES WITHDREW.

Dr OLIVER BERRY, POSTDOCTORAL RESEARCH FELLOW, INVASIVE ANIMALS COOPERATIVE RESEARCH CENTRE, SCHOOL OF ANIMAL BIOLOGY, UNIVERSITY OF WESTERN AUSTRALIA, WAS CALLED BY TELEPHONE LINK AND EXAMINED.

CHAIR (Mr Wilkinson) - Thank you very much for your time, Ollie. In relation to your expertise, for the sake of the record could you tell us your qualifications and you're your involvement with work like we're investigating now?

Dr BERRY - I am a research scientist. At the moment I am working at CSIRO, marine and atmospheric research, but I am also working for the Invasive Animals CRC, based at the University of Western Australia. I have a PhD in molecular ecology.

Ms FORREST - We have had some evidence about the various techniques for assessing DNA - I think Chelex is one and Banks et al. Could you give us a bit more information about how they work and the relevance? I understand one is quite cheap and one is quite expensive. Do you think what we're doing in Tasmania is the best way to manage the assessment of fox scats?

Dr BERRY - Firstly, there are many ways to extract DNA from faecal samples. Faecal samples are particularly difficult because they contain a lot of things that can interfere with the downstream analysis of the DNA. Regarding the two that we are talking about here, one is a method that is used quite a bit in human forensics and that is the Chelex method. It is a very simple process where you take a sample. There are different ways of getting the DNA from the sample but initially we take a sample and put it in a tube with these resinous beads, called Chelex, and we more or less boil the sample and then spin it in a centrifuge and take out the liquid and we use that. There is not really a purification step, other than the centrifuging. The DNA that comes out of that is relatively impure. Contrast that with what we are calling the Banks et al method, which is really just a laboratory version of a commercial kit that is produced by a manufacturer called Qiagen. That is probably the most commonly used method to extract faecal DNA for genotyping and individual identification, which is a different question to identifying species. I think Maxine Piggott submitted some information along those lines.

The Banks et al method is the method that I use in my laboratory for individual identification of foxes. It is just a lot more involved. There are many steps involving centrifuging and moving liquids from tube to tube, spinning them through filters and adding different reagents. I estimate that that probably costs about \$6 to \$7 per sample, just in terms of the consumables. It is probably just a few cents for the Chelex method. There is a significant difference in the workload but they are used for different purposes.

Ms FORREST - I think from what you've said what we are doing in Tasmania seems to be the right way to, firstly, identify with the Chelex method whether we actually have a fox and then only on those occasions would you go to the other method of determining the particular genotype?

Dr BERRY - Yes, that seems the logical, cost-effective and practical approach and that is what is being done in this case.

Ms FORREST - Can you provide us with some information about what work you've done for the Tasmanian fox eradication task force?

Dr BERRY - The work I'm doing is sort of the second step following on from the fox species identification, and that work occurs in Canberra. For those samples that are identified as fox, and there aren't a great number of them - I think we are up to about 38 now - those DNA extractions are sent to my laboratory at the University of Western Australia, where I have a range of other projects. We are working on identifying individual foxes from trace DNA samples, such as hair and faeces. The work I do is basically to process those samples with the same protocols and get an individual identity - a genotype - from those samples and then compare those individual identities and see whether they come from different individuals or the same individuals. So far the 10 that have produced genotypes have enough information on them for us to be able to be sure of their identity, and they all come from different foxes. The samples that have not yet produced individual identities we are still working on. I am optimistic that we will get further information from them, but that is as it stands. I supply that information to the Fox Eradication Program in Tasmania.

Ms FORREST - Regarding the 10 foxes, the ones you have been able to identify, what is the breakdown of male and female and are they in close cohabitation, would you suggest?

Dr BERRY - In a way I do this analysis blind; I don't know where those foxes are from so I can't tell you about that, although I am sure the fox eradication task force could. I don't have the data in front of me. There have been at least three females, I believe, from the analysis. There have been five males and two whose gender we haven't been able to determine definitively.

Ms FORREST - You didn't get their addresses, I suppose?

Laughter.

Dr BERRY - That sort of relates to some other analysis I have been doing, which is to look at the relationships of those scats and carcasses to foxes on the mainland, but I don't have the Tasmanian addresses, I'm afraid.

Mrs BUTLER - Are you saying that there could be a link to Victorian foxes?

Dr BERRY - There are two other aspects of the project I have been doing. The first is the identification of individuals and the second is looking at the relationships amongst the individuals. They may not be the same individual but are they related? The third is looking at their affinity to particular regions on the mainland. We might have some hypotheses about how they might enter Tasmania. For example, they might accidentally come aboard a freighter from Port Melbourne and I believe there is an example of that in Burnie from 1998.

I have been looking at the genetics of foxes at, say, the Port of Melbourne and I am in the process of trying to get further samples from other ports like Port Welshpool and I have basically compared the genetic similarity of those Tasmanian foxes to those places on the mainland to try to determine if that is a likely source for them.

Ms FORREST - Have you had any results from that?

Dr BERRY - I have. I have to emphasise, though, that this is quite preliminary and I presented these at a couple of conferences. Just because of their nature there is not very much information in the scat samples and we are not able to get very complete genotypes from them so I will talk mainly about the carcasses, and there has been four of them from which I have got good genotypes. There is a lot of information in them and I have compared three of them to the Port of Melbourne and it looks like none of them were obviously closely related to those foxes in the Port of Melbourne.

I am assuming here that my sample of the Port of Melbourne was an accurate sample of the foxes in the Port of Melbourne so that underlies what I have done, but certainly three of the foxes - and that was the Longford, the Cleveland and it may have been the Burnie fox - were not closely related to the foxes in the Port of Melbourne.

Mrs BUTLER - Were they related closely to each other, though?

Dr BERRY - We are looking at testing specifically as to whether they are related at the level of cousins or whether they are part-siblings or full-siblings, and I test those specific hypotheses against each other and against being unrelated. Again, I emphasise that this is preliminary data and it will have to undergo peer review. We can say with high statistical confidence that some of the carcasses are unrelated. For example, the Bosworth and Longford carcasses and the Bosworth and Cleveland carcasses, but for the majority of the combinations we cannot distinguish at this stage between them being unrelated and being related at those levels, cousin and half-sibling, et cetera. That is really an issue of statistical power, and I do not want to bore you with those technical details but it just means that, with the information we have, we do not have enough statistical grunt to really answer those questions at this stage.

The scats present even more of a problem along those lines. There are some that we can certainly say are unrelated, and we have pretty good statistical power to say that, but in terms of some of the other relationships, comparing cousins versus unrelated, it is very difficult for us to actually distinguish those sorts of quite close relatedness levels. The information is still partial.

Mr DEAN - A question that we asked of Dr Sarre was in relation to the ageing of the scats. Is that an area that you look at?

Dr BERRY - Do you mean how long have the scats been lying around?

Mr DEAN - Yes.

Dr BERRY - No, it is not something we look at; I don't know of any way of doing it. We have done experiments with scats to see how long they lie around for and we did a very big outdoor experiment in Canberra on this. The experiment ran for three months and all but one of the scats were still there at the end of the three months. It is quite possible that scats that are found in the wild are up to three months old. That is the only light I can really shed on it.

Mr DEAN - Are you looking at any research to try to determine how long the scat has been lying around for or is that not possible?

Dr BERRY - It would be a real challenge. When we did our original experiment we looked at how much DNA we were able to get out of the scats of different age, between one week and three months. There is a progressive decline in the amount of DNA that is available, and that is obvious. If you were very bold you could calculate and look at how much DNA was in the scat and say, 'This is this age', but it would be a very imprecise science with the approaches I am taking, unfortunately.

Mr DEAN - Is there any other work that you have completed for the Fox Eradication Branch outside of the foxes? Have you looked at other scats - devil scats and so on - or has it all been fox related?

Dr BERRY - No, I've been focusing on the fox work. Initially when some of this early work was done - and I was working with Steve Sarre - we developed a test that can distinguish the different scats for large carnivores in Tasmania. That is the extent of my work on it. It's not relating to individual identification; it is just identification of species.

CHAIR - In relation to what you know of the Tasmanian findings, Ollie, what would be your views in relation to, firstly, whether there are foxes in Tasmania? Secondly, if so, approximately how many? Thirdly, if the eradication process wasn't successful, what would be the damage to the community in Tasmania? Are you able to answer those three questions?

Mr BERRY - I'll have a go. I will start with number three. I think there is no doubt that if foxes were to become established in Tasmania there would be a massive economic and environmental disaster. I think there's no question about that. Based on my data, I can say that there are 10 individual fox scats that have been collected in Tasmania. I think you need to couple that with other information to determine whether there are foxes in the wild in Tasmania. There certainly seems to be. My impression is that there is a lot of other information that reinforces the view that there is a wild population of foxes in Tasmania. The problem is not going to be solved overnight. It is going to require lots of different forms of data to be brought to bear on it. I believe there is a wild fox population in Tasmania and my data says there are both males and females and that there is a minimum of 10 of them.

CHAIR - Do you know what the Tasmania task force is doing in order to try to eradicate the foxes?

Dr BERRY - I know they have a very structured sampling scheme to try to determine the distribution of foxes and that is work that is being done in association with the Arthur Rylah Institute in Victoria. I know there is intelligence gathering, as well as a large public intelligence gathering program. They also do rigorous surveys for scats and try to identify the species and then follow up with identification of individuals. If they establish a pattern I understand that that is the information they base their control programs on. I don't know how they go about the specifics of baiting for foxes.

CHAIR - From what you know of their program, do you believe they're going about it in the right fashion or do you believe that they are falling down in some parts, and if so, where?

Dr BERRY - I don't think I am really qualified to answer that question. In some ways I am quite removed from the on-the-ground work over there, and I think that is probably a good relationship to have, to be fairly independent. I really can't comment on them. I know that they are highly professional and that their job is made very difficult by speculation about it. Whether or not there are foxes there, they still have an important job to do, so I would be very hesitant to criticise anything that the fox task force has done. Things can always be done better; there is no doubt about that. They have been very open to speaking with experts from outside and inside Tasmania so I think they should be commended for the work they are doing.

CHAIR - In relation to the bad publicity that they get from time to time, in your profession as an expert in the area looking at matters like this, how does that affect those people working in the area? I suppose it affects them, depending upon their personality, in different ways, but how does it affect you?

Dr BERRY - Me personally?

CHAIR - Yes.

Dr BERRY - Like I said, I am quite removed from it. Even at the remoteness of Western Australia and not being directly involved, I can say personally that sometimes I feel some stress with the negative comments that are made by a small number of individuals. That is part of the job, I guess, but I have no doubt that it makes the job more difficult for all concerned.

CHAIR - Do you think it affects the community as well because part of the reconnaissance is the community looking out for foxes themselves? If there is this criticism, do you believe they also feel reluctant to come forward if they believe they see a fox?

Dr BERRY - Time and time again you hear about people saying that they were reluctant to come forward because of fear of public ridicule. It's speculation but I would have to think that public criticism is not having a positive impact. That would be my guess. I am pretty confident that criticism is more likely to hamper efforts to resolve the issue rather than help.

CHAIR - Ollie, thank you very much for your time and expertise.

THE WITNESS WITHDREW.