REPORT OF PROCEEDINGS BEFORE

JOINT SELECT COMMITTEE ON BUSHFIRES

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At Sydney on Monday 3 June 2002

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The Committee met at 9.00 a.m.

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PRESENT

Mr J. C. Price (Chair)

Legislative Council	Legislative Assembly
The Hon. Rick Colless	Mr E. T. Page
The Hon. Tony Kelly	Mr G. R. Torbay
The Hon. John Tingle	

BOB SMITH, Chief Executive, State Forests, 423 Pennant Hills Road, Pennant Hills, on former oath,

PAUL JAMES de MAR, Manager, Fire Management and Aircraft Services, State Forests, 423 Pennant Hills Road, Pennant Hills,

STEPHEN KENNETH DODDS, Regional Manager, State Forests, 423 Pennant Hills Road, Pennant Hills,

JOHN THOMAS FISHER, Deputy General Manager, State Forests, 423 Pennant Hills Road, Pennant Hills, affirmed and examined, and

NOEL PHILLIP CHENEY, CSIRO, Division of Forestry and Forest Products, Research Scientist, Consultant to State Forests, 423 Pennant Hills Road, Pennant Hills, sworn and examined:

CHAIR: Did you receive a summons issued under my hand to attend before this Committee?

Mr de MAR: Yes.

Mr DODDS: Yes, I did.

Mr CHENEY: I did.

Mr FISHER: I did.

CHAIR: Mr Smith, would you care to make a opening statement in support of your submission?

Mr SMITH: Thank you for the opportunity to make some preliminary comments to your inquiry. State Forests of New South Wales manages about 2.5 million hectares of native forests distributed along the coast and inland, ranging from eucalypt forest to river red gum forest along the Murray as well as cypress and eucalypt forest in the Central West of New South Wales. In addition, State Forests manages 250,000 hectares of plantations primarily pinus radiata concentrated around the Macquarie region, which is around Bathurst, Orange and Lithgow, and on the southern west slopes around Tumut and Tumbarumba. There are smaller plantations at Bombala and Walcha. The majority of the hardwood plantations are on the North Coast of New South Wales.

It is important to realise that New South Wales State Forests forests are in regional New South Wales and are not in the Sydney Basin where a lot of the fire activity was over the Christmas period. In terms of the economic criteria—and I think this is important—State Forests manages about $1.5 billion worth of assets. The majority of that is in the pine plantations in New South Wales. Investment associated with these pine plantations, in addition to the State Forests investment on the growing side and processing side, is in excess of $3 billion in New South Wales and employs over 7,500 full-time people. In addition, there have been a large number of investments in the last four or five years in the softwood industry in New South Wales. The major point I make here is the economic downstream benefit of protection, which is important.

Fire can have a major impact on State Forests' activities and it is important that we manage that in a comprehensive and risk-based manner. You would have heard from other people about the obligations of the various government enterprises under the New South Wales Rural Fires Act and State Forests is no different. We are aware and fully meet our obligations under the Rural Fires Act 1997. We are actually one of the four fire authorities listed under the Act. Also, we have an obligation under the Forestry Act to protect forests from fire and other denigrating influences.

In terms of our approach to fire management, State Forests of New South Wales fully co-operates in a co-ordinated manner with the other fire authorities, and I will come back to that with the other presentations. State Forests has a comprehensive risk management approach to fire management. It is a balanced approach based on asset protection to what we call a triple bottom line. State Forests not only manages economic activities but also to social criteria and environmental criteria. We are one

of the few government departments that actually produces a triple bottom line account each year, and we have done that for the last three years.

CHAIR: Are you tabling that document?

Document tabled.

Mr SMITH: I can, if you like, Mr Chairman. After asset protection, our approach is to maintain reliable access with fire trails, very heavy fire prevention and mitigation works, such as slashing and hazard reduction. A systematic approach to fire protection, including a comprehensive network of fire towers and more and more use of a lightning detection system, which I can expand on further if required. Pre-emptive deployment is part of our risk management. As the risk associated with bushfires in any given season eventuates, we make an assessment of that and we distribute our equipment around the State to address that. We also build up teams associated with summer crews for firefighting, particularly as we have had reductions in an our day labour force over the last five years and last, but not least, we have early detection and very determined attacks to keep the fires as small as possible.

In terms of the various types of assets, we have a much more intensive protection mechanism associated with our plantations. These plantations are the wood basket of New South Wales and they are the ones that actually have major downstream industry associated with them. If there were to be major losses associated with our plantations, it could have a major impact on economic activity in rural New South Wales. Consequently for our pine and hardwood plantations, we have much more intense and higher risk management than we do for some of our native forest in terms of hazard reduction, slashing and other activities. For some of our forests we do not have the capacity to be able to do hazard reduction and that includes our pine plantations, our cypress pine native forests and some of our younger hardwood plantations. For these areas our main method of attack is to have proper perimeter management and to incorporate hazard reduction on what we consider to be areas of risk.

In terms of hazard reduction, I know there has been a lot of debate about the position of State Forests and hazard reduction. It has often been quoted that State Forests' strategy is complete hazard reduction across 100 per cent of the State. That is not correct. State Forests' strategy is to have strategic hazard reduction based on a risk assessment of where we think the fire threats will come and that is done in association with other fire authorities and with the rural bushfire committees. Also, it is often quoted that State Forests is of the opinion that hazard reduction will stop any fire. Again, that is not correct. The hazard reduction strategy of State Forests is based upon the fact that it will reduce the number of fires started if it is done correctly; it will reduce the rate of spread of fire and intensity—and that is important—and it will reduce spotting. This is very important where we have to have the capacity to be able to stop fires that come at a face on to our plantations.

When fires get into plantations, their intensity and the rate of spread of the fire can be much higher than in a native forest. Overall with hazard reduction, the philosophy within State Forests is that it provides firefighters with wider control options than if it were not hazard reduced. It provides safer fires suppression conditions for the crews—we place great strength on the safety of our crews—and it reduces bushfire damage and environmental damage in areas which have been reduced compared to the areas that have actually been burnt by wildfire. It is important that State Forests' position be emphasised.

A number of my colleagues will go into more details on some of these issues I have raised but I place those preliminary comments on the record. Finally, it is important to recognise that State Forests is a land manager in its own right. It has different objectives to some of the other land managers. It has different geography, different types of forests and vegetation types that it has to manage. That must be taken into account when you look at State Forests' record. State Forests is actually very proud of its fire suppression record, particularly our importance and success in rapid, aggressive initial attack to minimise the number of small fires that can become large fires and our use of aircraft associated with that control.

Hazard reduction, together with a trail network, provides one of the major tools we use to minimise the risk. I think over the years our effectiveness in hazard reduction for fire control across all our

forests has been demonstrated. With those brief words, again I thank you for the opportunity to speak to you. There will be about a minute's presentation from each of the staff, if you agree.

CHAIR: Yes, by all means.

Mr de MAR: I will kick it off. Firstly, to have a look at the fire season and the conditions we are working in, it is certainly true that the weather events that occurred in sequence during the Christmas to mid January period were a severe event, but in terms of assessing whether the fire season was severe or where it fits into some scale of severity you need to look at it in context. Certainly on the North Coast of New South Wales there were areas where we had record drought indices. Our local staff up there, who have been working there for very long periods in some cases, said that it is the worst they have seen up there since 1968. So in terms of the fire season on the North Coast it was a severe season and it was a protracted season. It went right through into January, which was much later than it normally is up there.

Mr E. T. PAGE: This bug was not a forester. The guy who made this comment was not a forester. The forester said that the weather conditions were not terribly out of the normal.

Mr de MAR: We have many foresters who are of the opinion that it was a very severe season on the North Coast.

The Hon. TONY KELLY: Mr Page was referring to somebody the other day who suggested that the fire season was not all that bad. He said it was just a period of five or six days that were extreme every five or six days. So I do not know how long it went on for.

Mr E. T. PAGE: He was a foresters' representative.

Mr de MAR: But he would not have been from the North Coast. The point is that around Sydney, on the South Coast and in other areas the active part of the bushfire season was three weeks long. Conditions were quite mild leading up to Christmas. We had a hell of a time for three weeks there and then with February came very high rainfall and that was pretty much the end of the season.

The Hon. TONY KELLY: So that 21-day period roughly was supposedly some of the worst on record.

Mr de MAR: That was a very severe three weeks but in the context of a fire season the one that really hurts you is when you get that sort of weather over a much longer period and over a broader part of the State. That is why people refer to 1968 as a benchmark, because the conditions were certainly in that sort of category over a much wider proportion of the State and those conditions lasted a lot longer than three weeks. So I guess in context, if you are trying to look at where the season fits into the scheme of things, it was a very severe season on the North Coast but in other parts it was a short season, although severe during the short period that it was active.

It would be useful now to look at some of the facts and figures. For State Forests during the entire fire season we had an area just under 82,000 hectares burnt. During the Christmas period which we are focusing on—the Christmas to mid-January period—the area burnt by fires was about 45,000 hectares; 37 fires started on State forests, burning out a total area of 24,000 hectares; 11 moved off State forests and that area burnt was only 3,000 hectares for the fires that moved off; and we had 11 fires that started off State forests that burnt on to State forests and they burnt out 19,000 hectares, which is 44 per cent of the area that we had burnt out on State forests during the Christmas period.

The Hon. TONY KELLY: Do you know how the fires in your area started?

Mr de MAR: A range of different causes. The leading causes were incendiarism, which was more than half of the fires.

Mr E. T. PAGE: For laymen, that is done by an arsonist.

Mr de MAR: That is right.

Mr E. T. PAGE: We are easily confused here.

CHAIR: I think it might be appropriate if you allowed the presenters to present and leave the questions for later.

Mr de MAR: Despite the worst fire season on the North Coast since 1968, we had only 127 hectares of plantation burnt there, which, given the conditions, was not a bad result. In the pine plantations we had arsonists active out in the Macquarie Region, and we had numerous lightning storms. We are happy to report we had negligible damage in the pine plantation, despite numerous starts. It is useful to have a look at the cost of our operations. We spent $2.5 million on firefighting during the season. But that needs to be contrasted against the amount of effort we went to in terms of prevention and preparedness in terms of our risk management approach. We spent $6.5 million on prevention works and getting prepared for the fire season.

Our expenditure in that regard is instrumental in keeping our costs down at the suppression end. It is a parabolic curve and somewhere there is a point in the middle where you optimise your results and that prevention and preparedness work is instrumental in keeping those suppression costs down. Bob has already covered the risk management approach that we take to our activities, and it is covered in our written submission so I will not go into that in any further detail. What is important though is that in terms of hazard reduction—I know there has been a lot of focus on that—State Forests does not support a thin red line approach to hazard reduction, that is, working only around the urban interface.

We need to do hazard reduction tied into our fire trail systems out in the wider landscape to provide us with opportunities to pull fires up well before they get to the urban interface. We still need to work at the urban interface but it should not be our only line of defence. We need to have other options out in the landscape to control fires when conditions ameliorate. That is our position with respect to hazard reduction and whether we should be working just at the interface or elsewhere in the landscape. A final point is that one thing that honed that for a lot of us in State Forests is that seven of us went to America in 2000 to assist with the very bad fire situation they had there.

America has the world's largest arsenal of firefighting equipment and the biggest fire budget you could imagine. They have been very successful at putting out fires for decades. The result of that success and not using low-intensity prescribed fire in the landscape is that you have very large contiguous areas of heavy fuels. The result of their success is that inevitably they have to get too many ignitions for them to handle so that some of those fires will get beyond the threshold of control and they ended up with the season they had in 2000.

I think the result, and the lesson we came back with, is that if you are very successful in suppression and you do not put fire back into your fire-adapted landscapes the inevitable result would be large conflagration fires that you have to deal with. The Americans have recognised that and they have a $US1 billion program looking at going back to those fire-adapted landscapes to revert them to a condition where they can reintroduce low-intensity fire. Not in our case but certainly in the American case, their forests have become so thick that they cannot put low-intensity fire in there without some mechanical manipulation of the forest to return it to a condition where they can reintroduce fire. I think that serves as a useful background as to what happens if you do not use fire in the broader landscape in a strategic way.

Mr FISHER: I would like to illustrate how State Forests uses some of the principles that Paul has outlined in our fire management program. Our aim is to minimise the area of high-intensity fire that affects the forest estate and through our fuel management program and other fire infrastructure developments to provide for an effective and safe range of options for suppression activities that we will inevitably undertake when fires enter into the forest estate. We manage across the whole landscape of New South Wales so we manage across a whole range of forest types. Therefore a single fire management approach is inappropriate. In some areas the controlled use of fire for fuel reduction is one of the tools that we use.

In some of the more fire sensitive forests—for example the river red gum forests and the Cyprus/Ironbark forests in the western division—we use grazing as a management tool to reduce fine fuels, grass fuels, that occur in those areas. Obviously, the exclusion of fire from pinus radiata

plantations is one of the critical objectives that we have. We have been charged to protect that valuable asset. As Dr Smith indicated, we do that through a range of fairly intensive fire protection measures. We use a thin red line of defence around those assets because that is to protect those specific sites in the landscape. So we would use heavy fuel reduction. We use fire trails and we use mechanical means of slashing, et cetera, to reduce fuels in plantations.

Obviously, that is not an appropriate measure to use in a wider native forest estate. The problem that occurs to us in native forests is not low-intensity fires. Australian forest types are adapted, in many cases, as short interval fire-adapted ecosystems and we can use low-intensity fires to reduce fine fuels across the landscape and by doing so moderate the rate of spread and the intensity of wildfires if they venture into it. In doing so, our concern, with respect to the native forest estate, is not only the economic impacts that a wildfire has upon us but also the biological and social impacts that fire may also have.

Biologically, a wildfire is much more destructive of the forest landscape than low-intensity and cool fuel reduction burn. The impact upon soil of a high-intensity wildfire is quite profound. The reduction in micro-organisms, the ability of the forest to regenerate, the loss of nutrients and, importantly, soil erosion are quite profound in wildfires and our research indicates that that is not the case in the cool fuel reduction burns that we undertake. Therefore in the normal operations that we do for harvesting in protecting water quality and catchment quality in our forest estate, all this would be undermined by allowing high-intensity wildfires to proceed through that landscape at a future date.

We spend millions of dollars on protecting, riparian buffers and stream sites as well as ecologically sensitive areas like rainforests and threatened species habitat. To allow that to burn in one major wildfire event would defeat the purpose of that activity. As we have said, we use grazing in certain areas, mainly in the Western and Riverina regions, and we also use it in northern New South Wales. Northern New South Wales has a tradition of grazing more closely akin to Queensland rather than what you might see in southern New South Wales.

Over time we are trying to modify that grazing regime through the application of fuel management plans with the grazier and his burning which has been an issue on the North Coast for quite sometime. We are also looking at grazing strategies to ensure that we use grazing in an ecologically appropriate manner.

In the early 1970s, State Forests raised questions about the impact of frequent fire on forest structure and biodiversity. Currently we are analysing the results from two long-term frequent fire study sites—in Eden and in the Kendall district—that have been going since the early 1970s. That scientific research work over 30 years looked at scientifically developed sites using burn and no-burn options across a range of similar forest types. We are now gathering the results and last year started to write reports on them which we expect to be published in the next 12 months. The information we get from those research studies feeds back and informs our management and the use of fire. We find from those studies that unlike the popular myth that fuel reduction burning burns 100 per cent of the landscape that it affects. We find that it is not the case at all.

Our aim with fuel reduction burning is to burn a proportion of the landscape during autumn when fuel moisture levels are sufficiently high, and sensitive environments, particularly rainforest gullies, stream sides, buffers et cetera that are sensitive to fire, are not impacted by fuel reduction burning. That allows us to constrain fuel reduction burning in that period of time to the areas that are short-term fire-dependent ecosystems—blackbutt ridges, et cetera. That breaks up the fuels in the landscape and allows an effective suppression effort. Our research demonstrates that this has been quite effective.

The opponents of fuel reduction burning fail to realise the operational difficulty of fighting a wildfire in extreme conditions. The only option or tool that State Forests NSW has available is the manipulation of fuel in the fire triangle. The only responsible action for us to effect a rapid and aggressive first-attack response to fires as they start is if we have easy and safe access to the estate, as we do in State Forests, and we have areas that are fuel reduced that provide safe access and safe points of strategic advantage in the landscape. We see that as an option of where we can send our trained staff in to effect a direct attack on moderate fire days. There is no question that on extreme fire days

we would not attempt a direct attack in heavy fuels. Even in a fuel reduced area on extreme days there is no question that fires would burn through those fuels as well, but the moderating effect of that fuel reduction activity is quite profound and is quite useful in the periods of the day when those extreme fire behaviours wane. We use that through the nightshift to effect further fuel reduction burnings or back-burns, as you have seen, and that provides us with a safe and effective means to control fires on our estate.

Mr CHENEY: Any discussion of the effectiveness of fuel reduction burning has to have a little explanation of the relationship between fuels and fire behaviour, and to define the different factors that we are talking about. In terms of rate of spread, the important fuel factors of those that affect the flame length and the rate of ignition. These include fuel fineness, the bulk density of the fuel bed—which is a combination of the total fuel load and the height of the fuel bed—the continuity or spacing of fuels, particularly if they are clumped as are many natural fuels, and the fraction of dead and green material within the fuel bed.

All of these factors are not independent, they are usually co-related to each other, and apart from fuel fineness everything increases in time as fuels accumulate after burning. They are also difficult to measure numerically and because of that, in the past the fire science convention has been to use fuel load or the available fuel load, that is, the amount of material that actually burns, and define the fuels as those fuels below six millimetres in diameter. But there are problems in that the fuel that actually burns has to be predicted in advance—you do not know until you have had the fire just how much is going to burn because it depends on moisture levels at different levels and the different strata of the fuel. We are currently working towards replacing fuel load with a numerical index which takes in many more factors and which should give better predictions for fire spread.

The next factor to consider is the layering of the fuels, and this actually defines the fuel type. The simplest example is a grass fuel which is a single layer of fuel. The key factors that affect the spread of fire in grasslands are the continuity of the fuel bed, whether it is patchy, and the fraction of green material. Fires will not burn until there is more than 50 per cent dry matter in the grass sward and in grass the fuel load, although it is important in affecting the intensity of the fire, it is relatively unimportant in affecting its rate of spread. In shrublands you are starting to get a slightly more complex fuel; you have a surface layer on the ground of fallen leaf material, often very fine and compact, there is a near surface layer of low shrubs where the litter falls from above are suspended on grasses and shrubs, and the elevated fuels which are the tall shrubs. The rate of spread in this case is primary dependent on the near surface fuels and the elevated fuels. The best predictor variable, which is directly related to fire spread, is the height of the shrubs.

When we get into a dry forest with a tall shrubby understorey we have probably the most complex fuel type you could get because you have a surface litter bed which contains about 60 per cent of the total fuel load; you have a near surface layer of low shrubs, suspended litter and bark within them; you have the shrub layer, depending on the forest type; you have a contribution from the bark and the trees; and eventually if the fire intensity is high enough it will involve the canopy of the trees. The fire spread involves all of those factors. The critical one is really the surface and near-surface fuel layer depths and the continuity and the height of the shrub layers. So if we are considering a fuel reduction program it needs to be targeted to the layer that mostly affects the fire spread.

In some fuel types, say, grass and dense shrubland, any fire intensity is likely to remove all of the fuel within that layer. Within forests you can target to remove layers selectively, depending on the conditions, either the surface fuel layer or include the shrub layer involved with that. If these layers are removed a fire which is burning in heavy fuels coming onto an area that has been fuel reduced will carry its momentum primarily on the bark layer of stringy barks for some distance before it falls out of the canopy and comes to the ground. In our forests the tree canopies are so widely spaced that you cannot support a crown fire in the tree canopy unless it is supported by an intense fire underneath it.

The period that fuel reduction remains effective depends on the rate that the key layer takes to build up to its full potential for that site. In a tall shrub land, which may reach its full potential in something greater than 20 years in terms of the heights of the shrub and the amount of dead material in it, the effect of fuel reduction will persist for up to a period of 20 years in some degree. In recent experiments we found that in tall shrub layers in Western Australia fires in fuels 10 to 15 years old burnt significantly slower than fires in fuels 18 to 20 years old.

Fuel reduction cannot be taken in isolation without an efficient suppression operation. The factors that affect the difficulty of suppression, as John has said, include the speed of the fire but more importantly its rate of development to its potential speed, the total fuel load and the capacity of the fuel to produce spot fires under severe weather conditions, and this depends on the bark type within the forest. The general figure that is used for forest fuels is that fire suppression by any means will generally fail at around 2,500 to 3,000 kilowatts per square metre of fire intensity. That is, basically, a fire which is burning into the tall shrubs and starting to involve the intermediate canopy of the forest and is generally spotting up to 100 metres ahead of the fire. The reason that suppression fails is primarily due to the number of spot fires being produced. That intensity is relatively low, and it is around about 3 per cent of the potential intensity you could get in heavy fuels under very extreme weather.

The complexity of fire behaviour and fuel reduction burning and the necessity for it to be combined with immediate and effective suppression means that land agencies must be financed to do their own protection and their own fuel management. I do not believe that this job can be effectively done by a volunteer service coming to assist agencies because I think that puts far too much onus of responsibility onto the volunteers. It is not that individually they are not capable of learning it but basically the time they have available is insufficient to give them both the experience and practice of doing this task.

Mr DODDS: The evidence I give to this Committee is based on about 30 years of practical experience in forestry and as part of that forest management, the management of fires. I have had quite a large amount of experience in intense fire events starting in 1972 and ending in these Christmas fires which are the subject of this Committee's investigation. I will speak mostly from the perspective of the south coast region where I am currently based and where two of the large fire events occurred over the Christmas period.

I would like to explore some of the things, that from an operational perspective, State Forests puts in place in managing hazard reduction as part of the range of activities that might mitigate against high-intensity fires. Each year on the South Coast State Forests carries out hazard reduction burning and, depending on the weather over the autumn-winter-spring period, the amount of area that we achieve hazard reduction burning over varies. Usually we will attempt a program that varies between, say, 10,000 and 20,000 hectares each year. In dry autumn-winter periods we might actually achieve 20,000 hectares a year. Mostly we achieve less than that and in wet years it might be as low as 5,000 or 6000 hectares.

A proportion of that activity is in reducing the fuel load in areas recently logged. We do that primarily to protect the regenerating stand from the effect of future fire events. A proportion of it is in broad area hazard reduction and a proportion is in hazard reduction activity up against the built asset. We currently manage comparatively little land adjacent to centres of population, primarily as a result of the Government's forestry policies and the objectives to put under represented forest ecosystems into the reserve system. We have some advantages in carrying out these activities. I will hand around copies of a map for Committee members detailing the South Coast region. The map shows the Hylands fire near Nowra and the Deua fire west of Moruya. It also details tenure classes. White tenure is freehold land, grey tenure is national parks and green tenure is State Forests. What is immediately obvious on the map is that State Forests has a much denser roading and trail system than other tenures. This is basically because one of our primary businesses is the production of timber and, of course, you need access in order to remove that from the forest estate.

The other thing I would like to use this map for is to show some of the differences in the sorts of fires State Forests would prefer to fight. The Deua fire, to all intents and purposes, did not impact on private lands. If you have to fight a high-intensity fire there is no better place to fight it than where there are not any people. The Hylands fire, by comparison, invaded the urban stash bushland interface and really high proportions of the resources involved in fighting that fire—manpower, intellectual and equipment resources—necessarily were expended on protecting life and property. In a situation like that comparatively less effort is spent trying to round up the fire, to stop it from extending its boundaries. There is nothing you can do about that; it is just a fact of life.

We have heard a bit of comment this morning on what the weather was like—whether it was good, bad or whatever. I will hand around a trace of the fire danger index taken at two automatic weather stations close to the Deua fire. One is at Braidwood, to the north of the Deua fire, and the other one is at Moruya, which lies to the east. A lot of the difference in attitude that the Committee is hearing about how bad the weather was really depended on where you were. If I had a trace for Eden there would not be any peaks on it. If you had a trace for Tumut there would not be any peaks on it. If you had one for the North Coast there would be peaks all over it, for a longer period. So it would probably be prudent for the Committee to think carefully about those statements that are made by various parties and just ask the question: From what perspective was the answer given?

The other thing I would like to say about hazard reduction from a practitioner's point of view is that hazard reduction gives you a range of options. The range of options available during extreme fire weather are probably pretty irrelevant because most of the effort is spent on trying to save your own life or the lives of other people or community assets. But when the weather does moderate—and those traces show that the weather moderates every night—hazard reduction, if it is part of the landscape where the fire is being fought, gives you options. It gives you a place to start to put in train a containment strategy. If you have very large areas of unmanaged fuels, high fuel levels, the range of options available to fire controllers is much less. The first map I handed out showing the roading and trail patterns obviously would tend to indicate that State Forests has a built asset in our tenure, which means that we have probably more options than the Park Service in terms of seeking control lines. That is a fact of life.

One of the other things that happens during periods of high-intensity fire is that if you do not manage to contain the fire to a small area—that depends on the conditions, but let us say a small area is less than 100 hectares—in the initial attack then almost inevitably the fire grows to the cell in which it exists because you have to go back to somewhere that is already built. In the State Forests' estate the cell size might be 200 or 300 hectares between containment roads. In the Parks' estate the cell size might be 5,000 or 6,000 hectares. The reason for that is that the topography in the two places, by and large, is different. The parks estate is a much more rugged environment and they have fewer places to build roads and trials, and they also have a different set of drivers in terms of their management of their land base.

Mr TORBAY: I was looking for a local example for State Forests. From the reports in the local media in my area the Cunnawanna bushfire was indicated to have started in the Styx River State Forest, which is east of Armidale. I would be interested if somebody could confirm that and perhaps indicate what hazard reduction had been conducted in the Styx over, say, the past eight or ten years.

Mr de MAR: We have been right through our database to try to find a record of the Cunnawanna fire. We have found no record of a Cunnawanna fire. In the area that you refer to there was a fire called the McKenzie Creek fire. We understand that started on private property. It burnt mostly private property. It burned about 300 hectares of State forest and a larger amount of National Park. But primarily it burnt private property. Hazard reduction had been done in the Styx River State Forest, possibly contributing to the small amount of area that was burnt there.

Mr TORBAY: Could we get some details on what hazard reduction was done?

Mr de MAR: Yes.

Mr E. T. PAGE: In the submission from the Institute of Foresters it was stated that many roads, tracks, bridges and culverts have been closed or allowed to deteriorate on the National Parks and Wildlife Service estate. Can you confirm from your view that the State Forests north-east regional manager has stated publicly in a meeting attended by other fire authorities in New South Wales that State Forests will not be spending money on roads not required for timber haulage? In the Serendipity fire debrief the issue was raised about roads leading to a fire through State forests being not maintained and hard to traverse. National Parks has been given fire trails in the regional forest land transfer agreement in very poor condition.

Mr SMITH: Fire trails are maintained strategically within State forests. Not every fire trail is maintained. I have no doubt that some of the fire trails and bridges handed over to National Parks were not in top condition. That is exactly the same as across State forests. The maintenance,

particularly bridges, is associated with a logging regime. But in terms of actually closing trails within National Parks, that is an issue for national parks, not for State Forests. In addition, State Forests spent about $3 million last year on fire trail maintenance. So there is certainly no official policy of spending money only on non-fire trails.

The Hon. RICK COLLESS: I would like to pursue the issue of the fire danger index that Mr Dodds spoke about. Can you tell us the time frame between the readings? How often during the day are these readings taken?

Mr DODDS: The readings come from Bureau of Meteorology automatic weather stations. Each of the dots on the trace represents one calculation of fire danger index.

The Hon. TONY KELLY: It looks like hourly.

Mr DODDS: I do not know the exact answer to your question, Mr Colless.

The Hon. RICK COLLESS: What I am getting at is that these peaks that are there are very narrow in time. If they are hourly readings that fire danger index level might exist for only a couple of hours during the day. Would that be a fair comment?

Mr DODDS: That is a fair comment. They are a pretty torrid couple of hours, though.

The Hon. RICK COLLESS: I can understand that.

Mr DODDS: Bob has just asked me to make a comment about what the fire danger index means. The point on the graph representing extreme fire danger index lies above the level of 50. Very high fire danger index lies above the trace at 25. I think 10 is low and between 10 and 25 is high. Hazard reduction activities in winter occur at a fire danger index of less than 10. The critical thing about the traces and what you might or might not be able to do in terms of control strategy on a going fire is based on how quickly you can get your resources to a particular piece of fire edge and what equipment you can put in place. In the case of these two traces, the eastern side of the Deua fire was subject to less dangerous weather conditions, and consequently fire danger index, than the western edge. It was drier on the western edge and that is reflected in the difficulty of containment.

Much of the eastern side of the fire line was held on the initial control line. Much of the western end continued to jump control lines.

The Hon. RICK COLLESS: Table four on page 22 of your submission refers to the fire danger rating.

Mr de MAR: It is the same as the index.

The Hon. RICK COLLESS: Is it the same numbers as the index?

Mr de MAR: It is based on an index, which is a numerical scale of one to 100, and a rating groups them.

The Hon. RICK COLLESS: We received evidence on Friday in a document prepared by the Bushfire Council of New South Wales entitled "Officer Training Module No. CL4". Figure 20 in that document talks about the fire danger index, the fuel quantity and the type of fire behaviour that we could expect. It suggests that at fuel levels of 10 tonnes per hectare and below, even at the extreme fire danger indices, the fire will not crown. Do you have any comments in that regard? I am looking for the critical fuel level at different fire danger indices when the fire will get into the crown and basically become a wildfire.

Mr CHENEY: That is a general statement for a tall forest, probably with not a lot of stringy barks. Whether the fire will burn into the crown depends not only on the fuel load but also the amount of shrub component, the condition of the bark on the trees and the total height of the trees. In forests that are 10 metres high—which might be the height in quite a bit of the sandstone country—the fire

will come into the crowns quicker than in a tall forest that is 50 metres or so high. You have a bigger gap within which to manage the fuel. These are very broad guidelines put out at those times and we are trying to become more specific in tailoring that sort of suppression guideline to different fuel loads.

The Hon. RICK COLLESS: In terms of the index, particularly at Moruya but also at Braidwood there was only one day in the extreme category. I admit that there were many days when it was very close.

Mr DODDS: It does not really matter whether it is 49 or 51. If you have heavy fuels, difficult topography and a wind pushing the fire uphill, it gets pretty exciting. You may have a fire index of only 25. The major significance of those graphs, first, is to indicate how bad it was depending on where you were. Secondly, when you have extended periods—two or three days—between peaks you are much more likely to have a successful containment strategy than if you have cycling every 24 hours. The point about the Braidwood graph is that it was a really difficult place to contain that fire because no sooner did you have the resources there—you must remember that it sometimes took three or four hours to drive there—and people started on the work then you started losing it because the fire danger started to increase.

The Hon. TONY KELLY: Mr Smith, you state in the submission that you would like to see the fire danger period brought forward one month to 1 September. Can you explain some of the reasons for that suggestion?

Mr SMITH: One of the issues on the North Coast is that the normal fire season starts on 1 October but many people use the period between July and October to burn without a permit. If we brought the fire season forward they could still undertake burning activities but they would have to get a permit. So we would have much more management of it and it would stop basically what I would call opportunistic burning of fires in that part of the State.

The Hon. TONY KELLY: Should the period be different in different parts of the State? Should we regionalise it?

Mr SMITH: It could be. Paul has done a fair bit of work on the subject and has some ideas that he might want to convey to the Committee.

Mr de MAR: At the moment, because the bushfire danger period starts on 1 October, that suits the south of the State pretty well but it does not suit the north where we have summer rainfall. Until recently local government made decisions as to whether it would bring forward or put back the start or end of the bushfire danger period. For example, in the past year it was as green as anything at Eden—even the Monaro was pretty green—and people wondered why the bushfire danger period was starting when it was so green. In that situation you could have flexibility to put back the bushfire danger period. It is difficult on the North Coast because you must line up so many areas to bring the bushfire danger period forward. That is where it has been difficult to manage.

One of the major reasons why we had fewer fires on the North Coast this year in our opinion is that the delegation was given to the Rural Fire Service. In the past we had to negotiate with a number of councils to get the bushfire danger period brought forward but this particular season a relatively quick decision was made to bring it forward. We knew where the fires were because the permit system was in place and there was much less indiscriminate burning. So there was less loose fire in the landscape when the bad conditions hit in October, which certainly in my mind reduced the amount of fire damage on the North Coast.

The Hon. TONY KELLY: So in that case it is probably better for the State Bushfire Management Committee to declare it for the whole State or regionally?

Mr SMITH: We fully support that, yes.

The Hon. JOHN TINGLE: I refer to page 15 of your submission and the evidence given by Mr de Mar. The second paragraph states: "A significant proportion, 44 per cent, of State Forests area burnt during the emergency period was the result of fires burning into State Forests from other land

tenures, many burning on wide fronts at uncontrollable intensities at the time they entered State forests. During the period there were 11 fires that burnt onto State forests from other land tenures, burning out an area of 19,730 hectares." What were those other land tenures? Was there a predominant land tenure?

Mr de MAR: Of the 19,730 hectares?

The Hon. JOHN TINGLE: Yes, the 11 fires.

Mr de MAR: Two of the 11 fires, or three-quarters of that 19,000 hectares, was in the South Coast region and were the two fires that Mr Dodds referred to: the Hyland's and the Deua fires. The other nine fires and some 4,000 or 5,000 hectares were distributed mainly through the northern part of the State and were a combination of private property and national park tenures.

The Hon. JOHN TINGLE: I refer that question to Mr Dodds. Looking at the map, it appears to me that any fire that intrudes onto State Forests' land probably came from the national park. The national park seems to surround the State Forests' areas involved in those fires.

Mr DODDS: That is so in that landscape. I add that in many cases before they got to the national park estate the fires crossed somebody else's land. When you get these really big fire events—I think the Hylands fire was about 97,000 hectares—that run in a series of bad weather peaks, the fire does not respect what tenure it is crossing: it just keeps going until it reaches the great eastern fire break.

The Hon. JOHN TINGLE: I understand that. I guess my point is whether there is commonality of origin, but obviously I am on the wrong track.

Mr E. T. PAGE: They were not all from Coffs Harbour.

The Hon. JOHN TINGLE: Returning to fire hazard reduction, Mr Smith, you stress in the letter accompanying the submission—which I refer you to even though I suppose it is not technically part of your submission—the unequivocal opinion and experience of State Forests as land managers that properly planned and implemented hazard reduction burning programs are effective in reducing the number of fires that start, reducing the rate at which they spread and reducing their intensity and spotting potential. This brings us back to what I believe is the most vexed question of this inquiry: How much is enough? We have heard evidence that State Forests, for instance, hazard reduced 4 per cent of its tenure area and National Parks reduced about 1 per cent. It has been suggested that the figure should be 7 per cent. You speak about properly planned and implemented hazard reduction, but how do you know how much you have to do? Can you be sure that you have done the right amount?

Mr SMITH: In terms of whether it is enough, I do not think you know until after the event. State Forests' approach is risk management: we try to assess the full risk of the assets that we have to protect and do hazard reduction to ensure that that occurs. As Mr Dodds said, sometimes we can do more and sometimes we can do less. But over a 10-year period when we have gone through the full weather cycle, we would expect to be able to hazard reduce all the areas with a moderate risk fire potential, particularly our plantation assets. In terms of whether it is successful, we do after-burn monitoring to ensure that the hazard reduction activity that we have undertaken—whether it is slashing or hazard reduction—met the objectives of that particular plan. There is follow-up to ensure that. If it is not successful, we do it again in many cases.

The Hon. JOHN TINGLE: In many cases you would simply be working on what was hopefully your best guesstimate and, to some extent, trial and error because you do not know until you have done it.

Mr SMITH: No, but there is pre-planning. A lot of the work is assessing the risk of particular fuel loads and of particular geography to the assets that we must protect. There is a strategic approach to undertaking an activity that maximises our ability to manage a wildfire if it comes from that direction.

The Hon. JOHN TINGLE: On page 19 of your submission you make what I believe is an extremely interesting and important point. You talk about opposition to hazard reduction and say that "A lack of understanding amongst organised communities has led to unjustified misgivings and opposition to the practice. It is crucially important that this opposition is mollified and that determined and sustained efforts are made to improve community awareness of the objectives and effectiveness of hazard reduction burning." I think we have all come to that conclusion during this inquiry. How do we do that? How do we change people's minds about it, given the major campaign waged against it by some conservation interests?

Mr SMITH: The opportunities offered by the increased public awareness as a result of the fires at Christmas should not be lost. A campaign should be launched immediately to follow that up. The number of people wanting to participate in community fire services in the area where I live in, Hornsby, and the Sydney area is a very positive sign, which should receive full support. I think a lot of the science must be brought down to a level that people can understand. Basically, hazard reduction is a trade-off: it impacts on natural ecology but, compared with what can happen with wildfires, that impact is minor. It is a sell, sell, sell campaign if that is what people want. I have observed a much better understanding in the rural community than in the urban community of the pluses and minuses of hazard reduction.

The Hon. TONY KELLY: It is more difficult than that, Bob. As you said initially, what you do is totally different from what National Parks does—for a number of reasons that you have explained today. You have to sell that difference as well, do you not?

Mr SMITH: Yes, and I do not underestimate the difficulties. However, I think public awareness of the fires at Christmas presents an opportunity to build on that and come up with an approach that is much more acceptable to the broader community. At present there is too much adversity, stymieing proper strategic planning.

The Hon. JOHN TINGLE: Given the shortness of public memory—we must deal with that problem all the time—do we have to get across to people the fact that the consequences of not doing hazard reduction are much worse than the consequences of doing it? People seem to worry about hazard reduction burning because it might damage the ecology, but a wildfire will often do even more damage, will it not?

Mr SMITH: Very much so. This is the point brought out by Mr Fisher: there is a perception in the general community that it is basically a 100 per cent reduction. It is not. It is only 30 to 40 per cent. That is why I return to the theme of ensuring people understand what is occurring on the ground and the consequences of that. It is a difficult message to sell, but the consequences of not selling it will be a revisiting of the Christmas bushfires in perhaps three or four years time.

Mr CHENEY: It has to be promoted that fire is an ecological process; it is not all bad. A fire regime of burning every two years to maintain natural grasses—which is probably the rarest community in Australia at the moment—is just as important as a regime of long-unburnt forests. It really has to be positive in saying: This is the process that is going to happen, it is the only real process we can manage in terms of the ecology, and we should be doing it to get the spatial balance that suits the needs of our reserves, parks and State forests.

Mr E. T. PAGE: A disturbing reference in your submission was to arson activity. Is your authority or any other fire authority that you know of taking some positive action to try to overcome this difficulty? I might say, leading up to my view of what the answer should cover, most of these activities impinge upon non-metropolitan areas—areas where people's activities are generally known by the community. It seems to me to be somewhat anomalous that arsonists are not able to be identified by the community in which they live. It seems to me that authorities like yours should be able to tap into that knowledge, on the basis, "It is your house that will be burned down if this bloke down the street keeps lighting fires. So it is your interest personally to make sure we get together to stop him."

Mr SMITH: If I could give a couple of examples, Mr Dodds might expand on those. We have a very active neighbourhood campaign regarding arsonists. Two examples in recent years demonstrate that. In one forest around Lithgow we had a continuing problem with a local arsonist,

who had a propensity to go out and light the place up about every two weeks. We knew who it was, and the police knew who it was, but that was handled by the police having a quiet word to him, and he was not charged. But the fires have stopped.

Over Christmas, at Shooters Hill Road an arsonist started a fire in a second rotation slash area. If that fire had got away, it would have been very difficult to control. This person was suspected for some time as being an arsonist. He drove a particular type of Torana that is fairly unusual these days, so he was able to be picked up, and a all of a sudden those fires stopped. So there is a neighbourhood campaign. There are a number of incidents on the North Coast that I could point to. But getting any kind of conviction is very, very difficult, unless the person is actually seen lighting the fire.

Mr DODDS: My example is very similar to the ones that Bob gave. A member of one of the brigades on the South Coast was a pretty lonely sort of a fellow, and he got his jollies from going out with the blokes. This was immensely frustrating. His activities went on for about three or four years. We knew who the fellow was, as did the police and brigade members. Eventually, this fellow lost his licence and went lighting fires on a pushbike, so we caught him out. But he had been active for about three years and had lit maybe 30 to 40 fires. He was smart enough not to light them on really bad days. But we were immensely frustrated. We spent tens of thousands of dollars putting out those fires. He was eventually caught, got a bond and counselling, and he stopped doing it.

The Hon. TONY KELLY: What are the penalties for those who are caught?

Mr DODDS: I do not know what the legal penalties are but, as Bob suggested, catching the arsonist in the act is very difficult. In this case we caught him on his pushbike not far from the scene, and he made an admission to the police. But he got a bond.

The Hon. TONY KELLY: It was like a first offender's penalty.

Mr DODDS: He did not get a custodial sentence and he did not get fined.

The Hon. TONY KELLY: Do you have any recommendations to make to the Committee in that regard?

Mr DODDS: From my perspective, the objective was to stop him from continuing to light fires, and the action taken by the justice system achieved that.

The Hon. TONY KELLY: But perhaps an example needs to be made of some people who do this to deter other people from committing these offence.

Mr DODDS: There was plenty of that in the papers as a result of the Christmas bushfires. But in really bad weather conditions and when fire danger indices are high, I think the community has a different attitude to the one it would have in relatively mild conditions. But you should not dismiss how frustrating it is. We know who it is but it just goes on and on, year after year. He was amongst the bunch of people who turned up to put the fires out.

Mr de Mar: It is worth noting that, while we have heard about how much arson there was, there was a tremendous response from the police this year. They worked very closely with us. I am aware they worked very closely with other agencies. They were involved in some of the incidents that have already been talked about, and they were involved on the North Coast. Even in things like patrolling commonly-used recreation areas, they were patrolling with the fire authorities. I think a lot of fires were prevented through those actions. We got a tremendous response from the police, and we would be looking to continue that good working relationship in future years.

Mr TORBAY: I would like to focus on fire management in areas set aside for conservation. The Committee has heard some evidence on differences between agencies, particularly your agency and National Parks. What are some of the major differences, and how can we have a whole-of-government approach on corrective action that is necessary?

Mr SMITH: As Steve said, National Parks now has a completely different estate to that of State Forests, and probably a different clientele. We do not have, in the main, the urban-rural interface that National Parks has to address, and that brings its own tensions and requirements. Overall, there is very good co-operation between the firefighting agencies, particularly at the regional level, where there are strategic hazard reduction and fuel management plans that have been put together. In the main, they are implemented. So, at the regional level, there is very good co-ordination. I think the only issue with State Forests is that in certain parts of the State where we have high-value assets on the ground, we undertake activities a bit more intensively than is required to protect other assets. Again, it is horses for courses. But I would like to leave the Committee with the message that at the co-ordination level, at central agency level and at the rural level there is very good co-ordination.

The Hon. RICK COLLESS: Gentlemen, on page 32 of your submission is a quote from Christianson regarding the change in the fire regime following the arrival of the Aboriginal people in Australia and how that changed again when Europeans arrived in Australia. Mr Cheney is also quoted. Perhaps Mr Cheney could expand on some of his statements, particularly in relation to his statement that the pattern of fire that the Aboriginals had established here changed substantially once the Europeans arrived in Australia.

Mr CHENEY: Yes, it did. I think the evidence from most parts of Australia now is that Aboriginal burning was frequent, and the conclusion of most scholars who have looked into Aboriginal history is that they burnt to protect themselves, because they recognised that, in a grassy environment if they did not break up the fuels, in the sort of weather we experienced this summer vast areas would be burnt, particularly in desert areas where those conditions come up only every 20 years or so. In Central Australia, they would start burning after heavy rains, as soon as the first ridges would dry out. After about three years they had established a patchwork all over the country, so that when the bad weather came and everything was dry there were refuges for themselves and the animals that they were hunting. The oral histories are not so great for southern Australia, but most scholars believe it was exactly the same pattern: that, when you look at the summer conditions and how far fires can spread without any suppression capacity of all, they probably applied exactly the same technique.

When European settlers arrived, all the journal comments were of open forests and extensive grasslands. Cook's description of Sydney sandstone areas was of "more lands like the moorlands at home." The only way to conjure that is to picture an area that had been burnt probably every two to three years. Eric Rowles described very vividly the thickening of the Pilliga Scrub. Early explorers who came in on the transition to Aboriginal burning ceasing all reported on a dense thickening of the scrub. This is continuing today in areas where grazier burning, on leasehold land in particular, is being withdrawn.

The Hon. RICK COLLESS: In your view, which really is the true natural ecosystem that exists in Australia? Is it the regime that the Aboriginals imposed, is it the pre-Aboriginal regime, or is it the post-Aboriginal regime? Which regime ecologically should we be looking at to maintain our forests?

Mr CHENEY: Ecologically, there is no real point in looking back. I really do not think we could say we want to burn everything and convert much of our forests to open, grassy woodland, which much of it was. But, again, I think we have to recognise that there is a place for open, grassy forests in the total picture. The balance for ecological management I believe is getting the right proportions of different ages after fire and maintaining those across the landscape to suit as many of the environmental benefits as possible. It is a truism that you cannot have everything on the same piece of land. As I said earlier, an area for flora and fauna that requires burning every couple of years in many people's minds is just as important as areas which are long unburnt and hold different flora and fauna.

The Hon. RICK COLLESS: In the document you say that as the fire frequency decreased the resultant fuel buildup meant that the fire intensity increased, culminating in the horrendous fires in the 1930s up to the 1960s, when a policy of controlled or prescribed burning was introduced. Are we now moving back to the 1930s with the processes and policies that are being put in place?

Mr CHENEY: If we do not keep maintaining fire in the environment, yes we will, because we will end up with extensive areas of heavy fuel. As Paul said, under conditions of heavy fuels and

bad weather, even the most advanced country in the world could not put them out—even with his help! Fuel management is a key, along with rapid early attack and suppression, and the infrastructure needed for that.

Mr TORBAY: The Institute of Foresters' submission claims that the transfer of areas from State Forests to the National Parks and Wildlife Service has reduced firefighting numbers and skills in State Forests, but that the National Parks and Wildlife Service has not yet obtained sufficient firefighting experience to manage these areas. Is this a view held by State Forests?

Mr SMITH: Not at all. State Forests is not the IFA. It is important to note that the decision as to how land is managed is basically an issue for the government of the day. The downsizing in State Forests has very little to do with the transfer of land; it has more to do with productivity and different ways of doing business.

Mr E. T. PAGE: In its submission the Institute of Foresters makes the point that there appeared to be occasions of a reluctance to deploy back-burning operations because of an overestimated perceived field risk to firefighters. Do you believe that firefighters should be subjected to further risk by being required to do back-burning and fight fires?

Mr SMITH: Not at all. Mr Dodds could probably give you practical experience of what State Forests policy is on the ground.

Mr DODDS: State Forests' view is that if you have fuels modified in the landscape, the recent hazard reduction burns or some other mechanical means of reducing fire intensity during wildfires, that is an inherently safer place to be than heavy fuels. I will hand around a photograph showing Bull's Ground, near Taree, which shows a hazard reduction plot on the left-hand side compared with long, unburned fuels on the right-hand side—just to give you a visual idea of where you, as an individual, might care to be on a bad day. From State Forests' perspective, firefighter safety, whether they be our employees or other people that come onto our estate to control fire, is paramount.

Mr E. T. PAGE: That is what I believe. But I did not get that impression from the submission from the Institute of Foresters.

Mr DODDS: I think you need to go back to the Institute of Foresters, if that is the case.

Mr E. T. PAGE: I asked them. They did not seem to think that there was anything wrong with the statement. I think the last thing that responsible fire supervisors would be doing is to put the firefighters who are trying to address the problem further at risk.

Mr DODDS: I think State Forests position is that if you have hazard reduction as one of the tools to modify fuels in the landscape, it is an inherently safer place for firefighters to be.

Mr de MAR: Hazard reduction is one of the tools, and good training and experience of your crews to be able to use fire is another tool to reduce the safety risks to those people.

Mr E. T. PAGE: And a proper management assessment of the risks involved, so that you know what your firefighters are going to face?

Mr de MAR: Absolutely.

CHAIR: Mr Smith, with the transfer of State forest areas to the National Parks and Wildlife Service over the last several years, could you give the Committee, if not today certainly on notice, an idea of how much of the area that was handed over had in fact been fire-reduced over the previous five years? Could you also advise what was the state of the access fire trails?

There has been some comment that fire trails were poorly maintained, but it seems no-one could identify to the Committee which were the fire trails or where they were. It was a general statement. We have heard a lot of interesting evidence about what people think, but it would be nice to get some factual evidence if we could.

Also, once an area has been logged, what fire protection action do you take with respect to that logged area within the subsequent one or two years?

Mr SMITH: We normally post-log burn, to reduce the fire hazard to allow regeneration to be protected. Over a period of time, we normally do it only once, unless it is part of a strategic burning program. It might then be burnt again as a normal hazard-reduction activity. Mr Dodds has some information on the South Coast region.

Mr DODDS: This is an indication of the South Coast region, the area I am responsible for. I have a map, together with an attached table, showing the areas of the new National Parks estate which were hazard reduced by State Forests in the period immediately beforehand. In the South Coast, it is an area of nearly 7,000 hectares. I do not have further details on other areas.

CHAIR: Would you please take that on notice? It would be very interesting for the Committee to review that when putting the report together.

The Hon. TONY KELLY: You said that when an area has been logged, you then come in and burn the rubble. Do you have the figures on that?

Mr SMITH: About 40 per cent of the burning we are doing is associated with post-logging burning.

CHAIR: My attention has been drawn to the larger-scale maps. Are there any particular items of immediate interest to the Committee that you would like to highlight?

Mr DODDS: This a map shows an area of Eden management area, on the border. I have a hand-out map which can go round to Committee members. It details a very large fire that came out of Victoria in 1983, a fire called the Cann River fire, or Combienbar fire. It burned about 150,000 in Victoria and came towards the border on a very extreme day with southwesterly winds, one of these over 50 fire danger index days. It came into New South Wales on a front of about 40 kilometres wide—the worst possible scenario you could imagine.

The fire hit a large area of fuel reduction which had been carried out as a result of an early-season wildfire in 1980, three years before. It had the effect of splitting that 40-kilometre front into two pieces. The western end, which came over the border first, did considerable damage to the pine plantations. The eastern end burnt into Eden district, where I was at the time. But by the following day, both of those fires were rounded up—in other words, they had containment lines—by 4.00 p.m. the following day.

Had the fire approached us over its full extent—in other words, had it not been split—we would have been fighting it up here, somewhere closer to Batemans Bay. So three years worth of fuel reduction had a significant effect. In fact, no-one even looked at this piece of country in here. It just absorbed all the short-distance spots that Mr Cheney was talking about, and the fire did not proceed to the north as far as it might otherwise have done.

(The witnesses withdrew)

(Short adjournment)

PHILIP CHRISTIAN KOPERBERG, Commissioner, New South Wales Rural Fire Service, 8 Linksview Road, Springview, on former oath:

CHAIR: Would you care to make an opening statement?

Mr KOPERBERG: Thank you. I would like to make a couple of observations. Since the commencement of this inquiry there has been some suggestion, both in the media and elsewhere, that the Rural Fire Service in general, and its commissioner in particular, harbour some doubts as to the

value of hazard reduction in determining fire management outcomes. Let me say quite clearly that neither the Rural Fire Service nor its commissioner harbours any such doubts. We recognise that hazard reduction is a key element in effective fire management and influences fire behaviour to a very large degree.

There are, however, circumstances, particularly meteorological, which have the capacity to negate in all circumstances the effect of hazard reduction. Such is our concern about hazard reduction—or such is my concern particularly—that in August of 2001 I commissioned an audit of hazard reduction throughout this State to determine whether or not the perceptions of a decrease in hazard reduction were, in fact, a reality. It was an interesting process which, in part, has led to the introduction by the Government of legislation to streamline the entire process. There were certainly perceptions amongst the practitioners that it was difficult, that it was onerous and that it was cumbersome. These were perceptions, when tested, it was often conceded that, yes, they were not impediments but they were onerous in terms of meeting accountabilities and so forth.

I want to say to the inquiry that we, the Rural Fire Service and its commissioner unequivocally are committed to the value of hazard reduction, and that is manifest in quite practical terms through things such as the audit and the recommendations to the Government on how the system might be streamlined, which is the subject of legislation currently before the Parliament. The other observations I would like to make is that this part of the world, as I have said earlier, will sustain fire as it always has done for millions of years. It is an invariable consequence that those who manage the most lands or manage those lands where fire occurs are going to incur the greatest losses in terms of their estate. To give an example of this: over the last 32 years covering some seven major fire seasons State Forests, for argument's sake, has lost 1.557 million hectares to fire or had 1.55 million hectares of their estate burnt by wildfire and the National Parks and Wildlife Service have had 1.170 million hectares of their estate burnt over the identical period.

That does nothing more than to demonstrate that if you happen to manage a patch of land on which fire occurs under extreme conditions or very high to extreme conditions, you are going to lose a percentage of it and neither loss is significantly more or less than the other. That is the point I am trying to demonstrate. It is a reality of life. Notwithstanding the undeniable value of hazard reduction, particularly prescribed burning, in determining fire behaviour and, as a consequence, the ability to suppress fire, the reality is also that under certain conditions the effects are somewhat negated.

For argument's sake, in the Sydney Basin where the majority of losses occur—not all of them but the majority of losses—fuel will accumulate in about five years to about eight tonnes per hectare if there is no intervention. That is the nature of the fuel, the topography, the climate and so forth. Now, eight tonnes per hectare will produce fire intensity of round about 7,500 kilowatts per metre. That means it is not always capable of being readily suppressed. It is certainly not capable of being suppressed by direct attack where there are firefighters on the fire line attempting to apply water. There are other means such as parallel attack, which means burning from a predetermined control line, aerial firefighting, so forth and so on.

But under those circumstances in extreme weather conditions, crowning will occur. That means fire will go through the crowns of the trees; spotting will occur well ahead of the fire and, of course, the fire will make major runs under those sorts of circumstances. I am only talking about fuels in the order of between three and five tonnes per hectare, which will accumulate in the space of a mere five years in the type of vegetation we have around the Sydney Basin.

In examining the transcripts and reading the media reports I note that the meteorological conditions which prevailed over the period of this campaign and the extent to which they caused firefighters major difficulties, have had some doubts cast upon them. I did a random sampling of weather over that period based at the Richmond Meteorological Station and I would simply like to report a few facts rather than alternate notions.

On Christmas Eve, 24 December the temperature at Richmond was 36 degrees, the relative humidity was 11 per cent, the winds blew for most of the day between 35 and 50 and the fire danger was extreme; on Christmas Day, 25 December, the temperature was 36 degrees, the relative humidity was 10 per cent, the winds blew between 40 and 60 for most of the day and the fire danger was extreme; on 29 December the temperature was 39 degrees, the relative humidity had dropped to 9 per

cent, the winds blew between 25 and 40 and the fire danger was extreme; on 30 December the temperature was 37 degrees, the relative humidity was 10 per cent, the winds blew between 25 and 40 all day and the fire danger was extreme; and on 31 December the temperature was 36 degrees, the relative humidity was 11 per cent, the winds blew between 40 and 65 all day and the fire danger was extreme.

On 1 January, 33 degrees, 10 per cent humidity, winds 60 kilometres an hour, fire danger extreme. On 2 January, 35 degrees, 9 per cent humidity, winds between 40 and 60 kilometres an hour all day, fire danger extreme. The relative humidity in the Sydney Basin dropped to a record low of 7 per cent during that period. There is no doubt that the weather conditions during this campaign were a major influencing factor on the fire behaviour and in some cases relatively young fuel burnt with an intensity which made direct attack by firefighters an almost impossibility and in fact would have exposed them to significant danger.

Mr E. T. PAGE: I do not know whether you went through the submission made by the Institute of Foresters of Australia, where on page 8 the statement was made:

> There appear to be occasions of reluctance to deploy back-burning operations … because of an overestimated perceived field risk to firefighters.

In other words, they are saying you were not gung ho enough; the safety of firefighters impinged upon the efficiency of carrying out fire reduction. Do you agree with that?

Mr KOPERBERG: We certainly put firefighters' lives ahead of successful fire suppression outcomes.

Mr E. T. PAGE: I am glad you said that.

Mr KOPERBERG: Mind you, if it is someone's view that we should occasionally sacrifice a few firefighters, they better find themselves another commissioner. In recent studies by the CSIRO and Phil Cheney in particular during the conduct of Project Vesta in Western Australia, it was found that the criteria which has been in use for more than 30 years to determine fire behaviour in certain fuel and weather conditions was conservative by a factor of perhaps two or three. In other words, fire behaved in a far more severe fashion than was originally thought in a range of circumstances. I know it has been suggested to the Committee that the results of this research were not shared with our brigades—I think that was in evidence to the Committee last Friday.

I just point out that when the results of this critical information became available, because it did have an impact on firefighters' safety, all districts were notified on 8 February 2000 of the results of this particular research within Project Vesta. It included a circular alerting them to the fact that fire behaviour was not in all cases as it was thought to be using conventional criteria, and enclosing the results of Project Vesta. Back-burning, which is a major technique in the suppression of fire, is used judiciously with firefighter safety always being the overriding element.

CHAIR: Would you like to have that document included in your evidence?

Mr KOPERBERG: Yes, thank you.

The Hon. RICK COLLESS: You just made the statement a minute ago that eight tonnes per hectare of fuel would burn at an intensity of 7,500 kilowatts per metre. Is that correct?

Mr KOPERBERG: To be precise, 7,632, producing a flame height of some 16 metres.

The Hon. RICK COLLESS: Sixteen metres flame height.

Mr KOPERBERG: That is in the worst case scenario, of course, extreme fire danger. That is not generally the case.

The Hon. RICK COLLESS: In your training manuals there is a statement that the fuel load of 7.5 tonnes per hectare could expect a fire intensity of 300 kilowatts per metre.

Mr KOPERBERG: Quite so.

The Hon. RICK COLLESS: Fifteen tonnes, 1,300; 30 tonnes per hectare, 5,200 kilowatts per metre. There is quite a discrepancy between the statement you just made and what is in your training manuals.

Mr KOPERBERG: I do not have the material before me but the point I have just made to the Committee—

The Hon. RICK COLLESS: It is out under your name, the Rural Fire Service name.

Mr KOPERBERG: I did not say I was not aware of it; I said I did not have it with me. It is not in front of me, and it may surprise you to know that I cannot recite every word out of our training material. As I have just explained to the Committee, as research indicates changing fire behavioural patterns or whatever the case may be, as it was in this case, the advice went immediately to the brigades that the criteria previously used to determine a range of fire behaviour was no longer appropriate. That advice went out in the circular of 8 February, as I recall. I will examine the training material to see what, if any, discrepancies exist.

The Hon. RICK COLLESS: In figure 20 in another manual, which talks about the fire danger index and the fuel quantity, 10 tonnes per hectare to a fire danger index of 50 was likely to bring a flame height of 8.5 metres, and at a fire danger index of 100, 14 metres. There are many discrepancies in these, is there not?

Mr KOPERBERG: I reiterate: The results of research by Project Vesta indicate quite clearly that fire behaviour characteristics as determined by criteria which have been in use for some 30 or 40 years, on which the training material is based—that training material was printed before the results of Project Vesta could be acted upon. As an interim advice to all our districts, we indicated that the fire behaviour characteristics could be understated by a factor of two or three. We have now reviewed and revised the training material in the light of that research. The research is ongoing. In another six months we might find out something else and have to re-do it again but the advice did go out as a warning, if you like.

The Hon. RICK COLLESS: After the fires?

Mr KOPERBERG: No, after the Project Vesta results were made known. I think that circular is dated February 2000, which was before the fires.

The Hon. RICK COLLESS: We heard from members of the Kurrajong and Yaramundi brigades on Friday, and they made some statements regarding the effectiveness of hazard reduction in controlling even the fires that they had up there during the bad period.

They said that in areas that had been burnt as long as four years ago it brought the fire down out of the crown and they could control it temporarily, probably until the next day. What do you say about those statements?

Mr KOPERBERG: They are perfectly correct because on the days when that fire behaviour modified itself considerably the fire danger index was only 22, as opposed to being in the 70s where it had been, and the wind was blowing at seven kilometres per hour from the east. In other words, the fire was burning against the wind and you would expect some considerable modification in fire behaviour, would you not?

The Hon. RICK COLLESS: Are you aware of the block into which this fire went on the day they were talking about?

Mr KOPERBERG: Yes, I am. As I said at the outset, no-one needs to convince us of the impact of fuel levels on fire behaviour. It may have been you, Mr Colless, who said when I appeared before this inquiry that you had seen ploughed paddocks burned?

The Hon. RICK COLLESS: Correct.

Mr KOPERBERG: One would see those burn under extreme conditions and there can be nothing more hazard reduced, I should expect, than a ploughed paddock. On this occasion fuels were lighter, fire behaviour did become more benign but that benign fire behaviour was aided and abetted as well by the fact that the weather conditions were significantly better than on the occasions when the fire behaved in a far more severe fashion. The weather records for the Grahams Creeks fire are here. The temperature was 27.5 degrees, the relative humidity was up 22.4 per cent and the wind on average blew at seven kilometres per hour from the east which was to the opposite direction in which the fire had been travelling. So there were two factors responsible for that significantly improved fire behaviour: one, lighter fuels/younger fuels and, second, much improved weather.

The Hon. RICK COLLESS: When were the bushfire management committees appointed?

Mr KOPERBERG: The committees are a product of legislation which goes back to the 1970s. They are the successors of things we used to call bushfire prevention associations prior to that. It has been an evolving system designed to engage local communities and fire managers in the entire gamut of fire management. Committees continue to be formed and continue to be amalgamated with other committees as circumstances dictate. They have two principal tasks on behalf of the Bushfire Co-ordinating Committee, that also being a product of the 1970 legislation. Their two principal tasks are to prepare bushfire risk management plans and they do so at the behest of all of the land management agencies, including local government, to ensure as far as practicable that those plans are to be put into effect. Plans are exhibited for public comment and ultimately approved by the Bushfire Co-Ordinating Committee.

The second of their major tasks is to prepare operational plans to determine if fire occurs in particular areas who shall principally be responsible for the suppression effort, who should be recommended to the commissioner for appointment under various pieces of legislation and so forth. They provide an opportunity for all of the fire managers, the land managers and supporting agencies to come together on a regular basis and review their fire management activities.

The Hon. RICK COLLESS: Was there a forerunner to the committees that were constituted under section 50 of the Rural Fires Act 1997?

Mr KOPERBERG: Yes.

The Hon. RICK COLLESS: Were the bushfire management committees automatically appointed on gazettal of that Act?

Mr KOPERBERG: Yes, they were.

The Hon. RICK COLLESS: Section 52 of that Act states that each bushfire management committee must, in accordance with this division, prepare and submit to the Bushfire Co-ordinating Committee a draft of each of the following management plans, et cetera, to which you just referred. It says that the draft bushfire management plans of both kinds must be prepared and submitted to the Bushfire Co-ordinating Committee by a bushfire management committee within 12 months after the constitution of the committee. Would that mean that if those committees were constituted by the legislation they would have had 12 months to prepare the plans?

Mr KOPERBERG: Yes.

The Hon. RICK COLLESS: How many committees are there? How many plans have been prepared?

Mr KOPERBERG: There are in the order of 120 such committees. They are based on local government boundaries in the main. There are some amalgamations. Certainly, there were many committees that were unable to submit their plans by the prescribed date for all sorts of very good reasons, not the least of which was they had a whole new range of factors to take into account. It was no longer a simple process of making a few observations on a couple of A4 pages but was a far more

accountable process. These committees are not full-time. The members of them all pursue professions in their own right. They come together on a regular basis. We have significantly enhanced the level of support they get. In fact, our full-time staff, district managers, are now executive officers of those committees but the workload is enormous, as you would expect. It is not a black and white issue. There are many factors to be taken into account.

However, as we speak my understanding is that all of the plans, or very close to all of the plans have been approved, have been exhibited and are in the process of being implemented. I should say too that the non-approval of a particular plan does not necessarily inhibit the implementation of the plan. Hazard reduction does not come to a standstill because the plan has not gone through all of its stages because invariably the plan looks ahead and the work is often a catch-up phase. I cite the Hawkesbury committee as an example where they have just approved something like 40 hazard reduction proposals, all of them endorsed and work goes on notwithstanding the currency or otherwise of the plan.

The Hon. RICK COLLESS: If the work goes ahead under the plan, and the plan is not approved, and impacts on other legislation such as the threatened species Act and Native Vegetation Act, is there any conflict with that environmental legislation? I understand that once it is approved under the bushfire management plan then that automatically can be carried out with exemption under the environmental Acts?

Mr KOPERBERG: It is not so much exemption as conducting the review of environmental factors. If there are no significant issues arising from that review the work can be carried out as soon as circumstances will permit, and in the majority of cases, not all, those circumstances relate to having the right weather to do it.

The Hon. RICK COLLESS: Recently the Minister said in the Legislative Assembly that there were 93 plans that had been approved. You said there were 120 committees so that indicates there are still 27 plans outstanding. Why would there still be that relatively high number of plans outstanding when it is now June 2002?

Mr KOPERBERG: Since the information was provided to the Minister, there has been further progress in getting some of the plans approved.

The Hon. RICK COLLESS: There were 93 plans approved as at 10 April. How many have been approved since then?

Mr KOPERBERG: It is now 3 June. It is a dynamic process and I am approving plans on behalf of the co-ordinating committee on a daily basis, so it stands to reason that since the date on which the Minister made the announcement, which was correct at the time, further plans have been approved.

The Hon. RICK COLLESS: How many?

Mr KOPERBERG: I would have to take that question on notice.

The Hon. JOHN TINGLE: On the last occasion you appeared before the Committee we raised the question of fire hazard reduction and you said that quality was much more important than quantity, and I do not argue with that for a moment. Hazard reduction seems to be the central theme around which this inquiry is hearing so much. There has been a great deal of contradictory evidence and opinion offered to the Committee with some people saying it is not a good idea to other people saying that it should be carried out at a greater extent than it is. How do you decide the quality of hazard reduction we need in this State when, even in the words of your own submission before the Committee today, you talk about the possibility of the recent fires which we are investigating happening perhaps three times a century? It just seems to me that while we are inquiring into a specific set of circumstances, obviously we should be finding some general answers or solutions to the whole bushfire situation. What do we aim at? What sort of threshold or criterion are you looking for when you decide what is the correct quality of hazard reduction, say, over a period of a year, given all those variables?

Mr KOPERBERG: If I could preface my answer by suggesting that if the objective is to not again lose assets then we are not going to achieve that objective. By the very nature of the topography and the fuel types in which we live—

The Hon. JOHN TINGLE: You have lot of variables?

Mr KOPERBERG: Yes, by the very nature of the evolution of various fauna and fauna species which have dealt with a fire regime for tens of thousands of years we have to accept that fire is not only a natural part of our environment but a desirable part of our environment. Fires give rise to the evolution of a range of species. So far as our assets are concerned, we arrive at an over-riding principle which suggests that given the fact that fuel loadings in the majority of circumstances will determine fire behaviour to the extent that you can either put them out or you cannot, we should modify those fuel levels in close proximity to the assets we are trying to protect and that, indeed, is our focus.

I will not comment on the land management issues where burning takes place for a range of other reasons, the maintenance of biodiversity and protection of commercial assets and so forth. But in terms of our houses, shops and factories, et cetera, one of a number of measures to lessen the impact of fire is to modify the fuel by one means or another. There is contradictory opinion about the effectiveness of it or the desirability of it. We know, for arguments sake, that pre-European settlement there was in some parts of the country a different fuel regime altogether. For example, the Cumberland Plains has often been described by early adventurers as constituting predominantly open woodland. It would be wrong to assume that that was the predominant vegetation across the Continent: it was not. The fact is the Blue Mountains were so densely shrub layered that the early explorers had difficulty getting through it and spoke about the density of the bush.

It is not a black and white issue. We need to do a lot more research into the effectiveness of it and the desirability and that research is ongoing. Indeed, we are partnering, if you like, with the Australasian Fire Authorities Council and the Commonwealth Government for some co-operative research units to be established so that that, amongst other things, will be the subject of ongoing research.

The Hon. JOHN TINGLE: You cannot arrive at any sort of a set formula that could be used to determine the quality of hazard reduction that you should be aiming for because of those variables?

Mr KOPERBERG: It depends on what you want to achieve. If you want a fire-free environment then you reduce the fuels to zero or very close to zero. In terms of environmental and social issues that is totally unacceptable. One of the frustrations that we experience in attempting to do prescribed burning is the amount of opposition we get from people on whose land we wish to do the work, or from the people who are in close proximity to the land. We have as many objections by private citizens to hazard reduction burning in their proximity. It is a real case of not in my backyard.

The Hon. JOHN TINGLE: Maybe not in anybody else's backyard either, because there are interests in this State that are against burning or hazard reduction of that sort anywhere. State Forests raised that with us this morning in its submission. It pointed out that there is a real job to be done in trying to overcome the opposition which has been put into the minds of many people simply because of the fears about what it actually is and what actually does. I put a question to Mr Smith of State Forests this morning, and I put it to you: How do you go about changing what I believe is an emotionally designed propaganda campaign in some cases against hazard reduction? What do you do about it? How do you convince people that it is not the end of the world?

Mr KOPERBERG: I think that we are doing it with more than a modicum of success. We are engaging in the entire planning and execution process the very people who traditionally have had opposition to the process. One of our biggest allies now in getting sensible work done is the New South Wales Conservation Council, which is involved now in every aspect of the process. Thus they become more informed to the needs of the fire management community in terms of protecting assets. If you were to advocate a burning regime which would see negligible fuels on the ground continuously then, yes, they would oppose it for reasons of their charter. We would not advocate it in any event because, firstly, it would be physically impossible to maintain fuels at that level on all of the New South Wales urban interface and, secondly, we have an obligation to ensure that our activities

accord with ecologically sustainable development principles anyway, and we are not opposed to that. We are not so blinkered on this issue as to suggest that the only thing we are interested in his fuel levels of such magnitude as to require us to continually burn the countryside. Besides which, you could not. We talk about fuel levels of between five and eight tonnes per hectare over a relatively short space of time. It is in fact physically impossible to burn those in other than extreme conditions. But when extreme conditions arise they suddenly present you with a problem. It is far from black and white. It is a very complex issue.

The Hon. JOHN TINGLE: In that case, is there an acceptable level of fuel content? You save five to eight. Some people have told us two tonnes per hectare, and so on. Is there a level at which you would not be so concerned that you would undergo major hazard reduction? I am asking for a rule of thumb I suppose for the whole State, which may be impossible.

Mr KOPERBERG: Let us look at this based on the scientific research. For those who advocate maintenance of two tonnes per hectare, and given that in the Sydney basin, where the majority of losses occurred, fuel accumulates at four tonnes per hectare in one year, you would then have to hazard reduce it every six months, which you cannot, because it is only under extreme weather conditions that you can get that level of fuel to burn in the first place. So under benign conditions which are suitable for prescribed burning you could not get it to burn. So it would be impossible. If you consider that between eight and ten tonnes per hectare under normal fire weather conditions is capable of being suppressed, then some would argue that is an acceptable level because in those circumstances the fire fighting methodology will give you success in suppressing that fire before there is damage to assets.

The Hon. JOHN TINGLE: That is in usual weather conditions, not the ones we have just had.

Mr KOPERBERG: In usual weather conditions. But if you then get extreme fire weather even lesser or younger fuels will produce fire behaviour which makes it very difficult. So there is no rule of thumb.

The Hon. TONY KELLY: I would like your views on the new legislation that the Government has introduced but which has not been passed yet, particularly to ensure that the fire prevention is integral with the State's planning laws and streamlining the approval process. In particular, could you give us details on the approval process for hazard reduction and how it will be streamlined? We heard the other day from some of our witnesses regarding problems in the past in getting REFs. Some took six months for local government approval and others took up to six years. My understanding is that now that no longer will be necessary. The councils will have a map and it will be all categorised on that. Could you explain that to the Committee? We have not had any evidence or discussion on that matter yet.

Mr KOPERBERG: Firstly, can I say that the legislation before the Parliament is probably the most progressive in the country in terms of the cohesive and integrated approach to fire management issues generally. It incorporates the planning aspects, as you have said, and the feel modification respects, as you have said. Secondly, delays of the magnitude that you are talking about are totally unacceptable. There is just no earthly reason why an REF should take any more than a month—maybe two at the outside. I am sure that when Mr Gilligan gives evidence to this inquiry he will agree that those sorts of delays are totally unacceptable. We will work towards ensuring that those sorts of blockages do not occur again. So far as private land-holders are concerned, they will now be able to go, under the provisions of legislation, to local government, either in response to their own initiative to do hazard reduction on their lands or in response to a notice being served on them to clear lands, and have their proposal certified by the local government council. By legislation, that will have to be done in a very short time. Local government will be able to refer to its mapping process and to other sources of information regarding the requirements under the Threatened Species Conservation Act and the Native Vegetation Conservation Act and so forth and so on, all of which will be readily available to them, and will be able to deal with an application to burn—to hazard reduce by whatever means—very quickly. As has been said elsewhere, I think it is very much a case of grabbing a one-stop shop for proponents of hazard reduction.

Conversely, the legislation will also provide for a rigorous audit system on bushfire risk management plans and the activities of bushfire management committees so that where there is a level of unsatisfactory progress in the implementation or preparation of plans or whatever—provided it is not due to factors beyond their control—we will be able to require works to be done far more expeditiously. Thirdly, again on the hazard reduction side of it, the public will be able to bring to the attention of the commissioner any concerns they have about what they perceive to be a hazard to their particular asset or, for that matter, to anywhere else. The legislation will empower the Rural Fire Service to investigate and act upon that complaint in a variety of ways, not the least of which is to require the owner of that land, whether it be a public authority or a private land-holder, if the complaint is found to be legitimate, to do something about the hazard which is the subject of the complaint.

As I said, it applies equally to public land managers as it does to private land managers. Then there is the whole issue of planning. In the past it was desirable if local government consulted with the RFS on a range of developments. It will now be mandatory. In terms of integrated development—large subdivision projects in the form of housing for the aged, nursing homes, hospitals and other major developments—the Rural Fire Service will be able to determine that the conditions as set out in the planning guidelines for bushfire protection are adhered to and, where special measures need to be taken, will be able to require them to be conditions of consent. So in that whole regime, that whole suite of measures, the practical application of fire management will be far more cohesive.

The Hon. TONY KELLY: Forestry said in their submission that they would like to see the date for the bushfire period brought forward by a month to 1 September. From discussions it seems that this was more on a regional basis rather than to blanket the State. Obviously, the South Coast is totally different from the North Coast and different areas become combustible a lot earlier. Rather than local government being involved in declaring various areas, do you see advantage in yourself or the bushfire co-ordinating committee bringing the season forward in regions such as the North Coast or the Central West?

Mr KOPERBERG: Under legislation before the Parliament now the responsibility for determining a bushfire danger period, its revocation or its extension, is in fact removed from local government and resides with the Commissioner of the Rural Fire Service. The commissioner may, either on the recommendation of a bushfire management committee or collective bushfire management committees or on his own initiative, extend or revoke the bushfire danger period. That deals with State Forests' concerns in that regard. They are a major player in the bushfire management committee component so they can bring their suggestions forward.

Mr TORBAY: Following on from what Mr Tingle was saying about all the variables and the policy concept of a one-stop shop, I am interested in the consultation between all the various agencies. We have had some differing views. I am interested in how the consultation process will work under the new structure given that there are different interests in the process of managing the whole concept in an emergency.

Mr KOPERBERG: There are two issues, Mr Torbay. One is dealing with hazards on private lands and, secondly, dealing with hazards on public land, both of which require some input by various agencies having responsibility for a whole range of things. We are going to construct a code of practice, if you like, which will attempt to identify quite readily the criteria and the issues which have to be identified in, for argument's sake, doing a REF, a review of environmental factors, and other things. That code will be made available to local government. The legislation requires that in the preparation of that code, which will be done at ministerial direction to the commissioner, a whole range of agencies with land management and other responsibilities will have to be party to that code. So there is very little danger of something slipping between the cracks, as it were, in terms of environmental issues, planning issues and a whole range of other things. The very people who have responsibility under their respective legislation to ensure that this, that or the other is done or not done will have input into this process.

Even though we have provided under the proposed legislation a much streamlined capacity for them to carry out works on their land, local government will be provided with the information through the code on the part of all land management agencies and other agencies. The information and the criteria are being bought together so local government, which will be the certifying authority for

work on private land, will not have to go digging around the countryside looking at the native vegetation Act, the threatened species Act and some other Acts because it will all be incorporated in the code. All those issues that will be addressed in a REF, for argument's sake, will be made commonly available to the practitioners, the proponents and the certifiers. It is very much a condensation of what might be described as bits and pieces of information located in various areas.

Very little will change at the bushfire management committee level because all the agencies are there already and the process is working reasonably well. The major difference is that those committees will be more accountable than they have been in the past. The audit clearly revealed that there was room for improvement. Some practitioners thought—legitimately or otherwise—that it was all too hard, and it was. There were not impediments, but it was an onerous task. One could argue that that was only appropriate, but that does not mean to say that there is no room for improvement. I think this legislation will significantly improve both the consultative and the implementation processes.

The Hon. TONY KELLY: When we pass legislation we might impose a penalty, such as doubling the fine for speeding offences, that comes into force the next day. Obviously this legislation will have an implementation phase so the code to which you have referred will not be in place the next day. It will take some time. I presume the $4.5 million is allocated together with 50-odd staff to try to assist with that process. How long do you think it will take to implement that codification and to have the system fully operational? Will it involve a series of GIS maps that will have the code overlaid on them?

Mr KOPERBERG: All things being equal, I expect it will take about 12 months. There is a tremendous amount of work to be done and the Government is providing additional resources. Some of those resources will go into the audit process, which is critical to the site management issue, and some will go to districts to better equip them to deal with hazard reduction and a whole range of issues—not the least of which is community engagement, education and so forth.

Yes, a lot of it will be GIS based. A critical factor will be for land management agencies—all of them are represented on the bushfire co-ordinating committee—to ensure that the mapping process information, not least the bushfire-prone area mapping that local government will be required to complete within about 12 months, is readily available. I expect that we will provide pro formas and templates to make the task as easy as possible for local government and other agencies. As I said, I would expect that process to take about 12 months, maybe more. However, the other processes—the audit of the amount of hazard reduction work being done, the capacity of the community to come to the commissioner and raise concerns—will be effective once the legislation is proclaimed, if it is passed by Parliament.

Mr E. T. PAGE: We heard evidence last Friday from Captain Williams of the Kurrajong Rural Fire Brigade, who seems pretty convinced that what he said was spot-on. He said, first, that you cannot have a crown fire with fuel levels of 10 tonnes per hectare or less; and, secondly, that the RFS had evolved from an organisation previously largely involved in preventing and mitigating the effects of fire to just a firefighting force. Can you comment on those two propositions?

Mr KOPERBERG: Captain Williams is a very fine volunteer captain in the Kurrajong area and has many years of experience. The reality is whether you have a crown fire is determined by other than just fuel levels. Topography, for argument's sake, is a major factor. If you have wind pushing a fire uphill on a 45 degree slope with a relative humidity of 8 per cent or 9 per cent and a temperature of 30 or 40 degrees, I will happily produce—if the Committee would like to see it but I doubt that it would—a crown fire with fuels of five or six tonnes per hectare, given the right conditions. It may well be that that is not the case in the area where Captain Williams operates. Again, there is no black and white answer: it depends on so many variables as to almost preclude a rule of thumb.

On 7 January this year Assistant Commissioner Shane Fitzsimmons and I drove to the Shoalhaven where firestorms were occurring. Fire crossed the Princes Highway from the west to the east and we witnessed fire go through an area that had been burnt only two or three days before. This was not a hazard-reduced area but a wildfire area. Even though the penetration was not massive, the fire went into it. You could not have survived it. We had to shelter, along with a group of motorists, as the fire literally crossed the road in front of us. We sought refuge in a Roads and Traffic Authority clearing or compound. The fire behaviour was such that you could not survive it—and that was with

very light fuel because the area had been burnt a few days before. The wind was blowing probably in excess of 100 kilometres an hour, the temperature was probably in the high 30s and there was no humidity to speak of.

On the second issue, the Rural Fire Service is very much involved in prevention activities not only on the ground but across the board. It is involved in community education and community engagement and is the principal—although not the sole—resource for prescribed hazard reduction burning. In fact, so critical is that activity to us that it provides us with our basic training needs. If brigades were not engaged in hazard reduction, the first time they dealt with a fire would be the first time there was a fire. We do not want that. If anything, we promote the need for our brigades to be a significant resource in prescribed burning hazard reduction and so forth.

The Hon. TONY KELLY: When I flew to Sydney yesterday afternoon I saw about 20 units at Dubbo airport doing exactly that.

The Hon. RICK COLLESS: Of the back-burning operations as opposed to hazard reduction operations that occurred during the season, how many fires escaped and created problems in their own right?

Mr KOPERBERG: I cannot give you an exact number. I could not answer that question even on notice because there were many dozens of back-burns—small and large. If you are attempting to back-burn as a first or a last resort in order to contain a fire, some of them will escape under a range of meteorological conditions. Even hazard reductions escape under very benign conditions—such is the nature of bushfires. However, our investigations and examinations indicate quite clearly that, while back-burns failed from time to time—and they did so on many occasions; control lines were breached simply because the fire spotted across them or wind changes occasioned the back-burn crossing the control line—none of those failed back-burns led to fires that destroyed assets and could not be contained. Quite the contrary: there were many examples of firefighters having to fall back to a revised control line and back again and back again because it failed. On occasion a back-burn would crossed the control line and firefighters would have to chase it. However, as far as I am aware, they were all ultimately contained.

The Hon. RICK COLLESS: Are those back-burn figures included in the wildfire or hazard reduction figures?

Mr KOPERBERG: We would not cite them as hazard reduction.

The Hon. RICK COLLESS: So they would be included in the wildfire figures?

Mr KOPERBERG: The total area burnt.

The Hon. TONY KELLY: They happen while the fire is burning.

The Hon. RICK COLLESS: There is some confusion among the public about the difference between hazard reduction and back-burning.

Mr KOPERBERG: There is constant confusion—and not only amongst the public. Back-burning is a fire suppression methodology and is used when there is an actual fire to be contained, whereas hazard reduction burning is a preventative measure.

The Hon. RICK COLLESS: When you appeared before the Committee previously you said that it was unlikely that fuel levels would ever exceed 40 tonnes per hectare. What happens to fuel that continues to accumulate?

Mr KOPERBERG: It decomposes to a large degree. There are many theories expressed about this. In the Kosciusko some theoretical projections suggest that in some circumstances, particularly in mountain ash vegetation in south-east-facing valleys that are perpetually moist and never burnt and where you could start a fire only two or three times a year, fuel accumulation can exceed that. I told the inquiry during my last appearance that there are examples of fuel accumulations greater than 40 tonnes per hectare, but they are not common. If you look at the sorts of fuels with

which we have to deal on a regular basis—where fires occur on a cyclical basis—I suggest that, even after 25 years of non-intervention, they peak in dense canopy at about 30 tonnes per hectare. In more open canopy—in other words, that is devoid of the leaf drop that adds to the fuel accumulation—it would probably peak at about 20 or 25 tonnes a hectare because of the decomposition process that takes place at the lower levels. There are exceptions to every rule: it depends pretty much on where the fuel accumulates, what the natural intervention is and so on.

The Hon. RICK COLLESS: I am interested in what happens to that fuel after decomposition. What does it create? Is the by-product of that decomposition also combustible?

Mr KOPERBERG: I am probably not qualified to answer that question as well as perhaps others who will appear before the Committee. I am not a scientist. However, commonsense tells you that that material becomes moist and almost humus in nature.

The Hon. RICK COLLESS: The Kurrajong people told us what happens to the fuel layer. They agreed in principle with what you have said: the fuel level reaches only a certain stage above the litter and underneath that there is a very moist humus layer, which seeps slowly into the soil. You have a layer of organic matter that is not litter and not dirt that sits on the forest floor. They said that a cool hazard reduction burn takes off that leaf litter on the top but leaves the moist humus layer underneath, which I suggest is very desirable in terms of soil health, erosion prevention, nutrient recycling and those sorts of things. There are many biological benefits in keeping that humus layer in the soil. However, a wildfire that is burning at thousands of degrees Celsius will ignite and burn out that humus layer, which will create many environmental problems, including soil erosion and so on. Do you have any comments about that?

Mr KOPERBERG: I would expect conditions to be extremely severe for that to be a significant factor. I accumulate about 25 tonnes of fuel in my front garden and when I dig around in it I get covered in worms and very moist humus.

The Hon. RICK COLLESS: You try not to burn it at thousands of degrees Centigrade, I am sure.

Mr KOPERBERG: I try to avoid that wherever possible! It would not be a good look, would it?

The Hon. RICK COLLESS: No.

Mr KOPERBERG: I am not as well qualified as perhaps some others are to answer that question. I cannot answer on the intricacies of that, under what fire intensities that will burn and what logical consequences that will have. I am simply not qualified to answer that question.

The Hon. RICK COLLESS: In general terms, as Commissioner of the Rural Fire Service I guess you would like to see more and better fuel management programs across all sorts of different land tenures, with an overall objective of seeing lower fuel levels. That would be in your interest as the Commissioner of the Rural Fire Service, would it not?

Mr KOPERBERG: It would be in the interests of the community to have fuel levels managed to the extent where fires that occurred in normal circumstances could be suppressed or contained without the loss of assets. As we are, amongst other things, a fire suppression agency, and we rely on our volunteers to suppress those fires, a fuel regime that would not endanger them or the community is obviously a desirable outcome. But we also recognise that it cannot be universally so.

The Hon. RICK COLLESS: I was interested by your statement—when we were talking about fire activity at different fuel loads, different fire ratings and so on—about research underestimating the activity of fire at give fuel loads.

Mr KOPERBERG: Specifically, rates of spread.

The Hon. RICK COLLESS: Yes, specifically rates of spread. Surely, if the research is heading in that direction, that would justify keeping fuel levels at lower levels.

Mr KOPERBERG: It depends on your charter. The charters differ. If you are a land management agency—

The Hon. RICK COLLESS: What about the charter of the Commissioner of the Rural Fire Service?

Mr KOPERBERG: On the basis that we are principally, but not exclusively, a fire suppression organisation, I can only reiterate that it would be in the community's interests to reside within a fuel regime capable of suppression in most circumstances. But it would be folly not to recognise the complexities or the difficulties of that. The extent of urban-bushland interface in New South Wales alone is massive. In order to maintain fuel levels to the extent that all fire events could be successfully dealt with under any circumstances would require, as I said earlier, a constant burning regime. Well, that is physically impossible. Even if you had the days available to do it—which you don't—you would need thousands of people on the ground every single day doing this. It is not feasible, and perhaps not even desirable.

We have a multitude of responsibilities here, not the least of which is to ensure that the broader community accepts the fact that they and we live in a very fire-prone part of the world. That is not exclusive to us. The Americans, particularly people in western United States, regularly have to deal with massive loss of property. They have no limitations on resources, they throw billions at it, but they lose a lot more properties than we do. Fires are a fact of life. We have done a lot to modify the adverse impact, and we will continue to do that. But we cannot seriously be talking about a fire-free environment. It is not possible.

The Hon. RICK COLLESS: But, at the end of the day, that fuel leg of the fire triangle is the only leg of the triangle that we can control, is it not?

Mr KOPERBERG: It is.

Mr E. T. PAGE: I tend to dispute that because, in this context there is another factor, and that is to get rid of all the trees. That would save most of our wildfire problems.

The Hon. RICK COLLESS: That is still fuel management, and it is part of the fuel leg.

Mr E. T. PAGE: Yes, but not the fuel you were talking about.

The Hon. RICK COLLESS: It is still the fuel leg.

Mr E. T. PAGE: I agree with you that it is fuel. But we could strip all the trees, and that would basically solve the wildfire problem. I am not sure society would believe this is the thing to do.

CHAIR: We do not advocate agent orange! Commissioner, under the current arrangements the land management agencies are responsible for first strike suppression of fires within their own boundaries. We have heard from many witnesses that a number of fires during the emergency period were not immediately suppressed, with some burning for several weeks. Would it be feasible for the Rural Fire Service to take control of all rural fire suppression, including first strike response, on all tenures during a bushfire season?

Mr KOPERBERG: It would be unnecessary. The success of the New South Wales integrated fire management system is largely due to the fact that all of the agencies are integrated and do interact with each other on a regular basis. Operational plans, which are the purview of the bushfire management committees to prepare, recognise that capacities and capabilities vary from area to area. For argument's sake, where Rural Fire Brigades are largely in a farming community, they are not perhaps as instantly available as their counterparts in other environments might be. For that reason, first attack responsibility is assigned, notwithstanding a legislative requirement, through a process of commonsense planning. The agencies get together and say, "Okay, you are better equipped to provide

first attack here than we are, or we are better equipped than you are," and therefore under the operational plan first attack is predetermined.

Indeed it is the case that in many districts the Rural Fire Service is the first attack mechanism, by arrangement with the appropriate land authority. It would be dangerous to go down the path of prescribing precisely who would have that responsibility exclusively, because if that fails for whatever reason—and it can fail for many reasons—confusion arises. It is better to look at the total resource capability and assign, according to capacity, responsibility for initial attack, secondary attack and so forth. That is a process that is now evolving very satisfactory.

CHAIR: So you are comfortable that the elements of co-ordination are sufficient to do that not only in an emergency but for in between serious fire situations of normal maintenance and fire suppression?

Mr KOPERBERG: Yes, I am. Director-General Gilligan and I have been talking for a couple of years at least—well before the onset of these fires—about how we can better utilise our joint resources across landscapes for which we have respective responsibility. There are still some problems to be sorted out. I would not like to paint a picture that all avenues have been dealt with. The exercise is ongoing. But significant progress is being made, not only in regard to suppression but in regard to the provision of resources, to effectively do prescribed burning. I am firmly of the view that we need to do as much as possible to ensure we utilise resources from across the board on the basis of their other lately, and the need to engage them, not solely because legislation prescribes that one is the responsibility of somebody else. The legislation is accommodating for that to occur, and I am a strong advocate of that occurring.

CHAIR: And are you reasonably comfortable that the resources being considered at the moment will be sufficient for implementation as far as the legislation is concerned?

Mr KOPERBERG: I think the allocation of resources has been realistic. We will see what happens over the next couple of years. If there is a deficit, obviously I will provide that advice to my Minister.

CHAIR: Considerable urban creep has been created over 11,000 kilometres of direct boundary between residential and developed land and National Park reserves. Do the current arrangements regarding definition of urban and bush environment, and the existing geographical demarcation of responsibility between those two services, reflect the changes?

Mr KOPERBERG: They do, by virtue of the fact that one of the requirements of the proposed legislation is the mapping of bushfire-prone areas by local government. That obviously will have input from all the agencies concerned. They cannot do it in isolation. That clearly will define the sorts of works that have to be undertaken in those particular mapped areas, and that applies as much to the planning aspect of the proposals as it does to the hazard reduction process. It will be the first time we will have a comprehensive and cohesive picture of precisely what that line of demarcation, if you want to call it that, is, what constitutes those lands which are particularly fire-prone and those which are not fire-prone, and it will allow us to concentrate our activities and resources on that. So the short answer is: Yes, it addresses that issue.

Mr E. T. PAGE: This is a question that I asked of the chief executive of State Forests, which gave the Committee disturbing figures that about half of the 37 fires started in State Forest were caused by arsonists. Do you have any suggestions for additional strategies to try to identify arsonists and to minimise the problem of arsonists?

Mr KOPERBERG: Mine probably would not be socially acceptable! But, seriously, it is a vexing problem. The dilemma we have is that if we give arson activity profile it results in a whole range of copycat activity. If we give it no profile, the community does not respond by giving information to police and so on. You know that a lot of work is being done on profiling arsonists by people qualified to do that work. We try to engage communities by making them aware of the extent to which that problem exists. We are certainly training our people to be observant and to detect arsonists. We are setting up qualified fire investigation teams so that we can be more exact in attributing cause and origin of fires.

Once upon a time everyone died of natural causes because it was not known that people had died of this, that or the other. By the process of defining detection, diagnosis and so on we are becoming more precise in identifying cause and origin. That is leading, at least in part, to the reality that more and more bushfires are being caused by arsonists. It is a community-wide problem. We are in the schools, as part of our community education program, and we are out in the communities. The judiciary and the police are dealing with convicted persons in appropriate manners. But we do recognise that we have to give more attention to this particular problem.

Mr E. T. PAGE: Is there a problem with profiling within your own volunteer group? If you want to hide that you are lighting fires, isn't it good to be a volunteer in a fire service? Is that a problem?

Mr KOPERBERG: Are you referring to the incidence of arson with the service?

Mr E. T. PAGE: Yes, the possibility of it. I think if I was an arsonist in the country, I would join a fire service.

The Hon. RICK COLLESS: No comment, Ernie!

Mr KOPERBERG: We will sort you out pretty quickly!

Mr E. T. PAGE: I would hope so.

CHAIR: I think you've already been listed, Ernie!

Mr KOPERBERG: The Rural Fire Service is 70,000 people strong, and they are a reflection of the broader community. Like every other group, we have people with tendencies towards this, that or the other. We scrutinise our people as much as modern practices and all the socially acceptable standards will allow. In fact, the person who recently appeared before the Local Court at Penrith was a person within our brigades who had been under observation by us, in conjunction with police, for many, many months—will before the fires of 2001-02. In fact, we conducted what is commonly known as a sting operation on that particular person which led to his apprehension and arrest. So, yes, we have a problem, but it is no greater than anyone else's.

Mr E. T. PAGE: But you have got a strategy for it?

Mr KOPERBERG: Yes, we have a strategy for it.

The Hon. JOHN TINGLE: One of the elements of fire suppression that has come up at various stages of this inquiry is the question of fire trails. It came up particularly in the Committee hearings at Nowra. I remember asking one fire captain whether he always found that he had the right key to get into a fire trail where there is a gate that is locked. He said, "I don't worry; I just take bolt cutter with me," which seems to be the attitude that many people have.

What we also heard is that very often where a fire trail is in existence, whether it is locked or blocked by a mound of dirt or whatever else, it is often not in a maintained condition. It will be overgrown, there will be slips, erosion, and so on. I put it to Captain Williams that on my understanding, in some areas four-wheel-drive clubs had offered to keep tracks up to scratch if they were allowed to use them. He said he would be very happy to have an arrangement like that in his area.

On page 9 of your submission you make it clear that the Rural Fire Service is not a land management agency, so I guess it may be outside your aegis to say whether or not this should be done. However, is any consideration being given to the use of what you might call free resources such as that, to make sure that fire trails are always in good condition?

Mr KOPERBERG: I am sure that the respective land managers who appeared before you are probably better equipped to deal with the management issues of those trails. But it is certainly our

expectation that bushfire management committees ought to identify those fire trails which are strategically important to both the prevention and suppression efforts and that the land management agencies responsible for those particular trails ensure that ready access is available to firefighters to use those trails if and when they need to.

Having said that, we do not have any particular objection to a trail being locked off. Random access to vast tracts of country through fire trails presents us with other problems as well, not the least of which is arson, of course, as well as rubbish and constant use, making maintenance a difficult proposition, and so on.

We have no difficulty with a land manager saying, "We will maintain that trail in such a fashion. We are going to put a gate on it, or put some trees across it, or whatever, but the brigades will get access when they need access." In many cases, those arrangements are well in place and local brigade captains have keys to those fire trails.

That does not mean to say that every brigade in a local government area will necessarily have every key to every fire trail, but as a first respondent to fire in that particular area they would have a key. Where they do not, I am sure the land manager raises no objection when, in emergent circumstances, the universal key is used to gain access.

The Hon. JOHN TINGLE: That is the expectation. But we have heard evidence to indicate that even on strategic fire trails they are often not in good condition, they have had to get bulldozers in, float them in, to clear the trails and so on. Is it quite out of the question that something like a recognised four-wheel-drive club, who is prepared, under controlled circumstances, to clean up the trail should be allowed to do so?

Mr KOPERBERG: It is no more out of the question than arrangements with the local brigades who carry out the maintenance. I know that when I was a brigade member in the 1970s, a regular activity, almost on a weekly basis, was to maintain one fire trail or another, or put in a culvert, build a bridge, or whatever, and that was by arrangement with the trustee of the land, et cetera. That is a valuable training ground as well.

Mr TORBAY: It is occurring now, I think.

Mr KOPERBERG: It happens regularly. So, no, it is not an unrealistic proposition at all. So far as we are concerned, we expect district committees to identify those trails, and we expect the respective land managers to ensure that access is provided. How they want to do that is a matter for them.

The Hon. TONY KELLY: It is clear from reading the press releases of some members of Parliament that they do not understand the difference between hazard reduction and back-burning. You spoke specifically about back-burning and the associated difficulties at times. Following these last extreme events, some of the bushfire captains have sat down with National Parks and Wildlife Service officers to work out whether they should try to back-burn a fire. It is a situation where they are damned if they do and they are damned if they don't—if they just let the fire spread, whether it will get out of control and cause damage to outside assets; or if they clear the back-burning operation, whether the back-burning might get out of control and cause damage to those assets. At times it must be very difficult for group captains to make those decisions. I do not think the public understand the difficulty they are under at times.

Mr KOPERBERG: That is very true. And it is not by accident that the legislation, the Rural Fires Act, identifies for insurance purposes that any damage caused by a suppression activity is deemed to be damage by the fire; that legislation recognises the precarious nature of using a range of fire suppression methodologies and recognises that they can fail.

There are many experiences. The greatest users of aviation in fire suppression are probably the North Americans. It is not an uncommon event for their aircraft to crash, and kill the crew and other people. We use back-burning probably to a larger extent; the Americans are catching up in that regard, as are others. But we have always used back-burning as a significant effective fire suppression

methodology—and one of the most effective, when direct attack is simply not possible, because of fire intensity and the danger to firefighters.

There are enormous risks associated with that. It is important that we instil in our firefighters the confidence to engage these high-risk strategies without fear of retribution, litigation or anything else. That is why the immunity provisions in the Act are as strong as they are, to enable them to engage these tactics and strategies, because if they do not, the losses we are talking about would be significantly higher.

(The witness withdrew)

(Lunch adjournment)

BRIAN GILLIGAN, Director-General, National Parks and Wildlife, on former oath:

PHILIP CHRISTIAN KOPERBERG, Commissioner, New South Wales Rural Fire Service, on former oath:

CHAIR: Would you care to make an opening statement?

Mr GILLIGAN: Only perhaps to respond to a couple of matters arising from the last hearing. I took a question on notice from Mr Colless regarding the relationship between fuel loads and fire size or spread and I am happy to table for the information of the Committee a graphical plot of the fires and draw your attention to the lack of any significant correlation between fuel load and fire size and spread.

Graph tabled.

Secondly, by way of clarification, I remind the Committee that I mentioned when I appeared last before the Committee that a NPWS remote area firefighting team was withdrawn from earlier efforts to suppress the Mount Hall fire because resources needed to be diverted to deal with an arson attack elsewhere in the Blue Mountains. I wish to advise the Committee that I have since clarified the details of this matter with Commissioner Koperberg, who informs me that his decision in this instance was based on occupational health and safety concerns arising from an adverse meteorological forecast rather than any specific resource diversion imperative, so whilst my comments about the resourcing challenges that some of the arson attacks were promoting at that time were valid enough, in that particular instance it was an occupational health and safety issue rather than a resourcing one.

Finally, at the Nowra hearing the Access for All representative specified a number of fire trails on national parks and reserves which were said to have been closed. I can advise the Committee that we have checked the details of those specific trails. In fact, all of them have had machinery working on them as part of the service's rolling trail maintenance program this financial year and none of them are in fact closed. They may have been gated but not closed. I think we have previously discussed the significance of the difference between those two issues. They are the only matters of clarification from the earlier appearance.

The Hon. RICK COLLESS: In your previous appearance you also undertook to bring some information to us—in fact I think it was Dr Bradstock who took the question regarding the fuel levels in the 82 per cent of fires that were extinguished by the service before they reached five hectares in size. Is that information available?

Mr GILLIGAN: That is the information to which I referred earlier. That graphical plot covers all those fires that occurred on service's estate between 23 December and 24 January and that is the point that I was making, that there is not any particular correlation between the fuel loads and the size of the fire spread.

Mr E. T. PAGE: Much has been made about the apparent lack of fire reduction undertaken by the National Parks and Wildlife Service over the last few years. Do you cavil with the amount of hazard reduction activities undertaken over this period?

Mr GILLIGAN: The short answer is no. In every year since I have been the Director-General of National Parks and Wildlife we have only managed to do roughly half or less of what we have had scheduled and would have liked to have achieved. I think we can improve that level. We can improve it by more effective collaboration between the agencies and some of the issues that the commissioner made reference to today, but I do not think we can ever quite get to some of the levels that some people appearing before the Committee have suggested that we should. I think some of those comparisons just do not stand up because we are talking about areas being managed for different management objectives and areas being managed in totally different landscape configurations, which just make the exercise quite different.

However, to come back to the specific question you have asked, we would always like to do more and if we could get the 50,000-odd hectares done that we are targeting to get done in this year, I think that would be great, but the reality is that in this current year we have planned to do 146 burns totalling about 45,800 hectares. To date we have managed to get 81 burns done, totalling an area of about 17,000 hectares and we are still going, but we face significant difficulties because of the circumstances in which we are operating and the contrasting nature of perhaps some of the sites. If I could use an example. We have a burn planned for Ku-ring-gai National Park adjacent to the F3 Freeway, which was scheduled to happen on 16 June and 17 June this year until the rain came in the last couple of weeks. That burn was to burn an area of 450 hectares.

In order to do that safely the plan required closing the F3 Freeway using some 125 to 130 officers from three different agencies, 30 vehicles and two helicopters. By contrast last week we burnt just over 2,000 hectares at Gundabooka just south of Bourke with seven of our people and three local Rural Fire Service volunteers and a handful of vehicles and it was done in a flash. There is always going to be that frustration. The weather in the last couple of weeks in Sydney and adjacent to the coastal areas has not only taken those couple of weeks out of our hazard reduction program, it has effectively taken out probably the next six weeks and if we get another two or three days of rain towards the end of that six-week period, that will take out another month. There is that continual frustration of trying to get the work done at this time of the year.

The Hon. JOHN TINGLE: I would not for a moment argue that when it is raining it is very difficult to get an effective burn. You mention on page 21 of your submission that opportunities to undertake hazard reduction for your prescribed burning are tightly constrained by weather. Just as the weather is unpredictable in the way it can make a fire much worse, obviously any burning management plan is going to be affected by what the weather does. Are we always going to be at the mercy of the weather as to whether or not we are to reduce the hazards? Is there any way around this? Is there any other way it can be done where it is not so much at the mercy of what the weather might do without warning?

Mr GILLIGAN: It is always going to be a major challenge. We cannot avoid that. What we can do about it is get cleverer and better about how we mobilise the resources that we have to take advantage of those opportunities that exist and so I think the next generation of really focused effort on taking integrated fire management, which is a great success story, best testimony to that being the recent fires of course, but we need to take it to another level which focuses on such close collaboration on training and joint management exercises that we have seamless meshing of agency staff in incident management teams, communications arrangements, logistical planning able to mobilise staff from multiple agencies at relatively short notice.

I think we can do a great deal of that. We need to streamline our capacity to do that by having the plans in place and ready to roll with all the relevant approvals and so on as quickly as possible. Yes, weather is always going to be there as a fairly absolute constraint but I think we can do better at taking advantage of the windows when they exist.

The Hon. JOHN TINGLE: On page 15 of your submission you say, "What level of fuel management is required to effectively manage bushfires? That seems to be the central core of almost

everything we have heard in terms of hazard reduction while this inquiry has been going on, at least in my opinion that is the way it is". That being the case we have also been given figures that show that the National Parks and Wildlife Service has only reduced about 1 per cent of its tenure. I do not know if that figure is right, whether you accept it or whether you wish to argue with it. For the moment, if we accept without any significance being put on it, that it was 1 per cent, and you have just said you would like to do more, how much more would you like to do if the weather did not mess you up and other things were available? What would you consider would be a desirable percentage, 2 per cent, 3 per cent, 4 per cent, 5 per cent?

Mr GILLIGAN: First of all let me clarify that our average over the last 12 years is that we have, in fact, done 0.4 per cent of the area that we manage. If you want to compare that performance meaningfully with any other agency, I think you have to look at the area of, say, State Forests land that is managed for similar objectives to what our land is managed for, in which case you would be looking at the flora reserves and conservation zones of State Forests. I have not done that comparison but we have done the comparison with the Department of Conservation and Land Management in Western Australia. If you look at what they burn in terms of hazard reduction for their conservation reserves, I was only able to get figures for the last three years, and their percentage over the last three years is 0.3 per cent and during the past 12 months it was 0.4 per cent. Ours in the last 12 months was 0.36 per cent, so there is a certain equivalence there that is more meaningful than just a blanket comparison.

The Hon. JOHN TINGLE: I was not suggesting we should compare what the National Parks and Wildlife Service does with State Forests or anyone else. Because you said at the beginning you did not think you had done as much as you would like to do and you would like to do more, you have managed to clear 0.4 per cent, how much would you see as a desirable percentage? Can you pluck a figure out of the air?

Mr GILLIGAN: My apologies, I thought I had answered that by saying that this year we had planned to do 45,800 hectares. If we round that a bit, I guess you could get up to 55,000 hectares, which is roughly 1 per cent of 5.5 million hectares that we manage and my guess is that given the particular land that we are responsible for and the particular management objectives that we have, that is probably a realistic target and provided that that amount of burning is carefully, strategically targeted and provided it is linked with effective suppression strategies, then yes, it is probably adequate to ensure that the community's concern, both in terms of life and property protection and conservation asset protection can be achieved.

The Hon. TONY KELLY: One problem the Committee has is whether the evidence given to us is anecdotal or factual. I am trying to grasp some evidence we heard last Friday from one of the fire brigades which said that perhaps hazard reduction burns that had been approved by the bushfire management committee were held up because the National Parks and Wildlife Service would not approve the REF for, I think, six years was quoted. Do you know whether that is true? What is the normal time for approval of REFs?

Mr GILLIGAN: From preliminary inquiries that I have made over the weekend since that matter was raised in the Committee hearing on Friday, I understand that there has been one instance where there was an extended period of time approximating the time you talk about. Clearly, that is unacceptable. I have not yet got to the bottom of the full circumstances and explanation, and no doubt there will be some explanation.

The Hon. TONY KELLY: You might let the Committee know.

Mr GILLIGAN: In response to the second part of your question, the usual time is between one month and three months for a review of environmental factors to be undertaken and to be approved. I would have thought that that is obviously more what we would expect. Three years to six years is totally unacceptable. Clearly, if there are problems like that in the committee or happening within a district, to some extent the even more troubling thing about that from my point of view is that I got to find out about it via a joint select committee of the Parliament in a public hearing. I think the work that Commissioner Koperberg and I have been trying to do over the past two or three years has

been to work on getting a much tighter collaboration between our agencies and trying to get as many of the issues that need to be resolved effectively resolved at the district committee level.

It troubles me that in this instance there was not a mechanism to get that problem perhaps bumped up to us to get sorted out. That is something that I intend to do something about both in terms of talking further with Commissioner Koperberg but also internally. It seems to me that it might help if I was to write to the district committees throughout the State and clarify some of the service positions that may or may not be being as clearly presented in some of the committee forums as they should be. Also, it seems to me that if there are problems in some committees like that, perhaps I need to go and sit down with those committees and try to sort them out because I certainly agree with a proposition that that is totally unacceptable.

Mr E. T. PAGE: It used to be called management by exception.

Mr TORBAY: My question has partly been answered with that response. Obviously there is agreement that hazard reduction is an effective tool. There is agreement about what the commissioner termed a one-stop shop or what you termed a seamless process. Can what is proposed be done with the various cultures, the complexities, the different roles that the various instruments play in the process? We heard a little bit of a role difference between, for example, State Forests and your organisation and, indeed, the Rural Fire Service. Can it be meshed together so that there is a seamless process, or is it pie in the sky?

Mr GILLIGAN: I believe it can be done and I think—if I can come back to my earlier aside—that the very limited property loss and the absence thankfully of any loss of life in the most recent fires indicate a very strong level of achievement and it is a very good report card for integrated fire management as per the New South Wales model. I think one element of that that makes it such a strong model is that there is a recognition, as we heard this morning from State Forests, that it acknowledges that we have different management objectives for our land to what it has for the bulk of its land. When it comes down to organising things like resources, we do not go and buy up all these fire trucks that duplicate the resourcing and equipment that the RFS has.

We focus on the remote area firefighting capability and capacity. We have a massive fleet of small striker vehicles that go into relatively remote locations and can get into areas that might otherwise be somewhat difficult to access with the bigger vehicles. If that was the only resource we had at our disposal, clearly it would be inadequate if we had to try to stand alone as a fire management agency and managed on our own all of the fires that we might have to deal with then it would be grossly inadequate. Equally, in the same way as we rely on the other agencies and complement their strengths with our resources and the training of our staff, similarly we are able to help them out in those situations where we have the expertise, the skills and the equipment.

What I think we need to do in conjunction with the changes that will happen in terms of the legislation, the proposals that are before Parliament, is to ensure that there is this new generation, if you like, of additional levels of collaboration and performance in that integrated fire management. I think the particular areas that need to be targeted are the areas of training, so that we have people who can mesh into roles very quickly and incident management teams and so on quite seamlessly. I think this is one of the things that has already been the subject of comment. During the Christmas fires the people from other States commented on how well that integration did occur. I think it can work better still, and it will only work better if we are co-ordinated on training and if we are also doing some of the hazard reduction work together so that those things become worked examples and collaborative learning experiences for all of our staff.

Mr E. T. PAGE: What proportion of property losses in the recent fires were adjacent to national parks and reserves?

Mr GILLIGAN: While the full inquiries and investigations are still under way, the advice I have is that it is between one-fifth and one-eighth, so something less than 20 per cent of the losses have been adjacent to national parks, which on balance is something that we think perhaps is not a bad result, given the area of the interface that we manage.

Mr E. T. PAGE: I think that is quite small. I thought it would be much higher than that.

Mr GILLIGAN: I think sometimes there is a bit of confusion in the general public perhaps presentation of some of the information on the fires. I think there is a bit of an assumption that if it is bush it must be national park whereas even adjacent to some of our major urban areas and some of our major parks there are in fact pieces of Crown land or council-owned land that separate a national park from a town but everyone thinks of it as the national park. So all sorts of assumptions might have been made but I think those figures are ones that we will work through and finalise as the investigations are finalised.

I think also it perhaps highlights the point that you would expect, given the amount of land that we manage close to the interface, that there obviously would be a significant issue there. It has already been referred to this morning with State Forests acknowledging that most of the land it manages is away from that interface. In the Sydney region, we manage 38 per cent of the land in the Sydney Basin and State Forests manages 3 per cent of it in the Sydney Basin so naturally we will face some of those interface issues much more than virtually any other agency.

The Hon. TONY KELLY: On a number of occasions the Hon. Rick Colless has made the observation, going from the booklet where you have the triangle, that the only variable in fire management practices that you can manage is the fuel load. Do you have any comment on that?

Mr GILLIGAN: That is the only part of the hazard that we can manage in terms of the triangle that was being discussed this morning. You can think of it in a different way and inherently we all do. That is that, rather than focusing on the hazard, we in fact focus on managing the risk and we can do quite a lot to manage the risk a lot more and that is by an integrated approach to the array of the sorts of things that have been discussed by this Committee and some of the reforms that the Government is putting through where we have more and more effective hazard reduction. We have better urban planning and urban design. We have better preparedness and community awareness of what needs to be done. There is a lot of collaboration that can take place. Basically, you put a whole bundle of things together that help manage the risk, rather than being totally stuck on a fuel issue and a weather issue. Then you feel pretty much at the mercy of those two elements if you are not careful, whereas we can in fact focus on a number of things we can do to reduce that risk.

The Hon. TONY KELLY: How do you go with public relations? At the time of the fires there were a lot of complaints about the National Parks and Wildlife Service. I heard some quite ridiculous things. I went out a couple of days after the fires and asked specific farmers, "Is this true?". Invariably they said it was not true, that the opposite was the problem. It was not the National Parks and Wildlife Service. I asked them whether the problem was that the National Parks and Wildlife Service is not doing enough hazard reduction. One particular bloke, who had just been burnt out, said, "No, it is the opposite. They do too much sometimes." So you get different views.

The Hon. RICK COLLESS: I have not heard that one.

The Hon. TONY KELLY: It is a fact. Our trouble with a lot of the inquiry is trying to get to the bottom of the facts. Another thing is that we got very few submissions from our area. I thought there would be heaps of them because of the media at the time. One of the things at the time was about fire retardants. There was a big thing made about fire retardants sitting at Dubbo airport that could not be used because the story was that the National Parks and Wildlife Service thought that it would kill all the animals. Everybody said, "The fire will kill the animals anyway." "It was a silly thing for you to have done." I asked the bushfire fellows in charge and they said that was rubbish, that they used them. Do you have a problem with getting your message across? What would you do about addressing issues about trying to get rid of some of these erroneous and anecdotal statements?

The Hon. JOHN TINGLE: Can I just compound what you are saying? We have heard several times in this inquiry—

The Hon. TONY KELLY: About 80 per cent of the stuff is anecdotal.

The Hon. JOHN TINGLE: In Bega and Nowra people kept saying that the National Parks and Wildlife Service did not do the right thing by them, that the fires started in national parks. There is

a perception, which I am not suggesting is accurate, amongst a lot of people that the NPWS is the villain in starting a lot of fires.

Mr E. T. PAGE: Actually you start most of them.

The Hon. JOHN TINGLE: I am adding to what the Hon. Tony Kelly is saying. I think it is a very important question from every possible direction. How do you combat it?

The Hon. TONY KELLY: I do not know how you can.

The Hon. JOHN TINGLE: It has come up in this inquiry as well as in the media.

Mr GILLIGAN: I thought it might be useful for the Committee to see a publication called *Living with Fire*, which is several years old. We had not particularly thought about presenting it to the Committee before but it occurred to me in some of the discussion that was happening this morning that in fact it might well be relevant. As you will see from the logos, it is a joint publication between the RFS, State Forests, the Department of Land and Water Conservation and the National Parks and Wildlife Service.

I can assure you, first of all, that this is the unabridged version and there is an abridged version in a pamphlet for those who do not particularly want to read all the detail. We need to do more of some of this sort of thing to get the message out, which will help. Secondly, I would point out that my media people tell me that I did 250 media interviews between Christmas and the end of January. One way and another we certainly were trying to get a message out. The other point I would make, one that I think we may have discussed the last time I came before the Committee, is we do genuinely have to look at how we are engaging with communities across the State. I have used the example before that we had six reserve fire management plans out on exhibition for three months in the lead-up to these fires and we received a total of five submissions on six plans. The Goobang one was another example where we were criticised a great deal but, in fact, the plan had been out on exhibition for two months and no-one had responded.

I did not put those on the table to say, therefore, we have done our bit and the community or someone else has to do theirs. But those things are an indication that the mechanisms that we are using are not effective. Now we are tackling it on a couple of fronts. First, I tabled in my last appearance before the Committee our new format of fire management plans so that they are reduced down to two pages of basically two maps with all the relevant information boxed around those maps to make them as meaningful, as user friendly and readable as possible. Second, when we were faced with the half a dozen plans with nil response effectively we went back to those communities in the Oakdale, Hilltop area and some of the others in southern Sydney in recent times. We extended the period for receiving submissions but we also went out and conducted workshops with those communities in those areas, and I think we have to do more of that quite frankly.

The other point I would make is that I think we need to do more to engage the community with the committees. I have been disappointed to find sometimes that our critics do not seem to realise that we do not act unilaterally; that we actually are part of a committee and the Parks Service is one agency represented on these committees; and we are on about 120 of them throughout the State, and that is the forum where a lot of these issues can be addressed and worked through. That is also the forum where we can engage and actually learn from that local knowledge that is available there and tap that resource, if you like. I would have to say that I would see in a lot of places around the State we are not doing that effectively. I know it is something that Commissioner Koperberg and I have talked about from time to time and once or twice we have actually travelled to locations where there were particular issues and we have travelled together and encouraged people. We have met with land-holders who have been unhappy and actually encouraged them to engage with the committees. I still think there is a lot more work that could be done on that front.

If you wrap all that together, plus some updated versions of these sorts of things that perhaps get a wider appreciation in the community of some of the complexities that are involved then I think we can make some progress. One of the other points that comes through very clearly from the discussion that I have sat through the Committee's hearing this morning, is that it is very complex.

There are not simple black and white answers to most of the questions that are asked by Committee members and yet the community is looking for very simple answers. I guess in looking for simple answers they are also looking for someone to blame and it may be that we are it.

The Hon. JOHN TINGLE: This document is a good publication but are you not preaching to the converted, talking within the community of people who are actually involved in firefighting? I am thinking about the greater general public and I just wonder if you should not be saying to people publicly in a publicity campaign, "It wasn't us! We have a matchless record" or some catchy little slogan like that. Should you explain your position to the wider community because within the firefighting movement and the people who are involved in it—the bushfire management committees—surely they have their own knowledge and will know what is going on? I would think that when the media, as the Hon. Tony Kelly was saying, runs reports saying that you are to blame for everything that happened it might be a good thing to take on a generalised publicity campaign.

Mr GILLIGAN: Yes, it may well be a worthwhile exercise and I think it is certainly worth considering.

The Hon. JOHN TINGLE: You can have the slogan for free.

Mr GILLIGAN: When talking about the work that we do currently, I neglected to mention that one of the other things that we do is run fire preparedness days with our neighbours adjacent to the parks. That is particularly important for us to do if we have not been able to complete the hazard reduction burn in the asset protection zone adjacent to those properties in a particular year. What we do is try to keep those neighbours informed of the fact that, first, we are planning to do this thing and we are all watching the weather and everyone knows it is going to happen if we can possibly get it done. Second, if we cannot get it done then we do letterbox drops and have fire preparedness days with those householders and collaborate with other fire authorities.

To try to recognise the fact that, as I think Mr Cheney said this morning, you cannot treat hazard reduction on its own, and get that recognition that if you do not get the hazard reduction done it does not mean that the sky will fall in but it does mean that you have to up the ante on your suppression efforts. Part of upping the ante on the suppression effort is to reduce the risk by making sure that household preparedness on the adjoining properties is at its peak. We have to canvass all of that and I very much appreciate your generous offer of the slogan.

CHAIR: Would you like the document "Living with Fire" included as part of your submission?

Mr GILLIGAN: If it is useful I would be happy to have it included.

The Hon. RICK COLLESS: What process do you go through when you are declaring a fire to be a section 44? As I understand it, you as the land manager agency makes the decision to refer it to the Rural Fire Service for declaration?

Mr GILLIGAN: We have to recognise the three classes. If it is on our estate and we can readily contain it within our estate with the resources that we have, it is a class one fire. If we go to a class two fire we call in the other agencies for support at a local level and that involves the district level fire organisation. If it goes beyond the district it is up to the fire control officer and the district management arrangements to then take it to the next level of referring it to the commissioner for drawing in more resource to be able to address it. The call to the commissioner is made at that district level and the determination of whether it is a section 44 is made by the Commissioner of the Rural Fire Service. It is the commissioner who is making that call.

The Hon. RICK COLLESS: I have had one stint as a section 44 controller during which time on State Forests land the fire control officer and the manager of State Forests at the time made the call that it should be referred to the commissioner and it was subsequently notified. I was called in at that stage as the incident controller. For all practical points would that decision be made between your local manager and the fire control officer?

Mr GILLIGAN: Most of the time, but it depends on the level of activity and the level of concern. All of that is being reported in centrally and to the extent to which it is giving rise to any strategic concerns well then the commissioner may well make a call of his own initiative. I can recall in September/October 2000 when there were a run of fires on the north coast and up around the New England tablelands. At that time those bottom-up arrangements were working but I recall that Commissioner Koperberg called me to have a discussion about the cumulative effect, if you like, of all of the activity that was happening up there. He had in mind at the time the need to make some over arching section 44 appointments in order to get that situation under control and to do it strategically. In that instance he made that call and it was his discussion with me that went on through and ultimately gave effect to that, rather than just the bottom-up process being the only one that applies. So it does vary depending upon the circumstances.

The Hon. RICK COLLESS: The Deua fire and I think the Goobang fire were ignited several weeks before the bad weather conditions and were allowed to burn.

The Hon. TONY KELLY: They were bad weather conditions anyway.

The Hon. RICK COLLESS: Yes, but it was early in December before the extreme weather conditions. At what stage was the Deua fire declared as a section 44? Was it after Christmas?

Mr GILLIGAN: I would have to check on the detail which I am sure is available. I can recall having had discussions with Commissioner Koperberg about the Deua fire and having had discussions with my own staff about that. There were, in fact, quite a few resources put into that fire early on when we thought we had some hope of containing it. Ultimately, once we had decided that we were not going to contain it to the minimal area that we might have liked it became a matter of looking strategically at where the next level of containment lines were going to be. I know that ultimately the calls were made to work towards those containment lines. Can I make the point that we are always going to have to read those situations on a case by case basis, and ultimately the commissioner is going to make a call on the best available information.

I can recall that in that September/October 2000 time there were fires east of Tamworth and a little north of Walcha burning in very rugged country. Commissioner Koperberg called me and discussed his concern that these fires had the potential to ramble around in that rugged country for several weeks but then might come out and threaten property and pastoral areas at a time when we might not have been in the best position to be able to respond because we might have had more fires on our hands. At that time, based on those discussions, he made a call that that should be a section 44 fire and that we should go in and actually try to suppress those fires. I remember at the time we were criticised by some local land-holders that we were, in fact, putting firefighters into a dangerous situation unnecessarily and, in fact, that we should have been letting it burn; that it was doing a good job, or words the that effect. We are not always going to be able to please anyone or please every local judgment on what is the best thing to do.

The Hon. RICK COLLESS: To use the Deua fire as an example, your fire office would have had weather forecasts before those severe conditions arrived on 23 or 24 December?

Mr GILLIGAN: Yes.

The Hon. RICK COLLESS: How much notice—24 hours, 2 days or none at all—do you get of those extreme conditions arriving?

Mr GILLIGAN: That is a bit variable too, and the level of confidence that you can have in it varies at times.

The Hon. TONY KELLY: Have you ever tried to cut hay with those four-day weather forecasts?

The Hon. RICK COLLESS: My point is that even after the severe conditions arrived there was still the best part of a week before the Deua fire was declared at which stage it must have been well out of control? What triggers the declaration?

Mr GILLIGAN: One of the significant issues was just the configuration of the fire and the configuration of the locally useable control lines. If you know that you do not have a workable control line within the sort of distance that that fire is going to progress in the time frame you are talking about it is a question of how much you are going to do about it anyway. I know that there was consideration given at different stages of the Deua fire to how much backburning ought to be initiated and at what stage it ought to be initiated. In one sense you can ask: Why not go to your fallback control lines and backburn off them? But you have to watch the timing at which you do that as well, otherwise you will open up a second front if that gets out of control. I cannot answer your question precisely. Ultimately it was Commissioner Koperberg's call as to the status of the fire. But I can assure you that there were some complex considerations in there, including the availability or lack of availability of suitable control lines from which to work under that particular configuration.

The Hon. RICK COLLESS: Would you concede that keeping fuel levels low makes fire management easier?

Mr GILLIGAN: Generally, yes.

The Hon. RICK COLLESS: Do you actually estimate fuel levels in your national parks?

Mr GILLIGAN: Yes, we estimate it as part of the fire management plan.

The Hon. RICK COLLESS: So coming into a fire season you would have an idea of where your potential problems in terms of fuel might be as the season progresses?

Mr GILLIGAN: Not only as the season progresses. I think the more significant planning work is done more on the three-year rolling program. The fuel levels of concern rarely develop quickly: you know three years out that they are coming. Therefore we try to program the work accordingly.

The Hon. RICK COLLESS: We heard evidence the other day that CSIRO researchers into the project on fire propagation made a statement that hazard reduction during the cooler months is essential to reduce both the outbreak and the intensity of fire. Do you agree with that?

Mr GILLIGAN: Yes, I do. I think the most challenging part of that is a reference to cooler months because of the problems I have already alluded to, of actually trying to get the burns done within the cooler months. We face pressure to encroach on the shoulders of the hazard reduction period. It may well be something we need to do more of but I think we need to do it being very conscious that you are going into a higher level of risk with such burns. Hazard reduction burns do get out of control and have got out of control and become problems in their own right.

The Hon. RICK COLLESS: Commissioner Koperberg told us this morning that the guidelines for fire management needed to be reviewed because of the preliminary findings of Project Vesta. Would you agree that fire activity in extreme conditions is understated as the commissioner suggested?

Mr GILLIGAN: I would be relying on the same research findings as the commissioner. I have no reason to doubt that research at this stage.

The Hon. RICK COLLESS: Do you see that that might be a justification for managing our fuel at lower levels than we currently do, given that the fire activity will be higher at lower fuel levels than we thought?

Mr GILLIGAN: The critical issue is the implications for fire management across the board rather than just the fuel management. Yes, it might mean that we need to have a look at the local circumstances with regard to fuel management but it also might mean that we need to look at other parts of the equation as well as well as preparedness, suppression strategies and so on in those particular areas and in some of our resourcing and logistical arrangements. I think that the ramifications are more than just the fuel loads.

The Hon. RICK COLLESS: On the issue of fuel management, I would like to query you about the service's approach to the number of native grazing animals in the parks. Do you monitor the number of animals that are in there and is there any relationship between the number of native grazing animals and the rate of fuel buildup, the rate of fuel recycling and that sort of thing?

Mr GILLIGAN: Yes, there will be times, particularly in western New South Wales, when particularly large populations of macropods will reduce some of the ground cover. But there is a question of how much of that fuel load is reduced by grazing. We do not monitor it with any detail; just as part of the overall observations a local manager might take in terms of assessing preparedness for a coming season or in preparing the planning documents for a particular reserve or district.

The Hon. RICK COLLESS: With the zonal system that has been used—asset protection zones and so on—do you see that that system needs review and perhaps looking towards expanding the asset protection zones in areas adjacent to where there is a threat to life and limb? Do they need to be increased in size? Is there a need for a more intense hazard reduction or fuel management program in those areas?

Mr GILLIGAN: The policy and practice of managing asset protection zones is pretty clear: the asset protection zone ought to be on the development side rather than expecting it to be on the reserve side of a boundary. That said, there are some situations that we have inherited from previous planning decisions and therefore we have to make the best of them. We fundamentally take them on a case-by-case basis. But in getting to that figure of 50,000 hectares that we might manage by hazard reduction in a year, notionally we would be looking at making that up by a combination of burning asset protection zones and also burning some more distant strategic wildfire suppression zones that would complement the asset protection zones.

Notionally, we might ideally like to get 20 per cent of our asset protection zone hazard reduced every year. Then you know you are on a five-year cycle, which sort of makes sense. With your strategic wildfire suppression zones more distant, we might be talking about doing perhaps 10 per cent of that a year. You are just on a longer cycle because of the different configurations. We will always have to review those and worked them through for the particular plans and the particular districts that we are dealing with. I do not know that I can generalise on it much more than that. I think that what would be more useful for us is, when we get all the plans in place, as we are now close to having them, and get a bit more experience of real, integrated fire management as we have had in recent years but get a bit more experience of working that through a few more bad seasons, there will be lessons for us to learn from that practical experience which will inform the subsequent reviews of those plans and our site-specific practices.

The Hon. RICK COLLESS: I was interested in your point about the 10 per cent. Captain Williams from the Kurrajong brigade made the point that it is a significant advantage in a wildfire if areas had been hazard reduced up to 10 years ago.

Mr GILLIGAN: Yes.

The Hon. RICK COLLESS: That would be consistent with his findings there too.

Mr GILLIGAN: While ever the conditions are mild to moderate it will certainly be an advantage. In our submission we provided a number of case studies, one being the lower Blue Mountains and Warragamba area. Areas immediately adjacent to Warragamba were Sydney Catchment Authority lands. The Blue Mountains National Park was further distant but we burnt 500 or 600 hectares of it as part of a strategic wildfire suppression zone because it was significant and because it was on the west and north-west side of Warragamba. Over time we will need to develop, essentially, village protection strategies within district plans as we work it through. Those things need to become routine. There is no particular rocket science in them. Many of them are the things that we have been doing for many years anyway. But we can build on some of those experiences and make them more routine.

Mr E. T. PAGE: Commissioner Koperberg has said that in some alpine areas of the State high fuel loads can develop. Can you clarify the extent of this as an issue in fire management in Kosciuszko National Park?

Mr GILLIGAN: Certainly. There has been a lot of debate and discussion about just what the peaks of fuel load might be. Figures in excess of 100 tonnes per hectare and so on have been referred to that I am assured are totally unknown to science. Kosciuszko National Park totals nearly 700,000 hectares. About 10 per cent of it is alpine ash community. That alpine ash community is perhaps the one with the highest potential to develop significant fuel loads. The highest fuel load that I am aware of actually being recorded in Kosciusko is about 45 tonnes per hectare, which I think was recorded in the late 1970s by a university post-graduate student. The particular circumstances where those levels accumulate, however, is fairly unique.

We are talking about very moist gullies that suit collection of moisture and suit tree growth of the alpine ash. They are southeasterly in aspect and they are generally not a problem for a fire. In fact, my local managers tell me that you are lucky to find a handful of days a year when you could actually get something to burn in those gullies. So to some extent if there is a peak load in one of those situations it is not particularly an issue for fire management in Kosciusko. Ironically, some of the areas that are more worrying to us in Kosciusko are in fact lower fuel areas where they also happen to be low rainfall areas and therefore generally low humidity areas with a westerly aspect, particularly if you look at some of the Byadbo region. They are the ones that we are most worried about. It tends to highlight the situation that if you just pull out a map of fuel loads it is not really giving you your fire management strategy or even identifying your areas of greatest risk. As Dr Cheney said this morning, it is not just the quantum of fuel; it is the connectivity and the layering of the fuels and the nature of it that make the difference as well is the relationship between those fuel loads and assets that warrant protection.

The Hon. RICK COLLESS: What representation is there of people with expert fire experience on your national park advisory committees?

Mr GILLIGAN: Expert fire experience was not an explicit criterion in the call for nominations for those committees but, without having the criteria in front of me—

The Hon. RICK COLLESS: Do you think that is an oversight?

Mr GILLIGAN: Where I was going was to explain that I think we covered it with the term "experience in managing rural environments". There was a term like that that was in there that was an attempt to take a wider view of things rather than just specify fire.

The Hon. RICK COLLESS: Are bushfire management committees represented?

Mr GILLIGAN: Not explicitly, but we do have some members who were also on our regional advisory committees and district bushfire management committees. I stress that we have made a particular effort in calling for nominations, in our promotional work associated with that and in our analysis in putting recommendations for appointment to the Minister and Cabinet to ensure that we have the widest possible representation, particularly targeting that local knowledge. I think the local knowledge involved with dealing with real issues, for example, would inherently pick up local expertise in fire management. That was our goal any way.

The Hon. RICK COLLESS: Does it always happen?

Mr GILLIGAN: I do not know how to answer that other than to say—

The Hon. RICK COLLESS: My concern is that it may not happen and it does not have to happen.

Mr GILLIGAN: I can only acknowledge that fire management experience in and of itself was not an explicit criteria but there were related criteria that enabled us to pick up people who had that experience in most instances.

CHAIR: I have a question relating to one of your earlier answers. It is location specific but I think you may be able to answer it. In regard to the management plan for Thirlmere Lakes National

Park and the Nattai Reserve, will the final plan incorporate amendments made as a result of the community consultation held at the Oaks Primary School, particularly in regard to asset protection zones, fire trail establishment and maintenance and lack of community presence of National Parks staff? This question came out of a discussion with another member of Parliament who had a particular concern but I think it is relevant to the Committee's considerations this afternoon.

Mr GILLIGAN: Thank you for drawing that to my attention. I am aware that the local member, Dr Kernohan, drew attention to this issue and sought some clarification. As I said earlier, we have conducted a number of community workshops to try to draw out the issues of concern to the local communities in that area. I assure you that the relevant reserve fire management plans are being amended to take account of those concerns. There was criticism that there was not a specific enough action plan to specify hazard reduction to be undertaken within the draft plan. That is being amended because there is a schedule of proposed hazard reduction burns. There was one in the draft plan but it is being reviewed and enlarged.

There were proposals from the community for extending and widening the proposed asset protection zone adjacent to the eastern boundary of the Nattai Reserve that is to be managed jointly by the service and the RFS. I can report that those asset protection zones within the plan are being extended and will comply with Planning NSW guidelines—obviously wherever the terrain permits—for suitable access for construction and maintenance. There are also issues associated with fire trails and people wanting some of the fire trails and breaks constructed during the Christmas fires to be kept and maintained permanently. We are not giving an undertaking that that will occur in all cases but we are certainly looking at all proposed permanent trails and ensuring that they are properly and clearly marked in the final fire management plan and have a proper maintenance schedule.

An array of other specific proposals will lead to quite explicit changes in that plan as a result of the community workshop. I restate my earlier comments: I think that exercise has been a learning experience for the service. Both we and those local communities will be the better for that exercise over the past two months. They will be better plans and, hopefully, there will be more community ownership of them as a result of the interaction we have had. We will have to do more of that and factor in the time that it will take to make it happen.

CHAIR: That confirms your earlier statement about your intention to try to deal with that matter on a larger scale than occurs at present.

Mr GILLIGAN: It is arguably a challenge for all government agencies. It calls for us to be willing to dare to engage and work meaningfully with the communities that we are involved with rather than coming up with expert answers and then consulting them. That calls for some cultural change and for the development of new strategies by the agencies. We are committed to doing that and seeing it happen. I think it is the only way forward. It is the only way that we will be able to address some of the issues that we talked about earlier in terms of the community's view of the agency.

Mr E. T. PAGE: Realising that "Living with Fire" is three and a half years old, you state on page 17 that, according to fire statistics in 1997 and 1998, 75 per cent of fires started on the park and were controlled in the park; 8 per cent started on the park and moved off and 17 per cent started out of the park and moved in. Are those statistics roughly the same now? Have they changed very much?

Mr GILLIGAN: They are roughly the same.

The Hon. TONY KELLY: I think the situation has worsened; I think nearly 20 per cent start outside and come in.

Mr GILLIGAN: I think 22 per cent of fires start off park and move onto park. For some time fewer than 10 per cent of the fires that started on park have moved off park. We take a great deal of pride in that. In some years we have managed to get that figure below 5 per cent, which is a cause of considerable satisfaction. Broadly speaking, the figures are roughly the same. Seventy per cent of the fires that come onto the park from other land tenures come from private property. The next highest figure is 11 per cent from State Forests that have grazing permits and are therefore the subject of that ritualised annual burn with which I suspect Mr Torbay is most familiar.

The Hon. RICK COLLESS: The Premier recently announced an extra $4.5 million for hazard reduction burning. What proportion of that sum do you hope to secure for your department's use?

Mr GILLIGAN: We will have to do what happens within our existing resources. The benefit that we get from existing work will be the work that comes from RFS and our working collaboratively with RFS on the audit protocols and the protocols for streamlining the formulation and approval of proposals and actually getting it done. I am working on the assumption that the National Parks and Wildlife Service will be resourcing its own hazard reduction.

CHAIR: I have a technical question based on part of the submission from State Forests. Its submission stated that the biological and physical impacts of a fire event are directly proportional to its intensity and spread. It goes on to state, "The higher the fire intensity, the greater will be the damage to the environmental values of the burnt area. We have received some scientific evidence from a range of quarters that it is the frequency of fire not the intensity that has the most deleterious effect on biodiversity. We have heard that burning intervals of six years are enough to prevent the regeneration of certain plant species." What is the department's view about that statement?

Mr GILLIGAN: It is another one of those issues where it is not a clear case of one or the other. Fire intensity and fire frequency—I guess the third in that triumvirate is fire seasonality, which becomes an issue also—are relevant in their own way. You cannot say that just intensity is the critical issue. For example, some Australian native plants rely on a high-intensity fire to open their fruits and trigger regeneration. Many native animals and birds, for example, rely on the hollows that develop in trees often after fires. A high-intensity fire sometimes delivers precisely what those species need. If you have an extended period of low-intensity fires you lose the regenerative capacity of those plants that are counting on a high-intensity burn to trigger their regeneration. You also start to lose those hollows and some of that habitat. Different parameters will apply for other species; it is not a clear-cut issue one way or the other. I think it is worth registering that high fire frequency has been listed by the scientific committee that operates under the Threatened Species Conservation Act as a key threatening process for biodiversity and threatened species conservation in New South Wales. Biodiversity in itself is quite significant but you cannot view it as a black-and-white issue.

CHAIR: So you are faced with an area-by-area decision depending on populations within particular areas?

Mr GILLIGAN: Absolutely. We have been monitoring some interesting examples in places such as Royal National Park, where, as I explained in some of my 250 media interviews at the time of the fires—so many people were interested in Royal—the common and fire-resistant species would come back very quickly with no problem. The fact that some of that area had burnt again after having burnt in 1994 would not be a problem for them. However, we were worried about other species because their habitat would be impacted by the high fire frequency. It also depends on the community that is involved. In the case of Royal, we were particularly worried about the prospect of losing the heath community that had burnt in 1994. Several local threatened species would have been at great risk had that heath community burnt. Thankfully, it did not burn on this occasion so it was not such a bad result.

The Hon. RICK COLLESS: The State Forests' submission quotes a paper by Christensen the states, "More recently, some 30 to 40,000 years ago with the arrival of the Aborigine the frequency of fire increased dramatically and in some cases fire intervals as frequent as every two years have been reliably documented using dendrochronology, which is consistent with descriptions of open park-like forests with a grassy understorey described by early explorers." Is there not a conflict with what you have said? When the Aboriginal people arrived, for 30,000 or 40,000 years the Australian landscape was burnt on a low-intensity fire regime. Yet you are saying that those sorts of fires do damage. The paper the Chairman mentioned refer specifically to short fire periods but it does not discuss the intensity of the fire. I find it difficult to believe a high-intensity fire will be less damaging to the environment than a low-intensity fire. I cannot comprehend that. Compare a fire racing across the landscape at 30,000 or 40,000 kilowatts per metre of energy and a fire moving across the landscape at 200 or 300 kilowatts per metre. Which one will do greater damage to the biodiversity? Surely commonsense tells you that it is the hot fire.

Mr GILLIGAN: I am saying that there is not a simple answer to that question. We have to look at the history of fire regimes in New South Wales and Australia, not just pre-European settlement but beyond that to geological times. Fires have sculptured the Australian landscape. In geological times they were started by lightning and put out either by rain or by coming up against a massive landform feature. Some of those fires were presumably very intense. The woody fruits of some of our banksias, for example, will not open with a cool fire. The seed will not release, and therefore there will not be a regenerative capacity. Banksias would gradually die out in a particular area if they did not get a very hot fire occasionally. Without a hot fire in that area another, more fire-tolerance species will take over and gradually dominate the banksias.

So, depending on the change in regime there will be a change in the vegetation. There is heavy documentation and scientific literature on changes in vegetation communities as a result of fire regimes. I think it is also a mistake to take some of the assumptions based on the northern Australian experience of Aboriginal use of fire and transpose them to New South Wales. For example, our dissected landscape is dramatically different from the vast savanna landscapes of the Northern Territory, and the local regimes had to be broken up and much more of a mosaic developed of burnt and unburnt areas.

The Hon. RICK COLLESS: Which is what the Aboriginal did, essentially, is it not? They burnt on a mosaic-type pattern?

Mr GILLIGAN: They certainly burnt patches, yes. The other point worth making is that the most recent publication, which has come out only on the last few months, suggests that Aboriginal use of fire did not set a new trend but simply accentuated some trends existing in the geological timescale of evolution of the vegetation of Australia. So it is a very complex area. I come back to having to say to you that it is not a simple case of saying that a more intense fire will have a high impact. It certainly will have a high impact on individual animals and plants, but in terms of populations and communities continuing over time the high-intensity fire may be just what they need.

CHAIR: My question was basically about frequency, I suspect.

Mr GILLIGAN: Yes.

CHAIR: You are saying high-intensity fires have a greater time span than have the low-intensity fires.

Mr GILLIGAN: Certainly. Frequency of fires poses the greatest threat to vulnerable species at present. An example that we have used in discussions in recent months relates to threatened species in one of the metropolitan catchments at Cataract or Cordeaux which were being studied by students from the University of Wollongong in the lead-up to the 1994 fires. My recollection is that 27 individual species of the locally threatened population were being studied, and all of those were cooked and killed by the 1994 fires. Students monitored the recovery of those plants after the fires, and 143 or some such number actually grew from seeds after the fire. The students were monitoring those, the critical question being: Would they have enough time to mature, flower and produce more seeds before the next fire? The answer to that question was that they got cooked in 2001-02, before they had had a chance to flower and produce more seeds.

The question now the subject of monitoring by the University of Wollongong is: Were there residual seeds, as well as those that germinated after 1994, that were still in the soil and may come up, or have we just seen the local extinction of a particular plant? In that case it would have been an extinction resulting from fire frequency rather than anything else. Fire frequency becomes a problem for those plant species that rely on seeds for their regeneration, because they must have time to mature, flower and produce more seeds, otherwise the cycle keeps being broken.

The Hon. RICK COLLESS: On Friday Professor Whelan commented that many of the fires that we get now in the Sydney basin are high-intensity fires and that they are on a regular basis, as happened in Royal National Park. Some areas of the park have been burnt three times since 1988.

Mr GILLIGAN: Yes, high-frequency.

The Hon. RICK COLLESS: Yes, high-frequency and high-intensity. I suggested to Professor Whelan that, because of the problem with arson and because of the problem of human interaction with forested areas—and I accept all that—if the problem is that we are going into a phase of high-intensity regular fires, would it not be better to do more lower-intensity hazard reduction to reduce the intensity of the high-intensity fires, or hopefully get them under control a little easier?

Mr GILLIGAN: Reactions will vary from location to location and from species to species, and that is why we need to develop our reserve fire management plans as part of the overall exercise. In them, we identify the high-value conservation areas that need some special treatment. In fact, we do precisely what you are saying. If a species or community is vulnerable or threatened and requires special fire attention, we try to give it that, and we try to incorporate that in our reserve fire management plan. It is an ongoing and challenging exercise, but it gets a bit tricky because there is a real danger that you start playing God because you favour one species or community over another because the responses of the different communities do vary.

CHAIRMAN: You referred to a number of interfaces that your department has with Mr Koperberg's group. As Mr Koperberg is still here, I wonder whether he might like to give further evidence this afternoon. Mr Koperberg, if you would like to respond to any comments made this afternoon, feel free to do so. Members who have any questions for Mr Koperberg should ask them now, because they will have no further opportunity after today.

Mr KOPERBERG: Fire management, like any other enterprise, is a process of continuous improvement. You learn lessons from every event and experience. It is gratifying to observe that the days of unilateralism on the part of agencies are largely past. There is a tendency, whether caused by competition for resources or whatever, to look at the totality of the resource, irrespective of what it might be applied to, and recognise that there are a range of skills across the board that ought to be put to good effect. So, as Mr Gilligan has pointed out, not only the National Parks and Wildlife Service but the whole range of land management and fire suppression agencies are anxious to ensure that the community is served by the best use of the totality of resources, and that there is not a fragmented approach.

A lot of work is still to be done, but we find evidence of the fact that that approach is progressing satisfactorily in the results produced by the suppression efforts in 2001-02. So, apart from acknowledging the need to go down this particular path, and concurring with what Mr Gilligan has said, I have nothing further to proffer. We continue to aggressively pursue the notion that Rural Fire Service resources ought to integrate with other resources. Simply because the Rural Fire Service, the National Parks and Wildlife Service, State Forests and all other agencies have different charters is no reason to suggest they cannot share resources to achieve their respective objectives.

CHAIR: I have one question that has high ecological significance as well as practical significance in terms of location. What would be the fire management plan for the area in which the wollemi pine grows, for instance?

Mr KOPERBERG: We cannot reveal that to you, Mr Chairman, because it is so sensitive!

CHAIR: A pretty good answer.

Mr GILLIGAN: Generally, we would like to leave the fire regime in that area as natural as possible.

The Hon. RICK COLLESS: Commissioner, I understand you were requested by the Committee secretariat to furnish copies of section 44 reports. When can we expect to see those documents?

Mr KOPERBERG: I have been so requested, and we are preparing copies. Some of those reports are quite voluminous, some of them are double-sided in their printing, and most of them are bound, so that we have to separate them and photocopy them. I undertake to get them to the Committee as quickly as I am able.

The Hon. RICK COLLESS: Could you give a timeframe for that? The Committee has a very tight timeframe, as you probably know.

Mr KOPERBERG: May I seek advice from Assistant Commissioner Smith?

The Hon. RICK COLLESS: Certainly.

Mr KOPERBERG: By the end of this week, Mr Chairman.

The Hon. RICK COLLESS: That will be fine. Thank you.

Mr E. T. PAGE: Could we agree that the system did a great job in the last fires. All of this talk about experience and learning from what has happened before was evident this time. This tremendous effort obviously drew from the experiences of previous big fires. I think it should be on record that the Committee feels that they did a great job.

CHAIR: We note that recognition and congratulate the officers concerned, as we did at the time and continue to do. Thank you for your attendance today.

(The witnesses withdrew)

RUSSELL ALAN AINLEY, Executive Director, New South Wales Forest Products Association, Level 2/60 York Street, Sydney, sworn and examined:

CHAIR: Have you been issued with a copy of the Committee's terms of reference and also the Legislative Assembly's Standing Orders 332, 333 and 334, which relate to the examination of witnesses?

Mr AINLEY: Yes.

CHAIR: Did you receive a summons issued under my hand to attend before this Committee?

Mr AINLEY: Yes.

CHAIR: Would you care to make an opening statement in support of your submission?

Mr AINLEY: Yes. I would like to state that the interests of the New South Wales Forest Products Association with respect to bushfires is the protection of the forest resource that is the basis of supply to the industry.

Mr E. T. PAGE: Could you give the Committee a description of your association?

Mr AINLEY: Our association is the representative body of the sawmillers, hardwood sawmillers generally, in New South Wales.

Mr E. T. PAGE: Timber users?

Mr AINLEY: Yes.

The Hon. RICK COLLESS: On page 4 of your submission you make the statement that forest ecosystems tend to be more stable under low intensity, although more frequent fires. That statement is certainly in contrast with what we have heard from the National Parks and Wildlife Service. Would you care to comment on that?

Mr AINLEY: Yes. It is my understanding that low-intensity fires occurring at relatively frequent intervals actually maintain the ecosystems that exist there, on the basis that there is very little

change to the dominant species and relatively minimal impacts on the understoreys, whereas higher-intensity fires, even though they occur at greater intervals, tend to have a more destructive effect on the ecosystem.

Mr E. T. PAGE: What is the scientific basis on which you make that statement?

Mr AINLEY: It is my understanding from years of experience and actually seeing the effects of fires in the forests.

Mr E. T. PAGE: So it is based on your experience, not on scientific evidence?

Mr AINLEY: I am a forester by profession, and that was all of my training and understanding in forest management.

Mr E. T. PAGE: But you cannot quote any technical—?

The Hon. RICK COLLESS: It is anecdotal evidence.

Mr E. T. PAGE: In your submission you say that wildfires incinerated vast areas of national parks and that conservation values were ultimately destroyed. Can you explain what reasoning and ecological research undertaken supports this statement?

Mr AINLEY: The reasoning is that what I have seen is the results of a number of the fires that occurred last Christmas and the previous fires, where the landscape was left in a blackened and charcoal condition and parts of the Morton fire actually went through some private stands of timber near Tomerong and completely destroyed and burnt large mature trees to charcoal.

Mr E. T. PAGE: That is hardly a scientific response. Some people call the Morton fire the highlands fire?

Mr AINLEY: Yes.

The Hon. TONY KELLY: What is your view about the extremity of the weather during the Christmas bushfires? Was it a minor event; was it the worst in history?

Mr AINLEY: It was my understanding that they were fairly significant weather conditions. The weather conditions in that period were described as blow-up fire conditions. Whether they were the worst we have ever seen or not, I am unsure. We have seen weather conditions like that, and we have seen other major bushfires going back to the 1968 fires, when weather conditions were perhaps a little worse or perhaps not quite as bad. But those weather conditions were certainly conditions which would accelerate fires.

The Hon. TONY KELLY: Would you agree with the comment that those weather conditions were not extremely bad but they were extreme fire conditions for a period of five or six days every five or six days?

Mr AINLEY: In some parts, yes. I believe that on the South Coast those conditions were bad, but they have been worse down there. But the weather conditions in other parts of the State were not so particularly bad.

The Hon. JOHN TINGLE: You make the point on page 5 of your submission that the major factor that allowed the fire to develop into wildfires was the weather conditions. On page 2 you say that the probability of fires developing into campaign fires is entirely predictable. I am trying to marry those two statements. Are you suggesting that it was entirely predictable that the fires which you mention particularly, Morton and Duea fires, were predictable, given the unexpected extremes in the weather?

Mr AINLEY: I believe that the weather conditions at that time could have been reasonably expected at that time of the year in the bushfire season, knowing the history of fires and weather conditions at that time.

The Hon. JOHN TINGLE: But we could not have predicted that that extreme weather could happen, could we?

Mr AINLEY: I believe we could have.

Mr E. T. PAGE: Did you?

Mr AINLEY: Yes. Actually I did, in a very broad sense. Earlier in the year I said, "This is going to be a fire year based on the history of fire frequency we have had." We know that we get those fire conditions in something like a seven-year cycle, and in something like a 14-year cycle they are more particularly bad.

Mr E. T. PAGE: How did you know this was the seventh year?

Mr AINLEY: 1994 plus seven is 2001.

The Hon. TONY KELLY: So we do not need to spend any more money for another five or six years?

Mr AINLEY: That is a risk assessment approach to it. But I would expect that in seven years time there is a fairly high probability that we will have similar conditions again. The other part of the predicability of it comes from the fuel loads that are carried on the ground. We can measure those fuel loads. We do have a fire rating system, which was developed by the CSIRO many, many years ago, which predicts the fire risk at those times.

The Hon. JOHN TINGLE: Are you saying that those fires, those conditions and the intensity of those fires should have been seen in advance and that measures should have been taken in advance to try to stop them developing into such huge fires?

Mr AINLEY: I believe so. I believe that a strategic approach to how to manage the probability of fires occurring is entirely feasible and could have been done.

The Hon. JOHN TINGLE: What should they have done?

Mr AINLEY: A controlled burning in locations where we have a history of known fire paths; maintenance of breaks; and access to areas. In particular, I believe the extinguishment of all fires existing in the fire season needs to be a necessary step to be taken. We should not allow fires to burn when we are expecting a fire season, without attending to them.

The Hon. RICK COLLESS: Earlier we discussed with the director-general the Duea fire. Are you familiar with that fire?

Mr AINLEY: Yes, I have some knowledge of it.

The Hon. RICK COLLESS: Apparently, that fire was ignited by a lightning strike on or about 3 or 4 December, and it was allowed to burn for a couple of weeks prior to the season getting bad. Is that the sort of situation you are talking about?

Mr AINLEY: Yes, I believe that was the case with it. I knew it was early December, and I believe that some time up until 8 December it attracted storms and the bad weather conditions. Yes, that is the situation. I really believe something needed to be done with that fire. By the time we did have the weather conditions, it was a significant fire out there which was able to spread in a number of directions over a fairly big front.

The Hon. JOHN TINGLE: On page 4 of your submission you say, "A number of small fires occurred in State forests during the last fire season. Those fires were attended to promptly and suppressed before they could escalate and damage significant areas. In contrast fires within national parks were permitted to burn and spread. They were large fires before the bad weather conditions of

the Christmas to New Year period." Are you drawing there an unfavourable comparison between the responses of State Forests and the National Parks and Wildlife Service?

Mr AINLEY: I think what I was trying to say there was that the fires that occurred in State forests had access available to them and they were able to be attended to quickly and extinguished before they became large fires. I think there were three fires in that period in that South Coast area. One was a couple of hectares, one was 100 hectares and one got to be 900 hectares. But with those three fires, there was no significant damage done to the timber resource.

The Hon. JOHN TINGLE: You used the words "in contrast". You are saying it was not as well handled, in your opinion, by the National Parks and Wildlife Service?

Mr AINLEY: I believe that is right, in that the National Parks fires had been burning for some time unattended.

The Hon. JOHN TINGLE: Is there any reason for that, that you can think of?

Mr AINLEY: I would suggest access was the primary problem that they faced. To have been able to get a fire crew into the centre of the Deua fire would have created some difficulty but helicopter access could have been feasible.

The Hon. TONY KELLY: What, dropping guys into the middle of it with no access to get out?

Mr AINLEY: That is the problem with not having access, but early in December they could have been put there, not necessarily in the middle of the fire but in that time—

The Hon. TONY KELLY: What would be the point in putting them in if there is no fire?

Mr AINLEY: Not in the middle of the fire but they could have been put in within an hour's walk to the fire. There are some ridge tops in there. The weather conditions early in December were not the blow-up conditions, so you would have been looking at getting them in there to extinguish the fire in a relatively small way.

The Hon. TONY KELLY: You are obviously saying the difference between State forests and national parks is the access?

Mr AINLEY: That is one of the differences, yes.

The Hon. TONY KELLY: Do you think there is any reason for there to be more access in State forests and national parks?

Mr AINLEY: Yes. State forests are much more actively used for a great variety of purposes and the Deua fire in particular is a wilderness area where access is generally not an objective.

The Hon. TONY KELLY: That is right, so you would not spend millions of dollars putting roadways into a wilderness area but you might in a State forest where you want to pull out timber?

Mr AINLEY: That is right.

Mr E. T. PAGE: You called it the Morton fire, but with the highland fire you emphasised the great network of unmaintained breaks and trails. Can you clarify this statement?

Mr AINLEY: That is when the fire came over the ridge area into the Yerriyong-Jerrawangala forest areas which previously had been production forests. Those forests do have a great network of trails and roads in them.

Mr E. T. PAGE: That fire crosses many tenures and 50 per cent of the national parks estate was burnt in those fires. The National Parks and Wildlife Service had control of them for less than one year.

Mr AINLEY: Yes.

Mr E. T. PAGE: If you are complaining about the fire trails, how can you blame the National Parks and Wildlife Service if they have only had control of that area for less than one year?

Mr AINLEY: The problem with those fires and trails was that the fire actually crossed a couple of those trails as it travelled, particularly when it came down the Sussex Inlet side and what I would have expected to have happened is for the significant trails there to be cleaned and graded as fire prevention measures. The roads existed and all they needed was a bit of cleaning and maintenance.

The Hon. TONY KELLY: How often should you do that?

Mr AINLEY: It is fairly light cleaning of trails and I believe that should be done on an annual basis.

The Hon. TONY KELLY: It was less than a year that that happened, so it should have been okay anyway?

Mr AINLEY: Possibly.

Mr E. T. PAGE: On your criteria it should have been done by State Forests?

Mr AINLEY: Yes.

The Hon. RICK COLLESS: Looking at the map here, that area there is what is bounded by State forests. You can see the fire trails in there as opposed to the trails that are in the national park estate. Do you think that National Parks should have a program of better fire access into those sorts of areas? Do they need more roads and more fire trails in their parks?

Mr AINLEY: Be it National Parks or State Forests, I do believe they need more access into their areas.

The Hon. TONY KELLY: Is the geography the same?

Mr AINLEY: No. The wilderness area is generally much steeper and has more difficult access. The fire trails used to exist through there.

Mr E. T. PAGE: What is the view of your association on government policy of transferring areas from State forests into national parks?

Mr AINLEY: As it affects our resource, our association members have lost significant areas of resource to do that and that has occurred to create protection of conservation values. In doing that it increases the independence of the millers upon the commercial production of the areas that are left within State forests. Our position is that if those conservation values within the national parks are diminished, then there is an increased pressure on the production forests to supply those values.

Mr E. T. PAGE: So it is a financial problem?

Mr AINLEY: Certainly. It is the dependency of our industry upon the resource there and we see the fires as a risk, firstly, directly, that it can burn the resource and, secondly, that there may be a dependency upon that resource to substitute conservation values that may be lost in fires.

The Hon. TONY KELLY: You may wish to take this question on notice. On page 7, paragraph 2, you talk about lessees in the Dorrigo area reporting applications for hazard reduction being held up by the National Parks and Wildlife Service for considerable periods of time. Can you give us some dates that they were submitted and specific examples? We are trying to get away from anecdotal evidence.

Mr AINLEY: I will have to provide that to you because it was four years ago that the applications were lodged. I will get the statements for you.

CHAIR: Is there any further statement you wish to make?

Mr AINLEY: No, thank you.

(The witness withdrew)

(The Committee adjourned at 3.57 p.m.)