

Conference Proceedings – Speaker Transcript

People, fire and koalas comparing fire management approaches from the far north and south coasts of NSW

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[Link to Slides](#)

Scott Hetherington

Thank you for your time today. I'd like to start by acknowledging the Gadigal people from this part of the world and the Bundjalung people from where I am. I think that it is important to celebrate that the Indigenous people and projects that have been shared at this event really acknowledges the significance of cultural fire in reconciling all the issues that we're dealing with.

Getting onto our issue of fire and koalas, what we recognised, or what Michelle from NCC recognised on our behalf, was that we had some problems in common in the work that we were putting together (Slide 2), one of them being, as discussed over the last 24 hours or so, the dominance of long unburnt country, and the resulting situation of guaranteed high-intensity fires.

This presents a subsequent risk to human life and property as well as koalas and their habitat. We're also facing the issue of the community's concern about fire and people accepting that fire is a requirement of landscape and species management. What was also evident, particularly in the northern part of the state, is that fire exclusion presents an additional risk. In the absence of fire, we are losing koala habitat to rainforest succession. We have got to find that middle ground. The lack of fire presents these two extreme scenarios, in terms of koalas and koala conservation.

Max Beukers

We could just ignore the problem but we considered that we need to solve it (Slide 3) and there's some reasonable arguments as to why we should actually engage and try and solve this problem, not the least that there is significant interest and concern about koala decline in New South Wales. As Ross Bradstock pointed out yesterday, there is a growing area of interface between urban and peri-urban environments and koala habitats. There's potential conflict there in the way we manage fire and habitat. There is a growing risk to koalas and to buildings from bushfire over time. There is also increasing community interest in what we're going to do

about managing that risk in the landscape. As we work to address the risks we should consider the point raised by Scott that in the absence of doing nothing the habitat will change as well.

Whether we want to just observe that change or be engaged in managing that change over time is something we have got to consider. There are some opportunities at present. The SOS program that was presented is a major opportunity for us to engage in koala and fire management. Other opportunities that exist right now are the review of the strategic fire management frameworks that are being done by both RFS and National Parks. Lloyd van der Wallen talked about the review of the Bush Fire Environmental Assessment Code yesterday. That's another opportunity for us to engage with some new knowledge and extend our actions and conditions across a broader area.

Scott Hetherington

Just to set the scene a little bit for you, in terms of the spatial areas (Slide 4), we're talking about the northernmost and the southernmost extreme of the State, which is a nice part of the coincidence of us coming together in this. On the right-hand side of the screen there is the study area that I am working in, which is the Tweed Coast, about 13,000 hectares, just before you hit the Gold Coast. Indeed, we can see Queensland from where we are. If you just zoom in a little bit there on that area, what that demonstrates is the kind of landscape matrix that we're dealing with, where you have got coastal villages, reasonably large areas of bushland, private and public bushland, then a rural landscape that still has some agricultural activities, mainly sugar cane farming, when you get a bit away from the coast, together with small scale agricultural production.

This is the matrix of urban coastal villages, that are interspersed with bushland that forms our study area .. The colours that you can see there are, the green is a National Park estate and the purple is the Council bushland reserve estate in that particular part of the world.

Max Beukers

Our part of the world is between Bermagui and Bega on the far south coast. From a high point there, you could probably see Victoria. Here is roughly where it is on the map. It's a much larger area than the north coast area (Slide 5). It's got more forests. It's got less koalas.

Scott Hetherington

And our koala population is endangered.

Max Beukers

That's right, and you have got more people (Slide 6). So as you can see there is a nice opportunity for compare and contrast coming up here. All right, I'm going to stick with the top graph (Slide 7) because I'm not actually sure about the bottom graph which uses the NSW RFS "Planning for bushfire protection" specifications. We can look briefly at the biodiversity fire threshold. The top graph here is looking within an area identified as koala habitat. What's the threshold? There's about 3,000 hectares of koala habitat in our 60,000-hectare study area, so probably five percent. That area is a big area, 60,000 hectares. It's had a lot of fire over it over the last years of reasonable fire mapping that we can refer to. We map thresholds simply by overlaying time since fire maps onto a vegetation map, apply some guidelines and then end up with something that will look like this map on the right, which is a map of fire thresholds.

We have then intersected that with where the koala habitat occurs, which is mostly in a few small patches along the eastern edges of that map. Then we applied the bushfire risk model across that landscape as well using the planning for bushfire protection technique, which is one of my concerns about the bushfire risk model that we have applied here. One of the key points that we will come to later on is picking the right tools for the job. I'm not sure that we have picked the right tool for the job there.

Scott Hetherington

The fire history for our part of the world (Slide 8), just to show you a snapshot of what we are dealing with, what we have got here mapped are fires greater than 100 hectares, going back to the known fire records from about 1978. You can see that in this area, which is partly nature reserve, partly private property, that there are a series of reasonably large fires over that time period. A reasonable amount of that country has burnt during that time. Interestingly, though, if you look at that over the entire study area, it's nothing really like that, particularly in terms of when you look at the koala habitat which is mapped there in the red on those maps. There is actually nearly 60 percent of the remaining koala habitat is at a high to very high risk of wildfire, based on the time since the last fire.

That puts it into that category of being overdue for fire. When you look at that against the vegetation thresholds, we obviously have some areas of those areas that have burnt more recently that are in that not ready for fire category but we still have a large proportion of the landscape that is essentially overdue for fire. The dual impact or resulting issues being risk to human life and property, that are located within that landscape matrix and risk to koalas and koala habitat.

There's a whole range of things that have come together in terms of the solutions that we have applied that we wanted to share with you today (Slide 9). I suppose this is the broad overview and we'll talk about in a bit more detail as we move on. The key things are the community engagement and planning, collaboration, work across stakeholder groups, again, which we have heard quite a few other examples of during the conference so far. These have definitely been huge issues for both of our projects. Having the community actively engaged and looking at those treatment options, the community actively consulted with and engaged in understanding why we are doing this and what we're doing, have been key issues. Each project has examples of strong and engaged communities with quite vehement opinions and positions around fire management. That whole thing of developing those tools with our communities has been a key aspect.

What we have done is looked at producing models that we can share with others for potential adaptation or application in other places around the nation, certainly within those areas of koala habitat on the eastern seaboard. We've also focused on monitoring the outcomes and approaches of adaptive management. Each of us have had strong, rapid learning associated with the works we have done to date and we fully expect that to continue as we move forward. Just a little bit of detail from the far north coast about what have been the steps of what we have done in terms of that solution (Slide 10). There's the graph that I showed before. We started there with landscape analysis of fire history and ecological thresholds and through that developed a management plan that allows us to prioritise our burn requirements, obviously

within the legislative and conservation-based context but to say, okay, these are the areas that we most need to work on.

Coincidentally, from the perspective of council as a land manager, we have previously had quite reactive and not very well-resourced approach to managing our bushland reserve estate. We have a couple of thousand hectares of bushland reserve and we have coincidentally with this work changed that around and are starting to take a more proactive approach to what we do. What works in nicely here is for us to just get in and say, well, let's do this on our own land. Let's continue that application of this approach. Let's learn what we can and let's then see if we can share that and engage with others beyond our own land, so essentially get our own ship in order first. What the development of those guidelines has allowed us to do is to develop a whole range of practical strategies. Again, we have been fortunate in that we have been able to live test this approach.

Whilst we were preparing this information we were collaborating with National Parks and RFS on local planned, hazard reduction burns. We were able to test some of this stuff in terms of its feasibility. We're very open about the fact that to actually implement it takes more resources than is currently allocated to a standard prescribed burn, both in terms of looking at the site in detail, as part of the planning phase, but then also pre-burn surveys and post-burn monitoring. Again, that brings us back to the benefits of collaboration, in that we have been able to do that. Where, for example, National Parks weren't able to resource particular elements of it, our council biodiversity team was able to support that and so we have been able to make this stuff work. What the guidelines also provide are practical strategies relating to prescriptions for burns against various values that we are dealing with.

This example is for koalas, so we're looking at issues like fire interval, season, fire intensity and burn tactics - a whole range of ways that might suit a particular situation based on what we have been able to source from existing information, existing literature but also this live testing of doing some of this work as we go along. Just to paint the picture in terms of the scale that we're working at, (Slide 10), this is our proposed work program for this year. We might get to burn these three small patches of a 65-hectare reserve. Having said that, there's only been less than three hectares of hazard reduction burning recorded for the whole Tweed Coast since 1978. So, it doesn't look like much but it will be a significant advance on what's happened in our part of the world to date.

The other element of the work we've done is to develop some wildfire response procedures because we know it's going to happen anyway. Despite our best efforts at managing risk, at reducing fuel loads and collaborating with stakeholders and fire agencies and doing our stuff, we still get arson events. Fire happens anyway and so we have been able to improve our response capacity there as well.

Max Beukers

On the far south coast we're working with a larger canvas and we were very fortunate to be able to piggy back on the work done by koala recovery teams in our part of the world. At this point, I would like to acknowledge Chris Alan and all the work that he has done on building what will become a long-term study area, I hope, as we work on here (Slide 11). There's about 15 years' worth of data now here, based on a gridded scat survey methodology across our

study area. It's really trying to hone in where the koala habitat is. It produces, if we zoom in, this kind of response. I hope you can see in there the little contour intervals that we are using to define koala habitat. That survey work covers the previous 10 years. There had been two surveys with seven years in between, before we became engaged in looking at how we are going to resolve this anxiety between managing fire, protecting buildings and looking after koalas. The community were already heavily engaged in this survey effort, so there is a fair bit of citizen science and volunteers working on this, as well as members of the Aboriginal community and the Biamanga Board on whose land this work is occurring. We used those koala surveys to map, with a fair degree of accuracy, a koala population that's probably somewhere in the order of 30 to 50 individuals over a 60,000-hectare area. We then use satellite imagery and RFS to map where the houses are. You can see from that, that they are kind of co-located, which is a bit unfortunate but which was well-known to the local community and of course demonstrated their growing anxiety as to how they were going to manage bushfire protection and maintain koala habitat at the same time.

In 2016 National Parks, State Forest, RFS, the Hotspots program, the Regional Operations Team, the Koala Recovery Team, all got together in a room and collaborated. We put together a scenario of 12 burn programs that would run over a 10-year period (Slide 12). Each burn scenario of scheduled burns was based on different themes. For example: 1) let's keep what we've got, 2) let's separate north to south, 3) let's protect it from the west, 4) let's burn very close to the koalas, 5) let's do a combination, 6) let's do nothing. Then we hired Melbourne University and here I will acknowledge Trent Penman and Paul Bentley's work, who ran the Phoenix Fire Simulation Model across the landscape.

Very quickly, they selected the 15 worst fire days of the last 20 years (Slide 13). They did a one-kilometre grid ignition, a historical ignition, which is the middle picture, and a weighted ignition pattern. That's an interpolation of historical ignition. They ran that fire model to create probability surfaces of impact on koalas and buildings over time. They applied that to every one of those scenarios that we put together. The key product we got out of that process that we could take to the community and which the community could look at was to compare the relative benefits of the different strategies that were being considered (Slide 14). Each one of these points on the graph represents one of those scenarios, the probability of houses being burnt, the probability of koala habitat being burnt, based on those hazard reduction scenarios put together.

This is principally a tool. It's a tool that's being used to demonstrate that we can compare different alternatives and have a reasonable discussion about the relative merit of different options. It is a tool the community can comprehend. It enabled the community to get some handle on how to talk about their anxieties and to relate their desire to both protect the koalas and protect their houses. The option that was finally picked was this one here. As an alternative, it provided the lowest probability of house losses and the lowest probability of koala habitat loss at a realistic cost. This one here wasn't picked because ultimately, we decided that it would be impractical to put it in place. The assumption with any of this is of course that all our hazard reduction burns stay in the box, so we did need to consider this. The more you burn, the more risk you have, you want to avoid the prescription becoming worse than the treatment. As we progress up this way, these are different scenarios that we considered along the ways, including what we are currently doing.

Scott Hetherington

Just to talk briefly about the outcomes from the work that we have done (Slide 15), obviously, having specified the priority areas gives us a great framework for actually implementing what we need to do. We've published those materials on the [Council website](#) as management plans, guidelines and wildlife response procedures for consideration by others. We really have developed a fantastic relationship with our local brigades, with our district RFS and with the other agencies, like National Parks. It has been beneficial in many ways.

We did have several wildfires that happened during this time. We had one where there was a prescribed burn that was two years in the planning and 48 hours before it was due to light up, some teenagers did it on our behalf. In all those situations, having the relationship that we have with the fire agencies, the work that we have done to talk through the issues has meant that there has been an improved response and a lesser impact on koalas and koala habitat.

Similarly, it's meant that in our part of the world koalas are talked about and integrated to discussions at the BFMC and to the preparation of the most recent risk plan. From our perspective we are also being better recognised as a land manager in that part of the world and in particular as a facilitator of communications. Councils become a first point of call for a lot of community stakeholders about all sorts of things. Through this process the role that we can play in facilitating information to the community when there's a fire incident and also to provide information about what land management actions to take, has been improved remarkably as well.

Max Beukers

Some of our outcomes on the South Coast (Slide 16). We were able to piggy back on a couple of Hotspots programs that were being run during the period that we were doing this work. There was also the Reserve Fire Management Strategy was up for review, so there was another very large community meeting dealing with that as well. We were able to present this work and link in with work that was already being done by RFS and our own agency at other places. I think it's important to take advantage of those opportunities and having something meaningful to take to the community. It really meant that out of that we were also able to demonstrate a need for ongoing monitoring, which I think is a key point of maintaining that knowledge into the future. There is a published paper out of this that Trent Penman has published as well.

From a very practical point of view, we have got a reserve fire management strategy that now incorporates a modification of the preferred option. That in turn is now nested within the bushfire risk management strategy for that part of the world and that outcome is understood and owned not only by the fire agencies involved but by the communities that were part of the process. That was made possible through linking in with a lot of that extension work that RFS and the Koala Recovery Team have been doing along the way. As a result of that there is one small urban community in that part of the world which is Barraga Bay and they have taken on the responsibility of using a chipper that's provided by the local Council to do APZ maintenance within their own properties and around their streets, rather than passing on that responsibility to National Parks to do Strategic Fire Advantage Zones further away from the assets they want

to protect. If they work locally and close to their houses, they're serving the purposes of not only protecting their dwellings but looking after koala habitat as well.

We made a list of the lessons that we have learnt and it's not surprising to discover that we shared many things in common (Slide 17). I think that these would be some of the key principles that I think we could apply further around the state when we consider trying to resolve these seemingly intractable problems of looking after animals and the environment at the same time. I would like to think that a lot of these have already been said by many of our earlier speakers. I think they are self-evident in many ways. You need to engage the community. You need to have a long-term community perspective. You also need to demonstrate that engagement between the fire authorities and the agencies involved and recognise that a decision not to do anything is still a decision and it comes with its own inherent risks. Our business, at least as local and state government agencies, is to assist communities to make decisions.

Scott Hetherington

Just in wrapping up, in terms of our key messages to take away (Slide 18), despite the identified similarities, there is clearly no one size fits all approach and we've heard that and we support that. The advantage and the necessity of collaboration is one of the key messages. About involving the community upfront, if you are really going to get that kind of change in other perceptions or attitudes or behaviours, that needs to be through genuine community engagement. There's the use of adaptive management principles, using those outcomes and recognising there's no one-step solution and that we need to continually refine what we're doing. The do-nothing option isn't a viable option in terms of knowing that we are either going to end up killing koalas through high-intensity fires and damaging their habitat or seeing the transition of that habitat to something that is not suitable for koalas. We are out of time and we're happy to leave the ideas of 'where to from here' on the screen while we take some questions (Slide 19). Thank you for your time today.

Questions from audience

Question: Sybylla Brown here, a bush regeneration contractor. When you are talking about these critically endangered species, like your koalas, where you are talking about a population of 30 to 50, I think you said, on the south coast. Presumably, you can't afford to lose any in the way you may usually deal with some losses with a major disturbance like fire. Beyond improving their habitat by reducing the risk of catastrophic fire and by getting a good age class distribution, what measures did you take to try to mitigate the risk of fire itself, the fire event, carry out the fire event without impacting the population? I saw in a slide there from the north coast something about planting habitat after fire. Could you talk about that and any other measures like that, that you took?

Scott: Fire is obviously just one of the threats. The reason we have an endangered population isn't all about fire but it was identified as a key contributor to the sharp decline that we picked up in work in 2011. There are a whole range of other issues around other threats and also the establishment of additional habitat and improving existing habitat that we are working on. The lesson that we have learnt there around the value of the planted habitat was those areas we

have put in some large scale habitat plantings, hectares at a time, as part of this integrated recovery response to having an endangered population. What we've found is that when we have had fire events, one of those unforeseen benefits is that those plantings are readily identifiable as an important asset and so backburning operations are undertaken to protect them. Then you can see when you have a look afterwards, actually there's a photo just a little bit through here that shows when you end up in a landscape that has otherwise been reasonably well-cooked, that that area of planted habitat that's two and a half to three years old, that we know is getting used by koalas, is all of a sudden, a really important resource. That was the reference to the planted habitat.

Max: From the south coast point of view, we are exploring several different techniques for improving the quality of existing koala habitat, as we perceive it, potentially including the introduction of very low-intensity burning which. This, as we have heard, is what cultural burning is. There are potentially opportunities there to look at its application in the landscape. We would have to do it very carefully and very strategically though because we can't afford to lose any koalas.

Question: I'm a Federation University student and I actually work as a contractor in Victoria to look after some of the koalas that live in plantations there. To do with the question that followed, I wanted to ask whether you thought that possibly having a whole heap of areas that have been long-term unburnt, do you think it's causing koala communities to move into plantation areas of eucalypt species and, if so, are you working to manage these as well?

Scott: I don't know. We have got large areas of unoccupied suitable habitat. We are monitoring all of our plantings for koala use to be able to evaluate that. We have prioritised our investment in establishment of additional koala habitat based on information in the literature which makes reasonably obvious sense that putting it adjacent to existing occupied habitat is the way to go. Whether that causes them to use the planted habitat preferentially, I don't know. We entered into this thinking that was a five to 10-year aspect of what we're doing, so to have animals using planted habitat within two or three years has been a real bonus.

Question: Graham Douglas, Western Sydney University. I'm really interested in the South Coast discussion that it's engaged community to look at their own property protection issues, as well as the environmental impact of fire in the landscape. I think that's really good. My question really is about the use of the chipper that you referred to and how that was operated. Similar attempts in Victoria actually led to increased risk as a result of depositing the mulch and the materials really close to houses and in their yards, as opposed to being very careful about where the chip material goes. I'm just wondering how that issue is being handled.

Max: Right now, the chips are still in a pile within the community. It's only been done very recently. That was exactly the comment that I made to the RFS, when he mentioned this had happened I asked, "Oh, where did the chips go?" The answer was, "Right now, they are still in a pile." It's something that we will need to deal with and they are looking at a return visit maybe once every two years for that. I suppose it's all about adapting management, isn't it? We don't have the answers now but as we improve the education of the community we will deal with the wood chip problem as it increases. We were very encouraged at least to see that the focus was at least returning closer to the assets they want to protect.

Question: I guess the green waste issue is something one has to look at engaging the local government in that process. Otherwise, you actually end up with a potential serious problem.

Max: That's right and it's a long way to dispose of that green waste from Barraga Bay also.

Question: Mark Graham, Hotspots. You are both dealing with a fairly precarious situation in terms of the future of your koala population. You are both aiming at maintaining, I guess, and hopefully improving the situation. Have you given thought to contingency strategies and responses in the event that declines continue and I guess emergency type measures, reintroductions, that type of stuff? Is that on the cards?

Scott: It is in our part of the world. I suppose the way that we inform that is that we were running SAT koala activity surveys every three years and monitoring koala activity that way. But we are also looking at other measures that we might need. It's hard to identify where that point is. Where is that time when we jump from trying to manage a wild population and recover that wild population to a more active and I suppose in a way invasive type management, just to hold on to them. We haven't reached agreement on that but it's definitely on our radar in terms of what we may have to do when we get to that point.

Max: In the Far South Coast we have done DNA sampling of the local population. We have looked to source where we would get new individuals to translocate. We are also extending the methodology across a wider area, particularly within National Parks, where we are doing greater burning outside the study area. A similar but hybrid version that is now underway on the southern tablelands as well and it's being extended in that part of the world. We're ready to jump if we have to but we have some serious anxieties about some of the decisions we will have to make when that time comes.