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SELECT COMMITTEE ON AGRICULTURAL AND RELATED
INDUSTRIES

Reference: Bushfires in Australia

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**SENATE SELECT COMMITTEE ON
AGRICULTURAL AND RELATED INDUSTRIES**

Friday, 14 May 2010

Members: Senator Heffernan (*Chair*), Senator O'Brien (*Deputy Chair*), Senators Fisher, Nash and Sterle

Participating members: Senators Abetz, Adams, Back, Barnett, Bernardi, Bilyk, Birmingham, Mark Bishop, Boswell, Boyce, Brandis, Carol Brown, Bushby, Cameron, Cash, Colbeck, Jacinta Collins, Coonan, Cormann, Crossin, Eggleston, Feeney, Ferguson, Fielding, Fierravanti-Wells, Fifield, Forshaw, Furner, Humphries, Hurley, Hutchins, Johnston, Joyce, Kroger, Lundy, Ian Macdonald, McEwen, McGauran, McLucas, Marshall, Mason, Milne, Minchin, Moore, Parry, Payne, Polley, Pratt, Ronaldson, Ryan, Scullion, Siewert, Stephens, Troeth, Trood, Williams, Wortley and Xenophon

Senators in attendance: Senators Back, O'Brien, Fisher and Heffernan

Terms of reference for the inquiry:

To inquire into and report on:

The incidence and severity of bushfires across Australia, including:

- (a) the impact of bushfires on human and animal life, agricultural land, the environment, public and private assets and local communities;
- (b) factors contributing to the causes and risks of bushfires across Australia, including natural resource management policies, hazard reduction and agricultural land maintenance;
- (c) the extent and effectiveness of bushfire mitigation strategies and practices, including application of resources for agricultural land, national parks, state forests, other Crown land, open space areas adjacent to development and private property and the impact of hazard reduction strategies;
- (d) the identification of measures that can be undertaken by government, industry and the community and the effectiveness of these measures in protecting agricultural industries, service industries, small business, tourism and water catchments;
- (e) any alternative or developmental bushfire prevention and mitigation approaches which can be implemented;
- (f) the appropriateness of planning and building codes with respect to land use in the bushfire prone regions;
- (g) the adequacy and funding of fire-fighting resources both paid and voluntary and the usefulness of and impact on on-farm labour;
- (h) the role of volunteers;
- (i) the impact of climate change;
- (j) fire – its causes (accidental, natural and deliberate) and remedies;
- (k) the impact of bushfires on biodiversity and measures to protect biodiversity; and
- (l) insurance against bushfires.

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Committee met at 12.30 pm

CHAIR (Senator Heffernan)—I declare open this public hearing of the Senate Select on Agriculture and Related Industries. The committee is hearing evidence on the committee's inquiry into the incidence and severity of bushfires across Australia. I welcome everyone here today. This is a public hearing and a *Hansard* of the proceedings will be prepared. Before the committee starts taking evidence, I remind all witnesses that in giving evidence to the committee they are protected by parliamentary privilege. It is unlawful for anyone to threaten or disadvantage a witness on account of evidence given to a committee and such action may be treated by the Senate as a contempt. It is also a contempt to give false or misleading evidence to a committee.

The committee prefers all evidence to be given in public, but under the Senate's resolutions witnesses have the right to request to be heard in private sessions. It is important that witnesses give the committee notice that they intend to give evidence in camera. If a witness objects to answering a question, the witness should state the ground upon the objection is taken and the committee will determine whether it will insist on an answer having regard to the ground which is claimed. If the committee determines to insist on an answer, a witness may request that the answer be given in camera. Such a request may of course be made at any other time.

I ask witnesses to remain for a few minutes at the conclusion of their evidence in case the Hansard staff need to clarify any terms or references. I remind all people in the hearing room to ensure that their mobile phones are switched off or to silent. Finally, on behalf of the committee I would like to thank all those who have made submissions and sent representatives here today for their cooperation.

[12.31 pm]

DRISCOLL, Dr Don Anthony, Fellow, Fenner School of Environment and Society, Australian National University

CHAIR—Welcome. I invite you to make an opening statement. If you would like to make any alterations to anything you have already presented, now is the opportunity.

Dr Driscoll—Thank you. I have an opening statement. I have been asked to contribute here based on a peer reviewed research paper on which I was the lead author—and I have some copies here for the committee. It is called ‘Resolving conflicts in fire management using decision theory: asset-protection versus biodiversity conservation’. The paper is co-authored by a range of leading Australian fire ecologists and land managers. Some of the best Australian scientific minds contributed to this paper, and that includes a range of practical managers and state government agency staff. So this paper has quite a broad collaborative base.

What we are calling for here is an evidence based approach to fire management. We have set out a process by which this can be achieved. There are three fundamental steps that I will talk about in this approach. The first one is to define the objectives. There are a range of objectives that our society has for managing fire and that includes protecting houses, managing the landscape in an ecologically sustainable way, protecting human health and reducing carbon emissions. Human health and carbon emissions are not my area of expertise, so I will focus mainly on the topic of our paper: protecting assets and ecological sustainability.

Once you have defined your objectives, the next step is to put on the table all of the different ways for achieving those objectives. Do not just focus on one possible way of managing the fire problem; consider fuel management, engineering solutions and social solutions. Fuel management might include widespread fuel reduction burning, strategic fuel reduction burning or perhaps mechanical fuel removal in some situations. Engineering solutions could include sprinkler systems, fire resistant housing or even bunkers. Social solutions could include ignition management is an important one. If you can control ignition management, you can have a big influence on the incidence of unplanned fire. I think improving communications is something that is coming out of the Victorian commission, and I know it came out of the South Australian commission into the Eyre Peninsula fires. And of course the ‘go or stay’ policy is another solution. To make the best choice you need to have all the choices that are available on the table to start with.

The third part is to gather evidence to appraise how effectively each of those options achieves the range of objectives. So we need to work through a range of scenarios using all of the tools that we have available to us to be able to home in on a combination of options that best achieves those multiple objectives. For example, if we took the budget that is available for dealing with the fire management problem and applied it to improving communications and subsidising sprinkler systems and fire resistant housing, would that reduce the number of deaths in the next Black Saturday fire event? Would it make land management more ecologically sustainable? Would it improve people’s health? Would it change our carbon emissions? So what I am concerned about and what my co-authors have been concerned about is that we have not gone

through this rational decision making process. We fear that unless we do, poor decisions are going to be made and society's core objectives will not be achieved even though we could have done much better with the tools we have available to us today.

I want to finish with an example of how new evidence can be used to help appraise the effectiveness of certain fire management options. In particular I want to focus on the question of widespread and frequent fuel reduction burning. I will just quickly mention some examples from the international literature. There is growing evidence that widespread fuel reduction burning is not effective in all situations. There is a paper by Gadellov in 2005 in *Ecological Applications* talking about the fires in north-western United States who concluded that fuel treatments alone may not be effective in reducing the area burnt under extreme climatic conditions. Another paper in 2009 by Dilitz and colleagues published in the *Annals of the Association of American Geography* looked at the probability of fire occurring in Lincoln County, Nevada. That concluded that ignition by lightning strike was more important than fuel characteristics for influencing wildfire occurrence. There are two more I will tell you about. Podur and Martell looked at fires in Ontario Canada. In those boreal forests they found that fires burn forests in proportion to their presence and not in proportion to their fuel load. Keeley and Zedler in *Ecological Applications* talking about southern Californian shrub lands found no evidence to support the idea that fuels limit large fires in Californian scrub communities. The recent drought was a more likely explanation. I mention these just to make the point that there is a growing body of literature which suggests that what we had previously thought about the effectiveness of widespread fuel reduction burning might not be true. The important point is that it is new literature. It means that we need to reappraise what we have been doing in the past and consider new ways of dealing with the problem.

I want to finish with the handout that you have been given. This is an example that Ross Bradstock and Owen Price from Wollongong University prepared for the 2009 Victorian Royal Commission. It is titled, 'Fire severity patterns in the Victorian fires of February 2007-2009: influence of weather, terrain and land use history.' It has three graphs on it. On the vertical axes we have 'probability of CF', which means probability of crown fire. The probability varies from zero to one up that axis. One means you will certainly get a crown fire; zero means you will never get a crown fire. On the horizontal axes of all of these graphs is the time since fire. So it gives the probability of a crown fire occurring given a certain time since fire, based on the data from the Victorian fires.

Senator BACK—Looking at example (a), there is a probability of one at zero time since the last fire. So the highest probability of a crown fire is at zero time since the last fire.

Dr Driscoll—That is correct. It took me a little while to think that one through, as well.

Senator BACK—In my ignorance I read that to be the more recently the fire, the higher the incidence of crown fire. If it is zero time since the last fire there is nothing in the crown to burn.

Dr Driscoll—You are right. This graph is for an ash forest. When you burn mountain ash forest, it is all killed, and so the crown is the regeneration on the ground. After one year a fire, everything is near the ground, it is uniform and it is easy to burn. So you always get a crown fire but it is a metre or two metres tall.

CHAIR—You get trees that are 100 feet tall.

Dr Driscoll—After a fire the trees are killed. The crown is therefore near the ground. That is what this graph is telling us.

CHAIR—The tree is the statue.

Dr Driscoll—The tree standing there is dead, yes. That is no longer where the crown is, which is why this graph says ‘a 100 per cent chance of crown fire in mountain ash forests one year after fire’.

CHAIR—Is that just quaint language for ground fire?

Dr Driscoll—You can call it whatever you like.

CHAIR—An ordinary old bushy would say that it is a ground fire.

Dr Driscoll—Yes. In fire ecology terminology, the crown is the top of the vegetation.

CHAIR—If there has been a total wipe-out—and we have been to areas where that has occurred—and it is the first year after the fire and it is obviously after spring and some dry fuel or some burnt logs are on the ground, what is the crown going to burn? What is the crown?

Dr Driscoll—In this scenario that Bradstock and Price modelled, it is the top of the live vegetation.

CHAIR—That is just regrowth grass.

Dr Driscoll—No. In a mountain ash forest, what springs up is a whole bunch of new mountain ash trees. A whole lot of seedlings pop up; they are not very tall. That is why this counterintuitive graph appears because the crown is actually quite small, but it is the crown and it does get burnt.

CHAIR—What ignites the green shoots?

Dr Driscoll—Any source of ignition will do it. This is saying that—

CHAIR—Have you ever tried it with a match?

Dr Driscoll—in extreme or moderate weather this environment —this is the part that I have not got to explaining yet——will burn.

Senator BACK—I should not have interrupted you.

CHAIR—Righto. Away you go. I should not have interrupted you either.

Senator BACK—I just needed to understand it.

Dr Driscoll—It is counterintuitive.

Senator BACK—You clarified it in your explanation. Thank you.

Dr Driscoll—The final part of the explanation of these graphs is about the three weather conditions graphed here. Each graph has three lines. You will see that they are described as low, moderate and extreme. These map onto the extreme weather that occurred during the afternoon of Black Saturday, the moderate weather that occurred after the change and the low severity weather that occurred on the subsequent days. I want to make five points about these graphs. The first point is that you can see that the fire weather is the most important thing. It makes the biggest difference to whether there is a crown fire and what the probability of one is. The biggest difference is due to the weather.

The second point is that the fuel age influence is limited to the first few years after the fire. In the report, Bradstock and Price mention that, if you look at the actual data, there is only evidence of an effect time on fire for up to three years. It is implying that these curves have smoothed out that effect over more years than might be expected. So the fuel effect was only evident for up to about three years.

The third point is that the effect of the fuel age on the probability of a crown fire is typically very small. If you look at (b), the damp forest, you will see that, for example, under moderate weather conditions, if the previous fire was one year ago, the probability of a crown fire is in the high fifties. If the previous fire was 100 years ago, it is increased by about 10 per cent. While fuel reduction does influence the probability of a crown fire, it does not influence it very much. Bradstock and Price mentioned that this data is largely driven by unplanned fires. So the ‘time since fire pattern’ is driven by unplanned fires. If these had all been planned fires, the effect size would be smaller because the intensity at which planned fires can burn is lower. After a planned fire, the amount of fuel would be higher and so you would expect this effect size to be smaller.

CHAIR—That is provided it is a monoculture forest and it does not have grassy plains in between the bush forest.

Dr Driscoll—This draws on data from across the forest landscape.

CHAIR—If you go up to the Snow Mountains and come across a grassy plain that has been eaten out, if a crown fire should hit the grassy plain in other than the most extreme weather, the fire stops. Right?

Dr Driscoll—It would depend on the weather.

CHAIR—If there is no fuel load on the grassy plain—I am talking about when we used to eat it out with sheep and cattle or whatever; the other option is to burn it—you stop the fire.

Dr Driscoll—Under mild conditions—

CHAIR—Not just mild but reasonably bad conditions. If it is a crown fire and it is a mile across the plain to the other side and you have not reduced the fuel load on the plain, you spread

the fire. If part of the consequence of the low cool burn is that you have got rid of the grassy plain, then you get rid of the fire.

Dr Driscoll—Yes, under some moderate conditions—

CHAIR—This is a very simplified version of life in reality.

Dr Driscoll—This is data from—

CHAIR—Yes, but it does not take into account the scenario—

Dr Driscoll—Black Saturday.

CHAIR—of Black Saturday. I have to say that what happened on Black Saturday was not a normal fire.

Senator BACK—You were going to make a fifth point.

Dr Driscoll—The fifth point—thank you. The fifth point is that these graphs are showing the probability of a crown fire and not the threat to houses. That is a really important point because so much fire research has focused on how the intensity of a fire varies with the amount of fuel load and the probability of a crown fire but it does not very often measure the actual threat that we are worried about, which is whether or not houses are going to be burnt down. That is an area for research. We do not know much about it. Phil Gibbons at ANU is currently doing some research on this and it will probably be available in a couple of months.

To translate that evidence into a decision framework, we would have to ask: how much money do we spend on burning the forest every three years and how effective is that? In damp and dry forest, it is going to reduce the probability of a crown fire by five to 10 per cent. Under extreme conditions—and that is from roughly 70 to 60 per cent in dry forest or 85 to 80 per cent in damp forest—how does that small reduction in the risk of crown fire translate into risk of houses burning down? I do not think we know that yet. And was any marginal gain in saving houses a reasonable trade-off against all of the other competing objectives? Is the marginal gain in asset protection of burning the forest every three years so valuable that it is worth trading off the other objectives? In this scenario, with the burning of the forest every three years, we would certainly see a loss of species throughout the forest and an increase in health related deaths and associated costs, as well as an increase in carbon emissions.

Senator BACK—Thank you. Can I ask you for the first time to confirm whether this data—'ash, damp and dry'—is drawn from the actual circumstance of the Black Saturday fires, or has the data been gathered internationally?

Dr Driscoll—No. The data has been gathered from the Black Saturday fires. This is fire severity mapping from that day.

Senator BACK—Since the Y axis is going out 100 years, do we know that those forests were not burnt for 100 years? How has the data been gathered for 100 years?

Dr Driscoll—There are pretty good records of the age of the ash forests through that area, so it is from either actual records or estimated records based on the nature of the forest.

Senator BACK—I do not know much about the Victorian situation. You did just make the observation about the influence of burning every three years. It is my understanding, and please correct me if I am wrong, that the fuel loads were at the levels they were because there had not been any fuel reduction effort of any sort—either grazing, burning or mechanical removal. Am I wrong in that? You were mentioning the frequency of three-year burnings.

Dr Driscoll—Yes, that is wrong. There are a number of fuel reduction burning patches throughout that area. I have a printout from the DSE website which shows that the nature of the landscape is a mosaic of logged areas, of fuel-reduced burned areas and of unplanned fires throughout the landscape.

Senator BACK—The evidence given to us at our hearing in Victoria was that practically the only area that was saved downwind was due to the fire running into an area that had in fact been burnt about three to four years previously. I know from experience and the experience of firefighters from my own state—of which I was once the Chief Executive Officer of the Bush Fires Board of Western Australia, so I do have some personal knowledge—and I can only quote from the forests with which I am familiar, but we would say about five tonnes to the hectare of fuel on the floor was normally about the upper limit of safety when putting people and equipment in to arrest fires. Their report back to me was that there were 40 to 50 tonnes and, in some instances, 150 tonnes to the hectare. My question is: if the forests in that Victorian region had been burnt frequently how could they have accumulated 40 to 50 or 150 tonnes to the hectare?

Dr Driscoll—No, the forests were not burnt. The whole forest area was not burnt every three years—definitely not. These graphs are based on a range of burn ages—some of which were burnt one or two years previously; some of which were burnt at the time since fire. This is based on time since fire, not frequency, but it gives an indication of what sort of effect you would expect to have on the spread of fire.

Senator BACK—As figure four says, these are model predictions. Can you tell me the extent to which they were tested and therefore in some way validated? I understand the prediction basis but I am concerned about the 100-year timescale. Can you tell me the extent to which field observations have validated or not validated the model predictions?

Dr Driscoll—Yes, there are two things. The first is that the whole time series is based on actual data. There are data points out to 100 years since fire that have guided where those lines are put.

CHAIR—So do you go back after the fire and say, ‘This is a 100-year burn spot and I will have a look about and see what happened’?

Dr Driscoll—That is right. But this was using satellite data—

CHAIR—Can I tell you the flaw in that? On the right day when you get a head fire, generally it does not matter a rat's what is underneath because you have got the top fire going properly and what is underneath does not matter much.

Dr Driscoll—So is that an argument for or against fuel reduction burning?

CHAIR—No, it is an argument about how you track the difference between the lower fuel loads and the higher fuel loads once you have got a head fire on the right day. How do you determine that it was load that had something to do with the head fire once the eucalypt gets going? I presume you go to fires.

Dr Driscoll—No, I don't.

CHAIR—There you go. That is why I was curious about the fuel loads and the spread of the fire, and how you can slow a fire down and actually put it out on the right occasions. Perhaps you should go to a fire.

Dr Driscoll—I am not the right person to ask for that.

Senator BACK—The point that I am also trying to get to is that the graphs do not indicate fuel loading. None of the graphs indicate fuel loading. In your five observations, which I have recorded carefully, I cannot see reference to fuel load. If I could just take you through, you mentioned fire weather. I suppose I cannot help but look at this in terms of management.

As you say, fire weather is critically important. There is no doubt about that. I would not have any difficulty in accepting the position of your three graphs, except to say that, from a management perspective, one thing you cannot control is fire weather. So, whilst you point to it being important—and I concur with that—do you agree that there is no control that people preventing or managing fires can have over fire weather?

Dr Driscoll—Obviously, yes.

Senator BACK—You mention that fuel age is limited after the first few years—I think you mentioned three years—and that would not be inconsistent. The third point that I want to take you to is that 'the effect of fuel age on the crown fire is small'. That certainly would not be my observation and I did not think it was consistent with some of the CSIRO work and other related work that I have seen. I am very familiar with Project Vesta. Are you familiar with it?

Dr Driscoll—I am not very familiar with it but I know of it.

Senator BACK—Sure. It was work that was coordinated by CSIRO but it had involvement in and certainly support from all of Australasia's fire organisations, as well as Canadians and New Zealanders and others. It was probably the first time that there had actually been burning under controlled conditions. It was in the eucalypt jarrah forests in the south-west of WA. I would ask you to go back and review the statement that the effect of fuel age on crown fire is small. It may have been the case in Victoria, but—

Dr Driscoll—Can I clarify that. The point I am making is in relation to how the time since fire influences the probability of a crown fire. So the effect is small because, if the time since fire is one year for moderate conditions in damp forests, the probability of a crown fire is around 60 per cent.

Senator BACK—Could you take me through that again?

Dr Driscoll—Under moderate conditions in damp forests, as an example, the probability of a crown fire one year after fire is around 60 per cent, from the look of that graph. Then after 10 years it has crept up to what looks like a bit under 70 per cent. Then it goes up a little bit more—probably up to around 70 or 70-something. So, for all the effort and expense of burning the forest every couple of years, you reduce the risk of a crown fire by 10 per cent—from 70 per cent to 60 per cent. So it is not protecting us; it is just reducing the probability by about 10 per cent.

Senator BACK—But if you were to look at that same graph and consider the difference between moderate and extreme, in those same years you jump from 0.65 to 0.85.

Dr Driscoll—Yes. That is the really strong influence of the weather.

Senator BACK—I am trying, perhaps unfairly, to extrapolate this to forested areas in other states. In our own scenario, in Western Australia and I suspect South Australia—I do not know about New South Wales; others in this room would—we would not define a damp eucalypt forest in the summer time in Western Australia. We might in the very, very deep south of the Pemberton karri forests. But, for the forested areas for which we would have responsibility, we would be looking at your higher extreme graph under normal summer conditions.

Dr Driscoll—So the difference between these three graphs is that they are different forest types and it is not so much how wet they actually were; it is a sort of a floristic classification. My guess is that the damp forest—I would have to recheck the report to see how they define their damp forest; it is not really a moisture index, it is a floristic composition—would be roughly equivalent to the karri forest.

Senator BACK—Sorry I am ignorant here. When you say a ‘floristic’ condition, are you speaking of the humidity level?

Dr Driscoll—No, I am speaking of the plant species that are present.

Senator BACK—Do you define some species as damp and others as dry?

Dr Driscoll—Yes. I believe that is what they would have done.

Senator BACK—So we are not talking about whether an individual species, like a eucalypt, was damp or dry; you are speaking about dominance of species which would themselves be defined as damp or dry species?

Dr Driscoll—Damp or dry forests, so the collection of plant species that are present would define a damp forest, and probably Karri forests in WA would pretty well fit a damp forest definition. They have got tall trees, a multistructured understorey—

Senator BACK—Extrapolating from these model predictions, was it the case in the Black Saturday fires that forests that, for example, were defined as damp were not burnt and were not the cause of loss of life and housing and that dry dominated forests were? Is that a conclusion that can be drawn?

Dr Driscoll—No.

Senator BACK—So the damp forests burnt also?

Dr Driscoll—All of those forest types were burnt, yes. That is how we managed to get a range of time since fires for each of the plant communities.

Senator BACK—I will certainly want to go back and read it, but if you look at the position of the extreme and the moderate graphs across B and C—B being the damp and C being the dry forests—it would suggest that for any point in time the probability of a crown fire was actually higher in the damp forests than in the dry forests. I find it difficult to comprehend how a so-called damp forest would carry fire at a higher degree of probability in any year than a dry forest would.

Dr Driscoll—It is not to do with the year; it is to do with the weather conditions. That is what I am saying. The weather conditions really drive the incidence of these dangerous fires. The fires that have stimulated this sort of inquiry, the Victorian inquiry and the South Australian inquiries have all occurred under extreme weather conditions. So, really, considering what happens under mild or low conditions is not very important; it what happens under extreme conditions that is very important. That is why the results emerging from Project Vesta and some of these other studies that have looked at the way the fire behaviour under different fuel loads have not really got to the nub of the problem, because you cannot carry out field experiments under extreme fire conditions.

Senator BACK—That is correct. But I am interested in the fact that, in your five main points, you have not made any reference to fuel loading. We clearly know about a source of ignition. You have made the point about social aspects, and nobody would disagree with that. Ignition is obviously a factor. Oxygen air is a factor and fuel loading is a factor.

Dr Driscoll—Fuel loading is in these graphs, represented as time since fire. So you can assume that fuel increases over time.

Senator BACK—With deep respect, for me anyhow, the contrast between damp and dry does not seem to confirm that, unless you are saying that damp forests are of their nature far more productive—

Dr Driscoll—They are.

Senator BACK—and therefore have far much more fuel loading.

Dr Driscoll—That is right; they do.

Senator BACK—I do not know how I would be helped in coming to make decisions. Given that I think we agreed that you cannot control the weather, therefore in managing you must assume the likelihood of extreme conditions if you are going to protect lives and property, I am at a loss to understand what it is you are saying that is capable of control if not fuel loading.

Dr Driscoll—I am saying that controlling fuel loading may not stop houses from burning down when there is extreme weather. We cannot control the weather, and controlling fuel loading does not help us very much, so we need to consider the other options. We need to be considering those at the same time. So we need to say: ‘Well, okay, maybe sprinklers are going to be a better idea. We can’t control the fuel loading. It doesn’t make much difference to the carry of fire. The extreme weather is what drives it. Maybe we need to stop the houses from burning down, make them more resistant.’

Senator BACK—I am sorry to keep labouring it, but if you are talking probabilities of crown fires at a point anything better than probably 0.5 under extreme conditions—and each of these is better than 0.5—out three or four or five years, they are at close to one. They are at 0.8. They are at 0.6 or 0.7. All of those would put them at a level of risk where there has got to be some intervention by management to actually protect assets. I know you have concentrated on houses and I admire you for doing so. This might sound a bit unusual in the context, but I think there is an enormous amount more to be protected than just houses and lives. I know they are right up the top of the priority list, but, if one looks at the after effects of Black Saturday or the fires here outside Canberra or some of our fires in the eucalypt forests, the destruction of the biodiversity would cause me to put that very, very high on the priority list in terms of protection. The probability of crown fire is such that action has to be taken.

Dr Driscoll—Can I just ask you about that. What gives you the impression that these large intense fires have hammered the biodiversity?

Senator BACK—My observations of the forested areas that have never recovered would suggest to me that we would have been derelict to have allow that circumstance to have occurred. I am not familiar with red gum forests, but the advice that has been given to me from the Victorian situation and here in New South Wales has been that they just do not survive severe fire and do not come back. That would be an example. I can certainly show you examples from our forested areas in Western Australia which were the subject of uncontrolled plus-45 degrees Celsius, eight per cent humidity, summertime fires and the same areas that had been the subject of cool season prescribed fuel reduction, whether it was burning or grazing or other means, in which the variety and the health of plant species was severely contrasted.

Dr Driscoll—To my knowledge, there is very little published evidence that suggests that large fires have such an impact. You should ask Dick Williams about this this afternoon, because he has a paper looking at the influence of the alpine fires, which shows that a small number of species were impacted but generally the whole place is recovering. It is not the intensity or the extent of the fire that has the biggest impact; it is the frequency of the fire.

CHAIR—Have you driven from Cooma to Tumut lately?

Dr Driscoll—Not all the way to Tumut; but I have driven from Cooma up into the mountains.

CHAIR—If you go up that road, you will see—and there are one or two areas where there were low fuel loads—that there is mountain ash from here to that flagpole, 100 foot high and dead as door nails. It has all been burnt. In other areas there is mountain ash from here to that flagpole, as good as gold. It was all to do with what was underneath and what was going on. There are what I call ‘valleys of death’ up there, where everything is as dead as a door nail. With regard to the effect on the balance of nature in these forests between intense and non-intense, you say ‘bugger all difference’—I presume that is what you are trying to tell us.

Dr Driscoll—No, I think, not that there is—

CHAIR—Let me tell you, I rode—can you ride a horse?

Dr Driscoll—I have ridden horses. I mostly ride—

CHAIR—So we rode up through there after those fires for two days. Where the fire was intense, everything is dead. There was not a bird, a worm, a kangaroo, anything. There was nothing. The only live thing we saw were a few wild horses and they had moved a long way. There is a hell of a difference between a cold burn and a catastrophic burn and what it does to the balance of nature. There is just nothing to talk about.

Dr Driscoll—I agree. I think there is a big difference.

CHAIR—But a minute ago you said—I think you said—that it does not matter much. It matters a lot.

Dr Driscoll—What is important is the patchiness of the intensity. If you have the same intensity across the whole landscape then that is going to disadvantage some species and advantage some other species.

CHAIR—Have you ever been to a national park or a wildlife lockup which adjoins mixed farming land? You do not go to fires; I put them out. To get a firebreak in and to stop the head burn, it is very handy to have low fuel loads to do a burn-back. If you are putting a burn-back in—and it might be between two corridors of bush, because not all bush is just trees for 100 miles; there are valleys and things—you are a hero if it works and you are a mug if it does not work, but you have a better chance of it working if you have a low fuel load to work with.

Senator BACK—On the Victorian royal commission: I understand there was a panel discussion on fuel-reduction prescribed burning in recent weeks. Did you participate in that?

Dr Driscoll—No.

Senator BACK—Did Professor Bradstock?

Dr Driscoll—I do not know, but I would be surprised if he did not.

Senator BACK—Yes, so would I. If he did not, I feel he should have. I have not seen the transcript of that particular panel discussion, but my understanding is that there was an overwhelming agreement by members of the panel in support of fuel reduction. You probably cannot speak for Professor Bradstock—

Dr Driscoll—I can speak to that. Amongst the fire ecologists, state government agency staff who work on fire, and fire managers, there has been a very strong culture and belief in the effectiveness of fuel-reduction burning. It is based on trials, experiments and experience under less extreme weather conditions, because you cannot get that sort of experience under extreme weather conditions. You cannot run experiments when it is hot, dry and windy.

Senator BACK—No, but you do have the benefit of actually observing the wildfire behaviour under those circumstances. It is not what you plan to do, but the information you gain is not information lost under those circumstances, is it?

Dr Driscoll—No, we have learnt a lot from looking at wildfires, and that is where a lot of our new learning is coming from—from looking at how wildfires carry through the landscape in relation to fuel loads. It is showing that it carries right through, regardless of the fuel load.

CHAIR—I do not know what experience you have had with fires, but a lot of fires start in reasonable weather. The fire in the Brindabellas started in reasonable weather and could have been put out. It is like a snake catcher: occasionally you are going to get bitten by the snake. They said it was an occupational health and safety hazard to go and put this thing out when it was reasonable weather. Then the catastrophic weather came along and it became uncontrollable. But a low fuel load would have enabled that fire to have been put out, especially when they had planes sitting around with retardant waiting to put it out but they were waiting for a national declaration so the Commonwealth instead of the state funded it, and all that sort of stuff. Do you understand that a lot of these fires that become catastrophic, like these fires in Victoria, start from ordinary circumstances and the wrong weather comes along a few days or a week after they have been going? As to getting control of a fire when you can control it, fuel loads have a lot to do with that. It just makes it so much easier. Do you understand that?

Dr Driscoll—Under certain weather conditions, it reduces the intensity.

CHAIR—But do you understand that a lot of catastrophic fires started off as mundane fires and were there long enough for the right weather to turn up to turn them into catastrophic fires?

Dr Driscoll—I do not know how many catastrophic fires have started in that way. Certainly, the ACT one sounds like an interesting case.

CHAIR—Yes, it was an absolute—

Senator BACK—Part of the role of this committee is to try and advise government on how we should be protecting life and property and the natural environment. How would you conclude your advice to this committee in terms of the objectives we have, considering the information you have put before us?

Dr Driscoll—I think it is really important to recognise that there is a well-established belief that widespread fuel reduction burning is the answer to managing fire, and the disasters that we have had over the last decade show that it is probably not. What my co-authors and I are calling for is for all of the options to be put on the table and for the evidence to be considered.

Senator BACK—Sure.

CHAIR—That is fair enough.

Senator BACK—It is at odds with the experience that we have had, but I appreciate that advice. I will read the paper in more detail. I notice one of the authors is Dr Jeremy Russell-Smith, who has been a close associate of mine for some years. He oversees the annual burning in the West Arnhem Land region, where they have the West Arnhem Land Fire Abatement scheme. Perhaps his experience bears out, in some ways, what you are talking about. In that particular program, if you know it—

Dr Driscoll—Yes.

Senator BACK—the West Arnhem Land group are paid \$1 million a year in consideration of the documented saving of the equivalent of 100,000 tonnes of greenhouse gas as a result of early-season burning versus late-season burning, and controlled versus uncontrolled. But Jeremy's advice to me has been that one of the real winners has been the diversity and health of the plant species in those areas that have been the subject of burning. I know it is a very different mix of flammable fuel there, but that burning occurs much more frequently than three-yearly, so I will be very keen to hear his advice.

Dr Driscoll—I think the burning they are doing up there is working really well. It looks like they have hit on a solution that is a win-win in terms of fire management and biodiversity management. It works really well in the tropical savannahs, but the forests and woodlands of southern Australia are a really different kettle of fish. You cannot apply the same management across the whole country.

Senator BACK—No. I would not for a minute suggest that what goes on in that area should be used everywhere, except to say that the mosaic pattern of burning that has set the principle for that program is very much the pattern of burning that my experience tells me—which I understand independent observations would confirm—that that level of fuel reduction is the most appropriate management tool.

I do not know what I can learn from the material you have put in front of us that would actually help land managers to do what the community expects of them, and that is to protect the community, property and the natural environment from the risk of fire. I go back to that comment: 40-50 to 150 tonnes per hectare is well beyond that level of fuel loading in an area in which, acting reasonably and acting under a duty of care, anybody should ever put people to try and mitigate fire or control fire.

Dr Driscoll—Yes. One of the things I have not mentioned is that also coming out of this new research is evidence that, while burning broadly across the landscape does not seem to have a

big influence on how much the adjacent houses get burnt, what does seem to have a big influence is reducing fuel right next to those houses.

Senator BACK—But that is not the Victorian experience, is it?

Dr Driscoll—I do not know what sort of burning they did.

Senator BACK—Crowning was going on some five to six kilometres out—5,000 to 6,000 metres or more—so logic would tell you that burning 100, 200 or 300 metres out would have little impact. If the crown fire, under those conditions—

Dr Driscoll—Under those conditions, you can burn the forest every two years and it will not make any difference.

Senator BACK—I think if you can reduce fuel and prevent the crown fires from actually spotting out that distance, I would take issue. Thank you very much. That has been very helpful.

CHAIR—Thank you very much. We are out of time but we are very grateful for your evidence.

Senator BACK—Can I just ask finally, if I may: based on the advice you have given us and that of your colleagues, what strategies would you use to try and minimise the effect of high-intensity forest fires such as these; what would your advice be?

Dr Driscoll—I would first go through quite a detailed and complex process of considering: how much does it cost to put a sprinkler on everybody's house; how much does it cost to build them out of things that will not burn? The evidence is that under extreme conditions—we are going to get more extreme conditions under climate change; it is going to happen more often. We have to face that. It does not really matter how much you fuel reduce.

CHAIR—That does not help the pastoral people—

Senator FISHER—Chair, let the witness finish.

CHAIR—and the cattle blokes in between where the fire and the town is. He is focusing on the houses. There are a blooming lot of other things that get burnt besides the houses in town. There are all the cattle and sheep, and God knows what else.

Senator BACK—The engineering solution—

Dr Driscoll—I would go through this decision-making process and seriously consider all of those options: the costs, the effectiveness, the impacts on all of our society's objectives and then we will have a transparent decision-making process and everybody can say, 'That's the outcome. That's why it was.' And the decision was not, 'Are we just going to do more fuel reduction burning because everybody tells me that's the right thing.' We have actually got the evidence to support the way to go.

CHAIR—You have not actually told us anything yet of a practical nature.

Dr Driscoll—If you read the paper I have provided, you will see that it is providing a framework for making a decision. Nobody has gone through the process of gathering this evidence yet.

CHAIR—Fair enough, but does it include the well-being of the farm besides the town? Have you thought about what happens on a farm that is in between two forests—have you thought about that?

Dr Driscoll—Of course. The decision-making process is about considering what we want to protect. If we want to protect our farms then how do we do that? I do not know. I was on the Eyre Peninsula the day the fire went off. It burnt across paddocks with sparse stubble.

CHAIR—All of that. A lot of fires start on days that you can do something with them and they spread and they spread and they spread and then they become on the right day catastrophic. Thank you very much for your evidence.

Senator FISHER—Can I ask the professor a further question? I heard him at the end of your response to Senator Back. Doctor, I did not hear you ruling out reduction of fuel load being part of what might end up being the strategy coming out of the sort of work that you are talking about. I did not hear you saying that that is not a consequence. I did not hear you saying that that could not be a result; I heard you leaving the door open that that could indeed be a result once you have done the sort of investigations and assessments you are talking about—is that right?

Dr Driscoll—Yes. My feeling is that widespread fuel reduction burning probably will not be very effective, but we need to consider that more thoroughly. My feeling is that targeted burning in strategic locations next to the assets you want to protect is going to be more effective and, combined with a whole range of other approaches, we might actually avoid the sort of disaster we saw on Black Saturday.

Senator FISHER—Thank you.

CHAIR—Thank you very much.

[1.24 pm]

COMMINS, Mr Christopher Philip, President, Mountain Cattlemen's Association of Victoria

STONEY, Mr Graeme, Executive Officer, Mountain Cattlemen's Association of Victoria

CHAIR—Welcome. Do you have any comments to make on the capacity in which you appear?

Mr Commins—I am President of the Mountain Cattlemen's Association of Victoria. I live in a little place called Ensay, in eastern Victoria.

Mr Stoney—I am the executive officer and I live at Mansfield.

CHAIR—Would you like to make an opening statement?

Mr Commins—Yes, Chair. Thank you for the invitation to Graeme and me to address this committee. We both have a presentation and some photographs to explain, which will probably take about 20 minutes in total. Is that okay?

CHAIR—Good as gold.

Mr Commins—The mountain cattlemen and their families have intergenerational skills in the management of our high country—generational experience that must be given due recognition. We are well qualified to comment on and explain fire fuel mitigation alternatives on our public land. I am a third-generation mountain cattleman. I was born in 1954 and I have lived and worked almost all my life in the high country of eastern Victoria. As the owner of earthmoving equipment I am also a contracted primary firefighter to the Department of Sustainability and Environment and have been involved with every major fire in eastern Victoria over the last 38 years, including the recent tragic Black Saturday fires, as well as numerous minor fires. I am also a member of the CFA, with 38 years service. I have extensive experience in fire, fire behaviour, fire control and fire mitigation.

Fire has been an integral part of the Australian landscape for millennia and is little understood by most Australians. This lack of understanding has been manifested by almost a century of bureaucratic ignorance and mismanagement. 'Bushfire' is a misnomer when describing wildfire. Bushfires should be seen as our friend, and wildfires, variously described as feral fires or megafires, as our enemy. It is important to learn from our history, and I will refer to our paper, *The links between cattle grazing and fuel reduction in the grazing zones of the high country*.

Mountain cattlemen have a healthy respect for their environment. They survived because they were good observers of nature, learned from the Aborigines and continued the practice of firestick farming: lightning was allowed to run its course. Over the years, the cattlemen continued with the Aboriginal fire regimes and kept the grass trimmed down on their selections and, very importantly, on their runs. Grazing cattle did this in the higher altitudes, while

cattlemen concentrated their burning on the lower, scrubbiest sections of their runs. The grazed grasslands therefore remained short and green throughout the summer, and the cool fires reduced fuel loads and kept the land as open as the cattlemen had found it left by the Aborigines. This in turn reduced the intensity of an inevitable wildfire, which cattlemen knew had the potential to threaten the grasslands with hot, damaging fire events if fuel loads were not well controlled.

In 1890 Alfred Howitt, naturalist, scholar and explorer, delivered a document, *The eucalypts of Victoria*, to the Royal Society of Victoria. It was a paper on the changing forest patterns and declining arboreal vitality. Driving the transformations, he said, was the cessation of burning by Aborigines, 'to whom we owe more than is generally surmised'. Forests were open and well grassed before Europeans arrived, Howitt said, because of regular burning by the Aborigines, either accidentally or intentionally, when travelling or for the purpose of hunting. The annual bushfires tended to keep the forests open and prevent the open country from being overgrown. However, the influence of these bushfires also acted in another direction—namely, as a check on insect life, destroying, among others, those insects which prey upon the eucalypts.

With closer settlement, the practice of firestick farming was reined in. In about 1920, patch burning was banned by the newly formed Forests Commission of Victoria. This was ignored for many years by the cattlemen, who knew the directive was not sound management. Eventually, stronger application of the no fires rule meant cattlemen gradually ceased the practice. Many abandoned their runs as the land scrubbed up and became impractical, overgrown and dangerous.

Those who live and work in the high country have always known that, under modern management—which arguably began in 1920—some areas become unsuited to even cool burning because they have increasing fuel loads. Hot fires in these areas would destroy the environment. In the absence of Aborigines, the cattlemen knew the answer was grazing.

The areas not particularly suited to cool burning under modern management include most of the higher snowgrass plains in the mountain and alpine ash country. Where those areas were grazed, however, they enjoyed reduced fuel loads in the event of a wildfire. As outlined earlier, before settlement these higher, sensitive areas were burnt regularly, but mostly only with cool fires. Now that the lower areas do not have a regular cool burn, as the Aborigines carried out or were done by nature, the higher areas need intervention and management of fuel. It is needed because hot wildfire from the lower altitudes in the middle of the summer will carry across the upper level grasslands that are not grazed, with disastrous environmental results.

After 1920 the build up of fuel began, especially on the non-grazed areas of the high country. The lack of patchwork burning and cattle grazing meant that vegetation grew unchecked and gradually choked the forest with a scrubby understorey which shaded out the grasses and changed the viable landscape and environment forever. Wildfires, which still occur regularly, increased in intensity, causing increased environmental damage because they were too hot.

Just as the law can be perverted, so can science. The mountain cattlemen and their environment were short-changed by shonky science early last century, and little has changed in recent years. I have a copy of a 1932 *Herald* newspaper at home and I have transcribed a couple of extracts from it. The headline was 'Ban on Burning-Off Defended', with the subheading 'Commission's Reasons: Destruction of Sapling and Seedling Growth'. They wrote:

“Uncontrolled burning-off is disastrous, and is condemned in every country in the world where forests are regarded as valuable assets to the community,” says the Forests Commission, in a comprehensive reply to recent complaints about forest fire regulations.

Landholders complain that they are greatly harassed in fighting bushfires by these regulations.

What’s new! The second extract says:

It has been proved beyond doubt, not only in Australia, that nothing less than absolute fire exclusion will promote real progress toward a fully productive forest property.

The disastrous 1939 fires were followed by a royal commission. Various mountain cattlemen gave evidence that lightning was a major cause of fire. The only mention Judge Stretton made of lightning in that report was in one sentence: ‘the real but rare occurrence of lightning’. In his conclusion as to causes of fire he had the bushmen—that is, the mountain cattlemen—at the top of a list for illegally burning off. Lightning did not even get a mention. We were portrayed as the bogeymen of the bush and it was not until the 1960s that the Forests Commission acknowledged lightning as a major cause of fire in south-eastern Australia.

Today the greatest threat to the alpine park is another megafire. I hate to say it, but it is coming sooner rather than later. It is not climate change that is the problem; it is fuel loads. It is the only factor we can control. In many areas I see fuel loads many times greater than prior to the 2003 fires. The next fire is going to be seriously intense, much worse than 2003. To help mitigate this threat, government and people opposed to alpine grazing need to take their blinkers off and return cattle to the park. Every tool in the management toolbox should be used. Grazing and cool fire are complementary and go hand in hand with good management.

I have some photographs I would like to submit to the committee. One is of our run at Nunniong Plateau, 4,000 feet in elevation. There is a plot there that has been fenced from grazing animals. This photograph was taken in November, early spring for that altitude. The amount of senescent snowgrass on that plot would have flame heights 15 to 20 feet, and you would have a crown fire in November on a bad day in that situation, whereas you would hardly get a fire going on a grazed area. That area has been grazed for 150 years and has been probably the most intensely grazed country up there. There are many other benefits apart from fuel mitigation—species diversity et cetera—but that is another argument. The alternative, again, is in Kosciuszko National Park. As you can see from the photograph, it is just a senescent wasteland with excessive fuel loads that are just going to destroy everything. Because snowgrass is the dominant species, it crowds out all the other species and you get fuel levels that are just extraordinary.

Senator FISHER—So you are saying that grazing will eat away at the snowgrass, are you?

Mr Commins—Yes, grazing will stop it from being the dominant species. But in good management grazing and cool fire go hand in hand. People need to understand the difference between hot fire and cool fire—there is a big difference. I have some other photographs here of Bogong High Plains. The black part is where the fire scorched everything and it went out where the cattle were grazed. No livestock were lost in the 2003 fires on the high plains. This is a photograph of a destroyed moss bed. The cattlemen were kicked out of this part of Bogong many

years ago and the fire went through there and destroyed this moss bed. Cattle are the only agents that will year in, year out protect those moss beds from the ravaging effects of wildfire.

Mr Stoney—Thank you to the committee for inviting us. My family ran cattle on the high plains from the 1940s until 2005, when they were removed, and I spent years in the saddle droving and mustering. In 1992 was elected to state parliament, with my main interest being public land management. My remarks today are based on my observations and my records and research before, during and after my time in the Victorian upper house. When I was 12 or 14 I once mustered with an old cattleman called Jack Ware. When he was a young man, he mustered with the first cattlemen to run cattle on that section of the mountain ranges now known as The Bluff: Mount Eadley Stoney, Mount Lovick, King Billy and Mount Clear. Those cattlemen's names were Jack Bullock and James Barclay. The run ranges in altitude from 4,500 feet to 6,000 feet and is part of the Great Divide. On the autumn muster I went with Jack. We were in the midrange altitude country of this large run just in the snow gums and down below the grassed areas. I was riding behind Jack when suddenly there was a fire around my horse's legs. I yelled out, 'Jack, there's a fire!' He did not even look back. He just kept riding, waving his arms and saying: 'Don't worry, son. It'll be all right.' I watched, and Jack was flicking matches out judiciously as we rode along in this midrange country.

Senator BACK—What time of year was this?

Mr Stoney—Autumn in 1954 or 1955. I am 70 now. Jack was one of the last cattlemen to burn. He learnt that skill from some of the first cattlemen. He learnt it as a boy from Barclay and Bullock. The fires he lit that day burnt around quietly and went out that night—as it has to; otherwise the snow gums will die. I have never forgotten that experience and it stays with me today. The effect of that burn was a patchwork of burning and nonburning. It left the country open, and there were little fuel loads. That midrange country does not need to be burnt that often to maintain the status quo.

Over the years when burning was stopped, I watched that open country revert back to scrub. The cattle stopped going to those particular areas and the fuel loads built up. When the 2006 fires went through every ancient snow gum was destroyed, and it will take a hundred years to recover. But where the cattle stayed in the grassland sections, the high altitude part of that run, the fuel loads were always low due to grazing. Cattlemen Jack Lovick used to boast that no fire would ever cross the divide while the cattle were there, and he was right. We had many fires in the valleys, but they came up to the grazing areas and went out. But, after the cattle were removed in 2005, in 2007 those mountains all burnt to a crisp, including our hut.

I want to go back to the seventies and the eighties, when the pressure was building from conservationists to get rid of cattle. I was involved in a very bitter fight to retain grazing. I watched as a very fresh faced graduate, Dick Williams, gradually built a case to remove cattle from the Bogong High Plains. It was clear to the older cattlemen and even to me, and I was only young then, that he was using outrageous statements and selective science to back his personal beliefs. It was obvious he was also carving himself a career on this issue, and the cattlemen were helpless to prevent that.

Other scientists, such as Wilson, Oxley and van Rees—who had more balanced findings—were ignored by the environmental groups, who were promoting Williams and Williams's line

because it suited them. The Williams' line became conventional wisdom in the cities because of the third-party endorsement and the contrived publicity generated by environmental groups.

Some of the cattlemen's families, like the Stoneys, the Lovicks, the Commises and the Treasures, along with many other families, organised rallies around the state in defence of alpine grazing. MCAV became a household word. This was a campaign of conviction, based on the knowledge and belief that cattle should stay in the high country for good management.

The campaign resulted in a deal between the Labor government and the opposition on the floor of parliament in about 1989 to create an Alpine National Park. Part of that deal was to grant seven-year renewable licences in part of the park. The licences were legislated, which was an absolutely unique situation. This situation lasted until 2005, when the Bracks government broke the agreement, changed the legislation and kicked the cattle out of the park.

I need to make the point that the Black Saturday fires did not affect the areas we are talking about, so the MCAV did not really get involved in the royal commission, even though we did put in a submission. We had been through the 2003 and 2006-07 fires. The photos Chris Commis just showed you were of the 2003 fires, and it is quite clear that the grazing did stop the fires moving up into the grassland country.

We have produced a paper called *The Links between Cattle Grazing and Fuel Reduction in the Grazing Zones of the High Country*, and the committee has a copy of that paper. I will explain why we produced the paper and will then quickly read a couple of sections into the record.

We have become very concerned that the fuel reduction debate has concentrated on prescribed burning when there are other options besides burning to reduce fuel. We claim that in the higher alpine grasslands and in the red gum forests grazing is a viable option to reduce fuel. Parks Victoria is hesitant to cool burn above 1,200 metres; it will probably never happen. The total politicisation of grazing in both the alpine areas and the red gum forests means that grazing is not even on the agenda to reduce fuel. That means there is a vacuum in the authority's fuel reduction strategies for both the high country grasslands and the red gum forests, because neither of these areas can be burnt reliably by bureaucracies that are hamstrung by the process. You have to be on the job, wait for the day and burn just in the afternoon. Doing it properly is very technical. The Aborigines and then the early cattlemen observed and used nature, because they could wait for the perfect afternoon.

The main point of this contribution is to alert the committee that the influence of a self-described group of 'collaborative scientists' with personal beliefs has not assisted a mature debate about the value of grazing to reduce fuel. These scientists have sought and given advice to several inquiries, including the Esplin inquiry. They then, to strengthen their overall case against grazing, built a case in other forums by quoting these independent reports which contain their own findings. The issue of using grazing for fuel reduction is either conveniently ignored or fudged. Chair, if you wish to google these people you will see how they operate, see their personal agendas and see how they collaborate in publications such as the CSIRO publication *Alpine Grazing and Fire 2006*.

So, we are concerned, and we needed to bring it to the committee's attention, that some of the information available that is relied on by many people is tainted by personal views. I will finish

by quoting a couple of things from our paper. The issue I just raised was raised in 2000 by the Department of Natural Resources and Environment. On page 9:

... we accept Dr Williams has impressive qualifications ... nevertheless the panel does take a guarded view of his evidence bearing in mind his expressed opinion that the presence of domestic livestock is inconsistent with the basic objectives of National Park Management ...

That independent panel was Mr Tony Graham QC, Mr Neville Walsh and Jim McColl in 2000. Our paper quotes some eminent people who question the rigour of some of the scientific work that exists and they call for more rigorous studies. On page 8 of the paper, Jurskis in 2006 identified that some of Dick Williams' work is questionable and on page 10 David Packham of Monash University is quoted from an article in the *Australian* on 10 February 2009 referring to 'some shocking pseudoscience from a few academics'. On ABC *Rural* radio about last September, Packham also stated:

There is a need to consider grazing as one management tool to reduce fuel. Some of the science relating to this subject has at best been careless and questionable ...

There is no doubt that the Mountain Cattlemen have been duded.

On page 12 the Bushfire Cooperative Research Centre's *Fire Note* of April 2009 stated—and they are having a forum in Albury next week, I believe:

The existing evidence about whether the combined effects of fire and grazing are effective in managing fuel loads and fire risk was scant and inconclusive.

That was in issue 32 of the Bushfire CRC's publication of June 2009. Professor Mark Adams of Sydney—who I am sure this committee is familiar with—has just released a summary of progress on some current work on the high plains called *High Fire*:

... some of the research that is cited as being the 'evidence base' for major policy decisions, including decisions to remove or retain cattle grazing, could not be regarded as rigorous (i.e. well replicated at adequate scale) if judged by today's standards.

CHAIR—I am sorry, I have to impose some discipline.

Mr Stoney—I have one minute left. Can I finish?

CHAIR—How long will it take?

Mr Stoney—About 15 seconds.

CHAIR—Go.

Mr Stoney—We believe a strong case exists for the state and federal governments to commission a truly independent scientific study to establish an evidence based view of the link between grazing and fuel reduction on all types of public land. Our full paper can be found on

the MCAV website. I would like to present to the committee the *People's Review of Bushfires 2002-07*. Chairman, thank you for your time.

Senator FISHER—Gentlemen, thank you. Your passion and commitment are evident and I do not want to belittle your testimony by saying that. I come from the flat lands and you are talking mainly about the high country, the Australian romanticised notion of the high country. You have talked about cattle grazing on high country. Can you give a breakdown of what other bits of the country you refer to in your submission? Are you talking about high country and does that mean the highest country at the top?

Mr Commins—Generally, what we have said applies anywhere in Australia. We have focused on what relates to our members. That is, high country is generally considered country over 4,000 feet in elevation.

Senator FISHER—All right. Is it therefore country that is over 4,000 feet in elevation at which you are targeting the grazing of your cattle?

Mr Commins—Yes and so much country has been locked up. We have been booted out, on dubious grounds, from the Victorian Alpine National Park, country on which there has been grazing for 170 years but all of a sudden they found a reason to boot them out. Since they have been booted out we have seen a significant increase in fuel loads that are going to cause significant damage not just at the time of a fire but also from the subsequent erosion from a rain event which will be a disaster.

Senator FISHER—Obviously your members have a vested interest in getting access to the high country for grazing cattle. What do you say about that vested interest alongside, for example, your criticism of the likes of Dr Dick Williams? You cited some criticism of him on the basis that he has a view that domestic grazing is in conflict with management of public lands. Could you not similarly be criticised? Mr Commins, you just said your members are being booted out on dubious grounds. It could be said that you are just trying to get back in and you are talking about the positive effects of your members' animals grazing as an opportunity to get back in. How do you counter those criticisms?

Mr Stoney—It is a pretty easy shot, with respect, the argument that people who have a so-called vested interest do not have an opinion or have experience. The forestry industries or the mountain cattlemen have intergenerational experience on these matters. In areas of Kosciuszko where grazing has been removed it is our opinion that that country is in far worse shape and is far more vulnerable to catastrophic fires than the areas in Victoria that were previously grazed. Just because we, as you say, have a vested interest does not mean to say that we cannot bring an opinion that is absolutely accurate.

Senator FISHER—Of course.

Mr Commins—It is not just our vested interest; we are passionate about good management of that landscape. It makes me cry to see how it has been devastated by mismanagement.

Senator FISHER—Do you have any evidence upon which to base a view that the grazing of cattle is better than grazing by other animals of the high country as a method of fuel reduction and reducing fire risk over time?

Mr Commins—It is a lot easier to manage cattle.

Senator FISHER—So there is management.

Mr Commins—You do not have the same problems with wild dogs. Also, cattle do not eat eucalypts.

Mr Stoney—There is a huge influx of deer into south eastern Australia and the deer nibble lots more vegetation than cattle do.

Senator FISHER—So it is the material they eat. What about the damage that cattle inevitably cause? Even in a paddock you have to mop up after the wonderful cattle. What about the damage they do when grazing versus the sort of damage that other animals do when grazing, for example, goats? Irrespective of what sort of animal there is nonetheless, in the view of some, damage to the environment. How do you balance that off against what you would say would be the reduction in the risk of fire?

Mr Commins—One thousand years of cattle grazing could not do the damage that has been done in Kosciuszko National Park from no grazing. You have had massive soil erosion and the loss of mossbeds and flora and fauna—nothing. Every activity has an impact on the environment whether bushwalking or cattle grazing.

Senator FISHER—Yes, for every action there is an equal and opposite reaction.

Mr Commins—The impact of cattle grazing—because it is rangeland grazing; it is not intensive agriculture—is so miniscule compared to any other activity that the benefits far outweigh the negatives. That is why we say we have to use every tool in the toolbox available to reduce the fuel loads. That is the only factor we can control. From those paragraphs I handed to you I think it is fairly evident that the impact of grazing is positive. It is also positive, since you asked the question, for species diversity. Snowgrass is the dominant species that shrouds out all the other species. It is a wasteland and nothing lives there but ants. Where you can see in the photograph—

Senator FISHER—The comparison photo?

Mr Commins—That is correct. If you look at that, you can see land that has been grazed for 150 years—

Senator FISHER—Exhibit C.

Mr Commins—and land that has been fenced off from all grazing animals. As I said before, that was in November. Fire would get into that plot. If all the landscape was like that, like it is in Kosciuszko National Park, you would get a crown fire. You would not get a fire in the crown in that other situation.

Senator FISHER—For how long did you say that has been fenced off?

Mr Commins—That plot has probably been fenced off for 20 years.

Senator FISHER—To someone who is not familiar with snowgrass—and yes, it is only a photo—that does not look such a big deal to me. I am a country girl, but that does not seem to be such a big deal to me. Can you explain it to me. You have talked about the difference between a hot fire and a cold fire.

Mr Commins—If you have vegetation fuel loads like that—and look at the other photograph of the girl that has pulled the tussocks back—you are going to have a horrendously hot fire in there, whereas you are lucky to have a cool fire in grazed land. In the 2003 fires in Nunningong they had a control line across the plain where they were going to do a back-burn from. Our cattle lined up—they are very inquisitive—

Senator FISHER—Yes, cattle are inquisitive.

Mr Commins—About 300 heifers lined up watching—

CHAIR—Senator, your time is up.

Senator FISHER—Can Mr Cummins just finish that answer.

Mr Commins—They tried to do a back-burn from this control line, but they could not get a fire to go. I said, ‘If you want somewhere to burn, you come with me.’ There were 300 cattle all lined up there saying, ‘What idiots you are.’ The fuel loads were not there. It was a dewy night and they could not get the fire to take except where the fuel ran out of their torches. It has a very beneficial effect on the environment, contrary to what others say.

Senator BACK—Like Senator Fisher, my background is in the Western Australian wheat belt and not the high country. I have read the work of Dr Williams and I am keen on your responses. Dr Williams says:

The most flammable parts of the alpine landscape are the closed heathlands on the steeper slopes, where rate of fire spread is naturally faster. Grasslands, on the other hand, occur on gentle slopes and the grass fuels are less flammable than the shrub fuels. Cattle prefer to graze the open grassy communities, where there are the most palatable plants, and they tend to avoid the closed heath communities. Thus, any fuel reduction effect as a result of cattle grazing is occurring in the least flammable part of the landscape, and not where the propagating fuels (dense shrubs) are located. Long-term data show that cattle have very little or no impact on shrub cover (and hence fuel loads) in the heaths. The heaths are therefore likely to burn more severely than the grasslands, and fire severity within heaths ... will be similar whether that are grazed or not.

That seems to be the essence of the position taken by Dr Williams. Obviously, I will have the opportunity to ask him as well. From your experience you can comment on the summary I have just read out—you can either agree or take issue with it?

Mr Commins—We can both answer that. I am not quite sure what planet Dr Williams was on when he made those findings. There has been a decided lack of fuel reduction burning in that alpine park where the cattle were grazed. In earlier days in those woody heathlands they used to

put a match to it or lightning ran its course and there was not the weight of fuel there that there is today. Interestingly, where the cattle graze on Bogong the fire went out or it was so quiet that the cattle could just walk through it. There was no scorching of the ground. It was a cool fire.

Senator BACK—I was quoting from a chapter of the Esplin report of the 2003 fires, but they obviously picked up on CSIRO research. *Alpine grazing reduces blazing: a landscape test of a widely held hypothesis*—no doubt you are familiar with this work of Dr Williams and his colleagues—states:

The lack of a detectable grazing effect is consistent with previous research on shrub dynamics (little or no grazing effect on ... taller shrubs), diet and behaviour of cattle (herbs and dwarf shrubs preferred to tall shrubs; closed heath vegetation generally avoided), and fuel flammability ... Whatever effects livestock grazing may have on fuels in alpine landscapes, they are likely to be ... localised, with such effects unlikely to translate into landscape-scale modifications of fire behaviour.

I ask: at the time all that controversy went on—and we watched it in the West from afar—was there never a capacity to put to the test the impact of grazing or other means of fuel reduction as opposed to not grazing? Or is that still not able to be scientifically examined?

Mr Stoney—Since 2003 when the Esplin report came out, which was very disappointing—several other scientists have expressed disappointment in that and in some of the work that was quoted—Mark Adams from Sydney university has said:

... while there have been studies of grazing in the high country, there is a clear lack of research into the interaction of grazing with prescribed fire

He goes on to say, as I quoted earlier, that some of the present work could not be regarded as rigorous. So we have several scientists, whom we have cited in the paper, who are now questioning the work. Mark Adams especially has got work going on at present, as does the Bushfire CFC, which I think we should watch with interest. Some of their work is more independent than some that has already been done. We do have a vacuum with fire management policy in this whole area that we are talking about. One of the photographs you have there is of the Alpine fires in 2003—south Bogong. You can see the trial plot that was burnt, and the fire went out when it reached the grazed area. That trial plot is down on the sides—this is where we are talking about. But some of the work that has been cited has used those trial plots that are down the sides and the vacuum in the policy of the department is that that is not going to have any fuel reduction burning done on it. The top is now not grazed so there is actually a whole policy vacuum with regard to the High Country when it comes to fuel reduction.

Senator BACK—I have no further questions but I would certainly like to continue the discussion.

CHAIR—Because Dr Williams is probably waiting on the line I would like to conclude your evidence. From a practical farming cattleman's point of view, one of the arguments for de-stocking in New South Wales was erosion. If anyone takes a drive up there now and sees the results of a catastrophic fire, there is more erosion than there would have been if they had left the stock there. That is without a doubt.

Mr Commins—One negative impact on the environment that is never taken into consideration is the negative impact of rabbits. A lot of the overgrazing is caused by rabbits and hares that were in plague proportions. Hares and rabbits will keep out the grassy species and allow the woody species to dominate. That is very evident in lower altitude country where you see lots of tea tree and scrub where once there was open bush—the rabbits ate the grassy species and allowed the woody species to dominate and there was no fire to keep the woody species in balance.

Senator BACK—I do have one last question. Can you tell me what evidence there has been of influx of weeds as a result of cattle grazing? And, if there has been, has there been further evidence of those weeds actually now reducing, declining or being eliminated after cattle grazing concluded in 2003?

Mr Stoney—I am yet to be convinced that the cattle have contributed to the weed problem. A lot of the weeds you see start at the roadsides and move out. Whenever the road is disturbed with a grader or something across the Bogong High Plains that is when the weed species move out.

CHAIR—The other thing I would like to add just to complete the record is that the other argument against stocking is the disturbance to run-off and the silting up of the dams from the so-called ‘dreadful cattle’ versus the catastrophic fire effect. Non-catastrophic fire does not create the regrowth and the mountain fires in recent times at the back of us here resulted in an estimated 600 gigs net—1,000 gigs gross—reduction in the run-off for the regrowth period in the forest. So, there you go. Thank you.

[2.04 pm]

WILLIAMS, Dr Richard, Senior Research Scientist, Plant Ecology, Commonwealth Scientific and Industrial Research Organisation

Evidence was taken via teleconference—

CHAIR—Welcome, Dr Williams. I invite you to make an opening statement. If you want to alter anything you have already provided in evidence, now is your opportunity.

Dr Williams—I am a plant ecologist with CSRIO Sustainable Ecosystems. I have been in the Darwin laboratories of this division for the last 19 years. I am a senior principal research scientist with CSRIO, and prior to that I held teaching positions at Monash and Melbourne Universities. I did my PhD at Melbourne University in the early 1980s on the dynamics of alpine vegetation on the Bogong High Plains. I have been actively involved with plant ecological research for 30 years, and my focus has very much been on plant community dynamics—that is, the changes in the composition and structure that occur in plant communities over time, especially in relation to disturbance. The study of fire has been integral to my research interests, which include savannah ecology, alpine plant community dynamics and carbon dynamics as well as climate change and carbon dynamics. So fire has been a big part of my life for 20 years, and it has taken me to some pretty interesting parts of the world—Victoria, the Northern Territory and South Africa to name just a few.

In addition to my research work in the area of fire ecology and landscapes, I have been involved in other aspects of fire management in the Australian environment. For 13 years I was the CSIRO representative on the bushfires council of the Northern Territory, which is a statutory fire management authority. I was also a member of a number of Parks Victoria advisory committees, including one set up to look at fire impacts following the 2003 fires, and I have been an associate editor for the last little while on the International Journal of Wildland Fire. I am currently working on a number of major projects in relation to fire. These include fire and biodiversity projects in the Northern Territory and a national project on trying to understand the impacts of climate change on fire regimes and biodiversity. I also continue to have an interest in the dynamics of alpine vegetation and am involved in an Australian Research Council-funded project on climate change and fire interactions in heathland and grassland on the Bogong High Plains. So that is me in a nutshell.

CHAIR—I take it that all your research has been on non-smoking plants, but don't answer that!

Dr Williams—On which, sorry?

CHAIR—On non-smoking plants, but don't answer that!

Dr Williams—All right, I won't!

CHAIR—We had some earlier evidence which was putting a question mark over the value of lower fuel loads and some research that has been done along those lines. You may not have had the opportunity to see it, but given that scientists are talking—and you might confirm this, giving your experience—about more event-based weather under climate change predictions, do we really have to learn to rewrite the rule book on a lot of this stuff?

Dr Williams—I am not sure that we necessarily have to rewrite the rule book, but we do have to be continually open to evaluating and potentially re-evaluating evidence as it comes to hand. The business of fire management is a complicated thing, so we need to be using evidence from all over the place and evaluating evidence as it comes under changing circumstances.

Things are changing. There is evidence of potential climate change and its impact on potential fire weather. There are potential impacts on fuels of those sorts of climate change related changes to weather and climate. Society is changing—the patterns of where people live in cities and the bush, and the urban interface—and the rate of change of knowledge is also pretty impressive. It is important to keep tabs on all of those things and to make sure that we use a number of lines of evidence to learn as much as we possibly can about the way that fire interacts with the landscape and people.

CHAIR—One of the terms I use with respect to this inquiry is that it is curious that even though the gear is getting better, the fires are getting bigger. Would you like to draw a line between research and work before the fire starts and research and work after the fire starts?

Dr Williams—Which particular fire?

CHAIR—A catastrophic fire, not a cold burn.

Dr Williams—Any event?

CHAIR—Yes.

Dr Williams—Events are important because they teach us about individual fires, but a really important principle is the notion of the fire regime—that is, they are not just events; they reoccur across the landscape in space and time. It is the nature of the regime that we need to start thinking about. We need to have that as a central plank, in my view, in our thinking about how we might modify landscapes or try to modify fire regimes by doing various things. It is not just about anticipating and reacting to particularly events; it is about understanding the nature of the regime. And by ‘regime’ I mean patterns of recurrence and the variation that might come at a point in the landscape in fire intensity, the season in which it might occur and the frequency with which that point might be affected by fire.

CHAIR—Firefighting these days becomes a TV event for the evening news, and it always looks fantastic to see a helicopter swoop over and drop 600 litres of water—most of which evaporates before it gets to the fire. Do you think there is more emphasis these days on the towns—and a lot of these towns are built in areas which are just asking for trouble—as opposed to the farming land and the agricultural aspects of the effect of the fire? Do you think there is more focus now, perhaps too much focus, on the edge of a town rather than on the land between it and the forest, the farming land or the cleared land around it?

Dr Williams—I am not in a position to comment, I do not think, about that potential shift in evidence. It is not something I have looked at or studied.

CHAIR—No worries. We will go to questions from Senator Back.

Senator BACK—I have a couple of general questions about some forest fires and then I would like to get the benefit of your advice to us about management in the high country. Just in general terms, from the benefit of your experience under Australian conditions, what do you believe are the means by which we can minimise the occurrence of high-intensity fires? I am not necessarily specifying forest fires but including forest fires and others. What are the land management techniques that you believe we should be pointing towards?

Dr Williams—There are a number of fuel modification techniques that can be used, and prescribed burning is an obvious one, to reduce fuels. But the wider question is: what can we do to reduce the incidence of the high-intensity fires? That was your question?

Senator BACK—Yes, occurrence or incidence.

Dr Williams—There are a number of land management techniques that can be used, but the critical question is trying to get a handle on fire regimes—and for some parts of the country, a recurrence of high intensity fires is part of the furniture—and the extent to which we might modify those regimes and the reoccurrence of those events by manipulating other aspects of the landscape that are known to affect fire behaviour and therefore fire regimes.

Senator BACK—What sorts of aspects? Obviously fuel reduction is one you have mentioned.

Dr Williams—Yes, that is the obvious one.

Senator BACK—Yes. What others?

Dr Williams—In the United States, for example, they talk about forest thinning—taking trees out of the forest, those sorts of things. There are possible applications of grazing by domestic stock to influence fuel and to influence fire regimes. There is a range of land management techniques that can be used.

Senator BACK—Yes, I support what you are saying. You would possibly be aware one of your co-authors of the paper *Resolving conflicts in fire management using decision theory*, Dr Driscoll, was with us earlier in the afternoon. Would you care to give us the benefit of your thoughts on the whole issue of frequency of burning, particularly in forested areas? I am quite familiar with the work that you do in West Arnhem Land. We might look at doing that across more of the north-west of Australia, but I am more interested in the forest scenario now. What impact—positive or negative—do you believe the frequency of burning fuel reduction or wildfire has in this whole question?

Dr Williams—I would like to preface this by saying that the south-eastern forests are not the primary focus of my personal research efforts. I am aware of work that has been done. I have worked with colleagues on some aspects of it. Frequency is one element of the fire regime—that is, fires recur, so there must be a certain incidence of occurrence with associated intervals

between one fire and the next. It is a very, very important component of the fire regime of anywhere on earth.

Senator BACK—I am thinking of it more in terms of how your advice might assist us in how we write the report of this committee. One of its objectives is to see the extent to which the Australian government should be involving itself in the whole question of land management as it pertains to fire. Obviously we do not want to interfere in any way in the constitutional rights of the states and territories, but we do know the Australian parliament invests a lot of money in fire abatement, mitigation, perhaps less in prevention. So it is in that context that I am really interested in your response as to how you could assist us in our thinking.

Dr Williams—Do you want me to talk about Northern Australia in that context?

Senator BACK—Yes, by all means use it as an example, or the areas around this south-east area particularly.

Dr Williams—We can compare and contrast the two areas—Northern Australia and south-east Australia—based on some fairly fundamental fire climatic realities. Where I live and work in Northern Australia, the landscape is essentially tropical savanna—open woodlands with a grassy understorey—fine fuels are produced each year, they dry off each dry season. The wet season, dry season cycle is very predictable on an annual basis. We have high rates of ignition, either through humans or through lightning, and as a biome—a biogeographical bit of the world—the resultant fire regime is characterised by relatively high frequency fires. Bits of the country can be burnt every year, every two or three years.

Senator BACK—You have the benefit of now being able to observe the impact, over some years, of annual cool season burning as opposed to end of dry season hot fire burning.

Dr Williams—Yes. One of the management concerns for Northern Australia is the incidence of higher intensity, late dry season fires that burn bigger areas, potentially burn them hotter and, therefore, may have a more dramatic and higher impact on a range of landscape values. That is not to say they have not necessarily been part of the furniture at all over historical times but people are concerned about fire frequency, especially as it is driven by the incidence of bigger, hotter wildfires late in the dry season. Therefore, the management paradigm or basic theory and practice is to try to break the country up as much as we can with early dry season burning where you are burning under more controlled conditions. That is a relatively well understood and well practised part of fire management in my part of the world.

The same logic can be applied to anywhere on earth, but you have to understand what the limitations and the drivers of the fire regimes are in a different part of the world. In south-eastern Australia we have a regime that is characterised by the potential for much more intense fires because the fire weather is different and the patterning of the fuel dynamics—both the type and mass of fuel that can accumulate over time—are different. We have different sorts of topographic conditions and different opportunities for ignition. Essentially that all adds up to a regime that is characterised by less frequent fires but potentially more intense fires when they do occur. Then the question becomes: how sensitive is that particular historical regime to the sorts of interventions that people might want to practice?

Frequency and intensity matter over the whole of the country but the distribution of intervals associated with frequency, intensity types and severity associated with different types of fire events differ from north to south.

Senator BACK—I will move now to work you have done in alpine environments. I have read the material you kindly provided to us and your summary would be that cattle grazing had little if any effect on mitigation against fire as a result of different types of plant materials consumed by cattle as opposed to those that are more likely to burn.

Dr Williams—Sorry, can I just clarify something? Material that I provided to this Senate inquiry? I am not aware of anything that I have provided to you on that topic.

Senator BACK—I can tell you then what I have in front of me.

Dr Williams—What is the source of your—I am happy to answer the question, but I want to clarify what the source is.

Senator BACK—It is from the website terc.csiro.au profile. I have a lovely photograph of you explaining a bit about your background. We have that in front of us. I then have a research program called ‘Fire and Australian alpine environments’ from the Tropical Ecosystems Research Centre, a little bit of a comment on the Esplin report of the Victorian inquiry into the 2003 bushfires and I also have the abstract of your paper co-written with Dr Wahren, Dr Bradstock and Dr Muller entitled *Alpine grazing reduces blazing: A landscape test of a widely held hypothesis*.

Dr Williams—Just to clarify the source of the information, and that is fine.

Senator BACK—That is good. Our secretariat is so efficient that they have documentation to us whether you deliver it or not.

Dr Williams—That is right. I was just not aware that I had actually sent you anything. But that is fine; I am aware of the material.

Senator BACK—I have absolutely no knowledge of the high country at all but I understand that grazing ceased in 2003. Was that correct?

Dr Williams—Effectively, yes, immediately after the 2003 fires, cattle were removed from those areas on the Bogong High Plains that I know were fire affected.

Senator BACK—I have got two colour pictures in front of me of the Bogong High Plains in 2003. I am sorry, you do not have the benefit—

Dr Williams—It is a bit hard to see them over the phone, Senator.

Senator BACK—That is exactly right. One of them is an area which is fenced away from grazing. I do not know the scale but what I can obviously see are the fence lines in the sense that, as soon as the fire got to a fence where there had been grazing, it stopped. So the burnt area is inside a fenced area that had been blocked away from grazing. The second picture is not as

easily defined in terms of fencing but I can see where a fire reached an area that I am informed had been grazed and it went out when it got on to the grazed country. My question to you is, on reflection, do you continue to support the view that fuel reduction at all or fuel reduction by grazing is not an effective means of land management in that particular landscape?

Dr Williams—As I have argued in the paper that you have the abstract for, immediately after the 2003 fires, my colleagues and I spent a considerable amount of time walking across the high country—100 kilometres or so—where we were documenting the incidence and severity of fire as it occurred. We sampled the high plains pretty substantially. We had roughly half of our samples in areas that had been previously grazed to 2003 and areas that had not been grazed essentially since about 1990. So we were able to, over the whole of the landscape, have a comparison between grazed country and ungrazed country that was based on many hundreds of points. I do not know the photograph that you are talking about, but that is one point in the landscape. I had hundreds of points.

We also, for each point in the landscape, took into account the sort of landscape position—what was the slope, what was the likely vegetation and what was the vegetation there at the time of burning? You could put it into three or four categories very easily. For those heathland areas that were burnt, we used what was called the minimum twig diameter technique to look at severity. So we had a measure of occurrence and a measure of severity. We could also account for the relative contribution of grazing history, vegetation type and its associated landscape variables such as slope and aspect, and we analysed that with a variety of statistical models. The overwhelming determinant of whether country was burnt or not was the vegetation type.

Senator BACK—So closed health was 87 back and open health was about 60?

Dr Williams—So closed health was the most affected and open health—less grassland, less again. The snow patch herb fields basically did not burn. None of the points that ended up in the snow patch herb fields showed evidence of burning. Then when you looked at the influence of grazing in conjunction with those particular factors, there was no statistical difference between the grazed and the ungrazed sites. That led us to conclude that there was no detectable impact of grazing history on either the incidence of fire—the rough proportions were not statistically different—nor the severity.

Senator BACK—If, as you suggested in the abstract—and I think you mentioned diet and behaviour—the animals are more likely to graze on the grassland, which was only 12 per cent burnt, and less likely to graze in the closed health, which was 87 per cent burnt, wouldn't that point to the effect of grazing as having actually reduced the burnt area to a very low level, an acceptably low level of 12 per cent? What is the other explanation? If it is not grazing that has caused the level of grassland to be burnt at such a low level, I am just wondering what you might have put that down to. Presumably in a hot fire the grassland would burn as well if it is flammable.

Dr Williams—I guess there are two aspects to the answer. The proportion of grassland burnt was roughly the same in grazed and ungrazed country. So, again, the statistical effect of grazing on the incidence of fire in grassland was not apparent. That leads you to the second question: what do you put it down to? It is, for a start, topographic effects. The grasslands are on more gentle slopes. There is a potential fuel architecture effect as well, I suspect, that the grasses

themselves are just not as flammable as shrubby fuels. Our survey certainly said there was no detectable influence of grazing on the incidence of fire in the grasslands, and the conclusion that you would make is that other landscape variables are more important than grazing in determining the low flammability of grasslands compared to the other health land communities.

Senator BACK—Again, I am sorry I am ignorant of it, because I have never been there, but do you have any knowledge from colleagues that are still in this area of what the levels of fuels are for those different fuel types in this area now? That was 2003—seven or eight years ago. Do you know what the incidence is now?

Dr Williams—I have got colleagues who are measuring the responses and the post-fire regeneration characteristics of reference plots in the Bogong High Plains. I am not directly involved in that work, so I could not tell you off the top of my head what fuel loads are. As I understand, the biomass recovery is one of the things that is being measured. But I cannot tell you off the top of my head what they are at the moment.

Senator BACK—That is fine. Could you point the secretariat to where they may be able to go and source that information? It would be most interesting to me. There has clearly been no grazing for the last seven or eight years. It would be very interesting for us, using your 2003 study as a baseline, to actually find out what the situation is now.

Dr Williams—Yes, I am sure I can help the secretary dig that information up.

Senator BACK—Thank you for that. I do not have any further questions.

CHAIR—Thank you very much. We are very grateful for your input. I will bid you good afternoon.

Dr Williams—Thank you, Senator. It has been a pleasure to help you.

[2.34 pm]

BROWN, Mr Graham Robert, Farmers Representative, Canobolas Bushfire Management Committee

CHAIR—Welcome. If you would make an opening statement, we will then ask you some very delicate, gentle questions.

Mr Brown—I live on the slopes of Orange, the foothills of Mount Canobolas. I studied agriculture at Marcus Oldham in Victoria back in the early sixties, where we looked at holistic farm planning, including visiting the Potter Farm planners that got off the ground. That was looking at salinity, but it was also looking at holistic landscape management. On returning to the family farm in the early sixties I looked at the same principles of holistic farm planning and engaged the soil conservation service to do a whole farm plan for me. With what I had learnt in Victoria, because of their hot summers and high fuel loads in the high country and in the grass country, it interested me because we were on the up-slope of Canobolas and fires have always been part of our lives, through five generations of living there.

CHAIR—As you open grazing, sheep and cattle?

Mr Brown—Yes, open grazing. Steep country. We actually are no longer there. Newcrest Mining relocated me in 2000, Cadia Mine. I live just around the corner.

CHAIR—You are a neighbour of Bill Whiteley's, are you?

Mr Brown—That is right. Bill was part of our bushfire brigade.

CHAIR—There you go.

Mr Brown—It is a small world. For my sins I have taken a great interest in fire management because of the nature of our landscape on the southern slopes of Canobolas. We are in what we would call a very fire prone area due to the landscape. Black Rock Ridge was immediately to the west of us, and we would get regular lightning strikes. Bill Whiteley was one of those who was in a good lookout. He looked into my back door and I looked into his front door. We were some 10 kilometres apart. That was how we tick-tacked. But I am digressing. That is what gives you the interest.

The drought of 1979 to 1983 saw most of our country destocked considerably. We managed fire using livestock. It saw us destock by two-thirds. In January 1985 there was a fire started to the west of us on the Checkers' property, and it took out 25 neighbours, including myself. I have to tell you, it creates a passion that management is pivotal to what you do in managing the moment. So I suppose it is that passion that has driven me and continues to drive me in the whole process. Post the fire in 1985, I engaged with the local government and the local fire service and read and watched the coronials as they occurred over time in New South Wales. All of those coronials kept talking about landscape management and fuel reduction. There is a triangle: fuel, temperature and oxygen. If you can remove one of them, you have the fire out.

The only things that we can control are fuel. So that is what farmers do: we try to reduce the fuel loads.

I have been fortunate, since I have been semiretired since 2000, to have travelled the world. I looked at Spain a couple of years ago. They are regretting the generosity of the Australian government post the war in supplying them with eucalyptus. They had a landscape that was savanna with natural pine trees with animals grazing underneath them. That is how they managed their fuel in those Mediterranean climates. Now they have eucalyptus wall to wall and they have massive fires each summer. So there is an example. I have listened to some of the comments today, and I just shake my head in disbelief about the northern parts of Australia and south-east Australia in the drier sclerophyll forest. You have to have a management plan. I am digressing again.

In 1998 to 2000 there were changes in the New South Wales legislative processes for fire management. Prior to 1998, and this came out of the coronial inquiries, there were 173 fire organisations, which were local government organisations. Each local government organisation was a fire authority in its own right and it managed the local bushfire brigades. The recommendations from those coronial inquiries leading up to 1998 were that there should be one state organisation—in fact, there are two: there is the New South Wales Metropolitan Fire Brigade and there is the New South Wales Rural Fire Service. That started in 1998 to 2000.

The Rural Fire Service started to look at a risk planning process at that point in time. They had a model which I call a desktop model and it was the guideline for risk management. It talked about identifying the bushfire risk, analysing the process and evaluating it, treating the risk, and monitoring and reviewing the risk. As I say, it was a desktop model.

As a witness I am coming as a private individual but I have to wear a couple of hats here in background knowledge. I am a member of the local brigade. I am also a member of the local bushfire management committee. I am an elected member to the Executive Council of the New South Wales Farmers Association, and for my sins I sit on the New South Wales Bush Fire Coordinating Committee.

In the latter capacity I was asked by Alan Brown, who was my former chair of the New South Wales Farmers Association Rural Affairs Committee and lives in Wagga, if I would go onto the coordinating committee and help develop the risk planning process, the New South Wales Bush Fire Assessment Environmental Code and the handbook for bushfire management committees. So there were three documents that the subcommittee of the coordinating committee developed. I cannot speak for the coordinating committee; I can only tell you about where I have come from.

It was very clear that the risk planning model was not working as a desktop model. The fire in 2001-2002 in the Harvey Range between Parkes and Wellington, called the Goobang fire, burned out some 25 farmers and caused a reaction by those farmers against the—how do I put this nicely?—mismanagement at the wrong stage of that fire. In fact, those who were in charge of the fire after it had been initially suppressed at nightfall went home. The next morning the fire got away before they got back.

CHAIR—That has happened to me twice.

Mr Brown—Yes, I am very much aware. The outcome of that fire led the farmers and the Farmers Association to get their heads together with a view to taking court action. During the period where it was pending, a lot of excess energy was spent by the then local manager. David Hoadley was the farmer manager of the Rural Fire Service in the Canobolas area. There were four local government areas: Cabonne, Blayney, Cowra and Orange. He had been a farmer and he had a good knowledge of fire management.

He teamed up with a chap from National Parks, Alex Green, and Alex mentioned to David Hoadley that there was a chap at Coonabarabran who was called Mr Fiery—his name is actually Peter Brookhouse. Peter had been doing a lot of work in the Warrumbungle National Park in Central New South Wales on the use of fire in a mosaic pattern. Those two headed to Coonabarabran to get him to explain to them how to develop this mosaic pattern—mindful that the guidelines that they had were much more desktop-type arrangements.

The background to this is also that the Farmers Association at the same time had been calling for a landscape risk planning process for fuel management. The outcome of that trip to Coonabarabran was Alex Green and David Hoadley coming back and holding 80-odd meetings in the local area over an 18 month period. This is well-documented on the Canobolas website and I think I have sent a copy of that to you. The history is there; I will not repeat all the detail.

During that period of negotiation some of the local farmers had worked with David Hoadley to get outcomes from national parks. I will not go into the detail but, suffice to say, very quickly within two or three meetings Hoadley and Green could see that they were not asking the right questions. They were not getting the information they needed and they were not really listening the right way. So they went armed with a topographic map, a blank sheet of paper, two ears and a zipper on the mouth. The outcome of that was they started to get useful information on history of fire, where fires run, fuel loads et cetera, so the Canobolas model was born. David Hoadley used the support of the Rural Fire Service to modify the guidelines of the desktop model. By 2004 the Canobolas model was born and it has now been running for six years. The risk plans we have in New South Wales have a lifespan of five years and then they have to be reviewed and rebuilt.

I brought with me two maps which are what we call the ‘how we’re going’ maps. I do not have the 2010 map because we have not finished, but 2009 clearly indicates that we are starting to get that mosaic pattern that we have all called for. I should be able to display these if my secretary and my wife assist me—the two ladies could hold up one each. The greenish one is the ‘how we’re doing’, the mosaic pattern that is developing. The greener it is the more fuel load there is and the yellower it is the better we like it. In other words we are developing a mosaic pattern in the landscape. If you look at the map on your left, which is the one with all the brown on it, that indicates the sclerophyll forest in the region. Orange is at the centre right-hand side of the map and Forbes is at centre left of the map, Cowra is down the bottom and Wellington is off the top. The Goobang fire occurred right up the top of the map in 2002. I think that is all we need to see on those. You can see that there is a mosaic pattern developing. Thank you, ladies.

In that risk-planning model the landscaping is classed into three types. The first is the asset protection zone, which is around your assets. The second zone is the strategic fire advantage

zone. If you like to look on those maps you will see a couple of villages or towns where there is a blue colour.

Senator BACK—They are the asset protection zones?

Mr Brown—Yes, the asset protection zone immediately around the town. Bradstock and Keith are the two scientists who have provided a lot of the information for the environmental code on how frequently you can burn and what you can fuel reduce to. If you turn the brown map over you will see what it actually tells you there.

Senator BACK—The second was strategic fire advantage zone.

Mr Brown—Yes, strategic fire advantage zone. What we are doing with the strategic fire advantage zone is, in those brown areas, we are actually breaking the landscape up because we can fuel reduce more often. It is not necessarily fire that we are using. It may be livestock or it may be trittering. The local electricity authority does a lot of trittering along its powerlines, bearing in mind that 30 per cent of our fires are started from powerlines.

CHAIR—What do you mean by ‘trittering’?

Mr Brown—Trittering is a rotary hoe. It chops up the vegetation. In the rest of the landscape we have the two classes, asset protection and the strategic fire advantage zone, so that gives us the time, the fuel loads and the vegetation type that we can reduce to. The third area, unfortunately, was not in the risk plan process up until 2002 approximately, which is the land management zone, and that is everything else. We were very fortunate after a lot of lobbying to get the land management zone into the environmental code. Once we had it in the code then there was clear scientific evidence of how often you could fuel reduce and by whatever means. That was a big win.

I have probably digressed a little bit, but the thing that comes out in that is what the guidelines are. The first one is identifying the risk and then analysing the risk. I have talked you through that. Then there is treating the risk and auditing the process. That is in fact what we are now doing. If you go to the green map, which is the second map, you will see that most of the green is around the peripheries of our bushfire management area. The bushfire management area is denoted by that black line and the four local government areas are within that. We are finding that most of the fires that affect us are now outside of our zone. So we are moving towards regional landscape mapping and treating the fire threat or the fuel load threat on a regional basis.

In New South Wales we have only rolled out this risk planning process in toto this year, 2010. It is still embryonic to a lot of the 68 zones. The hazard reduction is still getting done. Since 2007, there has been an exponential increase in hazard reduction work in New South Wales. The commissioner gets very upset if I start mentioning the Canobolas plan specifically. My wife has reminded me that we need to look at this regardless of ownership—in other words, the risk plan is tenure blind. That is working really well. The Bushfire Management Committee is made up of all agencies, everybody that has an interest in it, and two non-government agencies, the Nature Conservation Council and the New South Wales Farmers Association. We found in the Canobolas area that we have engaged people like the Catchment Management Authority because they have an input and they talk to people. They understand that we are trying to manage the

landscape, minimise the impact of wildfire—I should not use that word; it is an American word—and create an environmentally sustainable process for our forested lands.

Some of that brown area on the first map is national parks, some of it is forestry country and some of it is private land. We have found over the last five years of the implementation of this plan in the Canobolas area that many of the private landowners do not have the capacity on their own to do fuel management, as our forefathers used to do. I heard somebody mentioning dropping a match as we ride out of the high country and that worked very well. If they can put that land into the risk plan then we have a process—and I think the federal government helps us in that area through funding—where we can target areas and prioritise where the highest risk is, whether it be bushland affecting grazing land or bushland that is impacting on infrastructure. Mount Canobolas is a classic example. Post the Canberra fires, within days we had a team of people on Mount Canobolas removing the fuel loads around the communications towers. So there are some lessons to be learnt from history.

Senators, I am not sure whether I can say anything more. I am just putting the plan before you. I am well aware that you are familiar with the fact that we have a risk plan process in New South Wales. It is just bringing you up to speed with the fact that it is now rolling out. I would say hazard reduction for this year is double and maybe even treble what we did in 2009, which was up about 50 per cent on 2008. 2006 was a bad year because we could not light fires. If you lit a fire, you could not control it. They are the limitations. You have got to go when you can really go. This year has been a terrific year for getting hazard reduction done.

Senator BACK—Have the priorities been in line with the three zones you described? In other words, if time, capacity and weather conditions et cetera have been constraints, has it been in the asset protection zones that you have placed the resources first, followed by the strategic fire advantage zones and then the land management zones?

Mr Brown—There has been no priority in that sense, but local government does a lot of work in the asset protection zones. Orange City Council, for instance, does a fair bit of work. There is nothing like a fire to wake people up. We had a fire just to the north of Orange in November, and I can tell you that you would not believe the amount of hazard reduction that was done the following weekend.

Senator BACK—I would.

Mr Brown—You need a fire in your backyard to wake people up. So there is no priority in that sense. The prioritisation of where hazard reductions may be done is subject to the senior management team of the zone. Submissions are put in and then a team—three of us, actually—analyse that and say, ‘Clearly, on the history of burning, we want to link this one with this one, so this is a mosaic of 2002 and this is an adjacent area,’ and we advance that mosaic pattern.

CHAIR—Have you had a look at the Kurrajong Heights mosaic?

Mr Brown—No, I have not had a look at it yet. I have noted the work that has been done in the Blue Mountains, particularly in the Grose Valley. I remember the former commissioner talking to me about the number of times that had been burnt over the last 40 years—overburnt in lots of areas. With the last big fire there, they threw everything at it. They lit up areas that had

not been burnt, and there was much criticism. The criticism, really, was about communication. They had not communicated with the community. That is the key to this: community involvement.

Senator BACK—Has the Canobolas model been extended elsewhere in New South Wales now?

Mr Brown—The Canobolas model is only a risk plan and, yes, the risk plan process has been rolled out this year right across the state. It is up to the 68 bushfire management committees to develop their own risk plan. The RFS has been very helpful in rolling that out and has provided a lot of backup. This one is generated from the grassroots up; the other has been generated in the other direction. We are still getting a degree of reticence because it requires work. There is no way in the world most bushfire management committees are going to hold 80 meetings in the community—in fact, when I look at the community consultation process, I think we are falling down badly. It is advertised in the local paper that there will be a presentation done in an area and if they get one or two people there that would be it. They may get people from the Rural Fire Service—local volunteers come along—but not community engagement. What we have tried to do in Canobolas is to go out to the farmers, out to the townships, out to the villages and hold public meetings by contacting, firstly, key people in the area. They then communicate. During the development of this we were getting up to 50 to 80 people coming along to meetings.

Senator BACK—That is a huge injection of your voluntary time.

Mr Brown—Yes, but it works. I am passionate about it.

Senator BACK—Obviously.

Mr Brown—The Bundarra-Bingara fires of last spring were caused by a succession of lightning strikes. I went to one of the council debriefs there. I took the maps with me and talked about what we were doing. They were just starting to roll out their risk plan in that area. There was a lot of animosity. I said, ‘The time is right. After an event like this you’ve got two years to get it right; otherwise it pales into insignificance and people forget.’ So the RFS is very much aware of that. Volunteers are aware of that. We have the expertise out there. We are worried about the baby boomers, the expertise—we are all falling off the perch. We have forgotten how to drop matches.

Senator FISHER—It has become politically incorrect as well.

Mr Brown—If I might digress, Rob Pallin sits on the Bush Fire Coordinating Committee as the representative of the Nature Conservation Council. Eight years ago, David Hoadley and I first went to the annual conference of the Nature Conservation Council. If we had worn a red suit with a couple of little horns, I think we would have been appropriately dressed. David did a presentation on what we were proposing to do in Canobolas. Last year, I attended their conference; I have a copy of their conference agenda here. It was entitled ‘Biodiversity Under Fire’. A variety of speakers were at that. I will just select a few whose names you might know: Ross Bradstock; Professor Peter Clarke; Dr Alan York—he was the little bug man and had a marvellous story; Dr Kevin Tolhurst, from Victoria; Dr Neil Burrows; Dr Scott Wilkinson; Cuong Tran, from Southeast Queensland Fire and Biodiversity Consortium, a great man for

understanding fuel management, prescribed burning et cetera; Dr Beth Gott, from Monash University, who is a great old lady who talked about the prehistory of Australian biodiversity; Dr Tina Bell; Dr Simon Heemstra from the RFS; Karl McKillop; et cetera. Every paper that was presented basically reaffirmed that prescribed burning on a mosaic landscape scale is the way forward—every paper. At the end of the conference there was a period of questions and answers. One lady from the auditorium said, ‘Okay, how do we do it?’—the question was aimed at me because I had just made a presentation—and I said, ‘Well, the first thing you’ve got to do is drop the match.’ It is as simple as that. Obviously, you need to do some planning. I think the risk plan speaks for itself: the planning is there, the process is there and then all the work is done appropriately pre-season, so when an opportunity arises such as this autumn that we have had—what an opportunity!—we are flat out burning.

Senator FISHER—Mr Brown, I think you were in the room when Dr Driscoll gave his evidence. I would probably not be mischaracterising his evidence to say that he may not agree with you that the first step is to drop a match. Indeed, he was talking about assessment and investigation. Is there a reflection you would make on his ideas?

Mr Brown—I think that is what the risk plan does. It does all of that. I am speaking as a farmer—I do not write too many things down.

Senator FISHER—As a call to arms, essentially—motivating people to take action?

Mr Brown—That is the way to do it—through the risk plan process in New South Wales. I would recommend that Victoria pick this one up. I have to say that the Victorians have in fact visited the New South Wales RFS to understand the risk plan process. They did it 18 months ago. The Canobolas plan will take 18 years to progress through the whole area and then we will start again. I have heard presentations from the high country. The coordinating committee visited Bogong High Plain some years ago and the bushfire CRC has research work up there. We also saw with our own eyes the result of the wildfire that had occurred there, and where it stopped was where the land had been grazed. It is history, really. My answer to you is that it is history: rabbit plagues; change of biodiversity; the removal of fire by the Australian Aboriginals; change of biology—kangaroos do a great job of grazing grass but, gee, they are hard to muster, and they are very soft—

Senator FISHER—Soft?

Mr Brown—They are soft on the ground. Cloven hoofed animals are very hard on the ground. The worst thing about cattle in the high plains—I throw this one in jest—is putting out the dung heaps after you have had a fire go through.

CHAIR—You need dung beetles—more dung beetles.

Mr Brown—Yes, more dung beetles. Cattle have big tongues, so they like grabbing swathes of grass. However, those who have trees on their properties certainly realise that cattle and trees are a bit of a problem because they like the bark on the trees.

Senator FISHER—Even if they do not eat the eucalypt itself.

Mr Brown—Yes, that is right. So those of us who have cleared our country over the generations or who have removed the harbour to get rid of the rabbits in the twenties and thirties, as my father did—I came in on the end of that—planted trees. When I came out of university one of the things that were patently obvious to me was that you could plant trees not only for windbreak protection but also for fire protection. People still, to this day, cannot understand why all of our buildings on Tunbridge Wells were not burnt down. I said, ‘It was because the windbreak was where it was.’ We lost the windbreak but we did not lose the houses.

Senator Heffernan is familiar with the Junee fires. I think it was Dr Simon Heemstra from the RFS who went down to analyse the impact of those fires. He said that if most of the homesteads had had just the ordinary corrugated iron fence on the western side, to stop ember attack, those houses would not have been lost. So you can have a tree line out 200 or 300 yards. I have not answered your question completely, but I suspect that somebody who was sitting in this chair an hour ago has never experienced a wildfire. When you experience a wildfire, as we did in Tunbridge Wells in 1985, you realise that it is not the fire that drives you out; it is the pressure wave ahead of the fire. It was 300 yards ahead of the fire. The flames were 150 feet high, for goodness sake. It melted the Marley guttering off the sides of the sheds. We did not lose a building till after the fire. We lost the hay shed. That was small beer. But all the houses survived. That was because we planted windbreaks on the western side, down slope, and made sure that inside that tree line the grass was short.

In our case, we bail the hay on a regular basis, on an annual basis, to remove the fuel loads. If you looked at Victoria last summer, there were round bales everywhere. They learnt their lesson. They continually have to learn their lesson. Every year they have to do that to reduce their fuel load. People forget where Melbourne is. Melbourne is in the centre of Victoria. It gets the hot air straight off the centre of Australia. Therefore, if you ignite the centre of Victoria then all of the high country to the east of that is going to burn, in years like last year. So there are some really simple messages, and that is where this risk plan gives you the history of fire and where fire paths travel.

Senator BACK—It is the dead cycle, isn’t it: disaster, the inquiry, apathy and the next disaster.

Mr Brown—Absolutely. I am sure you all understand what I am saying. You probably agree with most of what I am saying.

Senator FISHER—Plus, it is a case of cumulative apathy. There is apathy round 1, then fire et cetera. Apathy round 2 is going to be greater than apathy round 1.

Mr Brown—Yes. I have a copy of the information on the Canobolas website. It talks about the history of what we have done in the Canobolas area. I do not want that to overshadow the risk planning process that we have developed in New South Wales. It is just one model. Marie Bashir, the Governor of New South Wales, visited the Canobolas headquarters site a month or two ago. After David Hoadley had explained those maps to her and what we were doing, her comment was along the lines of: ‘It’s like the Viennese Orchestra. Everything has its place and everything is in tune.’ I thought that was a very profound statement. After 10 minutes of the presentation she could see how important this risk planning process that we have embarked upon in New South Wales is and how it meets our requirements at this stage.

The coordinating committee of New South Wales bushfire organisations is made up of all these various agencies. We believe the document is a living document. We believe the environmental code is a living document. So as new research comes along we will certainly consider it in the scheme of things. The Bushfire CRC is pivotal to providing some of that information, and we have a dialogue process with them.

Senator BACK—Can I ask you a question regarding the Bushfire CRC. There has been some quite spirited debate in our various inquiries as to the dominance of the CRC process by the fire authorities. The CRC, of its nature, will come to a close. This committee, I hope, will be addressing itself to recommendations with regard to future research in the bushfire area.

You do not represent one of the large bushfire authorities. Can you give us the benefit of your observation. Do you concur that the research activities of the bushfire CRC have been too closely directed by the members of AFAC, or are you satisfied that it has fairly directed its research to where it is needed? That is the first part of the question. The second part of the question is: can you give us the benefit of your advice as to what you think are the future needs for research? I am not talking about the actual projects but the process by which future research for bushfire management et cetera in Australia should be structured.

Mr Brown—In relation to the first part of your question, I struggle to give you a definitive answer because I am not close enough to the research and what they actually doing. I would say, however, that when I hear things from those that are involved in the fire industry that alarms me. I hope the science is good science and is not driven too hard by an industry.

Senator BACK—That has not been a criticism I have heard.

Mr Brown—Good.

Senator BACK—I have not heard any criticism of the calibre of the science at all. What I have heard is criticism of the dominance of the direction of the research by members of AFAC, not individually but corporately.

Mr Brown—I struggle to answer that particular part of the question because I do not have knowledge of it.

Senator BACK—All right. The second part of the question is: what do you believe is an appropriate structure for the future of bushfire research?

Mr Brown—The research structure should be all-embracing; it should be landscape scale. Out of what we have been doing with our particular risk plan is an audit process that is identifying areas, so we have research looking at what we are doing, and I think it will be self-evident. I can wear another hat from when I was involved in the days of the old Wool Board. The way we got research that motivated that area was to identify what work had been done and what work needed to be done. That was done on a landscape scale, obviously in that instance in the wool industry, with the pressure there from the individuals across the landscape.

Senator BACK—The work done in the immediate aftermath—starting within 24 hours—of the Victorian fires, getting people approved and out on the ground making observations and

taking recordings and collecting data, would have to be a first in the world. So I must admit I do not necessarily agree with those who have criticised it because, had it not been structured that way, it may well have been an opportunity lost. By the time they join that data to the research and data collected by the police and other services, we are going to end up with some data that is unique in the world. In fact, internationally there are agencies keen to contribute to and be involved in analysing that, so that is one example that one would have to say has been a phenomenal outcome of that unfortunate incident. But I am very appreciative of your advice from where you sit because research is an area where the Commonwealth will, I hope, have a greater influence in future.

Mr Brown—I think David Crombie made the comment the other day—and I suppose it was a little political because the budget had been handed down—about the fact that in Australia we were falling behind in our broad based research. I think that is self-evident, but equally one also has to listen to the experience of years. That is what I like about this document, it picks up on the experience of people that are on the ground. Landholders in New South Wales look after 73 per cent of the land area of New South Wales. That experience should not be disregarded. Some of us do not do it well, others do it quite well. But in general terms I think we do it very well.

It is very hard to quantify what we know in research. But it is possible, once you do what Hoadley and Green did in developing that risk plan, to go out and get that information and sift through it. If that is not research I do not know what is. I think there will be some really good outcomes in New South Wales. Obviously, from a coordinating committee point of view at state level, we are interested in seeing what comes out of the Victorian royal commission, but we think we will be well placed, with what we have in place, to meet what comes out on the national agenda.

CHAIR—Thank you very much.

Mr Brown—Thank you very much for the opportunity. I am sorry I am not a professional document writer.

Committee adjourned at 3.15 pm