

TRANSCRIPT OF PROCEEDINGS

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O/N 2348

**FEDERAL COURT OF AUSTRALIA**

**TASMANIAN DISTRICT REGISTRY**

**MARSHALL J**

**No TAD 17 of 2005**

**ROBERT BROWN**

**and**

**FORESTRY TASMANIA and OTHERS**

**HOBART**

**10.15 AM, WEDNESDAY, 7 DECEMBER 2005**

**Continued from 5.12.05**

**DAY TWO**

**MR D. MORTIMER SC appears for the applicant,**

**with MR P. TREE SC and MR T. MITCHELL**

**MR D. GUNSON SC appears for first respondent, Forestry Tasmania,**

**with MR A. ABBOTT and MR C. GUNSON**

**MR N. O'BRYAN SC appears for the Commonwealth,**

**with MR A. BROADFOOT**

**MR P. TURNER appears for the State of Tasmania,**

**with MR M. DIXON**

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HIS HONOUR: Yes, Ms Mortimer?

MS D. MORTIMER SC: If the Court please, may I announce the appearance of myself and my learned friend MR P. TREE SC, with MR T. MITCHELL?

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HIS HONOUR: Yes, thank you.

MS MORTIMER: Your Honour, one other matter before we start witnesses, and that is that it has been agreed that it is appropriate to tender the maps that we used on the view yesterday and the schedule, and if we can - we will have a copy - I don't know if we have got one in Court, I don't think so, but if we can attend to that and perhaps have it marked at a convenient time.

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HIS HONOUR: The schedule would be the schedule of the view?

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MS MORTIMER: Of where we went and what we did at what - - -

HIS HONOUR: All right. Well, the schedule will be exhibit A.

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**EXHIBIT #A SCHEDULE OF THE VIEW CONDUCTED ON 06/12/2005**

HIS HONOUR: The maps can be tendered together as exhibit B.

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**EXHIBIT #B MAPS USED ON THE VIEW CONDUCTED ON 06/12/2005**

MS MORTIMER: If your Honour pleases, I call Christopher Dickman.

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HIS HONOUR: Yes, thank you. Professor Dickman.

MS MORTIMER: Pardon me a moment, your Honour.

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HIS HONOUR: Now, Professor Dickman's evidence is at 575; is that correct?

MS MORTIMER: That is so, your Honour.

<EXAMINATION-IN-CHIEF BY MS MORTIMER

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HIS HONOUR: Yes, Ms Mortimer?

10 MS MORTIMER: Professor Dickman, can you tell his Honour your full name, your address and your current occupation, please?---My full name is Christopher Richard Dickman. My home address is 8 Kendall Street, Woollahra. My work address is the School of Biological Sciences at the University of Sydney.

15 And your present position is that you are Professor in Ecology at the University of Sydney and a Director of the Institute for Wildlife Research at Sydney University?---Yes, that's correct.

20 Now, Professor Dickman, you have sworn an affidavit in these proceedings that was sworn 19 October 2005. Do you have a copy of that with you in the witness box?---Yes, I do.

Are there any corrections you want to make to that affidavit or the exhibits that are attached to it?---Just one correction. There is a reference - - -

25 Your Honour, I think it is page 619 of the Court book.

HIS HONOUR: Yes?---It is in point 4, where there is a reference that has been made to Pimm et al 2005, that reference should be Dickman et al 2005.

30 MS MORTIMER: For your Honour's reference and those of my learned friends, I think what Professor Dickman is talking about is on page 619 of the Court book. This is appendix 2; is that right, Professor Dickman?---It is.

35 With the heading Source Materials Used in Compiling this Report, and it is the entry for number 19 on that; is that what you are looking at?---Yes, that's right.

40 And at the moment it reads Pimm S.L., Dickman C.R and Cardillo M. And what is the correction you want to make?---It should be to reverse the order of the first two orders, so Dickman, Pimm and Cardillo should be correct.

45 And why is that?---The manuscript was written primarily by myself and the second author, Stuart Pimm, and I guess after the last revision of the paper, we decided that I had probably done more than half of the original writing and re-writing, and Stuart was happy - - -

So you get to go first?---That's right. Stuart was happy for me to go first.

All right. Your Honour, if your Honour please, subject to that correction, I seek to read Professor Dickman's affidavit, or ask your Honour to take it as read.

5 HIS HONOUR: Yes. No objections have been notified?

MS MORTIMER: No, your Honour, not that I understand.

10 HIS HONOUR: All right. Well, what appears at pages 575 and following, constituting the evidence of Professor Dickman by affidavit will be his evidence-in-chief.

15 MS MORTIMER: Now, your Honour, I want to do two things to supplement Professor Dickman's evidence-in-chief. If your Honour pleases, the first is to take him through some aspects of his curriculum vitae to explain to your Honour what some of those positions that he has held and some of his research and publications are about. That is the first thing.

HIS HONOUR: Yes. Have you discussed with Mr Gunson - - -

20 MS MORTIMER: Actually, your Honour, no, I haven't. I haven't had a chance to talk to my learned friend about this.

HIS HONOUR: Yes. Is there any objection, Mr Gunson, to that?

25 MR D. GUNSON: No, your Honour.

HIS HONOUR: Yes, thank you.

30 MS MORTIMER: Your Honour, the second thing I would seek leave to do with this witness and with each witness is to ask him some questions in-chief in response to material filed on behalf of the respondents.

HIS HONOUR: Yes. Any objection to that course?

35 MR D. GUNSON: Well, I suppose it really depends on the extent to which my friend is going to take the witness to. We have had no notice of this. I am in a difficult position. I really can't comment, your Honour.

40 HIS HONOUR: Well, that is the sort of territory where, really, the Court is generally lenient with additional questions in-chief.

MR D. GUNSON: I accept that, your Honour. It is just that I don't know how extensive it is going to be. Perhaps my friend could give me some idea through - - -

45 MS MORTIMER: It might be between 20 minutes and half an hour, your Honour, maximum.

HIS HONOUR: Yes, all right. We will see how we go.

MR D. GUNSON: I think it is a case of, we will see how we go, your Honour, and take it from there.

HIS HONOUR: Yes, all right. Thank you.

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MS MORTIMER: Now, Professor Dickman, can you turn to your curriculum vitae? Your Honour, that starts on page 592 of the Court book.

10 Can you tell his Honour firstly, what is the Wildlife Institute?---Yes, I can. I have got my written report rather than the full CV here as well. Would I be able to - - -

15 You don't have a copy of that? Perhaps Professor Dickman could be shown that. It is the Court book, volume 2 - book 2, page 592. Now, it says in relation to your career history from February 1990 to the present you have been the Director of the Institute of Wildlife Research at the University of Sydney. Can you tell his Honour, please, what that institute is and what it does?---Yes. The Institute of Wildlife Research was created in 1990 as a collective of people within the University of Sydney and at external institutions, including the Australian Museum, National Parks, CSIRO and other organisations, with the intention of bringing together a number of people with similar interests, to increase the expertise that otherwise be available within the university. The objective of doing this was perhaps threefold. One was to increase the training outcomes for students, to provide them access to a greater diversity of people, particularly people inside and outside the university. Secondly, to maximise research opportunities by bringing in people with external skills; and thirdly, to act as a means of trying to bring in extra funding into the university to support research and post-graduate training.

25 Thank you, Professor Dickman. Can you look under the heading Other Distinctions and Research Achievements, on page 593, please? The first entry there is from 1991 to the present you were a member of the Species Survival Commission of the International Union for the Conservation of Nature and Natural Resources, known by the acronym IUCN, and you are a member of a specialist group. I will just ask you a couple of questions about that so his Honour can understand that. Can you tell his Honour, please, what is the International Union for the Conservation of Nature and Natural Resources?---The IUCN is the primary world conservation body. It directs conservation in many parts of the world by providing a set of standardised criteria and categories for the listing of threatened species and populations and communities, too, in some instances. To make the IUCN work effectively, there are volunteer organisations or sections dealing with particular groups of species in different parts of the world, and the membership of these is usually voluntary. There is no fundings provided by the IUCN. It is really a means whereby groups specialists can get together, under the auspice of the IUCN and by following its guidelines, come together to create lists of agreed threatened taxa.

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45 Now, your curriculum vitae says that you are a member of the Specialist Group for Australasian Monotremes. What is a monotreme?---A monotreme is one of the egg-laying mammals, in Australia these include the platypus and the echidna. There are more species that occur in New Guinea, but Australia has just the two.

And we probably think we know what marsupials are, but can you just give his Honour a range of the creatures that come within that?---Yes. These are familiarly known as the pouched mammals. It's probably not entirely correct because not all marsupials do have pouches. The key thing that separates them is that the marsupials give birth to young at a very undeveloped, early stage, so that at birth they are about the size of anywhere from a grain of rice to a baked bean. They're really very small. So the emphasis on reproduction in marsupials is very much with external lactation, on the outside of mother's body, rather than in utero, as the case with placental mammals.

10 All right. Now, the third entry there says that from 1992 to 1995 you were a Member of the Scientific Advisory Committee to New South Wales Government on Endangered Fauna. Can you tell his Honour what that committee is and what it does?---The committee was in existence until 1995 under an interim piece of legislation, the Endangered Fauna Interim Protection Act, and the Act allowed for the establishment of a scientific committee. This particular committee was a three-person committee - I was one of the three members - and the committee was charged with reviewing the status of all terrestrial vertebrates in New South Wales and publishing the consequence of the review in terms of listing them as threatened or as vulnerable in that particular case, under that legislation, with the publication of reasons for why the listings had been attributed.

20 All right. Now, there is another entry there, 1996 to 2002, that you were the Chair of the New South Wales Government Scientific Committee on Threatened Biota. Can you tell his Honour what that committee does and what its role is?---Yes, in 1995 the Interim Protection Act was rescinded and another piece of legislation, the Threatened Species Conservation Act, came into place, and that Act allowed for the creation of a scientific committee of 10 members and its operation again was to in part review the schedules of threatened species, also of populations and ecological communities in New South Wales, and also the operation and existence of key-threatening processes. The mandate of the committee was to identify species, populations, and communities at risk to list them as appropriate, as vulnerable, or endangered, and also to review and list key-threatening processes. There were a number of other more minor functions of the committee, such as to review joint-management agreements, to review and advise on recovery planning in New South Wales, that this was the primary function to recognise, to identify, and make recommendations about threatened taxa in the State.

35 All right. And just finally in that list, directly under that, there is an entry 1996 to 2002, Member, Scientific Advisory Committee, Worldwide Fund for Nature. Can you tell his Honour, please, what the role of that committee was?---Yes, this was a committee - it still is a committee - that is run by the Worldwide Fund for Nature, this is an international, non-government conservation organisation and its aims broadly are to conserve species and to conserve natural systems in which various species occur. The Scientific Advisory Committee began, at least in my tenure on that committee, as being a review committee to look at applications that were being submitted to the Worldwide Fund for Nature from scientists proposing to work on threatened taxa and it was the task of the committee in the early days to review those applications and to advise the WWF on the merits of funding and the likelihood of success. Towards the end of my time on that committee, the task became more general and the committee was charged with trying to provide strategic direction for WWF in terms of its Australian and broader conservation efforts.

5 All right. Now, finally just on your curriculum vitae, Professor Dickman, can you turn over the page to page 594 under the heading Research Interests where you describe the major focus of your research and I just want to ask you about a term you use there and that is terrestrial vertebrates. Can you tell his Honour, please, what species are encompassed in that phrase?---Yes, terrestrial vertebrates include frogs, reptiles, birds, and mammals. There is a fifth vertebrate group, fish, but they are not included in the term terrestrial vertebrates. So that is the four groups, frogs, reptiles, birds and mammals.

10 Thank you, Professor Dickman. Now, I want to ask you some questions about two of the affidavits that have been filed on behalf of the respondent and the first is the affidavit of Dr Meggs. So can Professor Dickman be shown book 4, please, page 1189? Now, can I ask you to turn, Professor Dickman, to paragraph 22, which is on page 1197? In that paragraph, Dr Meggs expresses an opinion about your evidence and the evidence of Dr  
15 McQuillan and Dr Michaels and then he goes on at the bottom of that paragraph on that page to make this statement:

20 *No evidence of widely operating threats occurring at a sufficiently high rate to meet IUC and threatened species criteria has been identified in the affidavits to which I refer above.*

I want you to focus for a moment just Dr Meggs' use of that phrase, widely operating threats occurring. In your opinion is that the correct or incorrect approach to that issue?---In terms of the IUC criteria for recognition and listing of threatened species,  
25 threats don't always need to be identified. If you have a small population or a species that occupies a very small geographical range that in itself can be the threat, it's population smallness is the threat. There need not be under some of the IUC criteria external threats. So the species may be at risk in its own right by virtue of being small or having a very small restricted geographical area.

30 Thank you. Now, can I ask you to look secondly at paragraph 25 on page 1198 where Dr Meggs expresses this opinion:

35 *The only objective measure as to whether the harvesting of these two coupes will further threaten the beetle is an increase in the threat status of the species to critically endangered under the EPBC Act and it is my opinion the species will not meet any of the criteria for this threat category.*

40 Now, Professor Dickman, do you agree with Dr Meggs' opinion that that is the only objective measure?---No, I don't agree.

45 Can you explain to his Honour why?---The threat categories that are referred to under the EPBC Act are endangered, critically endangered, and vulnerable. They are categories. And the means by which it is possible to determine whether a species should be in one category or the other include measurement of population size, the extent of distribution, the magnitude of threats, perhaps the rate of decline of populations, or distributions of species, and any of these measures I would have thought would be more objective than simply where a species is in terms of its categorisation. It would be, in my opinion,

5 preferable to measure the actual rate of decline or the actual extent of an area that a species occurs and the extent to which that is declining to get an objective measure of its status. The use of categories such as critically endangered simply recognise the end consequence of these processes where species end up after the populations have been reduced to certain levels. So as read in paragraph 25 it's certainly not the only objective measure to have another category available. In fact, if anything, we should be trying to go the other way and to recover the species from its currently endangered status.

10 What do you mean by going the other way?--The paragraph here talks about the species moving into critically endangered and really from the point of view of conservation broadly we really should, I think, be talking about having species being recovered from the endangered category and moving the other way into vulnerable or hopefully out of the threatened categories altogether.

15 Thank you. Now, can you look at paragraph 29 on page 1199? There Dr Meggs expresses this opinion:

20 *As there is currently no method available to accurately sample population sizes of the species there is no scientific data available on population trends of the beetle hence -*

Dr Meggs says -

25 *it cannot currently be shown whether numbers of the species are increasing, decreasing, or stable.*

30 If that be the case what is your opinion, Professor Dickman, about the approach that ought to be taken? I withdraw that. What is your opinion about the approach that ought to be taken?--I think the first line in paragraph 29 is the interesting one that suggests an approach. It may be the case that there is no method of accurately sampling population sizes of the beetle. To do so would be to have a very good, reliable measure of the total number of beetles in a sample area and at the moment there is no way to do that. But the second part of the sentence suggests that this means there is no scientific data available to measure population trends and I think the two parts of the sentence really don't go together very well. You don't need an accurate population sample to identify population trends, there are other measures.

40 Such as what?--Other measures might include looking at the catch per unit effort for example. If there is a measure of people searching for the beetle in areas of potentially suitable habitat you should be able to derive some sort of measure like the numbers of beetles captured per hour. It doesn't give you the population size. If you can show that the number of beetles captured on an hourly basis is declining that is a very good reliable surrogate for indicating population decline.

45 All right. Now, can I ask you to look at the second sentence in paragraph 29, Professor Dickman? If it be the case that Dr Meggs is right and it cannot currently be shown whether numbers of the species are increasing, decreasing or stable, what is your opinion in relation to principles about protection and recovery that ought to apply in that

situation?--If there are no data on the population size or population trends of the beetle then we do know that this is a very scarce species. It is currently listed as endangered. In the absence of other information the precautionary principle, I would think, should come into operation.

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And can you just describe to his Honour what you understand that principle to be?--Yes. The precautionary principle is taken to be a principle that operates such that you can take action if you don't have full information to hand. If you have reasonably good information that suggests that following a course of action will cause a species to decline but you don't know that for absolute certain then it is reasonable to note the precautionary principle and take action to reverse the suspected or expected population trends so it is action in the absence of absolute certainty but on reasonable grounds nonetheless.

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Can I ask you to turn now to paragraph 54 of Dr Meggs' affidavit at page 1207 of the Court book and I want you to focus please on the last sentence in that paragraph where Dr Meggs says:

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*It is my opinion that no case has been made that the species has been subject to an immediate risk of extinction in the wild in the interim.*

20

Do you agree or disagree with that approach in relation to the beetle?--The phrase "immediate risk of extinction" is the phrase that needs to be supported if these species is to be critically endangered. It is probably correct that there is insufficient evidence to indicate that the beetle is critically endangered. There probably isn't the case to be made that the species is in immediate risk of extinction but it would seem to me that again we are perhaps going the wrong way, that rather than talking about actions that may or may not place the species in immediate risk of extinction that we really should be thinking about recovering the species and to taking actions that affect that for the species rather than to place it perhaps further down the slippery slope towards immediate risk of extinction and critical endangerment.

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Now, can I ask you please to go to paragraph 96 of Dr Meggs' affidavit at page 1221. There Dr Meggs expresses the opinion that despite some of the matters to which he has previously referred it is his opinion that the beetle still meets the criterion for an endangered taxon under both the State and Federal legislation on the basis that the effectiveness of the measures outlined above has yet to be quantified. Now, just concentrating on that criterion that Dr Meggs uses, the effectiveness of the measures outlined has yet to be quantified, in your opinion is that important in relation to the listing or continued listing of a species or is that important in relation to something else about a threatened species?--It is a currently listed endangered species if there are measures that are proposed to - I am not quite sure without reading the paragraphs above but - effective measures outlined yet to be quantified. I think taking the precautionary approach we do know the species is endangered. It is at very high risk of extinction in the near future. I think that whatever measures are being spoken of here the prudent course of action would be to leave the species as endangered and to adopt any measures that might ameliorate the situation as quickly as might be possible.

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Looking at the effectiveness of measures that might be taken for a species that is in this category, can you tell his Honour whether, in your opinion, that is relevant to protection and recovery or not?--I think from the point of view of recovery you would need to be fairly confident that measures that you were specifying for the recovery of the taxon were going to work, that is you would need to have some sort of diagnosis of the cause of the species, present low numbers or small area distribution and you would need to be confident that the measures that you outlined to recover the species will traverse that situation.

10 HIS HONOUR: What is meant by taxon?---Taxon can be a species. It usually is taken to mean a species.

MS MORTIMER: Professor Dickman, can I ask you to go please to paragraph 102 of Dr Meggs' affidavit on page 1224 to 1225 and there Dr Meggs is talking about the range of the beetle and what he says in the last two sentences of paragraph 102 is this:

20 *The population of the species on Maria Island can be considered relatively secure as none of the potentially land threatening use activities identified as likely to impact on habitat of the species can occur therefore I do not consider that the species is currently facing a very high risk of extinction in the wild in the near future.*

In your opinion when one is looking at the population of the beetle in Wielangta, ought the population on Maria Island be taken into account?---In the absence of information on the nature of the species on Maria Island, probably a working hypothesis would be that the beetle that occurs at Wielangta and on Maria Island is the same. On the other hand from the point of view of looking at many other examples, in a taxa that have been isolated for relatively long periods of time, this includes other species of invertebrates, many species of vertebrates including a good chunk of the vertebrate fauna for example of Tasmania itself, you would expect that there would be genetic differences and these come about because populations of any species that are separated by barrier will be subjected to different selected pressures.

Right?---These will come about from differences in climate, differences in soils, topography, suites of predators, competitor species that occur in the two locations so it would be a working hypothesis to consider the Maria Island species to be the same as that on the mainland. It would be, from a biological perspective, probably not very good to do so. There would be almost certainly differences that could be determined genetically or morphologically.

Now, you have said, Professor Dickman, that those differences can arise when there is a separation and the words you used were "over relatively long periods of time". What do you mean by that phrase? What periods of time are you talking about?---Some work in other parts of the world, for example, in the Galapagos Islands, small changes in morphology and appearance have been determined in the birds that occur there over periods of years. In Western Australia some evidence from island populations just off the Western Australia coast suggest that differences at the sub-species level - these are really quite distinct and quite recognisable differences can come about after just hundreds of

years. In the case of the separation of Maria Island and the mainland we are probably looking at periods of thousands of years, perhaps as much as ten thousand. In that case we are looking at a very large number of generations and a very high possibility of differentiation having occurred.

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And in terms again of protection and recovery of species, if those genetic differences have arisen, what is the importance of that in terms of protection recovery if you have got two genetically different groups?--I think with two genetic groups one of the drivers in conservation, one of the key things that people wish to do is to conserve genetic diversity.

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If there are mainland and island populations that differ and have different gene pools, the key thing would be to try to conserve both and not to assume that they were the same, but really to conserve both to maximise their retention of conservation and genetic diversity.

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Are there any problems with a genetic population occurring on an island in terms of its long-term health and viability?--Yes, there can be because island populations in general tend to be rather small, they are obviously constrained by the confines of the island boundaries. It means there are less likely to be very high levels of genetic variation that are retained in the population. There are a couple of reasons for that. One is that the founding population of a small island is likely itself to be genetically not very diverse, so we are starting from a relatively low genetic base. The second point is that with a low - a small range of potential individuals among which interbreeding can occur there may well be genetic drift or fixation of particular genes with the loss of others in the population. Over relatively short periods of time small island populations can become quite un-diverse and there is a lot of documentary evidence for this around the coast of Australia and elsewhere in the world.

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Can I ask you to go to paragraph 127 of Dr Meggs' affidavit, page 1233. Down the bottom of page 1233 Dr Meggs is expressing an opinion that there is no evidence that fragmentation of habitat is a threatening process for the beetle and then he makes this statement:

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*To demonstrate that fragmentation is operating you need to show that a species is declining at a disproportionately faster rate than the rate of habitat loss, indicating that the spatial arrangement of habitat is having a greater impact on the species than the total amount of available habitat.*

35

Do you agree with that statement?--No, I don't agree.

40

Can you tell his Honour why not?--The statement says that you need to know that a species is declining at a disproportionately faster rate than the rate of habitat loss and although that may be of interest, it is not the usual measure of habitat fragmentation. Habitat fragmentation is more usually taken to mean the situation where potentially available habitat is removed and the species that formerly occupied that broader area of habitat are now confined to the fragments that remain. So in fact you can get an opposite effect rather than a disproportionately faster rate of loss in a fragmented habitat. You can get a local effect with the reverse of that where the displaced individuals move into the fragments that remain and it appears that you have actually got a population increase. It is

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a temporary one because the populations will decline afterwards. But nonetheless, this is it seems to me a strange and not widely accepted definition of habitat fragmentation.

5 Now, finally, Professor Dickman, if you look at paragraph 135 of Dr Meggs' affidavit and then also at paragraph 141, Dr Meggs repeats again the opinion that he has expressed earlier about measuring the effects of harvesting on the beetle by whether it is going to move further into the critically endangered category. And can I take it that you hold the same opinion that you already expressed before in relation to two other paragraphs about those two?--Yes, I do think that the best objective of determining whether there will be an impact on a species is to measure the population before and after, to measure the distribution before and after and not simply to take what might be to some extent an arbitrary categorisation, and to ask whether the action will cause the species to fall into that category or not. I think there are much more direct objectives and better methods than asking whether a category criteria - a set of criteria will be met.

15 Thank you. Now, that is all I wanted to ask you about Dr Meggs' affidavit. A couple of questions about one other affidavit filed on behalf of the respondent is that of Mr Wapstra which appears in book 5 at page 1925. Now, I want you to turn, please, to paragraph 190 of Mr Wapstra's affidavit. That is where he is dealing with your affidavit and in particular something about some comments you have made about foxes. I just want to ask you a couple of questions - oh and predators - about that. Firstly, Professor Dickman, why did you refer to risks from foxes at all in Tasmania?--About four or five years ago there is good evidence that foxes were introduced to Tasmania and there have been fairly good, reliable sightings that have been made subsequently. It looks as if the evidence that foxes are in the Tasmanian environment is really quite strong and the possibility - strong possibility is that they are here and that they may become established in high numbers in the future.

20 Now, can I just stop you there. What is the source of your knowledge about the presence of foxes in Tasmania? That is, what I mean Professor Dickman, is why do you know anything about that?--Last week I was part of a review team, three people were asked by the Invasive Animals CRC to conduct a review of the fox situation in Tasmania. And that was a review to determine the nature of the evidence that foxes had been introduced, the nature of the evidence that foxes had been sighted or shot, or faecal remains have been found to evaluate this and to evaluate the extent to which foxes are likely to be in Tasmania. So it was an independent review and I was one of the three people charged with carrying out that review.

25 All right. Now, what Mr Wapstra says about foxes, about three-quarters of the way down that paragraph from 1191, is he says:

30 *With respect to the latter reason in my opinion this is hyperbole without basis. Humans find it hard enough to shift logs that provide shelter for this low density species, so I cannot understand Professor Dickman's contention that a red fox can achieve this task and have an impact on the species.*

35 Can you explain to his Honour how it is in your opinion a fox can be a predator for the beetle?--Yes. I think in my original affidavit in suggesting that if foxes take off they may

include the beetle in the diet, I didn't really think that foxes would be rolling logs, but rather that they have an extremely good sense of smell, an extremely good set of ears and that they can detect buried prey. They can detect buried prey if it is moving around at 25 centimetres or more and they will dig to get it. In fact it is the basis for the 1080 baiting of foxes on the mainland and is part of the Tasmanian fox-free taskforce. Baits are actually buried with the sole intention that they will be available to foxes, but not to other species. And it relies on the fact that foxes really do have extremely good smell to detect buried food, very good ears with which they can hear buried food moving around and they would be very easily able to dig under logs. In fact I have seen them doing just that in different areas.

And Mr Wapstra then goes on to express a different opinion to you about the risks posed by kookaburras. Can you explain to his Honour what is it about the features of a coupe that has been logged that leads you to express the opinion that kookaburras might be a threat for the beetle?--Yes. Kookaburras are reasonably well able to sit up on perches near an opened up area and see prey moving about at some distance and are able to easily swoop down and take them. In areas that have been opened up such as in coupe situations where trees have been removed and the habitat has been opened, this is the sort of situation where kookaburras could readily forage.

I have no further questions for Mr Dickman, if your Honour pleases.

HIS HONOUR: Thank you. Yes, Mr Gunson?

25

**<CROSS-EXAMINATION BY MR GUNSON**

**[10.56am]**

MR D. GUNSON: Thank you, your Honour.

30

I think, Professor, we may stay with kookaburras for a few minutes since we are at that point and your evidence is fresh in our minds. I would like to ask do you have any evidence at all that these beetles actually form part of the diet of kookaburras?---No, I don't.

35

And kookaburras prey on very many sorts of small reptiles and animals in the bush, don't they?---Yes.

They have a very varied diet?---That's correct.

40

They are nest robbers? They would take small birds that are in nests?---Yes, they can do that.

They will prey on small birds, won't they, such as wrens?---That's right.

45

They will prey on lizards?---Yes, they will.

Snails?---Yes.

Basically anything they see that they can get into their mouths they will eat, won't they? They have a very varied diet?---Provided it's small enough. They do have a very wide diet and will take in a very broad range of prey.

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That is right?---That is correct.

And you are not seriously suggesting that by forest activities in Wielangta, opening up the forest is going to make the beetle particularly more vulnerable to the kookaburra, are you?---Perhaps not particularly more vulnerable, but I think there would be a risk.

10

What I am really saying I suppose is because there are less trees, the area of ground is opened up and therefore a kookaburra foraging in that area might see a beetle. That is what it really comes down to, isn't it?---That's correct.

15

Yes. And similarly with the red fox, you say there is evidence that the fox has been introduced into Tasmania. I don't think anybody is going to dispute that with you, but there are very extensive programs in place for the eradication of this pest, aren't there?---Yes, they are in place. They are quite extensive, but whether they are effective is another issue.

20

Yes. I was going to come to that, but on the face of things as they presently stand, they appear to be relatively successful, don't they?---In terms of sighting data, yes, it does appear that foxes are in the many areas in the eastern part of Tasmania.

25

But the number of foxes that have actually been found or shot is very low, isn't it?---Yes, it is.

And I think you would accept so far I think that there has been one positive finding of a fox, a fox that was shot at Simmons Plains, south of Launceston?---There are other pieces of evidence as well. There was for example a fox dropping that was found in the north-east earlier this year that was confirmed by DNA evidence.

30

Yes. And there has also been a very extensive baiting program in that area, hasn't there?---Yes, there has been.

35

And one of the problems that the researchers working in the eradication of the fox have experienced is the presence of the Tasmanian Devil, isn't it? The foxes die after eating the bait, you have the natural predator, the Tasmanian Devil, who comes along fairly quickly and eats the carcass and hence carcasses aren't found?---I think although that could be the case, there are many areas now where the Tasmanian Devil has dropped to such low numbers that it's possible to see carcasses lying on the road or in paddocks, whereas in the past they would have been cleaned up by devils.

40

Not fox carcasses, carcasses of other animals that have been killed. But you would - we would come back to the basic proposition that so far there has been one fox found dead, namely the one that was shot at Simmons Plains, and that was found some days after the hunter had shot it and lost it that night.

45

MS MORTIMER: Your Honour, there are about five questions in that, and my learned friend ought to break them up.

5 MR D. GUNSON: I will break them down.

You would agree, wouldn't you, that so far all the evidence points to one fox having been shot?---No, I disagree.

10 Can you suggest other numbers that have been shot?---There is some evidence of two.

Yes, and where do you suggest they were shot?---One in the Longford/Cressy area and the other one at Simmons Plains.

15 That is the one we have mentioned, though, Simmons Plains. The Longford/Cressy one, though, was generally regarded as somewhat of a hoax, wasn't it?---Yes. Some people do regard it as a hoax.

20 The carcass was never recovered. All that was produced was a photograph of some men with a fox standing under a street sign saying "Longford"?---There was some genetic evidence that was tendered indicating that this was a fox.

25 I am sure the photograph depicted a fox as well, but in any event you say there is some genetic evidence which suggested that it was a fox that had been recently alive, I suppose?---It indicated that it was a fox, and there was some suggestion I think that it might have been related to the other fox that had been shot.

30 All right. And the suggestion at the very beginning was that all of these foxes were related because some ill-informed persons brought in a litter of foxes?---Yes. That had been the initial evidence that perhaps two litters, perhaps three litters had been brought into Tasmania, that they had been perhaps kept for a period to grow them up beyond the cub stage to increase the chance of them succeeding upon liberation into the environment.

35 And we will come back to the fox, and we will leave the fox in a moment. Do you have any evidence to suggest that broad-toothed stag beetles normally form part of a foraging fox's diet?---No direct evidence.

40 So really, at the end of the day it is just a supposition on your part that if the logging is allowed to go ahead, that if the fox exists, the fox might move into the Wielangta area and one day a fox might decide to eat a beetle. Is that what it comes down to?---It's a supposition based on having observed foxes in forestry environments and in other contexts, both in Australia and in other parts of the world, and in one long-term study that I have been engaged in in central Australia, observing foxes moving into an environment from which they had been previously absent and wiping out populations of several species of beetles - mostly ground beetles, not Lucanids, the family to which the stag beetles  
45 belong - but other ground beetles of similar size and behaviour.

And those particular beetles, are they beetles that live within decaying logs or bury themselves in the ground?---Yes, some of them are.

5 And you are suggesting that those beetles are removed from the ground by the foxes digging them up; is that right?---We have some evidence that the foxes take them from the surface as they are moving around, and some evidence, too, that the beetles are actually being dug up by the foxes having detected them from above and then dug down to find them.

10 And that no doubt would depend also upon the composition of the soil, how easy it is to dig; sandy soil obviously being easier than maybe impacted soil?---Yes, I think sandy soil would be easier to dig in, there is no doubt.

15 All right. Thank you for that. You have no particular expertise in broad-toothed stag beetles; is that correct?---That's correct.

And you don't have any particular expertise in swift parrots; is that correct?---That's correct.

20 And you have not made any study of the broad-toothed stag beetle or of the parrot?---I haven't made a formal study of either.

All right. Have you visited the Wielangta Forest?---Yes, I have.

25 And when did you visit it?---I went on a site visit yesterday with other people, many of whom are present today, and about five years ago made a further visit while on a holiday in Tasmania.

30 And what was the purpose of the visit five years ago?---It was a visit to see some of the very nice parts of the State. It was very much a tourist visit.

And when I say you went to the Wielangta Forest, did you go to the coupes 17A and 19D?---No, we didn't go to the coupes.

35 And yesterday you visited those coupes?---Yes.

That was your first visit to the coupes?---Yes.

40 Thank you. Now, in respect of your evidence, have you ever had any experience with land management planning?---Little direct experience with it in terms of constructing plans for myself.

Yes. Have you ever managed land yourself?---No.

45 And I imagine you don't claim any particular expertise in forestry, particularly forestry in Tasmania?---No particular expertise, no.

5 And you have no expertise, obviously, in forest management?---I have expertise that has been brought about by having worked in forest environments for about 10 years, from having carried out my PhD in a forest environment, from having worked after my PhD in a forest environment, or forest environments, rather, and from having supervised a number of students over the years who have worked in forestry environments. So I have some expertise, I think, both directly from my own research and from supervised students on research projects based in forest environments.

10 Are you familiar with the provisions of the Forestry Code of Practice that applies in this State?---Not intimately familiar.

Have you read it?---I have read parts.

15 And when did you read those parts?---About - it would be about two months ago.

And were you requested to read those parts then, or was this just something that you were asked to do by somebody?---Yes, it was at the time of preparing documents for this case.

20 Thank you. Are you familiar with the provisions and regulations for forest management on the mainland as they apply to the swift parrots and their range?---No.

Are you familiar with the range of techniques that have been used to historically manage forest wildlife?

25 MS MORTIMER: I object to that question. It might be - it is unhelpful when it is that broad, your Honour, which State, which place?

MR D. GUNSON: I think that is a fair observation. I will withdraw it.

30 Are you familiar with the range of techniques that are used, have been used historically to manage forest wildlife in Tasmania?---I have got some familiarity with monitoring techniques that have been used to survey the populations of different forest, particularly mammal species, but to a lesser extent other vertebrates as well.

35 But what about in Tasmania?---That's in Tasmania.

Yes. When and where?---From the literature. There is a fairly big literature on forest mammal populations in this State and I have read at least part of that literature.

40 In recent times?---Yes. I should say that I also teach in two programs that require some knowledge of forestry practice and the monitoring of different species in forestry environments and to try to ensure that the teaching is effective it means keeping up to date with the literature on what is currently happening in forestry environments.

45 Thank you. Have you ever participated in a successful management of a wild population of animals or plants?---Could I ask you to clarify, please, what you mean by management?

Being involved actively in the management; hands-on, if necessary?---Okay, yes, then I do have experience.

5 All right. In what areas, and when?---I have worked in Western Australia on two species of threatened mammals, looking at ways of finding out the population size, trends, the habitat they occupy, the resources they use. I have done some work in New South Wales on the eastern pygmy possum, and an endangered population of long-nosed bandicoots that occurs in North Sydney, and this was all active management in the sense of going out in the field, to try to determine the numbers of species - numbers of individuals, rather, that were present; what they were doing; what factors might influence their populations.

10 Prior to yesterday, had you ever seen a nest tree or a foraging site of a swift parrot?---Yes, I had.

15 Whereabouts?---In Victoria.

And do you know what the reproductive rate of the swift parrot is?---I think they produce around four eggs a clutch, but I would need to check.

20 Is that a guess, or an informed guess, or what?---Yes, it's a guess.

And what about its life span?

25 MS MORTIMER: I object to this line of questioning, your Honour, because the witness has already answered the question that he doesn't profess to have any expertise about the parrot.

HIS HONOUR: Mr Gunson?

30 MR D. GUNSON: Given the conclusions that Professor Dickman has reached as to what might well happen if the nesting sites and the trees at Wielangta are removed, I would submit that it becomes relevant to know whether or not he has any knowledge at all of the bird's life span, your Honour.

35 HIS HONOUR: Ms Mortimer?

40 MS MORTIMER: Your Honour, in my submission what Professor Dickman has done is he has based his opinions on some of the other material with which he has been supplied, for example, the other experts to be called on behalf of the applicant so he is not professing to express those opinions because of his expertise about parrots.

HIS HONOUR: I will allow the question.

45 MR D. GUNSON: Do you have any particular knowledge about the life span of the swift parrot, professor?---No.

Thank you. And do you have any particular knowledge about its foraging requirements?---I have seen them foraging on blossoms - on eucalypt blossoms - in

Victoria and I have read from the literature that they are primarily nectar feeders but will take other materials too.

5 And that is your understanding of their basic food source?---Yes, that's correct.

And what is your knowledge or the extent of your knowledge about their nesting habitat?---It's primarily, from what I have read in the literature, it was augmented to agree yesterday by the site visit but the majority of what I know is from what I have read.

10 And their requirement for nesting habitat goes hand in hand with the requirements for foraging, doesn't it? They will nest in the area where they are foraging?---They can do but I think there is also some evidence that they don't always forage in the areas where they breed.

15 You would agree that as a general proposition that if a bird, such as the swift parrot, cannot find its foraging requirements in one area that it will move to another area where that foraging requirement can be satisfied?---It would certainly attempt to find food wherever it could.

20 You would agree from what you heard yesterday that the blue gums are not flowering in Wielangta at the moment?---Yes.

And the general discussions were to the effect that because the blue gums weren't flowering the birds weren't there?---Yes, that's correct.

25 And if the blue gums aren't flowering and they were flowering elsewhere you would expect the birds to be there, wouldn't you, as a matter of basic logic?---Yes, you would.

30 And taking into account their known behaviour?---Yes, you would expect them to be foraging in areas where there were blossoms that were available for them to feed upon.

That is not an unusual feature for any form of bird, is it? If they can't find their food in one area they will - - -

35 MS MORTIMER: Your Honour, one question at a time would be helpful.

MR D. GUNSON: I think you got the first question, professor?---Yes, my general understanding is that birds would fly to areas where they would find food. If they were hungry and needed to eat they would fly to where they thought they could best find it.

40 And you would expect them also if there was an abundance of food in that area and suitable nesting habitat to nest in that area as well?---You may do.

45 You would agree from what basically you learnt yesterday and what you already know the swift parrot is very much a migratory bird that comes into the Wielangta forest from time to time?---Yes, it is a migratory bird. It is not present all year.

And its presence in Wielangta is dictated by the presence of food primarily?---I don't accept that.

5 Well, its absence from Wielangta would be dictated by food, wouldn't it?---Yes, its absence would be.

Yes, thank you. If I could take you please to paragraph 54 of Mr Meggs' affidavit. Do you have that in front of you, Professor?

10 HIS HONOUR: What page of the Court book, Mr Gunson?

MR D. GUNSON: I knew your Honour was going to ask that. I am running from a separate page. I will just have my instructor turn it up. Page 1207, your Honour.

15 Just wait Professor, until his Honour finds the page.

HIS HONOUR: Thank you.

20 MR D. GUNSON: Thank you.

Now, if I can take you to the bottom of that page again, Professor, you were asked by Ms Mortimer about the final sentence:

25 *It is my opinion that no case has been made that the species has been subject to an immediate risk of extinction in the wild in the interim.*

MS MORTIMER: Perhaps if my learned friend could just wait. I think Professor Dickman is still finding - - -

30 MR D. GUNSON: Have you found it?---Yes, I just found it.

All right. The sentence that you were taken to is this one:

35 *It is my opinion that no case has been made that the species has been subject to an immediate risk of extinction in the wild in the interim.*

40 Now, that is the view expressed by Mr Meggs. And you gave us your view about that. Would it be fair to say that this really comes down to a fundamental philosophical debate between you and Mr Meggs? He holds that view. You don't hold that view?---I think it is correct that no case has been made that the species is subject to an immediate risk of extinction but I think a case has been made that it is at very high risk of extinction.

At some indeterminate time in the future?---It is currently at very high risk of extinction.

45 Why do you say it is at high risk of extinction at the moment?---It's what - my understanding is that the species is currently listed as endangered and the criteria for listing an endangered species, provided it is not already listed as critically endangered, that it is a species that is considered to be at very high risk of extinction in the near future.

Have you read the criterion recently?---Yes.

5 And you would agree that criterion 1 was not satisfied, that is the decline in numbers.  
There was no evidence against that criterion.

10 MS MORTIMER: Your Honour, if my learned friend is taking the witness to the criteria  
that are in the EPBC Act it may be helpful if the witness has that in front of him and that  
we also do.

10 MR D. GUNSON: Perhaps I can approach it a different way to save a little time.

15 Do you accept that the broad-toothed stag beetle is known to occur in approximately 34  
to 38 sites in south-eastern Tasmania?---I accept it on the basis of what I have read in the  
material that has been submitted to the Court.

And in particular Mr Meggs' affidavit?---Yes, Mr Meggs and others.

20 All right. Thank you for that. Do you know Mr Meggs?---No, I don't.

Have you read his affidavit fully?---Not fully, no.

25 Right. So we have Mr Meggs' affidavit of 17 November 2005 consisting of some  
approximately 50-odd pages, can I ask when you first saw a copy of Mr Meggs'  
affidavit?---Two days ago.

Were you given a copy or were you merely asked to look at various paragraphs of the  
affidavit?---I was sent the whole affidavit.

30 Have you read the whole affidavit?---No, I haven't read the whole affidavit.

35 Is there a reason why you have not read the whole of the affidavit?---I didn't read the  
preliminary information up-front and probably scanned some of the references that were  
referred to at the back of the affidavit but most of the rest I tried to read in the time that  
was available.

40 Do you feel it would be of some benefit to you to have the opportunity to read the whole  
of the affidavit before I questioned you further about it because I am going to take you to  
a number of paragraphs of it and ask you for your opinion on them?---I'd be happy to look  
at those paragraphs.

45 It is really a question do you think before I continue to cross-examine you it would be of  
benefit to you to read the whole of Mr Meggs' affidavit? It is a matter for you entirely. I  
am sure we will be guided by his Honour - - -

HIS HONOUR: Mr Gunson, doesn't it merely mean this, that Professor Dickman will not  
have any difficulty in respect of those that he has read and they may be entirely

co-terminus to what you ask questions about and if not, then there might be an opportunity for a break to read the material.

5 MR D. GUNSON: Well, I am particularly troubled about some aspects, your Honour because I am going to ask him, for instance, has he read Mr Meggs' seminal article which is the May 1999 article which is an exhibit, Distribution, Habitat, Characteristics and Conservation Requirements of the Broad-Toothed Stag Beetle. I will be taking him to that. I will also be taking him to the article by Meggs and Munks which is referred to extensively through the affidavit of Mr Meggs, which is exhibit 3, Distribution, Habitat, 10 Characteristics and Conservation Requirements of the Broad-Toothed Stag Beetle in general terms.

HIS HONOUR: Have you read those materials, Professor?---Yes, I have.

15 MR D. GUNSON: You have read both of those publications?---Yes.

Thank you. I think I can proceed along, your Honour, without the need for him to read the balance of the affidavit.

20 You would accept of course that Mr Meggs is probably the pre-eminent expert on this beetle?---Yes, I would.

You wouldn't quarrel with that in the slightest?---I think there are other people who also know a lot about the beetle but Mr Meggs I think would be one of the people who clearly 25 knows a great deal about it.

Well, it would seem on the face of the affidavit I think you will accept that he is a person who has made a particular study of that beetle?---Yes.

30 And you have read the two articles that I have just referred to, to his Honour, the seminal paper that he published in 1999 which is exhibit 2 - - -

35 MS MORTIMER: Your Honour, I object on this basis: if my learned friend is going to characterise things as seminal, then he ought not incorporate that as an assumption in the question. He ought to ask the witness if he agrees with that characterisation.

MR D. GUNSON: Happy to do that, your Honour.

40 You have read the item that is exhibited there as exhibit 2 by Mr Meggs' report to the Forest Practices Board and Forestry Tasmania, May 1999 entitled Distribution Habitat Characteristics and Conservation Requirements of the Broad-Toothed Stag Beetle?---Yes, I have.

45 Would you disagree with my characterisation of it as a seminal article?---Seminal usually means the first. My impression was that there had been some prior work on this species, so in that regard it wouldn't be seminal, although it would be an important article.

You certainly don't quarrel with its importance do you?---No, I don't.

Do you have any criticisms of the article per se as to its findings and recommendations?---I think what I would have liked to have seen would have been perhaps more emphasis of different ways of surveying for the beetle. I think there has been some discussion about  
5 looking for the beetle in terms of rolling logs and logs a certain size get rolled, but larger logs obviously don't get rolled because they are too big. I think that pitfall trapping had been tried, but given away at an early stage in the piece. That is usually considered to be a good method of invertebrate survey in many areas. So perhaps these two areas could have been improved, that is, spend more time looking at effective ways to survey for this  
10 particular species.

But apart from those comments do you have any comments or criticisms about the findings and inclusions of Mr Meggs?---No, I think that would be all.

15 All right. So it comes down to just a minor issue that you have just addressed concerning the method of looking for the animal, whether it should be by log rolling or by the little pitfall traps?---I wouldn't characterise it as being a little point necessarily. I think the methodology used to find the beetles is potentially very important indeed.

20 Well, what other option were there available to the researchers other than the two methods that have been adopted?---Pitfall trapping is very straightforward. You simply get some pitfall traps that might be similar to the glass jars on the tables here and put them in the ground and come back a few days later to see what's fallen in. It's a very simply and very standard way of carrying out invertebrate surveys.

25 That depends entirely though on the mobility of the animal doesn't it, how frequently it emerges from under the logs or out of the soil, how far it moves away from its habitat?---Yes, it does. You are more likely to catch very mobile species than ones that don't move very far.

30 And we don't have a particularly mobile species here, do we?---No, we don't.

It spends most of its life buried in the ground doesn't it?---A lot of the time it does, yes.

35 Or when it gets a bit active laying its eggs into the coarse, woody debris?---Yes, it does, but like most species I think it isn't confined to the one habitat for all of its life and I believe that there have been occasions where stag beetles have been recorded in pitfall traps in many studies. I'm not sure about the numbers of this particular stag beetle, but if there is a problem with mobility of the species the standard way of getting around that is to simply  
40 set more traps.

Or alternatively roll more logs?---Yes, that would be another alternative, but if it were the only one it would risk the problem again of not finding all the beetles that were there. Reliance on one method is potentially problematic I think.

45 But even with log rolling you are not going to find all the beetles because the evidence points to the beetles being buried in the ground doesn't it? You are going to have to dig up the soil to find them?

MS MORTIMER: Your Honour, perhaps my learned friend could wait for the answer before he goes on to the next question.

5 MR D. GUNSON: I think I was adding it as an assistance to the professor?---My understanding of the reading of the literature this is not a species that I'm personally familiar with, but my understanding from having read the literature is that they will often be found at the interface between logs and the soil surface.

10 That certainly emerges from the literature, but you also would accept from the literature and from what you have before you in the form of the affidavits in this case, that they are often found buried within the soil?---They can be found in the soil, but I don't know if you could say that it's often, because of the difficulties of sampling.

15 You would accept it as a general proposition: this is a difficult animal to sample?---Yes, that would be a fair comment.

Yes, thank you. Now, you have also read presumably the second article - sorry, the third exhibit to the affidavit of Mr Meggs, that is the article entitled Distribution Habitat Characteristics and Conservation Requirements of a Forest-Dependent Threatened Invertebrate, *Lissotes Latidens*, the authors being Meggs and Munks. Page 1309 I think, your Honour?---I'm sorry, what were the page numbers?

20 HIS HONOUR: 1309.

25 MR D. GUNSON: 1309. Have you read that article?---Yes, I have.

Do you have any comments or criticisms to make about the conclusions and/or recommendations that are set out in that article?---I think the main comment perhaps would again be about the methodology that was used to survey for the beetles.

30 Which in a nutshell was the same methodology as employed by Mr Meggs in respect of the first article: rolling logs and/or using the pit traps?---That's correct.

35 So with that exception you don't quarrel with the conclusions of Meggs and Munks?---I wonder if you could perhaps please be a little more specific because there seem to be a number of conclusions that arose from the study.

40 Well, if we go through the study, if we go to page 1310 we start with the methods and the study area. We then go over to the animal survey and the habitat variables on the following page.

MS MORTIMER: Your Honour, again just in terms of fairness to the witness if my learned friend is going to - the witness has asked my learned friend to identify what part and my learned friend is now just going to go through a list. It might be easier if he takes it part by part.

HIS HONOUR: I think what Mr Gunson is going to do, if I am reading him correctly and I may be wrong, is to identify the particular parts and then go back to them in turn.

MR D. GUNSON: Indeed.

5

MS MORTIMER: One by one? I appreciate that, thank you.

MR D. GUNSON: We then move on to the habitat variables at the bottom of that page, the statistical analysis which follows thereafter and then the results. Now, presumably you have read the results?--Yes.

10

And he points out that the beetle was present in 25 - or they point out more correctly - 25 of the 58 sites sampled and note that it is now been recorded from 34 localities in south-eastern Tasmania, 28 on the mainland of Tasmania and 6 on Maria Island. If we just deal briefly with Maria Island, you were asked some questions earlier today about that by my learned friend and you made your observations about whether or not it is possible there could be a genetic difference. You really don't know one way or the other do you?--I have no evidence.

15

You have no evidence one way or the other?--Not to this species. The comments really derive from my reading of the literature of what happens when species are separated by many generations.

20

And so your comments should be taken in a general term as to what happens generally with the animal population?--Yes, it was a general comment.

25

Because of separation such as the case with Maria Island from the mainland?--Yes, that's correct.

Now, you presumably have no difficulties with any of the results that are recorded by Meggs and Munks?--I did have one question that his - I couldn't find any easy resolution to it and that was the, what they call, the sites and the extent to which these sites were separate. Arguably, for example, Maria Island could be called one site.

30

But they have suggested, though, that on Maria Island they found the animal on I think six different places on Maria Island?--They have, but I just wonder if Maria Island itself could not be seen as being one single site.

35

Because of the potential genetic differences?--It's really quite a small island. The genetic differences wouldn't really - in that context if it's genetically different it wouldn't really matter whether it's identical to the species on the mainland or a different taxon that occurs just on Maria Island.

40

You wouldn't seriously describe Maria Island as being a small island would you?--It's reasonably small, yes.

45

We are talking about the same Maria Island I imagine, the one we could see from Wielangta yesterday, large north part, large south part separated by an isthmus?---Yes, that's correct.

5 And you describe that as a small island?---Yes, if you compare it with other islands off the Australian coast such as Barrow Island off north-western Australia it's - - -

10 Look, I wouldn't quarrel with you about that when you compare it to Barrow Island which is an exceptionally large island, but there are I guess small islands and small islands, and Maria Island I would suggest, given its size and the separation of the two parts by the isthmus, in reality can't be described as a small island can it?---Well, I guess its - - -

15 A question of degree?---A question of degree, yes. It would be a small island I think from the point of view of being very happy about the long term security of populations that were to occur on it. Based on islands that are the size of Barrow Island off the north-western Australian coast where some work has been done, there is evidence that species that occur there are genetically distinct from those that occur on the mainland, but are also losing genetic variation due to having small population sizes even though it's a relatively big island.

20 I think we probably disagree about big and small and so forth. I suppose there are some people who even think Tasmania is a small island, but we need not trouble ourselves about that. Could I take you then to the heading which is a couple of pages on, Conservation Considerations. Page 1319 I am told. Now, I assume, Professor, you have read that part  
25 of Mr Meggs' report, or article more correctly described?---Yes, I have read it.

Again, do you have any problems that you would like to articulate with respect to the portion of the report headed Conservation Considerations?---No, nothing that I can recall.

30 Do you accept what Meggs and Munks say about that?---Yes, the conclusion is that I think this was an endangered species under the provisions of the Tasmanian Threatened Species Protection Act. There are lots of other conclusions in there.

35 It is riddled with conclusions quite frankly, isn't it?---I'm sorry?

It is riddled with conclusions, isn't it?---There are lots, yes.

40 Yes. Now, would you like to take a moment just to re-read that portion of the article under the heading Conservation Considerations?

HIS HONOUR: Perhaps, the Court might break for 10 minutes to enable that to happen?

MR D. GUNSON: Certainly, your Honour.

45 HIS HONOUR: And the rest of us can stretch our backs.

MR D. GUNSON: Thank you, your Honour.

HIS HONOUR: You can read standing up if you like.

**ADJOURNED**

**[11.37am]**

5

**RESUMED**

**[11.55am]**

10 HIS HONOUR: Yes, Mr Gunson?

MR D. GUNSON: Thank you.

15 Professor, you have had the opportunity during the break to read that paragraph of Meggs  
and Munks headed Conservation Considerations. Having read that are there any  
comments that you want to make concerning the contents of that lengthy paragraph?---It's  
a fairly length discussion of different factors that may influence where vehicles occur and  
20 how many vehicles might occur in different areas with recognition that one factor in  
particular probably, that is coarse, woody debris is very important for the beetles and with  
a call towards the end of that section for further research to be carried out so that we can  
be more confident about how to manage the species in the future.

25 And with those comments you would make no other comments?---I think the conclusion  
is quite reasonable, that we need to carry out more research to find out where the beetle is,  
what factors it relies upon to occur where it does, and to really find out more about it so  
that we can assess how to recover it in the future.

30 Now, you speak about recovering it. Would you accept this proposition that there is no  
evidence in either Meggs 1999 or Meggs and Munks 2003 that the broad-toothed stag  
beetle is in decline?---I think it would be difficult to find evidence of decline in either of  
those studies.

35 Well, would you accept the proposition that there is no evidence of decline in either of  
those studies?---Yes, I think that would be fair to say, there is no evidence of a decline  
from either study.

40 And you would expect with particularly Mr Meggs' expertise in this field if there was  
evidence of decline in the species that it would be appropriate to report that fact?---Yes, it  
would be. If that was the finding in a scientific publication, you would expect that  
conclusion to be reported.

45 Yes. And Meggs and Munks have published in the journal entitled Journal of Insect  
Conservation. Are you aware of that particular publication?---Yes, I am, I haven't read  
many articles from it, but I'm certainly aware of it.

And you would regard it as a reputable publication in scientific circles?---Yes.

And you would expect, would you not, that if there was a decline in the species that Meggs or Meggs and Munks would have reported it?---Yes, if they'd found evidence of decline they would have done so.

5 Yes. And you can't point to any particular study that shows that there is evidence of decline of the broad-toothed stag beetle, can you?---No, not from a numerical point of view.

Thank you. Now, if I can take you back, please, to the beginning of the affidavit by - - -

10 HIS HONOUR: Before you do that.

MR D. GUNSON: Sorry, your Honour.

15 HIS HONOUR: Mr Gunson, earlier on you took the witness to heading Study Area at 1310.

MR D. GUNSON: I did, your Honour.

20 HIS HONOUR: Animal Survey and Habitat Variables at 1312 and Statistical Analyses at 1313.

MR D. GUNSON: I did, your Honour. I wasn't intending to take him through those and ask him the minutiae. Perhaps I could ask the Professor this particular question.

25 In general terms do you have any comments to make concerning the way in which Meggs and Munks have approached their study of the broad-toothed stag beetle, that is, in particular any criticisms of the way in which they have approached it, leaving aside - I think you have already addressed the means of capture of the animals?---Yes, I think I would come back to the methodology as being the major comment that I would make, that if you're not sure how best to sample for a species then it's very difficult to pick up numerical declines, increases, or otherwise. The methodology is really quite important in that regard.

35 Is it a criticism you make of Meggs and Meggs and Munks or is it an observation that perhaps another method could have been employed?---It's an observation, it becomes a criticism if it becomes a founding piece of evidence on which the conclusions.

40 Or alternatively you can produce an alternative means that can demonstrate that the means that they employed was wrong?---I would suggest pitfall trapping. It was tried in this study but not for very long because the returns were quite low.

45 And it wouldn't be unreasonable for Meggs or Meggs and Munks to abandon pitfall trapping if they got low returns when they were trying to survey the populations?---I think it would be reasonable if they had produced good effort with pitfall trapping to come to the conclusion that it wouldn't work.

And you of course aren't aware precisely of their results?---No.

You haven't had the opportunity to see their field notes?---No, I haven't.

5 And if you had the opportunity to see their field notes that may assist you in knowing whether or not they abandoned that process prematurely?---Yes, that's correct.

10 Thank you. Would you accept that Mr Meggs because of his particular study into the distribution and ecology of the broad-toothed stag beetle is perhaps best placed to make judgments on its conservation status?---Yes, I think he'd be very well placed to judge its status.

Best placed perhaps given his particular expertise?---I think I'd confine to saying very well placed to make the judgment.

15 Better placed than you perhaps?---Better placed than me, yes.

20 And similarly in respect of the - I withdraw that. You state in your affidavit - and these are my words and, please, correct me if I am wrong - the broad-toothed stag beetle is an endangered species and you say that it already is a species that is facing a very high risk of extinction in the wild in the near future. Is that a fair assessment of your opinion?---Yes, it is.

25 What factual material do you base the assertion that there is a high risk of extinction in the wild in the near future? What factors have you taken into account?---A number. One was that, that is the - that the criteria for listing as an endangered species are that the taxon must face a very high risk of extinction in the near future. The beetle has been evaluated by Meggs and Munks and others and it has been found to be most appropriately classified as an endangered species. So according to the people who have written these studies it is - it fulfils the criteria, that is, it is very near extinction in the near future.

30 So am I right in thinking that you base that opinion on its classification solely rather than any personal knowledge that you have acquired as to the broad-tooth stag beetle?---There are other factors as well. One of these is that the species has a very small extent of distribution that occurs in just one very small area in South-Eastern Tasmania, it's not a wide spread taxon by any means. It's also rare, it hasn't been found in very many surveys. The numbers of individuals that have been found are really quite small even by people who have been looking for the species in a systematic and dedicated way. It does appear to be genuinely rare within a small area. There is some evidence in, I think, the Meggs 1999 paper that about 190 hectares have been lost to plantation forestry and that has been demonstrated in both papers to be inimical to the survival of the species. So it's evidence such as that, small numbers, small extent of distribution, the evaluation by experts who know the species better than anybody else, that makes me arrive at the conclusion that endangered is an appropriate status for it.

45 You are aware that its geographic distribution was the reason why it was listed, aren't you?---It's about 43 square kilometres, which is very small.

Yes. And it wasn't just decline in numbers that caused it to be listed?---No, I wouldn't think so.

5 I wonder if the witness could be shown this document, please? Could you pass that to the clerk, please? Do you recognise the document you have been shown, Professor Dickman?---Yes.

10 And what you have been shown is, in fact, the advice to the Minister for the Environment and Heritage from the Threatened Species Scientific Committee of amendments to the list of threatened species under the Environment Protection Biodiversity Conservation Act 1999, haven't you? Is that correct, Professor?---Yes.

15 In respect of the broad-toothed stag beetle?---It's correct, it appears to be the document that was reviewed by the Threatened Species Scientific Committee.

Yes, and under the heading National Context it says:

20 *The broad-toothed stag beetle is endemic to Tasmania and is known to occur at approximately 34 to 38 sites in south-eastern Tasmania including Maria Island.*

And it goes on to then give some more general detail which I will not pause to go through and says:

25 *The species is not listed under the EPBC Act but is listed as endangered under the Tasmanian Threatened Species Protection Act 1995.*

Then there is the assessment how judged by the committee in relation to the EPBC Act criteria. That is correct, isn't it?---Yes.

30 And it says that:

*The TSSC judges the certain species to be eligible for listing as endangered under the EPBC Act. The justification against the criteria is as follows.*

35 *Criterion 1, decline in numbers.*

*There is no evidence against this criterion therefore the species is not eligible for listing under this criterion.*

40 So we can rule out decline in numbers as being one of the criterion that was adopted by the TSSC. Correct?---That's correct.

Then under criterion 2, geographic distribution, it is said, and I quote:

45 *The broad-toothed stag beetle is known to occur at approximately 34 to 38 sites in south-eastern Tasmania between Orford and Copping and on Maria Island off the east coast of Tasmania. The estimated extent of occurrence of the species is approximately 280 square kilometres centred around the Wielangta State Forest.*

5                    *Around 43 square kilometres, about 15 per cent of this 280 square kilometre area, is believed to be suitable habitat for the broad-toothed stag beetle as much of the area of occurrence consists of dry eucalypt forest and agricultural land which is unsuitable for the species. Around 15 per cent of a suitable habitat occurs on private land while between 50 and 60 per cent is estimated to be in State forest available for production forestry and the remainder is on crown land in formal and informal reserves protected for logging.*

10                  Now, it is reasonably clear from that criterion that it is the geographic distribution of the animal that is broadly responsible for being included as endangered under that criterion, isn't it?---Yes, that's correct.

15                  And in fact that is the concluding sentence of those paragraphs, isn't it, therefore the species is eligible for listing as endangered under this criterion. Correct?---That's correct.

                    And you go down then to population size and decline in numbers or distribution and the recommendations of the committee are:

20                    *There is no evidence available against this criterion.*

                    Correct?---That's correct.

*Therefore the species is not eligible for listing under this criterion.*

25                  That was the finding of the TSSC wasn't it?---That's correct.

                    The TSSC then dealt with criterion 4 which is population size and its conclusion was:

30                    *There is no evidence available against this criterion therefore the species is not eligible for listing under this criterion.*

                    Correct?---That's correct.

35                  Under criterion 5 the committee deals with probability of extinction in the wild and concludes:

*There is no evidence available against this criterion.*

40                  ?---That is correct.

                    And then suggests the species is not eligible for listing under this criterion. Correct?---That's correct.

45                  And so the only reason why this animal was included was because of the geographic distribution per se. Correct?---Yes.

                    Now, based on the findings of this committee, that extinction in the wild is unlikely because there is no evidence available, do you still suggest there is likely to be extinction in

the wild based on the views of the Threatened Species Scientific Committee?---The  
criterion for geographic distribution recognises that species that occur over very small  
areas are uniquely susceptible to declines in short periods of time simply because a single  
event like a long drought, a wild fire or any factors that may influence the ability of the  
5 species to move around between patches that have been subjected to these sorts of  
environmental factors is going to make it turn up its toes very quickly and disappear.

But if those particular events occur?---If they occur, yes.

10 First of all I should tender that document, if it please your Honour.

HIS HONOUR: Any objection.

MS MORTIMER: No, your Honour.

15

HIS HONOUR: It is not otherwise in the Court book is it?

MR D. GUNSON: No, your Honour.

20 HIS HONOUR: That will be exhibit 1.

#### **EXHIBIT #1 THREATENED SPECIES SCIENTIFIC COMMITTEE REPORT**

25

MR D. GUNSON: So we have - sorry, I will just wait until the exhibit is returned to you.

MS MORTIMER: Does my learned friend have any copies. It would be helpful now it  
has been tendered.

30

MR D. GUNSON: Pass a copy to his Honour if you would. I am sorry, we don't have -  
we have run out.

Well, you would accept this, Professor, would you not that the Threatened Species  
35 Scientific Committee is well placed to receive the information that is provided to it by  
persons or organisations nominating particular species?---Yes, I think that would be a fair  
comment.

40 And would you say that they are uniquely placed to make a proper decision based on the  
information provided to them?---Yes, I think they are extremely well placed to make a  
decision about the status for species for which submissions are being made.

And when they are provided with the relevant recommendations they are provided  
generally speaking with a significant amount of information, aren't they?---That's correct.

45

And a very detailed and careful scientific analysis is then performed by the members of that  
committee for the purpose of determining whether or not a particular nominated species

will appear on the list and in what category?---Yes, the species are placed on the list only after quite careful consideration to ensure that they meet the criteria.

5 And the criteria are very strict, aren't they?---Yes, they are. They are clear and they must be adhered to.

Yes. And there is no deviation, so far as you are aware, from adherence to those criteria?---Not that I can think of.

10 Now, if we return then to the declining numbers issue you would accept, would you not, based on that particular recommendation that there is no evidence to satisfy that criteria?

15 MS MORTIMER: I object to the form of that question. The document says "No evidence available".

MR D. GUNSON: Assuming that the committee had no evidence available to it to satisfy that criterion, you are not in a better position than the committee are you?---I don't have any documentary evidence about the actual numbers of the beetle, no.

20 And of course Meggs and Munks don't assist in that regard either, do they?---No.

No. And if we then turn over to criterion 3, population size and decline in numbers or distribution, again this scientific committee says that there is no evidence to satisfy that criterion and you are not in a position to suggest to the contrary, are you?

25 MS MORTIMER: Again, your Honour, I think the words are "No evidence available".

HIS HONOUR: Yes, that was part of the question but I notice that available is not included in criterion 1 but I don't know whether that makes any difference.

30 MR D. GUNSON: Based on the question I have just put to you, you don't suggest that you are in a better position to proffer advice than that particular committee?---I don't have the information on numbers but given that we know where the species occurs at least to some degree we can reasonably expect that numbers would go down in areas that are severely impacted by disturbance factors even if we can't measure the degree of the decrease in the population size.

35 You say you can expect it to occur but you can't produce any evidence to show that it will occur, can you?---No, there is no evidence that I am aware of that talks about actual numbers of beetles in areas that have been disturbed either before or after the disturbance.

40 That is right. There are simply no studies available are there?---Not that I am aware.

45 And you are not in a position to suggest that there would be automatically a decline, are you? It will depend on the level of disturbance?---It would. I think it would be reasonable to assume that if the major habitat components for the species are removed or greatly altered to the point where they are less suitable or unsuitable for the species, we could expect a decline. Even though the numbers are not there we haven't actually caught the

beetles and had them in hand. If the habitat components upon which the species requires have been removed I think we can expect a decline.

5 When you say the habitat is removed, to what are you referring?---It is the old decaying logs.

10 That is right. So if the old decaying logs are removed then logically you could have a decline in the population because by removing the logs you are removing their shelter, aren't you?---Yes, that's correct.

15 So if the old logs remain in place, we don't have a problem do we?---If they remain in place and retain their original values of providing buffered micro habitats, food and all the other resources required by the beetles at different stages of their life cycle, then we could probably say that the beetles are fine.

20 So if appropriate buffer zones, such as wildlife habitat clumps are in place, where the beetle is known to exist and log production is prohibited from those areas then that object is achieved isn't it?---I think it would be nice to have some quantitative information that confirmed that simply because wildlife habitat, wildlife protection clumps - wildlife habitat clumps rather, wildlife habitat strips are all reasonably small they are subject to edge effects, such as the wind throw; they are subject to alteration of the water regimes; and I don't think it would be reasonable to say that leaving these on their own and any old decaying logs that they contain, would be the same as leaving those logs in an intact forest.

25 So your proposition really, simply put, is that there should be no logging at all because there is the possibility by logging in areas where the broad-toothed stag beetle isn't found, there could be disturbance to the habitat?---I would prefer to see research carried out to determine the effectiveness of some of the provisions such as providing wildlife strips, wildlife habitat clumps to be confident that these provisions work. If they do then obviously logging is quite reasonable to take place. If they have no effect and the logs disappear and provide unsuitable habitat for the beetles in the future then I think we probably need to make decisions about the beetle's future.

35 It is generally accepted I think, apart from the one beetle that was captured by Dr McQuillan in a dry area, that the beetle is normally found in moist soil or moist areas with rotting logs. Now, yesterday you saw those areas didn't you, you were taken to them. I think particularly on the last spot we went to down amongst all that cutting grass and all of those leeches, it was a very moist, damp area wasn't it?---Yes, it was.

40 An ideal habitat as you understand it for the beetle?---Not quite ideal.

Why?---There was very little overstorey.

45 That was natural at that point wasn't it?---Yes, it may be but it still doesn't make the habitat the more suitable for the beetles.

Nonetheless the beetles were there weren't they?---I don't know.

MS MORTIMER: Your Honour, there is absolutely no basis. It was a good try by my learned friend, but there is no basis in the evidence for that question and he ought withdraw it.

5 MR D. GUNSON: I think you were informed yesterday that that was a particular reserved habitat clump where the beetle had been found?---Yes, I also understood there was some difficulty in determining precisely where the reserve was from the co-ordinates that were provided.

10 Why would logging cause a deterioration in that area, assuming that that was the reserve for the beetle, if logging is carried out away from that reserve?---I don't know what the edge effects would be in that particular case and I think the call at the end of the Meggs and Munks paper for further research into just these sort of questions is a very well made suggestion that could perhaps be taken up for the future. But I can't answer that.

15 All right. Thank you. And again the question of extinction in the wild is dealt with in the criteria you have in front of you, where it says there is no evidence available against this criterion. Again, you don't quarrel with that do you?---About extinct in the wild?

20 Yes?---No, it's clearly out there in small numbers.

It is out there and we don't know how long it has been out there in those small numbers do we?---No, I don't think we do.

25 Theoretically, it could have been out there in those small numbers since the last ice age, 10,000 years ago?---I don't know enough about the species to agree or not, but I suppose it is possible.

We simply don't know do we?---No.

30 It may have been existing in those numbers quite comfortably in those areas for the last 5, 6, 10,000 years and there is no evidence to suggest to the contrary is there?---I think I'd need to defer to people who know more about the beetle and its evolutionary history to be able to answer. I simply don't know where it might have been in the past.

35 But you would agree that there is no evidence that you have seen that is being presented to you to suggest that there has been a decline in the population of that beetle naturally, without the interference of man?---No, there's been no evidence that I can think of.

40 And there really is no evidence to show that logging in the Wielangta forest, in the coupe that is to be logged, will affect that beetle. It is speculation on your part isn't it?---There's no hard evidence because the research simply hasn't been done, but from comparative evidence with other species we can surmise that there will be changes in the hydrological regime, the micro climate associated with the logs where the beetles and the larvae occur, then there will be an increase in predation from factors such as red foxes or kookaburras, 45 so I don't think we can say that there won't be any effect of logging.

5 Do you seriously suggest that there is going to be a decline or an alteration in the hydrological regime, or again is that just speculation on your part?---I think it's reasonable speculation because when a good proportion of the overstorey cover is removed from a forest environment its much more likely that higher levels of sunshine insulation on the ground will increase the rate of drying of logs, leaf litter and other elements on the ground floor.

10 But yesterday you were taken to coupe 7A which had been logged I think seven or eight years ago and a very substantial amount of regrowth had occurred hadn't it?---Yes, it had but it takes time for regrowth to come back.

You saw the results within seven years didn't you?---Yes.

15 And you would accept that there was very significant regrowth there?---Yes, I would.

20 And that would alleviate the risk that you have just spoken about, particularly of the sunshine?---I presume that it would. What I don't know is the amount of time taken for the regrowth to reach a stage where it would provide the shading buffering qualities that appear to be provided by the overstorey cover in a forest environment and - - -

25 But you realise of course there is no intention to log in those areas where the broad-toothed stag beetle has been identified. In fact in those damp areas?---I guess the problem is that we don't know the other places where it doesn't occur because of the difficulties of finding it.

Well, we have the one report by Dr McQuillan of one beetle being trapped in one of his traps, I think 40 metres, from a known moist or damp habitat area, don't we?---Yes, we do.

30 And that is just one sample isn't it and I think you would agree, would you not, that is not a particularly good basis for concluding that it lives elsewhere in the forest?---It would be nice to have more evidence based on much more extensive rigorous sampling to arrive at the conclusion about the habitat preferences of the beetle.

35 One beetle does not mean that it lives throughout the dry forest?---It doesn't mean that, no.

40 Particularly where other researchers have been unable to find the beetle in dry forest?---It's true that they haven't been able to find it, but we can perhaps come back again to the methodology that is being used. We might, for example, suspect that if the people has a requirement for damp, moist areas in rotten logs, that if it does occur in dry forest environments it would be much more deeply buried perhaps, or more difficult to find.

45 Or it doesn't exist?---That's a possibility too.

And you wouldn't be prepared to say that because the beetle has been found in dry forest on one occasion by one researcher that that is a reason to suggest that it lives within the dry environment?---I don't think it's possible to come to any unequivocal conclusions

based on one beetle that's been found in dry forest. It opens up a number of possibilities, but none I think can be called definitive.

5 In fact you would say, would you not, that it would be a very poor scientific basis to assert one beetle means it therefore lives in the dry forest?---Yes, I think it would be difficult to make a really firm assertion that that was the case.

10 It may in fact have struggled away from a kookaburra that caught it even?---It's possible, who knows?

15 Perhaps I shouldn't have said that. But there is all sorts of factors that could have led to that beetle being where it was found?---Yes, I think the main point is that we don't know enough about the beetles to know if they occur extensively in dry forest, but we haven't been able to find them, if that was a rare occurrence, a vagrant drop by a bird, or any other reason.

Yes. Meggs and Munks, though, concluded that its natural environment is the damp, moist areas that they have identified in their reports, haven't they?---Yes, that's correct.

20 And as a scientist you would accept that is the strong likelihood, that that is the environment of this particular beetle?---Yes, the weight of evidence so far suggests that those moist, damp environments - - -

25 And taking that into consideration you would say that forestry operations should not take place in the known environment of that beetle, which is the damp, moist forest?---That's correct.

30 Now, your concern, as I understand it, is this, that if forestry operations move up to the edge of that damp, moist area there is a possibility of some drying out at the edge which might possibly affect the environment in which the beetle lives?---Yes, I think without research to document the effects of the proposed harvesting operations that it would be very difficult to know for sure what the likely effects on the beetle will be.

35 Your Honour, just excuse me for one moment.

HIS HONOUR: Certainly.

40 MR D. GUNSON: Could the witness be handed volume 4 of the Court book, please? Do you have volume 4, Professor?---Yes, I do.

Could I ask you, please, to turn to page 1725? Perhaps before asking you to do that could you go to 1705, please? Do you have 1705, Professor?---I do.

45 Your Honour, what the witness is being shown is an affidavit by Sandra Roberts who is a forest hydrologist. Can I ask you, Professor, have you read that affidavit?---No, I haven't.

Your Honour, I specifically would want Professor Dickman to read that affidavit and I want to take him to some portions of it at a later stage. Perhaps if I could take his

attention now - and then I can ascertain whether or not he will need to read the whole of the affidavit. If you would turn to page 1725, Professor, and if I could ask you then to look, please, at paragraph 78 which commences:

5            *There is considerable literature describing the effects of forest harvesting on micro climates at the edge of the forest.*

Do you have that paragraph?---Yes, I do.

10    Yes:

*Most studies have been designed to assess impacts of harvesting on the micro climate of retained forest rather than the harvested areas.*

15    Ms Roberts said then:

*It is generally accepted by scientists, for example, Westphalen 2003 that an established forest yields to the ground and the understorey.*

20    You wouldn't argue with that, would you?---No, that sounds quite reasonable.

She continues:

25            *The bulk of light absorption occurs in the canopy of the forest and as such the conditions inside a forest tend to be cooler, more humid, and have less air movement in comparison to the conditions outside the forest or in a harvested area.*

30    You wouldn't quarrel with that, would you?---No, that sounds fine.

She continues:

35            *Clearing creates an edge that allows the penetration of some wind and rain under the canopy with the result of micro-climate change between the forest edge and the forest interior.*

Again, would you quarrel with that?---No, that sounds reasonable.

40    And you would accept it?---Yes.

So we can accept - or you accept, as I understand it, that paragraph 78 and 79 of Ms Roberts' affidavit accurately reflect the scientific - sorry? Sorry, I am reminded, Dr Roberts' affidavit accurately reflects the appropriate scientific criteria?---Yes, as far as I'm aware, that's correct.

45

Now, I imagine you have not read the study by Westphalen that is referred to by Dr Roberts?---No, I haven't.

And Dr Roberts continues:

5           *Westphalen 2003 studied the impacts of forest harvesting on the micro climate of adjacent eucalypt obliqua wet forest in southern Tasmania. In the process he measured temperature, vapour pressure deficit and photosynthetically active radiation in a harvested area and in transects in the adjacent forest.*

I would ask you to accept that as a fact for the moment. She continues:

10           *His study showed the gradients in micro climate and epiflora in the forest edges generally extended less than 10 metres into the forest. Wind throw could extend up to 50 to 100 metres in from the edge. Changes in PAR were detectable for up to 50 metres from the edge. However, changes in average daily temperature and VPD only penetrated up to 10 metres in from the forest edge at all sites and*  
15           *correlated with the degree of exposure of the edge to direct sunlight.*

Now, would you like just a moment to perhaps read that to yourself again and just have a think about it? I have put a lot to you, but I just want you to reflect on it for a moment. Now, you have had a chance to reflect on it?---Yes.

20           Assuming the study by Westphalen is correct do you quarrel with any of the matters raised by Dr Roberts?---Assuming that the study has been carried out properly, the results have been interpreted correctly, then the conclusions are probably quite reasonable. I will have to make those assumptions without having read the paper.

25           I appreciate that. I don't think Westphalen is exhibited. No, it is not. Now, if you were to accept what Dr Roberts has said do you still adhere to what you said earlier about the edge of the forest? Not the forest, the edge of the protected area in the light of  
30           --?---Yes, I think there are two parts to that answer. Firstly, it's good to see that some work has been initiated by Westphalen to look at these sorts of edge-effect issues. The second point is to suggest that perhaps there are a range of other factors that could easily operate into the forest. Wind throw here is said to extend for up to 100 metres in from the edge, which would cut across wildlife clumps, wildlife habitat strips, and it also says nothing about the possible incursion of predators.

35           Now, if you then would read through, please, paragraph 83 of Dr Roberts' affidavit where she addresses then the fact that Westphalen's example is from southern Tasmania and she makes some comments then about the micro-climatic changes at Wielangta. Have you read that paragraph?---Yes, I have.

40           Well, do you disagree with the view reached by Dr Roberts where she says that:

45           *The ground surface of an unharvested forest at Wielangta is afforded far less protection from solar radiation and wind than in Westphalen's example from southern Tasmania and as a consequence I believe the micro-climatic changes would be even smaller at Wielangta than in Westphalen's study.*

?---I can't really comment without having seen the forest in which Westphalen worked. It sounds like reasonable speculation.

5 You would accept, would you not, with that caveat you have just imposed?---Yes, I think it would be - it's reasonable speculation. So to that extent with that caveat I would accept it.

10 By a person who is well placed to speculate given her qualifications? I probably should take you to those if you would be so kind as to go to the beginning of her affidavit. You will see in paragraph 1 there her qualifications and expertise, and I just invite you to read those to yourself, please, Professor. You have read those?---Yes, I have.

15 And on the basis of what you have read, you wouldn't quarrel about Dr Roberts qualifications to express the opinions that she has expressed in the paragraphs that I have taken you to?---No, she appears to be well qualified and experienced.

20 And given the fact she is well qualified and experienced, or appears to be, do you still adhere to the form of the answer that you gave about dryness at the edge of the reserve clumps - and I refer to them as reserve clumps - being a factor that might impact on the broad-toothed stag beetle?---With respect, I think that is a two-part question. The first being that I do respect the qualifications and expertise of the person making these statements. Her background and qualifications are clearly very good, but I don't know that that's sufficient for me to be able to accept the second part of what you put to me, that the conclusions of her study make it more or less better for the stag beetle. I don't know  
25 that there is a connection between the two.

We simply don't know at this stage, do we?---We don't.

30 Do you speculate that there may be dryness at the edge of the wildlife habitat clump or the wildlife strip and Mrs - Dr Roberts, I am sorry, has said it is unlikely to be the case, hasn't she?---Yes. That's true except for wind throw.

35 Well, what do you understand wind throw to be?---It's the effects of the external environment, particularly wind, moving in from the outside of the harvested area into the interior of the remnants of forrest that remain and causing drying effects. It possibly affects on the structure of the interior of the forest.

40 You don't understand wind throw to be the process by which trees are knocked down by the wind?---That's part of it.

You also refer to wind throw as including the drying effect of the wind?---Yes. It is perhaps a more broad understanding of the effects of wind throw.

45 But you would accept that generally speaking the expression "wind throw" when used within the logging environment or industry refers to the wind knocking down perhaps an old tree or a poorly rooted tree?---I don't know whether that would be the perception in the logging industry.

5 But when you use the word or the expression wind throw, what specifically are you referring to? It is important for us to know this so we can get our terminology right?---Yes. It's the overall effects of the wind on the interior of the forrest as it moves in from the outside. So it would include the knocking down of trees but also the potential drying effects that come with that.

That is your understanding of wind throw?---Yes.

10 But having read Dr Roberts affidavit, would you agree with this; that perhaps your earlier assessment of the possibility of drying out needs to be modified now on the light of what she has said?---Yes, I think I would be happy to go with the results of the study and to accept some of the conclusions that Dr Roberts has come to.

15 Well, are there any of the conclusions of Dr Roberts that you would not accept? Please take your time?---Yes. I think if wind throw is included in the conclusions in paragraph 83, that is quite reasonable.

20 And when you say "wind throw", we include your definition of wind throw, which is the drying process generally, which includes the possibility of a tree being felled by the wind rather than the sole process of a tree being felled by the wind?---That's correct.

25 So with that one reservation, you accept all of what Dr Roberts has to say in paragraph 78 through to 84; is that correct?---I think it would be up to paragraph 83 rather than 84. Paragraph 84 seems to go onto other issues.

Yes, I happily concede that with you. All right. Now, can I just ask you this: at paragraph 78, Dr Roberts says this:

30 *There is considerable literature describing the effects of forrest harvesting on micro climate at the edge of the forrest.*

She says:

35 *Most studies have been designed to assess impacts of harvesting on the micro climate of retained forrest rather than the harvest areas.*

Have you ever read any of the published literature that describes the effects of forrest harvesting on the micro climate at the edge of forrest?---Yes, I have.

40 Are you able to recall - and this is not an exam or a test, Professor, I can assure you - the authors of any of the articles that you have written on this particular subject?

HIS HONOUR: Read.

45 MR D. GUNSON: Sorry?

HIS HONOUR: Authors of the articles that he has read.

MR D. GUNSON: Authors? Sorry, your Honour?

HIS HONOUR: I said - I thought you said the authors of the articles that he has written.

5 MR D. GUNSON: No, no. I said has he read any of the - can he recall the identities of the authors of any of the articles?---I think one is an article by Cornish, Peter Cornish I think from memory, but I would really need to go back to my literature records to be certain.

10 Is it fair to say this that your reading on the subject of the effects of forest harvesting on the micro climates at the edge of forests is somewhat limited?---Yes.

15 Thank you. And can I also assume that probably the literature that you have read occurred some years ago?---Yes, probably two to three years ago. The last papers that are published that look at the effect of fragmentation of habitat are around two years ago and that would have been probably the last time that I made a systematic attempt to look at that literature to interpret the results that I got in my own work.

20 Now, thinking back to what you read at that time you would agree that most of the works in question draw the same conclusions that Dr Roberts has drawn?---Yes. There are some very specific conclusions that were drawn here. I am sorry, unless you are referring to the more general conclusions in paragraph 83?

25 Yes?---That would be correct. It was a generality from my understanding of the literature.

Basically we have got now Dr Roberts' opinion and she has based that on the literature and in particular Westphalen and you haven't read Westphalen but you agree that what you have read concurs with the view expressed by Dr Roberts?---Yes, I think so.

30 Thank you. Is that a suitable time, your Honour. I was going to go - - -

HIS HONOUR: We might go on until 1 o'clock.

35 MR D. GUNSON: Yes, certainly.

HIS HONOUR: I should indicate, while you are interrupted, that I propose to start at 10 am in future and to incorporate a 15 minute mid-morning break if possible at some convenient time between 11.15 and 11.45, depending on whether it is appropriate to interrupt the cross-examination or not, which might mean on some mornings we miss out.

40 MR D. GUNSON: Thank you, your Honour.

Now, I wonder if I could ask you to return that volume if you would please to his Honour's attendant.

45 HIS HONOUR: And by that I mean that normally we would be finishing at this time in future.

MR D. GUNSON: Yes.

HIS HONOUR: Thanks.

5 MR D. GUNSON: Now, do you have a copy of Mr Meggs' affidavit in front of you. It is  
the same volume I think. Page 1189 if you would please, Professor. Now, we discussed  
this affidavit earlier on. I think you said that you had read relevant portions of it and we  
have discussed the qualifications and expertise of Mr Meggs and I don't think, from what  
10 you said earlier, you have any quarrel about his qualifications or expertise. Is that  
right?---No.

And I think you have accepted the proposition that he is well placed to draw the  
conclusions that he has either alone or in conjunction with Munks?---Yes, that was the  
conclusions with respect to status of the species.

15

Right. Now, if you then turn to paragraph 13 of his affidavit please, under the heading  
Primary Source Material Consulted - do you have that in front of you?---Yes, I do.

Now, you say that you have read Meggs 1999. Is that correct?---Yes.

20

And you have read Meggs and Munks 2003?---Yes.

And can I assume that you have read the affidavits of Dr McQuillan that are referred to in  
items C and D?---Yes.

25

Have you read the affidavit of Dr Michaels?---Yes, I have.

And of course we have your affidavit. Have you read the draft affidavit or the final  
affidavit of Dr Michael Laffan?---No.

30

Have you looked at the forest practices plan for coupe WT017E and the variations to that  
plan?---I have.

And you obviously looked at the listing advice for the broad-toothed stag beetle?---Yes.

35

And no doubt you have looked at a copy of the EPBCA species nomination forms and  
guidelines. They are familiar to you?---Yes.

Very familiar to you in fact. Correct?---They are familiar to me, yes.

40

And have you read the draft listing advice for the south-east stag beetle including the  
broad-toothed stag beetle prepared by the Tasmanian Threatened Species Unit, DPIWE,  
and dated July 2005?---Do you recall the author of the draft listing advice?

45 No, I can't. I think it was a collective report?---I don't recall reading it.

All right. Have you read the next item, item L, a report on the new broad-toothed stag beetle locality prepared by Yee and Grove of Forestry Tasmania?---No, I don't think I have.

5 Have you read item M, a report on wildlife habitat clumps at WT017E, pre and post harvesting prepared by Yee and Grove in September 2005?---Yes, I have read that one.

And have you read item N, a report on the outcomes of a post harvest survey of coarse woody debris at WT017E prepared by Grove and dated October 2005?---Yes, I have.

10 all right. Thank you. Now, have you gone through or considered the detailed list of references that are cited by Mr Meggs in his affidavit?---I haven't gone through and read each of the references.

15 No. Have you actually read the list though rather than the 50 or 60 particular articles? I wasn't suggesting that you may have done that?---Yes, it is an extensive list.

And could I suggest a very extensive list. It probably contains something like 70-odd articles, if not more?---Yes. Yes, it may well be.

20 And presumably you went through that list to satisfy yourself that there was a - they were all proper, well researched articles?---I scanned it rather than going through it in great detail. I didn't really go through and check each one against the text, but I did scan to get a feel for the range of literature that had been used.

25 And the feel you no doubt got was that this work by Mr Meggs has been well researched?---Yes, it's quite extensive.

It is very extensive, isn't it?---Yes.

30 And well considered?---Yes, as far as I can tell. There are lots of references that seem quite general as well, but just from a quick scan that yes, in general this is a good list.

35 But there are a number of very specific ones. For instance, if you look at page 57, looking at the top of the page, if you go down for instance to item PPP there is an example of a very specific article or item dealing with a very specific item, the role of retain strips for fauna conservation and production forests in Tasmania by Lunny. That is very specific, isn't it?---Yes, it is.

40 And specific to the study being carried out by Mr Meggs which forms the basis of his affidavit?

HIS HONOUR: Sorry, which page is this on?

45 MR D. GUNSON: Page 1245, your Honour, item PPP.

That is very specific to the sort of task that was ahead of Mr Meggs, wasn't it?---From the title it does look a specific study, yes.

And you no doubt - of course I am not being critical of you - you haven't read that study?---If I have it would be a while ago.

5 Yes, all right?---1991.

Yes. Now, if you look at the list of exhibits that is referred to at paragraph 16 of Mr Meggs affidavit, we have established already that you have read Meggs 1999 and Meggs and Munks 2003. Have you read Mr Meggs' curriculum vitae?---Yes, I have.

10

And you would accept, would you not, that he has as a result of the work that he has performed that he is very well placed to provide the opinions that he has provided in his affidavit?---Yes, for the most part I would.

15

Uniquely placed, I would suggest, given the nature of the work that he has performed, particularly with the beetle?---I wouldn't say uniquely well placed. There are - - -

Very well placed?---Very well placed, yes.

20

And probably one of the persons most familiar with the requirements of this particular beetle?---Yes. I think the area that I am least comfortable about is the whole area of sampling design, the methodology used to obtain the beetles and to work out what requirements they have.

25

This takes us back to the processes we discussed earlier this morning of rolling logs versus traps?---It does. The main point is that somebody can be an extremely good taxonomist. They can tell one beetle from another and they can identify the sexes, they can work in that regard on beetles but in terms of sampling design and many other aspects of ecology I think these are two different areas and it is clear that Mr Meggs is very good on this beetle. I am just perhaps less confident that some of the issues with respect to sampling design, sampling methodology, put him in the pinnacle of being uniquely well placed to tell us about the beetle.

30

35

Yes. I wonder if you would just turn to paragraph 38 of Mr Meggs' affidavit, page 1201, your Honour, and if you look at paragraph 38 Mr Meggs there deals with the issue - I am sorry, Professor, I don't think you have got quite to it. Are you there now?---Paragraph 38.

40

Page 1201?---Yes.

45

Now, I will come back to it. At paragraph 37 Mr Meggs deals with surveys that he carried out in 10 dry eucalypt forest sites noting that no broad-toothed stag beetles had been found and a decision was made to devote the remaining study resources solely to those forest types in which the species had been found. Now, given that up to 10 surveys in dry eucalypt forest revealed no beetles you wouldn't quarrel with the proposition that they then should move onto the well established known habitat to continue their research?---I would question it.

After 10 surveys?---I would ask what is the intensity of the surveys and whether the methodology that was used was appropriate.

5 Then it comes back to an issue for instance of you would need to see the field notes perhaps to decide whether or not that decision made by the researchers was the correct one?---Yes, I think that sort of information would be quite helpful.

10 All right. But assuming that they found no beetles in the dry eucalypt forest after 10 properly conducted surveys, you wouldn't quarrel with their decision then to confine their studies to the wet, moist areas where they were known to exist?---Yes, if they were 10 properly conducted studies using the appropriate methodology at the right times and so on, then it would be reasonable to move on.

15 And that is the only caveat that you would place on it, that you don't know the precise methodology of the study?---That's correct.

Subject to knowing that you would be content with the conclusion being the correct one and move on?---Yes, I think I would.

20 Now, the paragraph 38 Mr Meggs says this:

*The lines of evidence we draw on to support our conclusions that dry forest could generally be considered unsuitable habitat include: (a) our failure to find the species in the 10 dry eucalypt forest sites sampled.*

25 Now, again with that caveat that you spoke about a moment ago, that is a correct conclusion isn't it?---Yes, with the caveat that the sampling was intense enough and appropriate enough to detect them if they were there.

30 Then if you look, then - sorry, I didn't mean to interrupt you?---Sorry.

I didn't mean to interrupt you, I think I cut across you, have you finished?---Yes.

35 Thank you. Then if you look at paragraph 38(b) appears this:

*Our confidence that the log rolling sampling method was the best method available to locate the species.*

40 So what you have got here is a researcher who is expressing complete confidence that the log rolling sampling method was the best method available to locate the species haven't you?---Yes, that's what is written.

45 And wouldn't you think that he was best placed to make that decision, notwithstanding the views that you have expressed about using the traps?---I think it would be difficult to be very confident based on purely negative results.

But if you were not finding the beetles wandering around and obligingly falling into the traps to be collected and killed in the process, then the best method would be log rolling

wouldn't it?---Well, it is a standard invertebrate survey technique to use pitfall traps and although I think you mention that they would fall in and be killed, that's not necessarily the case. Many studies use dry pitfall traps or with some leaf litter or other material at the bottom and particularly for threatened taxa, if they fall in, they fall in and run around at the bottom of the trap for two or three days or however long they're set for and then the investigator comes to pick them up again.

With threatened taxon such as the beetle you consider it appropriate to use pitfall traps that result in the death of the beetle, or would a more prudent surveyor of the beast put in some leaf litter or something to try and keep the thing alive?---I think it would be from a prudent point of view to keep as many individuals alive as possible to simply use dry leaf litter or other material at the bottom of a dry pitfall trap.

HIS HONOUR: Is that a convenient time?

MR D. GUNSON: That is suitable, your Honour.

HIS HONOUR: The Court will adjourn until 2.15.

**ADJOURNED** [1.00pm]

**RESUMED** [2.15pm]

**CHRISTOPHER RICHARD DICKMAN:**

HIS HONOUR: Yes, Mr Gunson?

MR D. GUNSON: Thank you, your Honour.

Professor Dickman, do you still have the affidavit of Mr Meggs in front of you?---Yes, I do.

I wonder if I could ask you please if you could turn to exhibit 3 which is page 1309. I wonder if I could take you then please to page 140 of Mr Meggs - 1312, footnote there. Now, this is the paper by Meggs and Munks to which I am referring you and if you have a look there under the heading Animal Survey. Do you see that?---Yes.

And it reads:

*Eight of the known localities of the beetle on mainland Tasmania were sampled initially to determine the optimal animal sampling technique. At each known locality the following sampling method was tested within a 25 metre radius block.*

1. *The underneath of all the logs in the plot that could be moved by hand were searched for adult beetles and larval lucanids.*

2. *A sub-sample of these logs were broken open and the rotting log was searched.*

5

I will just paraphrase this. Number 3 - in a sub-plot of 10 metre radius, six by 1 metre square leaf litter plots were search for live adults or body parts of dead ones and then the authors say this with respect to pitfall traps:

10

*Pitfalls traps were not used to sample the species for ethical reasons and because hand collecting of litter invertebrates has been found to be more time efficient and to provide more accurate data on species abundance that pitfall trapping referring to obviously an article by Mezaboth et al in 1995. In addition the previously recorded low level of trapping success for this species using pitfalls relating to published data, Michaels 1996, 1999, suggested that this method had limited potential for sampling populations of this beetle.*

15

They continue:

20

*Rolling logs and searching under them proved to be the only reliable method of locating the beetle therefore this method was used for the rest of the study.*

25

Now, in light of what Meggs and Munks say about that process including ethical considerations and the failure in the past to successfully use pitfall traps, do you still adhere to the reservation or caveat you expressed?---Yes, I do.

30

And notwithstanding what they have written?---I'd just checked the reference to Mezaboth et al that talks about the relative efficiency of the different methods and it seems to be a paper that talks about the relative efficiency of hand collecting versus pitfall trapping of millipedes which are a very different taxon to all insects.

35

I accept that but the principle we are looking at, what you have got is Meggs and Munks going about their research adopting a specific method of collection because of what they have presumably read, as they say, and because of ethical considerations?---Yes. I think I would have expected some pilot survey work on the part of the authors themselves to determine the effectiveness for themselves in areas where the beetles were known to be found.

40

They refer to a preliminary survey, don't they?---Yes, they do.

Might that not be what they have done and established quite clearly by the preliminary survey that it was ineffective?---I don't think they provided any data.

45

But if they did then would that alter your opinion?---It would certainly help.

And may well alter your opinion?---It may, yes.

Thank you. Now, I wonder if the witness could be shown this document please? Could you pass that across? And I wonder if I could take you please to page 211 under the heading General Discussion.

5 MS MORTIMER: May I ask if my learned friend is showing something that is in the Court books?

MR D. GUNSON: No, I am about to hand the copy to - - -

10 HIS HONOUR: While we have this interruption I should say that my executive assistant will contact Mr Nick Mooney by e-mail - my associate will ensure that this happens as well - to tell him that he will be interposed at 10 am on Thursday, 15 December to give his evidence then or to be cross-examined rather on his report.

15 MR D. GUNSON: Yes.

MS MORTIMER: If your Honour pleases.

20 HIS HONOUR: I am given a note that she already has. Now, everybody knows. My staff are one step ahead of me which is par for the course.

25 MR D. GUNSON: What I have handed to you, Professor, is the document to which I referred earlier this morning when we were dealing with Dr Roberts' evidence and what you have been given is the document titled The Ecology of Edges in Tasmanian Wet Forest Managed for Wood Production by Grant Westphalen and I am not going to ask you to read the lot, you would be pleased to know, but if you could just go to page 211 please and you will see it is headed General Discussion and then the paragraph is headed Edge Research in Tasmanian Wet Forest - I am sorry, your Honour, I put it aside to give to you and promptly forgot. I apologise.

30 HIS HONOUR: Yes.

35 MR D. GUNSON: We then move on from the general discussion to what he described as epiflora regeneration on Tasmanian coupes and finally to paragraph 8.2.1 under the heading Micro Climate Changes in Tasmanian Wet Forest Coupe Edges. Now, rather than me read that into the transcript could you take your time, please, just to read that small sub-chapter, it is only about three paragraphs?---Yes, just section 8.2.1?

40 8.2.1 please. Have you finished reading, Professor?---Yes, that section goes on for several pages, is it primarily the section on page - - -

No, 8.2.1 only. Page 215 and 216?---Okay, it does go on for pages beyond that - - -

45 MS MORTIMER: My learned friend did ask for that whole part to be read and it goes on for four pages.

MR D. GUNSON: I thought I made it quite clear 8.2.1.

HIS HONOUR: Are we looking at the same document?---It is four pages.

MR D. GUNSON: Sorry, can you pass me what you have got, Professor?---Sure.

5 It may be that I have got you looking at the wrong portion of the - it was only paragraph 8.2.1 under the heading Micro Climate Changes in Tasmanian Wet Forest Coupe Edges that I wanted you to read.

10 MS MORTIMER: Your Honour, I think the photocopies have been put in backwards, so we all thought it went for four pages.

HIS HONOUR: 8.2.2 which ordinarily follows 8.2.1 commences midway through page 218 on my copy.

15 MR D. GUNSON: Look, I can see what has happened, your Honour. Whoever has put these together has obviously put them around the wrong way. Could you pass that, please. I am sorry, your Honour, I can see what has happened.

20 HIS HONOUR: It seems it has only afflicted your copy, Mr Gunson.

MR D. GUNSON: Yes, it is the hard copy that I was coming from and it is the bound volume I was working from and whoever has put these together hasn't done it very well. I will make sure that is corrected, your Honour.

25 HIS HONOUR: Yes.

MR D. GUNSON: If your Honour was to take them apart you would find that page 215 and 216 then run on and the relevant paragraph was only one and a half pages.

30 Sorry about that, Professor?---No problem. Thank you.

HIS HONOUR: I see what the problem is. Yes, 216 and 217 no it has afflicted my copy as well.

35 MR D. GUNSON: I apologise yet again, your Honour, I didn't check the copies.

HIS HONOUR: Yes, I was a bit curious about ending a sentence poorly.

40 MR D. GUNSON: Yes, well it makes sense when we get to the next page.

HIS HONOUR: So, yes?

45 MR D. GUNSON: Now, we come back to I think now we have sorted ourselves out, Professor, have you finished reading those two pages?---Almost, if I can have just another few seconds.

It wasn't done to confuse you I can assure you.

HIS HONOUR: It does affect everybody's copy not just yours, Mr Gunson.

MR D. GUNSON: Yes, thank you, your Honour. I couldn't work out what everybody was on about to be honest, I was getting strange looks from the other end of the bar table.

5

HIS HONOUR: I constantly think everybody is crazy except me.

MR D. GUNSON: I was having that feeling for a moment. Now, if you were to have a look at the second paragraph on page 215 under the heading 8.2.1 you will see:

10

*High spatial and temporal variation in southern Tasmanian wet forest micro climates was a major limiting factor on the penetration of edge related gradients as changes associated with the edge were largely encompassed within background levels of change. Edge-related differences in micro climate were only identified in the spring and the summer. In terms of changes in vegetation is thus also restricted to warmer periods and hence may take a considerable time to take effect, particularly if there is a degree of recovery in cooler seasons. While seasonal observations in micro climate gradients and edges may not be relevant for decidual systems where there is no canopy for half the year and thus little if any edge effect or in the tropics where the seasonal variation may not be large, temporary stability of micro climate gradients and edges is otherwise poorly understood even within a particular season as most studies collect data for a few or only one season.*

15

20

25

Now, we discussed this, this morning in the light of what Dr Roberts had to say about in particular the Wielangta area. Do you have any quarrel with what Westphalen has to say in that paragraph to which I have just read to you, particularly with respect to the recovery in cooler seasons?---Not on the face of it, it's a discussion - - -

30

Sorry, I didn't mean to cut across you?---It's a discussion of results that had been presented previously in the thesis and I assume that they have been reported accurately.

35

All right. I seek to tender that portion of the report, your Honour. It may be easier if I had it completely re-copied for you and the whole of the document can go in as the one exhibit with only those relevant pages marked.

MS MORTIMER: Your Honour, we submit the whole article could go in - should go in, you can't possibly just extract two pages.

40

HIS HONOUR: Right. That will be exhibit 2.

## **EXHIBIT #2 RE WESTPHALEN REPORT**

45

MR D. GUNSON: Yes, I will make sure that it is copied, your Honour, properly. If I could have the - - -

5 MS MORTIMER: And can I clarify with my learned friend the purpose for which it is tendered? It is being tendered because Professor Dickman has been cross-examined on those two pages and has given some evidence about those two pages, it is not going in to prove the truth of its contents or as evidence of the opinions stated therein because the author is not called.

HIS HONOUR: Yes.

10 MR D. GUNSON: It goes in because of the nature of the cross-examination of Professor Dickman concerning that this morning with respect to Dr Roberts' evidence and Dr Roberts will be giving evidence that she relies on Westphalen.

HIS HONOUR: Is that satisfactory, Ms Mortimer?

15 MS MORTIMER: Well, Mr Tree was just talking to me so I lost that a little bit, I didn't quite hear what my learned friend said about how it is relevant to Dr Roberts.

HIS HONOUR: Dr Roberts will be called.

20 MS MORTIMER: Absolutely, your Honour, that is right.

HIS HONOUR: Yes.

25 MS MORTIMER: So in my submission the only relevance of it at the moment is that Professor Dickman has been asked about two pages of it and has given some evidence.

HIS HONOUR: Well, I understand from the way the application for the tender was made in a limited way that that is all it is being relied upon for.

30 MS MORTIMER: If your Honour pleases.

HIS HONOUR: Yes, and then it was sensible to suggest that the whole document go in because that is the ordinary course.

35 MS MORTIMER: That is right.

HIS HONOUR: Yes, so the whole document is exhibit 2. I think I have reconstructed mine. Your juniors might want to check with my associate at the adjournment.

40 MR D. GUNSON: You are ahead of my junior to my right, your Honour, but we will deal with it and get a copy to the Court. In the meantime, if I could have the original back from Professor Dickman?---Sure.

45 And Professor if I could take you back to Meggs' affidavit, please? Do you have that in front of you?---Yes, I do.

Okay.

HIS HONOUR: So where are we now in the Court book?

MR D. GUNSON: Yes, you are back to the Court book, your Honour, I will just give you the page number. Page 12 - 1196, your Honour. Now, under the heading there  
5 Executive Summary Meggs says:

*A fundamental requirement for the development of conservation management  
strategies for threatened species is knowledge of the spatial distribution and  
10 extent of habitats utilised by the species and identification of areas where the  
conservation requirements of the species may conflict most strongly with land-use  
practices.*

You would agree with that, I imagine, Professor?---Yes, as far as it stands, as far as it  
15 goes, I do.

It is an accurate statement, isn't it, and based on appropriate scientific practices and  
premises?

MS MORTIMER: Well, that is two questions, your Honour, in one.  
20

HIS HONOUR: We might have the first repeated.

MR D. GUNSON: You would agree that it is an accurate statement based on scientific  
principles?---It's accurate but incomplete.  
25

All right. You say it is incomplete what would you add to it for completeness  
sake?---You may wish to know something about other threats beyond those associated  
just with land use.

Other threats such as?---Such as introduced predators or competitors or disease or other  
30 factors that aren't directly associated with land use.

All right. Absent those other factors you have just addressed you would accept the  
statement as correct?---Yes.  
35

Thank you. And you will see that Meggs goes on to say that:

*The research of Meggs and then Meggs and Munks represents the best  
40 information available on which to base such a risk assessment for the endangered  
broad-toothed stag beetle.*

Would you accept that?---Yes, I think it is, but again incomplete because of the  
uncertainty about the best methodology to follow.

45 Which we have discussed several times already?---Yes.

With that one caveat you accept that statement by Meggs?---Yes.

Thank you. At paragraph 19 Meggs says this:

5           *Major threats to the species from forestry practises by Meggs 1999, Meggs and Munks 2003 and in the relevant threatened species listings statements for the beetle include clearing of potential habitat for agricultural or plantation development, clear-fell burn -*

so silviculture -

10           *intensive management of regrowth forrest and post harvest firewood collection.*

Do you accept that that is an exhaustive definition of the relevant threats to the species?---It's almost complete, but not quite so.

15        You would add again what, disease?---Yes, I would add the other factors that we currently don't know very much about simply because it is a threatened species upon there hasn't been a great deal of research.

20        And you would accept that nothing is known about the diseases that may potentially affect this particular beetle?---As far as I know there is nothing known about the diseases and there is the speculation perhaps that there is an impact that might be like we have seen from predators or other taxa in the environment.

25        Well, the predators we discussed briefly this morning, we won't really return to them at any length, but you talk about again the possibility of the red fox becoming established in Tasmania and the possibility of the kookaburra including this particular beetle within its diet?---Yes, that's correct.

30        They are the two basic threats as predators that you see?---They were really examples of predators. It would be - I think it would be quite possible to imagine other predators as well.

35        What other predators do you have in mind?---Currawongs might be one predator that could inflict some damage on the beetle population.

Do you have any evidence that currawongs dine upon the beetles?---Not upon this species, no.

40        No. Any other predators?---Another possible species would be feral cats, probably the quolls as well.

Do you have any evidence that there is a population of feral cats within Wielangta?---Yes.

45        Have you any evidence that feral cats are eating the beetles?---No.

Do you have any evidence that quolls eat them?---Not this particular species, but quolls in general do eat lots of beetles as part of their diet.

But you have no idea of the population of quolls within Wielangta, have you?---No.

Or whether they are the native quolls or the tiger quolls?---In terms of the distribution, both species could be present, both the eastern - - -

5

But you have no - - -?---I am sorry?

You have no idea of whether they are present and if so to what extent they are present, or whether they eat the beetles?---No.

10

Thank you. So in general terms, with those exceptions, what Meggs and Munks says about the potential threats is correct?---Yes.

And they conclude - or Meggs concludes by saying:

15

*Partial harvesting has never been identified as a specific threat to the species.*

Do you argue with that?---As far as I'm aware that's a correct statement.

20

It is what?---It's a correct statement.

It is a correct statement. Because there simply is no evidence to support the contrary view, is there? There is no evidence that partial harvesting has ever been identified as a specific threat to the species?---That's correct. I think there is no evidence in respect to the effects of partial harvesting one way or the other.

25

And in the next paragraph Meggs says:

30

*The population of the beetle, or populations of the beetle are of highly variable risk of extirpation across its range reflecting the highly variable distribution of potential habitat throughout this area. In the western half of the species range populations occur in relatively isolated patches or ripe-bearing corridors of wet or damp forest amongst a matrix of dry eucalypt forest and are of high risk of extirpation from disastic events such as catastrophic wildfire, uncontrolled land use practises.*

35

Well, you wouldn't argue with that, would you?---No, I think that's correct.

That is a fair comment, isn't it?---Yes.

40

*The majority of potential habitats of the species occurs as a relatively large contiguous area in the eastern half of the species range encompassing WT017E. Within this area, potentially threatening processes are not occurring at a sufficiently higher rate to suggest that local populations are facing a very high risk of extirpation in the near future.*

45

Now, do you accept that to be correct?---No.

5 You don't? That's within the area and you say there are processes occurring to suggest they are facing a very high risk of extirpation in the near future?---From our site visit yesterday it seemed that there had been a lot of removal of trees. The environment at ground level for decaying logs, the sort of habitat that seems to be most suitable for the beetle did not really appear to be catered for in the areas of harvesting that we witnessed yesterday.

10 But the areas that had been set aside for the beetle were identified to you yesterday and those were indeed the moist damp areas, weren't they, in the wildlife habitat clumps?

15 MS MORTIMER: Your Honour, I object to this line of questioning on this basis. I think this is the second time that my learned friend has put to this witness in the plural that areas set aside for the beetle were shown to this witness and to the Court yesterday and we saw one. That is my understanding. My learned friend ought to be accurate about that. That is my understanding - I stand to be corrected - but my recollection.

20 MR D. GUNSON: My junior reminds me, and I think he is correct, that all of the wet forest areas were demonstrated yesterday, particularly in the areas at 17E that had already been harvested.

HIS HONOUR: But it is being put that there is only one area set aside for the beetle that was the subject of dealing specifically for that purpose.

25 MS MORTIMER: That is right.

MR D. GUNSON: That was 7A at the very end.

HIS HONOUR: Yes.

30 MR D. GUNSON: But other areas were identified where they were set aside for the beetle.

MS MORTIMER: Your Honour, we don't remember that.

35 MR D. GUNSON: I think it was in the sense that it was wet forest which was a suitable habitat, is the best way to explain it.

HIS HONOUR: That is another issue, yes.

40 MR D. GUNSON: Well, I think I will approach it this way.

45 You would agree yesterday that when we were at 17E, which had been harvested, that you were shown a number of areas that were obviously wet damp areas that had been not harvested?---Yes.

And you would agree, would you not, that in those areas there was more than adequate coarse woody debris available in the form of fallen logs?---There was certainly coarse woody debris available, yes. That's correct.

And if the harvesting had occurred in areas where the beetle was not known to exist and had not gone into those areas then you would agree, would you not, that appropriate attempts had been made to prevent damage to the beetle?

5

MS MORTIMER: Your Honour, there is at least two negatives in that question and two assumptions and, in my submission, I can't understand it and it is an unfair question.

HIS HONOUR: Yes, you are quite right.

10

MR D. GUNSON: All right.

Yesterday you were shown areas that were not harvested. Correct?---That's correct.

15

They were damp?---They were damp.

And quite wet?---Yes.

20

And were filled with fallen trees and coarse woody debris to use the phraseology?---Yes, there were fallen trees in at least some of those areas.

And those areas certainly did not show any sign of harvesting, did they?---No.

25

Thank you. Now, Meggs concludes paragraph 20 by saying:

*I do not consider the species is currently facing a very high risk of extirpation in the wild in the near future despite its eligibility of listing as an endangered taxon under the EPBC Act.*

30

Do you agree or disagree with that?---It seems to me that we don't know enough about the population trends and other aspects of the beetle to be, I guess, very confident about some of the trends that are mentioned in the affidavit. We don't know the species has a very small geographical range. It has been represented in collections by a very small number of individuals and it fits the criteria under the geographical range size criterion under the EPBC Act for the fitting of the category of endangered which is that it faces a very high risk of extinction in the wild in the near future.

35

Thank you. At paragraph 20 he says that:

40

*Meggs in 1999 and Meggs and Munks in 2003 recommended that, what he describes, as a multi-scaled conservation management strategy for the beetle that aimed to reduce the risk of extinction of it in the near future by ensuring that maintenance of contiguous areas of potential habitat in "off reserve" areas throughout the eastern half of the species range which encompasses WT017E and by increasing levels of protection to fragmented habitat in the west.*

45

Now, are you aware of those recommendations?---They were reported earlier in the papers by Meggs and Meggs and Munks.

Yes. And he goes on to say that:

5           *The recommendations of Meggs have now formed the basis of specific management prescriptions for the conservation of the species habitat in areas subject to production - forestry delivered by the private forest practices system.*

Are you aware as to how the forest practice system works?---No.

10       Are you aware that the Forest Practices Board actually arranges for assessments of areas of forests to be harvested to identify threats to species that live within that area?---I was aware there was pre-logging surveys but not the role of the forest practices system in doing so.

15       Now, in fairness to you, would it be reasonable to say that you have no knowledge of how the Forest Practices Board operates in its assessment of areas?---I'd have very little direct information or understanding about how they operate. That's correct.

20       Thank you. I think I said it is the Forest Practices Board. It is the Forest Practices Authority but the same answer would be given.

Paragraph 24, if you just turn over the page, Meggs says this:

25           *Whilst there is insufficient data to draw any firm conclusions on the long term effects of forestry practices on populations of the beetle there is some limited evidence (Meggs and Munks) the beetle may be able to survive in or recolonise areas following clear-fell, burn and sow silviculture, areas previously subjected to partial logging and stream-side reserves retained within eucalypt plantations.*

30       It goes on:

35           *Information combined with an assessment of the likely impacts of forestry compared to natural disastic disturbances and the post harvest evidence of ongoing habitat potential in WT017E lead me to conclude that the harvesting of WT017E would have had only a minor and short-term impact on the local population of the species and a sufficient habitat would be available throughout the silviculture cycle to maintain the local population in the area. WT019D largely constitutes unsuitable habitat so the harvesting of this coupe will have minimal if any impact on the local population of the beetle.*

40

Now, you saw 19D yesterday didn't you?---Yes.

And you would also no doubt agree that that area seemed, at least on the face of it, to be different to 17E?---Yes, I think that would be reasonable to say.

45

And if Meggs says that as far as he is concerned the beetle doesn't reside in 19D, he is in a far better position to state that than anybody else isn't he?---I would come back to the issue of methodology again because - - -

With that one caveat again?---Yes.

5 All right. And you will note that Meggs concludes his executive summary by saying that in his opinion the species will not meet any of the criteria for this threat category as a consequence of the harvesting operations. Now, with your one caveat about the methodology you would agree with that presumably?---Yes, I don't think there is evidence that it would meet the critically endangered category stated in paragraph 25.

10 Thank you. Paragraph 28, before we go on to that, in your report which is annexed to your affidavit you refer to the population level of the broad-toothed stag beetle at Wielangta. What evidence did you have as to the population level when you wrote your report?---It was evidence from the papers that we had before us, the reports that had been cited, an affidavit by Peter McQuillan.

15 So you relied on McQuillan's work?---Yes.

20 Had you read Meggs and Munks and Meggs 1999 before you prepared your affidavit - more correctly your report which is annexed to your affidavit?---Yes, I had one of them at the time, I can't recall which, but one of the Meggs papers I did have.

25 You express in your report concern about forestry operations that you say are likely to kill the beetles by directly crushing them. What did you have in mind?---In harvesting operations there is a lot of heavy machinery that uses the roads, it uses the areas where the logs are piled up and moved and that has the potential if the beetles are in the area to physically crush them.

30 Presumably that is the case when they are out in the open, but if they are under logs that are not driven over, they are going to be perfectly safe aren't they?---Yes, if they are under logs that would be correct.

Is it your belief, and I don't criticise you for this, that timber is harvested on these coupes mechanically or by chainsaw being used?---I would think mechanically.

35 Right. So your belief is that some way some machine comes along and cuts down the trees as it trundles through the forest; is that right?---The machine that I've seen in operation in New South Wales has - it's really quite big, heavy machinery. It has a grab that clasps the tree some way above the base and then cuts it off near ground level.

40 Well, let me say this to you and I am sure it will not be contradicted, in Tasmania harvesting is carried out by men who go into the area to be logged using chainsaws. They cut the tree down, they trim it, that takes the head off, take off any branches and the tree is then harvested, or recovered more correctly by what is called a snigger or vehicle of a similar name which is Roberts-hired, comes along and it has got a grab and then drags the tree out along designated snig tracks. So it is quite a different process to what operates in  
45 New South Wales. Bearing that in mind does that alter your view?---I accept that but it does sound as if there must be a need for heavy machinery to get in to bulldoze the roads and to take the logs out, even if they are cut by chainsaw.

Well, we start with the first point you are correct, we saw yesterday, bulldozing is required in the first instance to make the roads.

5 MS MORTIMER: Your Honour, is that a question or a statement of evidence?

HIS HONOUR: That is a question I believe.

10 MR D. GUNSON: Yes, assume that to be so. Now, it is quite possible for the wet areas to be avoided isn't it?---Yes, it should be.

And logically you are not going to put a road through a wet mushy area are you?---No, that's correct.

15 You are looking for the dry sort of area?---Yes.

20 Right. The next step after that according to the forest practices plans is the placing of what are called snig tracks which are the little tracks that go into the forest to where the operation is being formed along which the skidder then brings out the logs; assume that to be the case. And assume also that these are rubber tyred vehicles that just basically go into the bush, back on to the snig track and out. And then the logs are taken back to the landing where they are picked up by trucks. Now, the process I have described to you is quite different to what you had in mind isn't it?---Not greatly different because the only real difference is that in New South Wales the cutting is more mechanised than appears to be the case here, but the roading practices, the movement of logs on log trucks in and out of the sites, it sounds very similar.

25 Along formed roads, though?---Yes.

30 But insofar as potential damage to the beetle in the forest itself is concerned you had an expectation the track vehicles would be in there trundling around cutting down the trees, didn't you?---It wasn't a great expectation, I'd assume that the timber would be taken out somehow, but I didn't really have a formed opinion before yesterday about how it would be done.

35 But now your opinion as to the degree of likelihood of the beetle being crushed by equipment must change, surely?---I think it's less likely than I'd first thought.

40 Just bear with me, your Honour, for one moment. Could the witness be shown volume 3, please, of the Court book? If you would turn to page 1138, I think it is, it should have an affidavit by Michael Dawson Laffan. Now, what you have got in front of you, Professor Dickman, is an affidavit of Michael Laffan who is a senior soil scientist employed by Forestry Tasmania and if I could take you, please, to page 1151, to paragraph 59 of Mr Laffan's affidavit? He deals basically with the subject of soil compaction and so forth and you will see there under the heading Relevant Studies of Logging Impacts on Similar Dolerite Soils in Southern Tasmania and you will see he says:

*The studies of soil compaction and analysis of snig-track areas following partial logging, that is, 10 per cent basal retention in clear felling have been well documented for soils formed on dolerite in southern, northern, and eastern Tasmania.*

5

Omitting the references:

*The studies cited, Pennington, Laffan, in southern Tasmania include well and imperfectly drained soils correlated with Kermadie and Murdunna soil profile classes respectively, with graduation or texture profiles characterised by clay loam A1 horizons overlaying light and medium clay B horizons.*

10

Then he says:

*Surveys carried out of logging showed that the area occupied by snig tracks, major and minor snig tracks, varied from 13 to 23 per cent of the total harvested area and that major snig tracks, that is, snig tracks with multiple machine passes cover between 2 to 6 per cent of the coupe.*

15

20 Now, do you understand what a snig track is?--It's a small track off the major harvesting  
---

20

That is correct. Well, if one accepts that Laffan, and I ask you to accept it for this purpose, is correct you will see that the snig tracks really do not occupy a very great deal of the coupe, do they?--It's up to a quarter of the coupe area.

25

But the chances of a beetle being damaged, killed, by the impact of machinery is far less than you had anticipated, isn't it?--I think, yes, it is, but nonetheless up to - in fact if you take the upper percentages of 23 for the minor tracks and 6 per cent for the major snig tracks, we're looking at 29 per cent, getting on for a third of the coupe area impacted by snig track making and passing.

30

You haven't read the forest harvesting plan for coupe 19D, have you?--Yes, I have.

35 You had? You will recall then what he says about class 4 streams, and I will remind you:

*Class 4 streams will have 10-metre wide stream-side reserves.*

There are four C4 streams located in the vicinity:

40

*No machinery will enter the stream reserve except at designated crossing points. Within the stream reserve there should be no disturbance to the understorey or woody debris on the forest floor.*

45 Now, you have asserted of course that forestry operations are likely to kill the beetles. Bearing in mind that restriction in the beetle's habitat would you agree it is a practical and sensible restriction?--I think to leave buffers either side of the stream is certainly a very sensible precaution to try to maintain some of the area of habitat they might occupy.

5 And the restriction on people taking firewood out of the coupes after the harvesting has finished again enhances the chance of survival of the beetle, doesn't it?--Yes, except that firewood perhaps would be the smaller end of the timber that would be taken out. It would be unlikely perhaps that people will be taking out large decaying logs for firewood.

And it is the decaying - - -?---So a sensible prescription, but - - -

10 And it is the decaying logs that are the habitat of the beetle?--Yes.

And the leaving of dry logs on the ground that ultimately rot is a sensible thing, isn't it?--Yes, it would be.

15 Because in the years to come as that log rots down and starts to decay it provides a habitat for the beetle?--Yes, you'd expect so.

Thank you. At paragraph 29, Meggs says this:

20 *As there is currently no method available to accurately sample population sizes of the species there is no scientific data available -*

MS MORTIMER: Perhaps we can wait till the witness finds - - -

25 MR D. GUNSON: Oh, I am sorry, your Honour, I - - -

MS MORTIMER: We were all on a different spot.

MR D. GUNSON: Yes, and my apology, your Honour, I just - - -

30 HIS HONOUR: Sorry, are we going back to Meggs? I have still got book 3 open. What page in the Court book are we at now? Someone queried why my staff brought Court books and it obviously saves lots of time. Just imagine me foraging through these files for the relevant affidavit.

35 MR D. GUNSON: 1199, your Honour. No, I am sorry about that, I just casually put my volume away and went to the next one.

HIS HONOUR: 1199?

40 MR D. GUNSON: And we will be staying with Meggs for some time.

HIS HONOUR: It is on book 4; is that right?

MR D. GUNSON: Book 4, your Honour.

45

HIS HONOUR: Yes.

MR D. GUNSON: You have got paragraph 29 in front of you?--29, yes.

29?---Yes, 29.

Thank you. And Meggs says this:

5

*There is currently no method available to accurately sample population sizes of the species. There is no scientific data available on population trends of the beetle. Hence it cannot currently be shown where the numbers of the species are increasing, decreasing, or stable.*

10

And he says:

*This was noted in the advice to the Minister for the Environment and Heritage from the Threatened Species Scientific Committee.*

15

Now, Meggs is obviously the acknowledged expert in this particular beetle and if he says, as he has said there, that there is no method currently available to accurately sample population - - -

20 MS MORTIMER: Your Honour, I object to this question with the assertion from my learned friend that Meggs is obviously the expert.

MR D. GUNSON: I will rephrase it.

25 MS MORTIMER: It is perfectly acceptable if Professor Dickman is asked to assume that that is the respondent's evidence. I have no objection to the question being framed like that.

30 MR D. GUNSON: I think you have accepted already that Meggs is an expert in respect of this beetle?---Yes, he is.

35 Okay. Now, accepting that he is an expert with respect to this beetle and he says that there is currently no method available to accurately sample population sizes of the species would you accept therefore it is reasonable to state that there is no scientific data available on population trends?---No.

40 Why would you disagree?---I think the two things here are different. In the first part of the sentence Meggs is talking about a method to accurately sample population sizes and that implies to me that we're looking at a method that would allow us to count the numbers of beetles and to get a fairly precise estimate of the density over particular areas. And I would agree that we don't have a method that allows us to do that, but I don't think that is the same thing as the second part of the sentence where it goes on to say as a consequence there is no scientific data available in population trends.

45 If you cannot accurately sample the population size surely you cannot determine a population trend. You need to know, surely, a starting point as to what the population was at a certain date; correct?---Yes, for a trend you need a start point and a stop point.

And you would need to know how accurate the first assessment was, that is, the start point?---Accuracy isn't really an issue.

Reliability is an issue?---Reliability is.

5

Yes. So you would need to know how reliable the original information was, and you would determine its reliability by assessing the means by which the first assessment was done, wouldn't you?---I think the critical thing is that if we start with a point where there is an assessment of beetle numbers, and irrespective of whether the particular that is used at that particular time is the most accurate one available or another method of lesser accuracy, provided that method can be used reliably on subsequent occasions it can be used in a catch per unit effort way, in which fisheries data and many other wildlife populations are indexed. It is really a recognition of the fact that population size is a very difficult thing to get for most organisms. You can't really numerate most things.

10

Basically that is what Meggs is saying, isn't it? It is very difficult to determine the population size of this beetle?---Yes.

15

It is much easier, I imagine, to go out in a forest and to trap a marsupial. You get a rough idea then of how many marsupials of a particular type occupy that area?---It depends on the marsupial.

20

More common ones perhaps, excluding the sneaky ones?---Yes. Yes, for some it would be easier for some that - - -

25

Yes. The reality here though is that to determine the population of these beetles you effectively have to disturb their habitat, don't you?---I don't know that you do. Certainly with the log rolling or log splitting method that has been used to get the beetles in the studies by Meggs and Meggs and Munks, yes, there is habit destruction that is involved.

30

Which should be avoided wherever possible?---Yes.

35

And to merely try and calculate the number of beetles that live in a particular area wouldn't be a proper scientific course of conduct to just go rolling over logs?---I think if the logs were replaced it would be a reasonable thing to do. If the logs are on the other hand split and taken apart to count the numbers of larvae or beetles that they contain, that is obviously destructive sampling and those logs wouldn't be available as habitat for the beetles.

40

And destructive sampling is not encouraged, is it?---No.

It is regarded these days as somewhat unethical, isn't it?---Yes. I think particularly the destruction of habitat.

45

Yes. In fact, destruction of habitat is to be avoided at all times under the ethical guidelines, isn't it?---Yes.

Yes. So do you criticise Meggs for saying there is no method currently available for accurate sampling of the population size of the species?---I don't criticise him for it because I think that is an accurate statement.

5 And if the species hasn't been sampled in the past to any extent then his comment that there is no scientific data available of population trends of the beetle is correct, isn't it?---I think it would be, if Meggs or other people sampled beetles in particular areas at particular times at the past it would be quite reasonable to assume that if you used the same methodology in those sites subsequently at intervals of a year or two years or some  
10 interval that might be reasonable to pick up a trend, then you would be able to pick up a trend whether it is upward, downward or stable even though you don't have an accurate understanding of the actual population that is there.

15 You are going to get an understanding but nothing more than that, aren't you? It is not going to be accurate?---The trend would be accurate, but the population size would be difficult to know.

20 That is right. The population size at the end of the day can't be established, can it?---I don't believe so.

Thank you. Now, Dr McQuillan in his affidavit said he was of the opinion that the research reported by Meggs and Munks in 2003 is flawed in part because:

*Sampling was biased against drier forest types.*

25 Do you accept that as a legitimate criticism by Dr McQuillan?

30 MS MORTIMER: Your Honour, I object to this, and I object to my learned friend occupying too much of our time today cross-examining this witness, who has admitted that he is not an expert on the beetle, at any great length about matters that are within the area of expertise of someone who is an expert on the beetle. It is not helpful. This witness has already conceded that he is not an expert on the beetle and it is not relevant for that kind of cross-examination to continue.

35 HIS HONOUR: Mr Gunson?

40 MR D. GUNSON: I submit that it is relevant, your Honour. Professor Dickman has been put forward to the Court as an expert in the area in which he practises, and the main area is the likelihood of extirpation of a species. We are talking about this very issue here. McQuillan for instance criticises the part of the Meggs and Munks research because it was a bias against drier forest types. If it can be shown that that bias is incorrect because of the one sample found by McQuillan then it is a relevant matter for your Honour to consider at the end of the day.

45 MS MORTIMER: And my learned friend can ask Dr McQuillan about it, of course, your Honour.

HIS HONOUR: Yes.

5 MS MORTIMER: But it is not the case that this witness has been put forward in this proceeding as an expert on the beetle, and that is obvious from his affidavit. It is obvious from the evidence he has given this morning and it is obvious from the content of his report.

HIS HONOUR: Does the proposed - sorry.

10 MR O'BRYAN: Your Honour, I hesitate to intervene. Could you please look at page 580 of the Court book for a moment?

HIS HONOUR: 580?

15 MR O'BRYAN: 580.

HIS HONOUR: In book 2, is it?

20 MR O'BRYAN: It is in book 2, your Honour, yes. It is the letter of instruction that Professor Dickman received from Fitzgerald and Browne. If you look at the bottom of page 580, your Honour, you will see question 13 which commences with the words:

*As to the broad-toothed stag beetle, Dr McQuillan has recommended there be no forestry operations in those parts of the Wielangta forest area that is potential habitat -*

25 and a footnote reference is given. We are over now on 581:

*Do you agree or disagree with those recommendations and why?*

30 Your Honour will find corresponding with that question in paragraph 13 of the professor's report which you will find on page 588 that the professor more or less quotes that sentence from his instructions as part of his report. He says that he agrees with it and goes on to explain to why. And then finally in his summary of his opinion in relation to the broad-toothed stag beetle which you will find in paragraph 19 on page 591 he states his  
35 conclusion based upon his reasoning in inter alia paragraph 13. Now, your Honour, in my respectful submission, Professor - Dr McQuillan's opinions about these things, the basis for the opinions, the reasoning it lies behind them, the criticism of Meggs, the analysis, is absolutely central to the Professor's reasoning and it is vital in fact, and because if it is not  
40 able to be done by Mr Gunson, I would seek to do it on behalf of the Commonwealth. It is entirely legitimate, your Honour, to question Professor Dickman about this aspect of Dr McQuillan's reasoning.

HIS HONOUR: Ms Mortimer, is the objection maintained?

45 MS MORTIMER: It is, your Honour, on this basis and if my learned friend, Mr O'Bryan, is going to continue to intervene like this I might have something to say about the Commonwealth's role in this proceeding and take your Honour to the role of interveners in the rules but put that to one side for a moment - the objection is maintained because if one

looks at the way the question has been asked in the letter of instruction to Professor Dickman and answered, of course we would have no objection if Professor Dickman is being cross-examined on what he has said in his report and the recommendations of Dr McQuillan but that is not the question I objected to.

5

What I objected to was cross-examination of this witness about whether Dr McQuillan's conclusions were valid in an expert sense, that is putting Meggs' opinion against McQuillan's opinion and asking the person, who has said he is not an expert about it, to arbitrate that. That is not an appropriate process. If the respondent's case is that Dr McQuillan's evidence is flawed - opinion is flawed, then some of the basis for what Professor Dickman says will go. We accept that. But that is an issue in dispute between the two people that are experts on the beetle, not this witness.

10

HIS HONOUR: Mr Gunson, can you take me, by reference to the Court book page number to the particular passage in Dr McQuillan's evidence that you are going to put to Professor Dickman?

15

MR D. GUNSON: Yes, I will, your Honour.

20 HIS HONOUR: Somewhere after 491 presumably?

MR O'BRYAN: Your Honour, if I could try to assist again. The key report, your Honour, is in volume 1. It starts at 108.

25 HIS HONOUR: I see.

MR O'BRYAN: The key report was in fact the report that was presented to the Court in the context of the interlocutory application much earlier in the year and at 108 at volume 1 your Honour will find the affidavit of 29 May of Dr McQuillan which attaches Dr McQuillan's report.

30

HIS HONOUR: Yes.

MR O'BRYAN: It doesn't have a date on it. I think it was completed shortly prior to the swearing of that affidavit. It refers to various events and studies and so forth done in early 2005 and your Honour will find that commencing at 115 and I suspect that is probably where my learned friend is heading.

35

HIS HONOUR: Yes. Thank you very much.

40

MS MORTIMER: I am sure he is very grateful, Norman.

MR D. GUNSON: He is. It is page 112, your Honour, paragraph 18.

45 HIS HONOUR: Page 112, paragraph 18?

MR D. GUNSON: Yes. It commences:

*The recent paper by Meggs and Munks -*

HIS HONOUR: Are you going to relate that question to loss of habitat?

5 MR D. GUNSON: No. I was primarily concerned about his comment that the Meggs and Munks - - -

HIS HONOUR: Whose comment?

10 MR D. GUNSON: That is Dr McQuillan's comment which is reported there that Meggs and Munks were flawed in their methodology was incorrect because of the bias. I want to take him to the point about whether in terms of methodology it could be said that there was that bias.

15 HIS HONOUR: Methodology in respect of what?

MR D. GUNSON: The sampling.

HIS HONOUR: Does that clarify or assist you, Ms Mortimer?

20 MS MORTIMER: Well, your Honour, again in my submission it is at least a matter of fairness to the witness that he ought to be asked whether he considers that is a matter within his expertise that he is able to answer and the question, in my submission, needs to be very precise.

25 HIS HONOUR: Well, I suppose that is a fair question to commence with.

MR D. GUNSON: Yes.

30 Do you think it is in your area of expertise to comment on whether or not the work by Meggs and Munks 2003 was flawed because of the methodology they adopted by choosing what is called candidate forest sites for sampling which McQuillan considered to be biased against drier forest types?---I am not a beetle expert nor beetle ecologist so although I could answer it would be from a more general point of view of ecological  
35 sampling.

Yes. In general terms, yes. I would be happy with that, your Honour.

HIS HONOUR: Do you want to persist in this line of questioning?

40 MR D. GUNSON: Yes, your Honour, on a general basis.

HIS HONOUR: Ask your next question and see where we go.

45 MR D. GUNSON: I will.

HIS HONOUR: Don't answer it if you mind just in case there is an objection.

5 MR D. GUNSON: McQuillan, in the affidavit I just read, said he was of the opinion that the research reported by Meggs and Munks is flawed in part because the sampling was biased against drier forest types and what I want to ask from that is, did you accept that to be a reasonable criticism based on what you had read taking into account Munks and Meggs 2003?

HIS HONOUR: Is there an objection to that question?

10 MS MORTIMER: No, your Honour.

HIS HONOUR: You may answer it, Professor?---The one thing I guess that concerns me is the methodology again that was used by Meggs and Munks. If they had really shown that the methodology they were using would be sufficient to pick up the beetles in areas of different habitat where they might occur then it would have been reasonable to proceed and then look only in the wet forest areas and to reject the dry forest ones.

15 MR D. GUNSON: So again it comes back to this whole issue of methodology which we discussed earlier on?---Yes.

20 Thank you for that. At paragraph 40 of Meggs' affidavit - - -

HIS HONOUR: Court book page?

25 MR D. GUNSON: 1202, your Honour.

Meggs sets out the results that were achieved by Meggs and Munks as to the forest habitat in which the beetle was found, and he says that it was wet eucalypt forest dominated by the species that he identifies there *obliqua regnans* in globulus with occasional *riminalis* and wet damp eucalypt forest patches and riparian areas amongst dryer forest types. It goes on to basically say that is where predominantly you will find those beetles and you saw those various species yesterday in that sort of micro climate, did you not?---Yes.

30 They were pointed out to you?---That's correct.

35 He said the numbers did not differ significantly between the three wet forest types, that is wet eucalypt forests, damp eucalypt and riparian wet forest and you are not in a position to challenge any of that are you?---I think the numbers that were reported in the previous documents would support the fact that the numbers of beetles that were collected are similar between those three forest types, certainly.

40 Meggs at paragraph 53, page 1206, your Honour - 1207 discussed the McQuillan appendix to his affidavit. Half way through that paragraph he says this:

45 *Hence it is not safe to conclude from the trapping of a single beetle in dry eucalypt forest within 40 metres of wet eucalypt forest, that this is evidence of a breeding population in a dry forest.*

As a scientist with your speciality you would accept that be a valid comment, would you not? The trapping of one beetle, isolated, could not possibly be evidence of a breeding population in a dry forest could it?---That's a reasonable conclusion.

5 And if that was asserted by somebody you would say it is an assertion that cannot be supported on a scientific basis?---Because I'm not an expert in beetle ecology I wouldn't know whether the beetle that had been collected was perhaps a female with eggs. If it had been then it might be possible to assert the breeding population was present in the area where the beetle was found, but I really - - -

10 And similarly if one red fox male was walking down the road and was captured and red foxes didn't live in the area, you would not say that that is evidence of a breeding population of red foxes would you?---True, not a red fox male, but a female with cubs would be a different thing.

15 Yes, I accept that, that is why I chose the male. But it proves the point though doesn't it, one member of a species does not prove the existence of the rest of that species, let alone a breeding population?---Yes, it would be thin evidence I think to say this was a breeding population without - - -

20 And as a scientist you would decry that approach would you not?---Well, I think if the assertion was made it would need to be challenged.

25 Yes, thank you. On this page at the bottom of the page, paragraph 54, Meggs says:

*In my opinion no case has been made that the species has been subject to an immediate risk of extinction in the wild in the interim.*

30 You would support that would you not?---I think that would be correct. There has been no case made for an immediate risk of extinction.

Thank you.

35 HIS HONOUR: I think he said that before.

MS MORTIMER: He has, your Honour.

MR D. GUNSON: Yes, thank you, your Honour.

40 HIS HONOUR: I am cheating I have got a yellow highlighter and as you go along I am highlighting what you are putting.

MR D. GUNSON: Thank you, your Honour, I am grateful for that. If your Honour will let me know when it is empty I will arrange for another one.

45 At 21, that is page 21 - I will just give your Honour the page, 1209. Meggs says this, "The beetles," paragraph 58:

*...has also been recorded from roads on two occasions and twice from roadsides (Meggs). This highlights the need to treat incidental records that are not part of a properly designed and replicated scientific study with caution.*

5 You would agree with that I imagine?---Yes.

He said:

10 *Roads can no more be considered to be a reliable predictor of the species presence than dry eucalypt forest.*

Do you accept that?---Yes, I think so.

He also says:

15 *Another explanation for the discovery of the two specimens in dry eucalypt forest is that the species is able to exploit moist micro sites within close proximity to wet damp forest habitat.*

20 You would accept that?---Yes, that's certainly possible.

It says at 60, all three hypotheses to explain the trapping of this individual at 17E are possible but there is insufficient evidence to support any of them. And again you would accept that, would you not?---Yes.

25 Thank you. Paragraph 77, which is page 1214, Meggs discusses the beetle being listed as endangered in the inaugural schedules of the Tasmanian Threatened Species Protection Act due to its restricted distribution, low population density and loss of habitat. Were you aware that that was the basis for the original listing in the TTSPA?---No.

30 But it is a reasonable basis for a listing, isn't it?---Yes, and presumably, with its restricted distribution, low population density and so on, it was shown at the time to fulfil the criteria needed for listing as an endangered species.

35 Under the IUCN threatened species criteria, how would it be listed?---Sorry, this is under the Threatened Species Protection Act, paragraph 77.

The species would meet the criterion B though under the IUCN 2000 guidelines, wouldn't it?---Oh yes. Sorry.

40 Thank you. Paragraph 127, page 1233. Mr Meggs says that Drs McQuillan and Michaels claim in their affidavits that the harvesting of these two coupes and by implication any harvesting will further fragment habitat which they claim is known to be a threat to the species. He says:

45 *In my opinion -*

HIS HONOUR: You have already taken the witness I think to - - -

MR D. GUNSON: Not to fragmentation I don't think, your Honour.

MS MORTIMER: Your Honour, I did in-chief?

5

HIS HONOUR: I am sorry. I should have a different highlighter for you. A different colour.

MR D. GUNSON:

10

*In my opinion there is no evidence that fragmentation of habitat is a threatening process for the beetle. To demonstrate that fragmentation is operating you need to show that a species is declining at a disproportionately faster rate than the rate of habitat loss indicating that the spatial arrangements of habitat is having a greater impact on the species than the total amount of available habitat.*

15

Now, you made reference to that this morning. Do I understand that you completely disagree with the totality of those propositions advanced by Meggs?---Yes, I do.

20 The totality of it?---Yes. The beginning of the statement is to demonstrate that fragment is operating, you need to show that the species is declining at a disproportionately fast rate and I disagree because you don't need to show that.

25 Why not though? Surely you have got to have a starting point?---The major issue with fragmentation is that you are confining species to progressively smaller portions of original habitat and so because of that there is no need to show that they are declining at a disproportionately faster rate than is the habitat itself and in fact there are many situations where the numbers of individual species actually accumulate in the remnant areas of remaining habitat despite the effect of fragmentation and then after the build-up, because  
30 they are moving from the disturbed areas into the remnant fragments, after a time of being there at high density the numbers fall again to perhaps approximately what they would have been prior to the time of disturbance.

Meggs goes on to say - and I quote:

35

*Despite the fact that fragmentation is a threatening process, it has become somewhat of a mantra in conservation biology. The evidence for this as a significant threat to biodiversity is weak.*

40 Do you accept that?---No.

He then goes on to say:

45 *An excellent review of the literature on the effects of habitat fragmentation on biodiversity, Fahrig 2003, found that most studies failed to differentiate between habitat loss and fragmentation as a separate process.*

Are you familiar with the study to which he has referred?---Yes, I have seen it and I have read parts of it but I hadn't read the whole - - -

Haven't head the whole of Fahrig?---Not recently.

5

And what you have read of it, do you disagree with Meggs' assessment of what Fahrig has stated?---From what I remember Fahrig did a review of the predominantly international literature and made scant mention of the information that was available in Australia. There are in fact some good reviews slightly earlier than that from Fahrig by Richard Hobbs and Dennis Saunders among others that I think come to different conclusions.

10

So to put it another way the whole issue is undecided, isn't it?---Yes, I think it is. It is fair to say that there is dispute about how best to evaluate habitat fragmentation and its effects.

15

There are very much strong competing views within the scientific community about this, are there not?---I think it would be fair to say that Fahrig is a minority view, it is not - the mantra perhaps that is referred to near the top of the page is perhaps referring to the predominance of publications in the conservation biology literature that talk about fragmentations of threatening process, I think.

20

And as you said a moment ago, there are two schools of thought, are there not?---Yes, one large and one small.

25

You belong to one?---I think from the evidence that I have seen and from my own research the effects of habitat fragmentation are really quite great and predictable.

There is room - - -

30

MS MORTIMER: The witness hadn't finished, your Honour.

MR D. GUNSON: There is room for a competing - - -

MS MORTIMER: Your Honour, the witness had not finished.

35

MR D. GUNSON: Sorry, the witness had finished I thought, your Honour. If he hasn't, I apologise?

40

HIS HONOUR: Have you finished your answer to the previous question?---Yes. I was just going to add that the effects can be predictable. The effects of fragmentation can be predictable.

MR D. GUNSON: And there is room for the competing view though, is there not?---Yes, in science there should always be room for competing views.

45

That is right.

HIS HONOUR: I think that is what the judiciary calls a matter on which reasonable minds might differ.

MR D. GUNSON: Fahrig concluded that whilst empirical studies to date suggest that habitat loss has large consistently negative effects on biodiversity, habitat fragmentation has much weaker effects that are just as likely to be positive as negative; is that a fair assessment of what Fahrig has concluded?---From what I recall of Fahrig's paper, yes.

Do you agree with the next sentence where Meggs says:

*Hence terms such as habitat fragmentation need to be defined and used cautiously.*

?---Yes, I think it is always good to have clarity in definitions so that people can be talking about the same things, certainly.

So are we correct in thinking then that there is no clarity of definition as to habitat fragmentation?---I think for the majority of people who work in conservation biology habitat fragmentation was a reasonably clearly understood process. It is the loss of habitat and the dissecting essentially of continuous habitats so that only fragments remain. It is very much as the process sounds.

HIS HONOUR: Breaking up of habitat?---Yes, the breaking up into smaller chunks, yes.

MR D. GUNSON: Meggs then goes on to say:

*With respect to this for a species like the beetle with an apparent ability to maintain populations in relatively small areas it is difficult to see how forestry operation conducted under current policy settings could result in an increased threat to the species from fragmentation.*

Now, do you accept that view expressed by Meggs?---I think the fragmentation could be a real threat to the species if it is presently contiguous - apparently continuous habitat area is chopped up so that smaller sub-populations are unable to communicate with one another, then it is a threat.

But do you have any evidence to suggest that the beetles do migrate from one damp area, for instance, through dry forest, to another damp area, maybe hundreds of metres, if not kilometres, away?---There's no clear evidence.

There is not, is there?---No.

No, and in fact there is very little evidence to suggest that occurs at all, is there?---I think yes, it is true there is - the numbers of individual beetles that have been caught and marked and recaptured are probably negligible or zero and that is the sort of information that you would need, apart from doing a genetic study with an assignment test to look at the spread of leels, that is the sort of information that you would need to get an idea of dispersal within the species.

And here there is no dispersal?---We really don't know.

I think Meggs somewhere said there is about a 40 metre dispersal as far as he could determine it?---That could be.

5 So if that is the case then fragmentation of the habitat, at least pro tem up until trees re-grow within the harvested forest, really is not going to be a problem, is it?---Some of the effects that we were speaking about earlier, the loss of habitat quality, the drying out of logs following harvest operations, I think we still know insufficient about those sorts of potential problems to know whether beetles would be able to disperse or not. I just don't  
10 know that we have the evidence to be confident to say.

If you would look, please, at paragraph 128, there Meggs discusses the wildlife habitat clumps and he says:

15 *The sources of future recruitment to large coarse woody debris in 17E include the wildlife habitat clumps, retained seed trees, cold trees, that is non-merchantable trees, the skylight management zone input from unharvested coupe edges -*

he says -

20 *in the longer term CWD will also be recruited from retained advanced growth new generation.*

Well, that is logically correct, isn't it?---Yes, in the longer term that is correct.

25 Are you aware that from the forest practices plan for that particular coupe that the wildlife habitat clumps have been retained at almost twice the rate recommended by the Forest Practices Code?---No, I hadn't been, I read that particular document, but hadn't realised it was at twice the rate.

30 No. Does it surprise you that it is twice the rate?---Not particularly, there will be variation in the amounts of habitat that are set aside for wildlife habitat clumps and strips, presumably under different topographic and other conditions.

35 And Meggs concludes that paragraph by saying:

*The increased rate of retention employed in 17E will ensure that retained clumps are well within the believed dispersal abilities of the beetle.*

40 You don't quarrel with that, do you?---Well, we just don't know enough about the dispersabilities to be really confident, I don't think.

But you say we, and in fairness to you, you really don't know a great deal about the beetle, you are very much dependent on what you have read and Meggs is the expert, isn't he - or  
45 an expert, isn't he?---Yes.

HIS HONOUR: Well, I think it has already been established that Meggs is an expert.

MR D. GUNSON: Yes, but I just wanted to make the point, your Honour, about that particular issue relating to dispersal.

5 You would accept Meggs on that, wouldn't you?--I'd accept Meggs is an expert but unless he has data on dispersability I don't think he'd be much better able to quantify the dispersability of the species than other people. It should be presumably evidence based.

If you go to paragraph 140, please, page 1237, Meggs says:

10 *Whilst there is insufficient data to draw any firm conclusions on the long-term effects of forestry practices on the populations of the beetle there is some limited evidence the beetle may be able to survive in or recolonise areas following CBS clear burn areas previously subjected to partial logging in stream-side reserves retained within eucalypt plantations.*

15 You would agree with that?--Yes, I think so, there were limited data that were provided in one of the Meggs or Meggs Munks publications.

20 He then concludes by saying:

25 *This information combined with an assessment of the likely impacts of forestry compared to natural disastic disturbances, imposed harvesting evidence of ongoing habitat potential in 17E lead me to conclude that the harvesting of 17E will have had only a minor and short-term impact on the local population of the species and that sufficient habitat will be available throughout the silviculture cycle to maintain the local population in the area.*

30 And again you would agree with that?--I'd like to put some caveats on again and come back to methodology.

Yes?--And some of the other potentially important but still not very well known processes that include predation by potentially birds, foxes, the sorts of issues that we talked about earlier. So I think they would still need to be resolved.

35 With that standard caveat, yes, you would accept that proposition?--Yes.

And he concludes by saying:

40 *The only objective measure as to whether the harvesting of these two coupes will further threaten the beetle is an increase in the threat status of the species to critically endangered under the EPBCA.*

And he says:

45 *The species will not meet any of the criteria for this category as a consequence of these harvesting operations.*

And you wouldn't quarrel with that, I imagine?--Yes, I do.

You do quarrel with it?---Yes.

5 In what way?---It says that the only objective measure as to whether the harvesting of the two coupes will further threaten the beetle is an increase in the threat status to critically endangered and because critically endangered is just another category it's not an objective measure in that it doesn't provide - it doesn't allow for any assessment of population decline or anything else, it's simply a movement from one category to another.

10 Thank you. Now, can we move on to the parrot, the swift parrot. And I think you said this morning - and, please, correct me if I am wrong - that you really don't profess to have any particular expertise with respect to the swift parrot; is that right?---That's true.

15 Have you read the affidavit by Mr James Michael Shields that has been filed in this matter?---Yes.

And do you know Dr Shields?---Yes.

20 Have you worked with Dr Shields?---Yes, I have.

And what work have you worked with him?---We were on the New South Wales Scientific Committee together for about six years and we are currently on another committee, the Scientific Advisory Committee for the North Head Sanctuary in Sydney.

25 Just bear with me for one moment, please, I won't be a moment. Could the witness be shown book 5, please? If you turn to page 2492, please, Professor? Now, I assume that you are aware of the academic qualifications and work experience and professional experience of Dr Shields?---Yes, I am.

30 And you would accept him, I imagine, as an expert with respect to parrots?---Yes.

And well qualified to make the comments and recommendations that he makes within his affidavit?---Yes, I think he is well qualified.

35 Very well qualified?---Yes, very well qualified.

Yes. And well regarded within the scientific community?---Yes, I think so.

40 Thank you. Have you read Dr Shields' affidavit in detail?---I have read it but I'd need to, I guess, go back to looking at it in some detail again. It was read fairly quickly.

How long would you need to do that?---I'm happy to answer questions on particular aspects but if the questions are general about the whole document - - -

45 All right. Well, if at any stage you feel inhibited in answering my question because you have not had the opportunity to refresh your memory from the affidavit would you tell me, please?---I will do, thank you.

Thank you. If you then go, please, to page - it is paragraph 8, your Honour. Page 2499. At paragraph 8 Mr Shields says that:

5                   *He will be performing three tasks to deliver his evidence, (a) assessing whether logging the coupes will have a significant impact on the swift parrot; assessing whether logging all the coupes in the Wielangta State Forest will have a significant impact on the parrot; and assessing whether logging native forests under the forest practices system in Tasmania will have a significant impact on the swift parrot.*

10

Did you perform those three tasks yourself when you came to answer the questions directed to you by Mr Browne?---Yes, that's what I attempted to do.

15

Assessed the material that was before you on those three - basis of those three separate categories?---Primarily on the first two. That is 8(a) and 8(b).

Well, is it fair to see that you didn't regard it necessary to proceed on 8(c)?---I thought it would be encompassed in the first two.

20

All right. In assessing significant impact Dr Shields says in paragraph 9 that he used the terms and definitions from other cases as precedent, and the definition is most succinctly regarded as:

25

*An impact that is important and notable or a consequence having regard to its context or intensity.*

30

Is that the definition you would adopt for significant impact?---In general it is. For endangered species I think that impacts of any magnitude can be taken to be potentially important.

Of any magnitude; what do you have in mind when you say that? The death of one bird, for instance?---That's possible under certain circumstances. Endangered species could be put at risk by the death of one or a small number of individuals.

35

But death occurs naturally within the environment, doesn't it? Not necessarily through man-made causes?---That is true.

40

And through the natural process a bird is possibly going to decline in the event, mightn't it?---That's true. Extinctions do occur from time to time and they are or have been and will continue to be natural events.

Are you familiar with the swift parrot recovery plan that is referred to on the next page by Dr Shields?---Yes.

45

Dr Shields is critical of the swift parrot recovery plan and midway through paragraph 11 he says this:

*I find the document lacking in its consideration of management actions to improve the status of the species, realistic budgets for these actions and strategic planning to acquire the necessary funds to meet the budgets in a timely manner for effective recovery.*

5

Is that a criticism you would echo?---I felt the document did have a number of management actions that were outlined reasonably clearly. The budget sections probably could have been improved. There was no clear strategy as I recall it for generating the funds to meet the quite high costs of swift parrot recovery.

10

Have you been provided with the habitat model derived by Luke Ellis of the Forestry Tasmania GIS Analyst?---No.

15

Were you aware of its existence?---I was aware of a habitat model, but not of its origin or much about its operation. It was mentioned I think in the swift parrot recovery plan.

Have you read the results that the modelling procedure and 10-year analysis of the habitat of the swift parrot at Wielangta?---Not for Wielangta specifically.

20

The east coast and north-west breeding ranges?---From the recovery plan from recollection it was a more general model, rather than one that related specifically to particular areas.

25

Paragraph 21 of Shields, 2502, Shields says it is his understanding that:

*(a) a high quality foraging habitat within five kilometres of the coast does not approve the harvest; (b) high quality foraging habitat five to 10 kilometres from the coast requires inspection and development of sites specific to management prescriptions and; (c) regardless of location, all known nests are protected and searching is carried out to plan coupes within 500 metres of a known nest.*

30

Were you aware of those matters?---I was aware of the restriction on the harvesting of Blue Gum, which is one of the high quality foraging habitat trees for the species, but I think there is still the possibility of harvesting of other trees that are used when the Blue Gum itself is not flowering.

35

Such as?---Swamp Gum.

40

And what was the prevalence of Swamp Gum at Wielangta?---We didn't see very much, I think towards the end of the day, I can't remember of the number of the site that we - - -

The last coupe?---No, not the last coupe.

45

But you would agree that there was very little Swamp Gum there wouldn't you?---Well, of what we saw and was pointed out to us, yes, but I wouldn't - - -

The plain fact is this isn't it, if the eucalypts aren't flowering in a particular area the birds that migrate from the mainland to Tasmania for the summer months will forage elsewhere

won't they?---If they can find eucalypts flowering within I guess the area where they would normally breed, they will head there and get food from those sources, yes.

5 And if they go to their area by whatever process they arrive at the area, they determine there is no food, whatever drives them will lead them to move on to somewhere else won't it?---Yes, you would think they would move on.

10 And that is the peculiarity with these birds, they come to Wielangta, the gums aren't flowering, they will go somewhere else where they are finding the gums that are flowering?---Yes, that's correct.

15 For instance at the present time places like Bruny Island?---Yes, it may be if gums are flowering on Bruny Island then it would be a reasonable expectation that the birds will go there to forage.

20 That is right. And similarly they will nest within a reasonable proximity to where they are foraging?---Other things being equal you would expect that because it is energetically less expensive to breed close to where you forage. But if there are other things that preclude that such as unsuitability of breeding sites near to where foraging might take place in flowering eucalypts then you would expect there to be a difference between the feeding and breeding sites.

25 Yesterday, of course, we saw no parrots did we, because there were no gums flowering?---That's correct.

Now, if you go to the next page and look at paragraph 23 Shields says there in the second sentence:

30 *On the other hand the instincts, behaviour and adaptations necessary for migration give the species the ability to move widely, use and find new habitat and have resulted in the evolution of relatively great longevity.*

35 Referring to Foreshore and Cooper, 1981 and Brown 1989. I don't imagine you would disagree with what Shields has said there?---No, I think that would be quite reasonable.

The following paragraph he says:

40 *In my opinion the number of breeding pairs is relevant to the issue and to significant impacts because the swift parrot would not be listed due to the threatening processes were it not for the estimated low population size. It is restricted now in range and migratory pattern and habitat use alone would probably not trigger listing by IUCN or Australian Government regulations.*

45 You would accept that as well?---Yes, I think low population size is probably the critical issue for this parrot.

In the paragraph on the next page, paragraph 25, Shields addresses the fact the species is highly mobile and uses breeding, foraging and wintering habitats that are widely separated. It says:

5            *It uses all these habitats sporadically appearing in one district one year and absent the next with the movements apparently associated with the availability of flowering eucalypts generally and flowering eucalypts in close proximity to suitable breeding habitats. On the mainland as well as Tasmania the parrot is frequently found foraging in planted trees or landscape gardens.*

10

And you agree with all of that obviously?---Yes, I think so.

15            If I could take you please to paragraphs 29 and 31 and if I could ask you please if you could just read those to yourself under the heading Nesting Biology and Hollow Preferences. Do you disagree with anything contained in those paragraphs?---No, it seems quite reasonable from what I know of the swift parrot.

Thank you. Could I take you to paragraph 36 please, page 2508. Shields says there:

20            *There is no reason or evidence to suggest the swift parrots will not use partially harvested forest and indeed virtually all the forest I saw at Wielangta had been selectively logged sometime, perhaps 80 years ago also, by my best estimate, hence the existence of a road next to the single nest I observed. Habitat quality for nesting and foraging would undoubtedly be reduced by the removal of hollow bearing or foraging trees. However, after the recent harvesting operation large numbers of trees remain standing in the coupe and these are in addition to those present in parts of the original coupe areas specifically set aside for habitat including stream-side reserves, skyline reserves, seed trees, wildlife habitat, clumps and areas reserved for other threatened taxa including the other two species relevant to this case but the preferred foraging habitat is open by definition, Brereton 1997, and there is no detectable requirement for closed tall forest.*

25

30

35            Would you agree with that?---I think in general it is probably quite accurate. They probably can use partially harvested forest but I guess it is a question of the extent to which they use it compared to when the forest has not been harvested.

40            And we simply do not know the answer to that?---I think going to the harvested areas yesterday some of the habitat trees that had been left were quite large. Some of the hollows were obvious standing on the ground looking up at them were also quite big and therefore unsuitable for the swift parrot based on the small entrance requirement size, the four to 20 centimetres entrance diameter. Much of what we saw yesterday was not in that category, at least from my observations standing and looking at the trees in the harvested areas.

45

But in general terms you do not disagree with what is said in that paragraph?---In general terms I think they could be used but I would be interested to know to what extent they would be more heavily used if the area were not harvested.

Can I take you please to page 2514, paragraph 50. I am sorry, I will take you to paragraph 49 first. Shields says:

5           *The areas harvested and proposed for harvest in the nominated coupes at Wielangta comprise less than 120 hectares. In my opinion the overall population of the species will not be significantly impacted by this action, either directly or indirectly.*

10        Would you accept that as valid?---By his earlier definition of significant impact it is probably correct.

          Yes. And you do not greatly quarrel with the significant impact - that is the definition of significant impact apart from the caveat you put on it?---That's correct. I think 120  
15        hectares in the entire area that the birds use is probably relatively small.

          And unlikely to have any significant impact in reality?---Perhaps not a significant impact but it's, I guess for an endangered species that is already near to extinction by definition of being endangered, impacts of any kind could be considered significant even if they involve  
20        only a small number of birds.

          The birds, regardless, are going to move on to a flowering gum somewhere else, aren't they?---Yes, if they can find them and there has been habitat loss of course over all of eastern Tasmania due to agriculture. We are probably looking at the last remnants of the  
25        bird. It's down to its last 1000 individuals. We don't know how many there would have been in the past but it's probably many, many more than the 1000 we currently have.

          Well, is it 1000 or 1000 breeding pairs?---Sorry, 1000 pairs.

30        By one estimate?---Yes, that's right.

          And there are other estimates in place, aren't there?---That's correct.

          And again we face the problem we discussed earlier with respect to the beetle and that is  
35        how difficult it is to assess a population particularly a fast flying migratory bird?---That's true. It is not an easy task. You don't know always which areas to go to, to count the birds. You might go to a certain area and find that they have all moved somewhere else so it is not an easy issue to count them and get an complete and accurate numeration.

40        But in the case of this particular bird at best it is really a calculated estimate, isn't it?---Yes, I think it is. I think the estimates vary between around 1000 and 1200 in the various reports that have been compiled. There are clearly not very many. Whether it is 1000 or 1200, it is a small number.

45        To save a little time could I ask you to read paragraph 50 to yourself please. First of all I must put to you the proposition advanced by Dr Shields that you are effectively asserting the operations on Wielangta are going to be - to use his words - "the straw that broke the camel's back". Is that really your position?---Not really that breaks the camel's back but it

is just that for a species that is down to such a small number of individuals, any incremental depression of that number is going to eat away progressively at their status and it is already endangered.

5 That is what it comes down to at the end of the day, isn't it? That is the assertion you really make that any loss of one parrot eats into the overall population?---Yes, I think for endangered species which by definition are close to extinction in the near future, these sorts of depressions in numbers - it might be one here, might be one somewhere else but these sorts of depressions although small on an individual basis - - -

10 And in a perfectly ideal world, not a single gum tree that is capable of flowering would be felled. Is that correct? I am not criticising you for that. I am just asking you is that really what it comes down to?---I don't think it is because we keep coming back I think to the issue of how much we really know. The methodology used to count different organisms is clearly crucial. The extent to which we understand habitat requirements of species is also crucial and in the absence of incomplete information which I think is the case for both beetle and the swift parrot my feeling is we should be invoking the precautionary principle more than we have.

15  
20 If you could then go to paragraph 77 under the heading Conclusions - this is page - Dr Shields repeats his opinion which I have discussed with you a moment ago, that says:

*That continuous improvements should be sought to secure the species recovery -*

25 and thereafter lists a number of positive solutions and says in paragraph 79:

*If these actions taken above are followed through there is no reason to think that the swift parrot should not recover significantly in the next 20 years.*

30 If we just take a moment to look at the items that he has identified, I will ask you simply whether you agree or disagree with those propositions. You would agree with all of those?---I think that's a very good set of recommendations for the future.

And you endorse them, I assume?---Yes.

35 Thank you. Now, at question 14 of the question directed to you by the solicitors who instructed you, you were asked - - -

HIS HONOUR: Court book page, please?

40 MR D. GUNSON: I am just having it turned up, your Honour.

MR C. GUNSON: 581.

45 MR D. GUNSON: Thank you very much. 581, your Honour.

Do you have question 14 in front of you?---Yes, I do.

It reads:

*In the PVA -*

5 that stands for population viability analysis, does it not?---It does.

10 *In the population viability analysis study by Dr Bekessy and others, it is concluded that the wedge-tail eagle faces an extinction risk in the Bass Forest district over the next 200 years of 67 per cent, rising to 91 to 97 per cent when forestry operations are factored into the model. Dr Bekessy has recommended revision of management prescriptions.*

15 Do you agree or disagree with those recommendations and why? Now, in response to that question, you said that without re-running the PVA to check the numerical results that have been presented that you were not able to state the increased extinction rate would be precisely as reported. Now, have you re-run the PVA to check the numerical results?---No, I haven't.

20 You saw no need for it?---No.

All right. If the data upon which the assumption on which the PVA is based is wrong, is it fair to say that you may not then share the view or continue with the view that you have espoused?---Yes, I think any conclusions would need to be made on the best available data.

25 And it follows that if the material upon which the PVA is based is wrong then your opinion may well alter?---Yes, that's correct.

30 You read the report to the Court by Mr Nicholas Mooney as to the wedge-tail eagle?---A very recent one, no, I haven't.

If your Honour will just excuse me for just one moment.

35 HIS HONOUR: Certainly.

MR D. GUNSON: Thanks, your Honour.

HIS HONOUR: Thanks, Mr Gunson. Ms Mortimer?

40 MR O'BRYAN: Your Honour, I desire with your Honour's leave to ask the professor a couple of questions. I understand Ms Mortimer does not object to me asking a couple provided I don't stray over the blue-taped lines that - - -

45 MS MORTIMER: I just want to express - and I will do it now, your Honour and then I won't have to do it again - the basis on which we consent because order 6 rule 17 does not permit interveners to lead evidence or examine witnesses and the form of orders made by your Honour in relation to the Commonwealth does not give such permission. Now, if my

learned friend seeks to be excused by that, in my submission the questions that he asks on behalf of the Commonwealth have to satisfy the criterion in order 6 rule 17(3).

5 The role of the intervener is solely to assist the Court in its task of resolving the issues raised by the parties and the Commonwealth has leave to intervene, I think, on four issues only so that in my submission the questions need to be confined on that basis, so they have to be directed to assisting the Court to the issues on which leave has been given.

10 HIS HONOUR: Mr O'Bryan.

MR O'BRYAN: If your Honour pleases.

Mr Dickman - - -

15 HIS HONOUR: I am just wondering, given the time, whether it is appropriate to start your cross-examination now unless it is going to be particularly short.

20 MR O'BRYAN: Look, it will be quicker in the morning, your Honour. It will be short, but given that it is almost 4.15, it certainly will be a few minutes and it will be quicker if I have a moment over night to consider the transcript and eliminate things that it is unnecessary to deal with, your Honour, if one doesn't have the benefit of doing it on the run during the day.

25 HIS HONOUR: Now, as I understand it the intervention is limited to issues 2, 8 and 9.

MR O'BRYAN: Yes.

30 HIS HONOUR: In the agreed list, which appears at page 11, and your questions will only go to those issues, is that correct?

MR O'BRYAN: Yes, they will, your Honour, they will be limited to that and to a - well, that is so, your Honour.

35 HIS HONOUR: I suppose technically you need leave given the requirements of the order so I can dispense with the requirements of that order under order 1 rule 8 to that extent.

MR O'BRYAN: If your Honour pleases. We would seek that dispensation, your Honour, to that extent.

40 HIS HONOUR: Yes. I will give that dispensation and those questions can be asked at 10 o'clock tomorrow morning.

MR O'BRYAN: If your Honour pleases.

45 HIS HONOUR: The Court will now adjourn.

**ADJOURNED UNTIL THURSDAY, 8 DECEMBER 2005**

**[4.14pm]**

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