Independent Forestry Panel

TRANSCRIPT OF PROCEEDINGS

INDEPENDENT KOALA EXPERT PANEL

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LOCATION:	VIA VIDEOCONFERENCE
DATE:	FRIDAY, 1 NOVEMBER 2024

<THE MEETING COMMENCED

MR PETER DUNCAN: Mick, you've got Mary and myself. So probably to introduce what we're doing is the most important thing. Our purpose and our piece of work that we're doing for government is in relation to the Forest Industry Action Plan that government's working on as central government and through its agencies and whatever. We've been asked to lead and report on key stakeholder engagement and to provide advice to the government as the Forestry Industry Action Plan and supporting business case are developed [redacted].

So that's sort of a very broad piece but we're doing a very targeted stakeholder engagement and obviously your group or panel that you work on is very important to this and it's important in a couple of areas. It's the Great Koala National Park and it's the Forest Industry Action Plan, but we really would like to listen to your views today rather than try and lead it in any way. We'd probably have some questions along the way if that's okay.

So I'm not quite sure how we should best go about this but you know Professor Mary O'Kane, you know my name's Peter Duncan, I'm chairing this panel with Mick Veitch. Unfortunately, Mick's not here. Clare and Oliver are online and they're the secretariat from the Independent Planning Commission. So they're really helping manage the process for us and the engagement. So over to your –

PROF MARY O'KANE: And maybe I should just declare just for the record that I of course was associated with this panel for many years or predecessor panels.

MR DUNCAN: Yes.

PROF O'KANE: So just so we note it.

MR DUNCAN: Thanks.

DR DARREN SAUNDERS: Maybe if I just give a very brief background to where we're at and obviously Mary, you're as familiar with this as I am. So I currently chair the expert panel and basically our role is to give an annual advice letter, in its current format anyway, our role is to basically write an annual piece of advice to the environment minister, reviewing the progress of the koala strategy. That is happening over the top of a revision to that strategy and I think the next iteration will be called a koala plan instead of a koala strategy. I'm not sure but that's the way these things work and that's currently being formulated by DCCEEW, that's state DCCEEW, not federal DCCEEW.

So I guess probably the most useful thing is for I'll stop talking in a minute and hand over to our experts to let you hear what their concerns or comments or thoughts are on the progress of the strategy and how it intersects with forestry and let them really lead the discussion. There's a couple of really key points that'll come out of the advice that we're preparing at the moment, some of which are around public accessibility of data, which I think is a really important point that helps us to understand what's going on.

And I think that that's a barrier at the moment to all of us in this space is publicly accessible data. I probably won't say too much more than that but I might hand back and I guess it would possibly interesting to know specifically what things you'd like to hear but I think particularly probably Jonathan and Carolyn would be the two most relevant starting points and no doubt Oliver will have some very strong feelings as well. But I don't know, this will be fairly free ranging if we don't have a reasonable idea of exactly what it is you'd like to know from us.

MR DUNCAN: Yes, Darren, just before we go to that next step, could I just tease that publicly accessible data comment out a little bit more. Are you meaning across all tenures or data that's available to you or just to clarify that a little?

DR SAUNDERS: Yes. So, you know, there's a lot of activity going on around data collection on lots of different aspects, whether it's land clearing, whether it's even just baseline surveys of koala numbers, it's quite a fragmented approach and that's okay, it's being done by lots of different organisations and agencies. But a lot of that data sits within various parts of government departments and it's not necessarily publicly accessible and it's not even accessible to us as the expert panel. And that's an ongoing source of frustration and I think it's a problem that's hindering conservation efforts. You know, you don't really want to have fragmented data kept behind closed doors. It should be out there publicly accessible, especially when it's publicly funded.

MR DUNCAN: I think that yes, there's two levels to that and we have seen this as well that the data is sort of siloed in certain areas. What you're talking about is have it public and broadly feeding into one set of information.

DR SAUNDERS: Yes. I mean, I come from a cancer science background where all of the genetic data, all the genomic data that's been collected over many, many years is made public as a condition of doing the work in the first place and it has accelerated and driven huge breakthroughs in the field just by having that data publicly accessible and in an aggregated form where everybody can access it. And so I think –

PROF CAROLYN HOGG: Darren, it's not just publicly accessible but it's publicly accessible in as real time as possible because the other issue we have is we're not getting data for three years. So it's really hard to make informed recommendations to the minister in relation to koala conservation with clearing datasets that only go up to 2020. And so it's really then hard to say, well what's the trajectory of purchasing land and connecting like the landscape and habitat together when you have no idea whether or not the trajectory of loss of habitat is still at the same or has it flattened off or is it – you know, we all are very aware that there was a very large increase in land clearing in 2017, 2018, but did that continue? We have no idea. We don't actually know what the status is.

PROF O'KANE: So there's no obligation for the various people involved in all of that to put their data into SEED?

PROF HOGG: I think it goes into SEED but it doesn't get released. It gets embargoed and I don't know if it goes into SEED and is embargoed or if it's just not even put into SEED. Like, we don't know –

DR MARTIN PREDAVEC: I think it's a combination of both.

PROF O'KANE: Okay.

PROF HOGG: – why it's not there, just all we know is we can't access it. So Jonathan, as a researcher, it's unfortunate he's not here, but Jonathan Rhodes, as a researcher, has access to some of it but he's not meant to release it because it's under certain embargoes. So that's really where the problem –

PROF O'KANE: Even – sorry, Darren.

DR SAUNDERS: No, sorry, Mary. Go ahead.

PROF O'KANE: I was going to say even for you people to draw on for your annual statement to the minister?

PROF HOGG: Yes, we're not allowed access to it.

DR PREDAVEC: We're not allowed.

PROF HOGG: You can imagine how well that goes down every year.

DR SAUNDERS: Well, I think there's a couple of aspects to it. To be fair, I think there's a couple of aspects. I think (1), it's clearly politically sensitive data and I get that. But I think (2) there's probably that aspect of, for want of a better word, sort of academic gatekeeping going on where people want to maintain data until they've had a chance to write a paper about it. And I think in that way there's a bit of a confusion around data and analysis. So it's possible to supply data in an unanalysed but collated form that doesn't then stop other academics or even government scientists from doing analysis, writing papers about it. I think that's part – so I think there's a combination of those two things going on.

PROF HOGG: Yes.

MR DUNCAN: Anyway, so –

ASSOC PROF BEN MOORE: Can I say –

MR DUNCAN: Yes, sorry.

ASSOC PROF MOORE: Yes, yes. In the context of forestry specifically, not just the land clearing but the change to the forest composition, it's very hard to get data on that and I suspect it's sort of there. Like, you know, forestry knows what they're taking out, they know what's there when they survey a coupe before they log and they know

what they remove and there are inventory plots which can tell us something about the change in forest composition and the change in proportion of koala food trees over time. I presume the data's there but some of it may be – you know, the older data may be written on cards, stored in a filing cabinet somewhere but that sort of data would be really useful to understand the long-term implications of forestry practices, different types of harvests for koala habitat quality. And I don't know how to get hold of it.

MR DUNCAN: Okay, we should talk more about that, Mary.

PROF HOGG: Yes, and Peter, just so you know, the whole panel is – like we all have signed confidentially agreements, so whatever information the expert panel receives in order to do our assessment of the koala strategy or plan on an annual basis, obviously that's if the data's embargoed for whatever reason then we would still have to hold to that embargo through our responsibilities as a panel.

MR DUNCAN: All right. But look, it's a very good brief discussion and an important aspect for us. So let's move on, as Darren suggested, if that suits. So who first?

DR PREDAVEC: Can I ask just at the outset why you're talking to us? Are you talking to us as a panel or are you talking to us as a disparate group of people who know about koalas? Because I think there is – and it comes back to what Carolyn was saying, there's differences in what we can probably – we haven't discussed things necessarily as a panel talking to you.

PROF O'KANE: Should I answer, Peter, or –

MR DUNCAN: Yes, Mary, I'd be happy for you to –

PROF O'KANE: Yes. Given that we were asked to listen and get stakeholder feedback, I felt that one or we felt that one important stakeholder group was the lead panel advising the government on koalas and that's why I requested that we or requested that we meet with you because this is effectively the main advising group and it was important that you not be missed in this process.

Now, we hear the point about that you've signed confidentiality agreements, so there are probably things you can't tell us because this is going on transcript and everything. But it's because such a panel exists, it's an unusual panel in government structures, it's been going in some form for a long time and it's made some important contributions over the years. So it's to get that level of expertise. I think we'd be thrilled to hear individual comments from you about particular koala issues as well, but it's the panel that was the interesting [unintelligible 00:11:31].

MR DUNCAN: And Mary, it's a good point because we will be reporting engagement with the panel, so it reinforces that aspect of it, Martin.

DR PREDAVEC: Okay. Thank you. Yes.

PROF HOGG: So I guess I'll start as one of the longer standing panel members still around. Hey, Mary. I haven't seen you for a long time. So I've been associated with the panel since about 2014, 2015 and one of the key things that would be helpful moving forward is not only what forestry has done or is doing at this point in time with their forestry coupes and what the tree composition looks like but data being made available about what their future plan is over the next three to five years.

So obviously they don't make a decision instantly in what forestry actions are going to be taken but if you know what's happening in the future aspect, you can plan for that because there's been a significant investment from the government over the last few years in relation to koalas and the environment. And we now have a lot of information around where we think koalas are, we've got a very intense survey at some sites in relation to disease, genetics and general life history patterns. Ben Moore is going quite a lot of work in that space as well in relation to the feed trees and what type of trees that koalas are feeding on.

And so what would be useful moving forward is to be able to overlay that dataset that is being generated through the sentinel program and the current koala strategy and marry that up with forestry plans, in addition to current conservation estate, Indigenous protected areas, what management is happening in those Indigenous protected areas and I'm sure Ollie will have more comment around that, in addition to agricultural land. Because the issue is that none of these aspects, whether the land tenure is forestry versus agricultural land versus conservation estate versus state forest versus IPA, don't work independently of each other for the species.

But they've been managed historically independently of each other and that's really the crux of the problem is that because there's no oversight across what's happening or no kind of forethought or future thinking about the different types of land tenure and how they intersect for the species, it has impact not only on koalas but all the other species that exist in those kind of habitats. So that's kind of something that if I had to pick a wish list of watching what's happened for the last decade, that would be really good to see a change in how we manage the system between now and 2030, it would be that.

MR DUNCAN: Carolyn, it's not only managing the system, it's the oversight and that sort of information, isn't it?

PROF HOGG: Yes.

MR DUNCAN: It's the layers here rather than have them as silos, there should be layers that –

PROF HOGG: Yes. So my ultimate dream would be to have a map that's created by the New South Wales government where you can click on and click off koala monitoring, forestry estate, IPA, what other threatened species exist and if you're a developer or a mining company or a farmer or forestry or just a general member of the public and you want to know what's happening in a certain part of the state, it's intersecting all that – and that information exists now but there's no overlay or

intersection of the information and I like to think in this new age with artificial intelligence and machine learning, we actually now have the technological capability to start pulling those datasets together and I think we should.

MR DUNCAN: Yes, good point. Okay. Have you got more that you wish to –

PROF HOGG: No, I'll let my colleagues talk because I tend to talk a lot, so I'll stop for a while.

MR DUNCAN: Okay.

DR PREDAVEC: You're always a wonderful starting point, Carolyn. It's really good.

PROF HOGG: That's because I've been around for so long, Martin.

DR PREDAVEC: You have. Look, I totally agree with everything you've just said there. I would suggest also I guess playing off what you've said, Carolyn, that we shouldn't or the government shouldn't be focusing on koalas or a single species and particularly on a threatened species. I don't believe that koalas are a good umbrella species or a good sentinel species. So what's good for the koala in the forest is not necessarily good for a lot of other species of concern within the forest.

So I think we need to take a broader approach and by focusing just on the koalas, we could have some very negative effects going forward. So I think given your brief which is to look at forestry, just to have the koala in there as the one species, if we can get everything right of the koala, everything will be right going forward, don't take that approach.

MR DUNCAN: No, that is also a good point. We saw that quite starkly when we started to talk about gliders and koalas in the same conversation. There are completely different issues with the gliders to the koalas and locationally as well. So just on that, there's this issue of the regional impacts of forestry or the regional practices of forestry. As a group, obviously with the koala you see regional occurrences, is there anything from a regional perspective we should be looking at from either koala or key species point of view?

PROF HOGG: I think what you'll find is a lot of species are not managed at the regional level and that the regions for species is not necessarily the same regions that are regions for forestry. And different species move across different bioregions, so it's whether or not you're measuring it as a regional level at these are the LGAs in the area or is it a regional level that this is the bioregion that we know exists currently across the landscape. It really comes down to how you define the word "region."

MR DUNCAN: Yes.

PROF HOGG: And I think if you look into it, Peter, you will find that everyone has a somewhat slightly different definition of "region" and how they draw the lines on the map.

MR DUNCAN: Yes. Very similar s[cross-talk 00:18:16].

ASSOC PROF MOORE: I mean, in terms of the forestry prescriptions, you know, the big koala forestry conflict has always seen and been the upper and lower northeast coastal IFOA regions from a forestry point of view, which overlaps with I think three koala management areas, one, two and three, and I guess those prescriptions recognise that there are different koala tree preferences throughout there and those are being reviewed and I was part of that review of the koala tree list.

Yes, certainly koalas in different areas feed on different trees because there's different trees available and they may have different preferences and there's always a lack of information there and the consequence of that is that the prescriptions are not always perfect, not necessarily protecting the right trees in the right place. And in the process of doing that review with Karen Marsh, who's also a member of this committee but is not here today, we spoke to a lot of people and a very common theme that came through was that most people are of the view that the current retention rates were inadequate, I guess, in the coastal IFOA in terms of the number and the size of trees that were retained.

And I think there's a bit of a knowledge gap there about obviously from the forestry perspective the retention is purely assessed on the size of trees, the diameter at breast height. But really we need to think about the amount of canopy that's retained. I think that's a gap because it's the canopy that the koala lives in and which provides food for the koala.

MR DUNCAN: So Ben, the prescriptions are interesting to me and I know them from an operational point of view but also from a planning point of view and the sort of rules based process always lead you to this problem, doesn't it?

ASSOC PROF MOORE: Very complicated list of prescriptions.

MR DUNCAN: You define it so perfectly, there's think you've covered it but then there's the broader issue that you're missing and I don't know how to get around it but is there any contemporary sort of, I don't know, codes and regulatory processes that you're aware of in the sort of natural environment, in natural resources? You know, a model, any better model?

ASSOC PROF MOORE: No, not that I'm aware of except I think that focus on I guess understanding how much habitat in terms of leaf is retained for koalas and what's required to maintain a koala population density. I mean, we can look at the low koala population densities in a lot of these forests and a huge amount of foliar biomass that's there, but once we start to remove the great bulk of that biomass and recognise that not all of the trees that are retained actually offer koala food, the amount of food

per hectare starts to sort of look like it might intersect with the area where there's not enough leaf to support the pre-existing koala population densities.

MR DUNCAN: Yes.

PROF HOGG: And as Martin said as well and Ben's pointing out, you need certain canopy for koala but you also need certain canopy cover to maintain your understory which is critically important for a suite of other species that reside in that landscape.

MR DUNCAN: So if I can summarise that discussion, there's probably some need to look at the more contemporary views of the prescriptions in line with what the outcomes that people are trying to achieve, whether it's for the koala and other species or the forestry itself. Is that fair to say there needs to be some work done in that area?

ASSOC PROF MOORE: Well, I mean there's been some work done but it's purely focused on the list of tree species and it was not prepared to consider changes to the amount of number of trees retained or the size of those trees.

MR DUNCAN: Okay, thank you.

PROF HOGG: I think some – sorry, Mary. Go.

PROF O'KANE: Well, no, you go on, Carolyn and then [cross-talk 00:22:09].

PROF HOGG: I was just going to say, Peter, I think there is definitely scope to try and start utilising more contemporary methodologies and tools to understand the dynamics of the system. In some aspects, some of the methodologies that are used we've used for two or three decades, which is good because it allows you to be able to look at large scale changes over time but also by not utilising new technologies that give you a greater resolution and a greater understanding, I think you can potentially still make decisions that may not be the best moving forward, if that makes sense.

MR DUNCAN: Okay.

PROF O'KANE: And if I can jump in, Peter, a question, Carolyn, you went just where I was headed. Have scientific tools, techniques and scientific discoveries in the whole species area and the food, have they been moving much in recent times or is the science relatively stable and we're just applying it a bit more? I'm just curious.

PROF HOGG: I think the science is accelerating in some aspects much faster than those of us – like the way our science is accelerating compared to what is applied from a management sense [cross-talk 00:23:29] it has always had a bit of a gap because you have to prove that the science is working but I think I mean in genetics and genomics and I can say that although we've made massive leaps forward in the genomics space, management is now only just starting to utilise it and it's not utilising it to its capacity at all.

And I know that in some of the new drone technology and lidar radar systems and imagery that can be taken, I don't know much about it. Jonathan and Ben might know more but yes, I do know that there's been a massive acceleration in technologies in the last decade, in all of the last – yes, since 2015 that may not be incorporated at this point in time.

PROF O'KANE: Thank you.

MR DUNCAN: Just on that, I've seen it operationally being utilised but whether it's being utilised for a research and a broader outcome point of view. So again, things that are sort of in different parts of the layers if you like or silos that's not coming together, the use of that technology or passing it on from one to the other?

PROF HOGG: Yes.

MR DUNCAN: A bit of validation that it's all correct as well. But I notice Oliver's got a comment there. Oliver, how are you? Can you hear us? We can't hear you.

MR OLIVER COSTELLO: Sorry, I'm just trying to – can you hear me now? I'm just trying to navigate back to my –

MR DUNCAN: So you've got a comment in the chat, is it something you want to add to this discussion?

MR COSTELLO: There's a few things, I guess. Just when Carolyn was talking about having a system where you could overlay information from different sources and stuff, I've been working on a project for a couple of years to do that called Conservation Futures. I just threw the link in it. [https://www.conservationfutures.org.au/our-activities/building-the-integrated-knowledge-system] The idea is that we have like a publicly accessible space that has lots of like protocols around, so people can put their own - like we built it largely around being able to put cultural information and like commercially sort of sensitive confidential information in so that different users can have their own information and they can share that with their team or their partners or their clients or whoever.

And there's some information that they might want to like push out into a public domain, but then there's all this other publicly available information that you can then kind of like stream in or export in and create like maps and geostories and different stuff like that. So we've been working on things like that, so just when Carolyn said it I was like, "Yes, no." People have been talking about that for a while, so I thought I'd share that.

There's another – like and hey, Peter and Mary, haven't seen you for a while, Peter. But yes, I guess my main interests are really around the fire and the cultural sort of significant stuff and so I agree with the other panel members and a couple of things. Yes, like Carolyn mentioned, the IPA, the Indigenous Protected Area Network, like what role does that play, the ranger programs as well. There's a few ranger programs that cut across forestry and other sort of forest kind of management areas as well.

I just clicked another link for a report that we just recently sort of released and that we're looking to do a formal release of in the next few weeks. I'll send it round to everyone when we send the invite out. But that's looking at I guess the barriers to legal and policy barriers to cultural fire management and that was funded by North East Forestry Hub. [https://nenswforestryhub.com.au/news-reports/reports/report/10-identifying-and-overcoming-legal-barriers-to-cultural-burning]

So it's looking at how do we understand that there's all these different complex legislative and policy and all these different parts of government imposing different rules or barriers or something to support – that stop people from being able to maintain their culture fire practice, which is critical for boorabee, for koalas. Like, good fire management I think is one of the big issues.

Obviously there's lots of other big issues but yes, I think we need to be thinking more about that and that plays into a broader forestry discussion as well around the appropriate use of fire and where we're seeing inappropriate use of fire through a lack of good fire or yes, poor decision making during wildfires and things like that. So there's lots of impacts on forests from that point of view.

MR DUNCAN: Oliver, I think you mentioned the Indigenous Protected Network, is that right? Is that what you called it?

MR COSTELLO: Indigenous Protected Areas are part of the National Reserve system. They're generally Aboriginal owned, not always, lands. Yes, and there's a few in the Northern Rivers that have koala populations and stuff that interface with –

MR DUNCAN: So from a state point of view, is there key players there? You may be involved, but are there any other key people there? One of the things that we or the Forest Industry Action Plan has to do is actually look at future Aboriginal engagement and management of forests and in a six to eight week period, we just haven't had the – and to get to all of the networks in that space. Are there some key people that you would recommend to us that we should talk to? Maybe we could do this out of session but –

MR COSTELLO: Yes, depends what you want to talk to them about. I guess there's been in some of the work that I've done developing like fire plans and strategies and working with not just the IPAs but other Aboriginal landholders, like land councils and native title groups, yes, there's been previous sort of forestry activities like out at Tabulam where they did one of those plantations and it's been super problematic, sort of like community got sold this idea and it's become a fire risk and they planted the wrong trees and there's all sorts of things, that's a plantation example.

But definitely like – yes, so the IPA thing is relevant and I've got lots of hats obviously with probably a few conflicts and stuff but yes, like Jagun Alliance recently – I didn't even think about this, it's just coming to mind. We recently were successful in a consultation grant from the Commonwealth to develop a cultural landscape, cross--tenure Indigenous Protected Area in the Northern Rivers. So we'll be mainly

focused on talking to private landholders about building that connectivity across the landscape for different regions. But there's no reason that we can't be engaging and National Parks have already reached out to us, but engaging with forestry and different parts of the forest industry around that work as well.

So identifying those sort of cultural sort of values and I guess cultural practices that can support healthy country and there's obviously different land use and different values and I guess we're keen to try and support better practices. But that might mean that existing practices still occur that are detrimental to those values, but at least we're trying to reduce the impacts of those values. And also there's another consultation again in the Bellinger, Nambucca Valley, there's a group down there that have one and they're specifically working with forestry as well and National Parks to develop a sort of multi-tenure Indigenous Protected Area thing as well. So I can definitely put you in touch with Dean and those guys on that one.

MR DUNCAN: We might come back to you. I might give you a call and we'll have a bit more of a talk about that and get some more information. So that's terrific.

MR COSTELLO: Just one other thing, Peter, on that is around that cultural significance of koalas and the relationship they have to forests and so one of the other projects we have here is the Boorabee Songline project. So there's a cultural songline that goes from say Evans Head out through sort of towards Lismore and out up through Bungabee towards Kyogle to Mount Boorabee there and then out to the west. And so that sort of cultural pathway for koalas is also a cultural pathway for people and all through forests you have those kind of stories and stuff. And so that's an important thing for us to be thinking about and the relationship around how we manage forests and koalas is understanding that there's places that are tangibly sacred because there's important cultural heritage sites there.

But there's places that are intangibly sacred because there are really important cultural stories and pathways and stuff and being able to protect those places and days is really critical to support people's continuing connection to that practice and to their country. So we see big issues in other parts of the state where there's a real clash around that as well, definitely down Gumbaynggirr country, they've got Yarriabini there's a koala culture there and that impacts forestry and the Great Koala National Park, there's a whole big story there that I'm not across enough. But definitely worth considering how we better approach that cultural significance.

PROF O'KANE: Could I ask a question there, Peter?

MR DUNCAN: Yes.

PROF O'KANE: Ollie, you know, thinking about that data structure you've been building and thinking about Carolyn's multilayered idea which of course is where SEED was supposed to go but clearly hasn't, have all the songlines been – I guess you won't have captured everything but have the songlines been largely mapped so that a layer could be the songline layer?

MR COSTELLO: Yes, there's some – we've mapped some and we're trying to – it can get quite tricky and that's a part of the reason why we've been building Conservation Futures because people have – there's a lot of cultural politics, there's lots of politics everywhere. When people don't – obviously when people don't agree on something, it gets political.

So but yes, so trying to do that work and make sure that people have control of their knowledge is a really big thing. So we only really sort of communicate the publicly known information. Like, if it's already been – it might not be appropriately have been sourced and made public but it's out there now, so we just feel like well it's out there, maybe we can improve awareness around it.

But yes, we've been mapping that Boorabee songline, we mapped the Nguthungulli songline and a few other ones. That links to a few other stories. But we think that's really important work but it is having the resourcing, having the cultural protocols and a system and that's why we've – I mean, like it becomes a bit hard to kind of go and do the work properly if you can't repatriate the historical information, bring in the sources. Some of it's oral histories and some of it's reading country, like knowledge holders actually being able to get out and start to like map the features and we get to do a bit of that with the burning.

But it's also bringing in those other datasets from like Carolyn mentioned, others have mentioned, like having all the information about where koalas are, where different food source trees are, where impacts are and stuff that we can sort of see where the sort of cultural sort of knowledge about where the koalas would go and how that links to our pathways and where they're going now and things like that. So being able to bring in all that really rich ecological and different datasets is important to be able to overlay, so you can do the mapping kind of justice really. Yes.

PROF O'KANE: And presumably it's multi – the songlines cover multi species.

MR COSTELLO: Yes, they cover like whole continents.

PROF O'KANE: Yes, I know.

MR COSTELLO: Nguthungulli songline, Julian Rocks in Byron Bays, that's the Nguthungulli, you used to be able to walk out there back in the day when the sea was further down. But yes, that's a songline that goes all the way to like Western Australia, it links to a whole heap of different stories and up the coast and down the coast you'll see those points where there's different stories that cut across The Great Eastern Range, it doesn't divide us, it connects us. It's a cultural songline that – so yes.

PROF O'KANE: Yes, yes. Makes good sense, thank you.

MR DUNCAN: Mary, can I ask another question? I'm trying to find a way to actually describe it but maybe the best way to say from your expert panel's point of view, what are the major headlines that we should take away from your work about the koala?

PROF HOGG: Stop cutting down trees.

MR DUNCAN: Well, two or three points. That's one, yes.

PROF HOGG: Seriously, Peter, that's the main point that comes up every time. So one of the key issues we had for the last decade is we were not including habitat loss was something that could not be actioned by what are they now? DCCEEW? BCS? I can never remember their official name but the people who are responsible for managing koalas have really no oversight of how to control the habitat loss. And so in that way it was never really part of the strategies but koalas live in trees, they feed on trees and they need trees to move through the landscape.

And so the conflict between koalas and forestry in my mind really stems from this fact that we've been kept – it's in these two silos where they're not integrated enough, so you can't make informed management decisions around how to protect habitat and have a sustainable forestry industry at the same time because the two plans are not – there's no touchpoints or integration between them.

And so when people keep asking, "How are we going to solve the koala problem in New South Wales?" I think anyone you ask, the first words out of their mouth is protect their habitat is the first thing and that's the issue for the panel is we have – it's been very difficult in the last few years to get land clearing data to even understand what's happening to their habitat to be able to make informed recommendations around what we should do next.

MR DUNCAN: Yes. So it's not just cutting down, it's also losing that habitat, isn't it? So whether it's fire or, you know –

PROF HOGG: Yes, it's fire, it's forestry, it's putting in linear infrastructure. Martin, you're on mute.

MR COSTELLO: Can I just say it is – you go.

DR PREDAVEC: I was going to say it's habitat modification rather than just simply habitat loss.

MR COSTELLO: Agree. So similar thing, yes, what's coming back in are like – and we're seeing that intentional kind of like managing the landscape to maintain the connectivity. So you need – you know, it's not just a habitat, it's how the habitat is connected as well. And that's the whole songlines sort of story, it's like the koalas are – there's a whole big yarn about that but it is like families and bloodlines and stuff like that and that's the same with habitat, those different species of plants and animals relate to each other and if you're losing that connection between those species, then you start to have these problems.

And so yes, it's logging, it's fire, it's development and I love to live [unintelligible 00:39:00] and I love wood, I want to have a sustainable forestry industry. You know, the Northern Rivers, I think we should be growing trees. We've got the landscape to

grow trees but we need to be thinking long term, like we need to be thinking intergenerational. Like, we need to be planting for the trees that are 3 or 400 years old and that's the problem, it's all very short-term- and it's very fragmented in different planning and different approval pathways.

So people are just biting off chunks everywhere instead of having like a really strong cultural and ecological landscape plan that says here's where we're investing in the future and having really strong connectivity for not just koalas, like all the cultural and all the indicator species that really tell us the country's healthy, making sure they've all got really strong pathways. And then for the people and the infrastructure and the housing development in the forestry industry, framing those sections out as well. So everyone, you know, we're creating balance, that's what kinship's about, like balance in the landscape so that all the families get along and that's how we should be seeing it.

And people are competing with each other because of the disconnection between them instead of like working together collaboratively because of the connection, the shared understanding of values and responsibility they have to each other. And you see it in government, you see it in the community, yes, and we need to kind of think about planning frameworks that actually like increase awareness and connectivity between people that have shared values and different values and understand how those values are influencing each other so that we get better, more informed decisions.

PROF HOGG: And Peter, there's data that actually exists to support that. So like the whole genome data we've generated for koalas can tell us their historical movement patterns because it's a signature in the genome. But the guys at the Royal Botanical Gardens are also creating genomic data for some of the tree species across New South Wales because we need to get a handle on what connectivity is reflected in the historical information we can pull out from genome sequencing.

And so that's where the marrying together of like the Indigenous knowledges and songlines with empirical data that we can get from some of the species and marrying those two together is really critically important to kind of show which are the key parts of the landscape that really need protection and others which we can utilise for different types of sustainable use [cross-talk 00:41:27].

MR DUNCAN: There's a lot in that. That's more than one headline, there's a lot there but I understand where we got to with that discussion. But it was kind of where I was leading to was the climate change is going to modify habitat to a certain degree anyway and that's happening. Is there a further headline, something to do with what's the koala doing as a result of climate change?

PROF HOGG: So we've done a model around that like just from a genetic level. Koalas genetically will be – like, koalas as a species from how they look like now for their adaptive potential will be fine but the trees that they live in may not and I'll let Ben talk to that because that's his area of expertise. But the marrying together of the genetic data with all the climate models that we have show that there is some pressure in the northwestern areas and they'll move more south and up into some of the

highland areas. But that doesn't meant their feed trees and their habitat will do the same. Ben?

MR DUNCAN: Yes, that's a good point. Just before we go, Ben, I just wanted to raise something on that. So the RBG is doing some work in that area and I know Forestry does some work on genetics with trees but for production. I guess just a short answer on that if I could, is there enough research in that genetic work? Is there enough energy being put into that genetic work to get the result for the answer you just gave?

PROF HOGG: I think there's a good start to it but as soon as we start marrying together the different datasets, it's going to raise some more questions. But there's definitely been a good start with koalas and some of their trees.

MR DUNCAN: That's good. Okay, Ben.

ASSOC PROF MOORE: I mean from what I know of forest genetics, it's really very much focused towards production traits. I don't think it has much relevance to sort of population ecology of trees at all. There may be some of that starting to happen but –

MR DUNCAN: Yes, I understand. But what I was getting at there, again it's a siloed bit of one's for production and one's for something else but is there enough holistic sort of genetics work to give you good outcomes all round, if you like?

PROF HOGG: Yes, it depends how you – so you can generate a dataset for production but you need to interpret it in a slightly different way for a kind of conservation management point of view. But it's essentially you can start by looking at what data is available and then decide whether or not you need to generate more or you can use what you've already got.

ASSOC PROF MOORE: But more broadly, yes, I mean going back to the same point that we've all made, it's about changes to the quality of the habitat. I mean, that's how forestry impacts – most forestry harvesting operations probably don't count towards habitat loss on a map of vegetative cover because something's left or it's left to regenerate, but it's not the same. So there's some research that's shown certainly koalas can survive in a post--harvest landscape but there are koalas present but in terms of the population dynamics of those animals, the number of individuals and their long-t-erm sustainability, that's –

PROF HOGG: And their health.

ASSOC PROF MOORE: Yes, and their health. That's what we need to understand.

PROF HOGG: You know, you're putting them under a huge amount of stress.

ASSOC PROF MOORE: So at the moment the forestry prescriptions where trees are retained is – they're very, very complicated. One thing that's probably not in there so much is particularly leaving aside what might be koala refugia. So refugia not just

against fires but particularly against droughts. We're seeing a lot of dieback of trees of course in increasing hot droughts.

I've had a student just finish, done a bit of work sort of mapping foliar moisture content for koalas across New South Wales and foliar water can become a very limiting factor for koalas, especially in more arid parts during hot dry years. So understanding which parts of the forests retain water in the canopy might be one way of identifying refugia and that's perhaps something we need to think more about retaining those.

Of course there's the conversion to forestry, we talk about changes due to climate change and forestry practices and my point earlier was that we don't really have a good understanding of how tree species composition has changed through time as a result of fast forestry practices. But we know that's going to accelerate with climate change as the climatic conditions suit different trees. But I don't really understand exactly how the change comes about.

It's probably going got be through a traumatic event like fire, we get a new cohort of trees coming through or a big dieback event where one species is killed. But forestry harvesting operations are themselves of course another way that a change in species composition happens and that can be done proactively or it might just be the regeneration produces a very different forest. I don't think we understand that very well. There's also of course the conversion of forest to plantations and once they're plantations, they're no longer subject to the same prescriptions when it comes to harvesting, right. They're like a little tree farm and they could be cut, but they can provide koala habitat.

So how are those koalas – that's an area I'm not so clear about how plantations are managed in terms of koala conservation. And of course plantations could be designed in a way that they're perhaps more useful to koalas than is necessarily the case at the moment where might be planting out a blue gum monoculture, for example, which is probably of limited use for koalas.

MR DUNCAN: Right. All right.

PROF O'KANE: Peter, could I ask a quick question? Where are the big scientific research centres on this work, Ben? I mean, who's doing the best work?

ASSOC PROF MOORE: On which?

PROF O'KANE: On particularly the tree ecology supporting koalas but interested, Carolyn, to sort of talk about who's leading on the koala research too. I mean, what I'm trying getting at is there's enough research happening in Australia, particularly in New South Wales, are we investing enough research in these areas to build research groups of considerable impact? So you people are doing great work, is it your groups that are leading? Are there many others?

PROF HOGG: I guess one of the things we have highlighted as a panel is investment into research that is needed to fill key knowledge gaps, I think, can I say that. So we know I think we're still in the process, Martin, would you correct me if I'm wrong, still identifying some of where the key knowledge gaps are. So obviously –

DR PREDAVEC: It's an ongoing process, it changes over time.

PROF HOGG: Yes, over time, as you get information. We've made huge inroads since the fires in relation to genetic genomic work and that's just starting to scratch the surface. The new investment into the sentinel program is really giving us a key understanding of disease across the state and that work is being led by the Koala Health Hub at the University of Sydney. So we lead the genomics, they lead the health. Ben, you do a lot of work in the feed tree space.

ASSOC PROF MOORE: Yes, so I mean we've got techniques for determining diet composition from scat, so that's just sort of largely confirming what we think we know but yes, we're getting a better picture of how that varies across the landscape and how the nutritional quality varies.

PROF HOGG: So the one gap that we have identified that we need to work towards is actually understanding the genetics of the trees themselves. So we've started doing some work with the Botanical Gardens on it but there hasn't been – it's kind of using information that others have generated for different studies or trying to leverage off people collecting stuff for different work, whether or not we can use those kind of samples. But there's no, to best of my knowledge, no real dedicated understanding of what we think might happen to the tree species from an adaptive potential point of view moving forward as the climate changes.

ASSOC PROF MOORE: I mean, there's a lot of people working on eucalypt genetics in sort of natural eucalypt populations, I guess, around the place, at UNE and ANU and in Tasmania, of course. In terms of understanding the actual species composition, that sort of traditional forestry work, there's just not so much of that happens now, right. I mean, it's just ANU and Melbourne are the only places that really do forestry these days.

DR PREDAVEC: I wonder if changing that question around – and I understand where you're coming from, Mary, with that question but turn it round to I guess my initial point should we be looking at a broader suite of species rather than just the koala. So yes, we're doing a lot of research –

PROF O'KANE: No, I agree, Martin, that's a really good point. Yes, yes. Ollie –

DR PREDAVEC: Yes, I think it's that broader knowledge of the ecosystem that's going to be more useful than just information on the koala.

PROF HOGG: Yes, I agree.

MR COSTELLO: I was going to say something different but on that, like when we do our cultural assessments of healthy country, we look at different indicator species and koalas are one of them but there's different indicator species that teach us that like they're sort of – that there's old trees and there's different species of trees and different animals' features that we'd be looking for. Yes, to see – yes. So I think – and koalas, we need to be putting into that context of a suite of species that have high value. We do it with the cultural stuff.

But the thing I was going to mention before is BMAD as well, thinking about other things that are happening in the landscape and I'm no expert on genetics but yes, just understanding that like part of the challenge is in a broader sense for koalas and in the forestry context is what trees are we planting and what is the genetic story around them? Because there's just lots of good intentions and lots of good – and you don't want to tell people to stop trying to do things because we need to just try things. Innovation is key.

But where we are learning from that, like we really need to shift that learning much quicker because we're seeing competition in like what should be planted, what should be restored, you've got big scrub and koala fights going on around home because there's lots of money to plant koala trees and we need some but in some areas there's different priorities about what should be there and we just need that. And we've been yarning to Maurizio and staff at Botanicals about the river stuff more, about the healing country, the healing river stuff about what is the species compositions we should be trying to put back in to look at nature-based solutions for reducing flood impacts.

But also for cultural connectivity, like what food and medicine plants and in the industry, what you see is that people are trying to solve a problem, so they're growing lots of Lomandra. Lomandra's good but there's heaps of other species that are like Lomandra that have other values and then there's the genetics around it, like where are we sourcing and propagating? Because you're seeing that trees are being put out and we're getting lots of genetic issues around the expansion of hybrids and other species that don't belong there and in a changing climate with different potential pathogens or pests and stuff, like we could see big issues, like BMAD or whatever, Phytophthora's and stuff where we end up with issues we didn't know that we were going to have. So we have to do that work.

PROF HOGG: The other issue as well is that there's this assumption that if you plant something out, you've restored the landscape.

MR COSTELLO: Yes.

PROF HOGG: But somebody actually has to go and water those trees and get rid of the weeds and make sure the pest animals are not eating them. And so Maurizio has a great figure of a restoration of a project which is selective genetically diverse trees and then you lose some through the fact that you've got natural attrition and then you lose some from the pest species and then you lose some from the fact that they don't grow or breed well.

And the next thing you know in 50 years' time you have a forest that is genetically depauperate because over time you've lost – no one took care of the forest once – it's this mindset of well we planted the trees, so therefore our restoration activity is done and one of the conversations we've been having as a panel is about investment in restoration is not just an immediate restoration but it's also ongoing monitoring and management of that restoration activity to ensure that what you think you're establishing becomes viable for the longer term.

PROF O'KANE: Yes, good point.

ASSOC PROF MOORE: And the ultimate test of course should be are koalas inhabiting the restored habitat in [cross-talk 00:54:06].

PROF HOGG: True.

MR DUNCAN: Yes, exactly. Look, we've got a few comments in the chat which we'll record.[1] We've got about five minutes or less but is there any final thing that we need to raise or that you felt we haven't covered? We're more than happy to get some information back but we've only got a couple more weeks of sort input into our stakeholder report.

PROF HOGG: No, I guess just thank you for the opportunity to actually provide you some verbal feedback.

PROF O'KANE: Well, thank you, it's been a very good meeting.

MR DUNCAN: It has and we might come back to you individually or together if we need to but at this stage, we've got to do some initial work for government and then see what happens after that. But there's a lot going on in this space, I could say that.

ASSOC PROF MOORE: Just one more point I'd make as well and that's just to do with the dynamic nature of koala populations. I always bring this up but you've just got to look at when we look at the status and distribution of koala populations in relation to whatever sort of management or habitat quality we've got, that those populations probably vary by severalfold through climate cycles, El Niño, La Niña and look at a study –

DR PREDAVEC: Totally agree, Ben.

ASSOC PROF MOORE: – [cross-talk 00:55:16] and having to put it – yes.

[1] Links shared in chat:
https://www.conservationfutures.org.au/our-activities/building-the-integrated-knowledge-system
https://nenswforestryhub.com.au/news-reports/reports/report/10-identifying-and-overcoming-legal-barriers-to-cultural-burning
https://nesplandscapes.edu.au/projects/nesp-rlh/nsw-northern-rivers/

DR PREDAVEC: Well said.

MR DUNCAN: Yes, and impacts of major events I guess as well.

ASSOC PROF MOORE: Yes, fires, of course. Yes.

MR DUNCAN: All right. Well, look, thanks very much for your time, I really appreciate it. It's been very interesting and I'm sure, Mary, it's something we can – some good information out of.

PROF O'KANE: Yes.

MR DUNCAN: See you.

ASSOC PROF MOORE: All right. No, thank you.

PROF HOGG: Thank you very much. See you later.

DR PREDAVEC: Thank you.

PROF HOGG: Bye.

PROF O'KANE: Bye.

>THE MEETING CONCLUDED