

REPORT ON PROCEEDINGS BEFORE

**PORTFOLIO COMMITTEE NO. 7 - PLANNING AND
ENVIRONMENT**

KOALA POPULATIONS AND HABITAT IN NEW SOUTH WALES

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At Jubilee Room, Parliament House, Sydney, on Friday 16 August 2019

The Committee met at 9:45 a.m.

PRESENT

Ms Cate Faerhmann (Chair)

The Hon. Mark Buttigieg

The Hon. Catherine Cusack

The Hon. Ben Franklin

The Hon. Mark Pearson

The Hon. Penny Sharpe

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The CHAIR: Welcome, everybody, to the first hearing of the Portfolio Committee No. 7 inquiry into koala populations and habitat in New South Wales. The inquiry is examining current status of koala populations and their habitat and focusing on the impacts and effectiveness of existing policies relating to land management reform, forestry and the environment. Before I commence I would like to acknowledge the Gadigal people, who are the traditional custodians of this land. I would also like to pay respects to elders past and present of the Eora nation and extend that respect to other First Nations people present. Today is the first of several hearings we plan to hold for this inquiry. We will hear today from the New South Wales Government, the Environmental Defenders Office, experts from the School of Life and Environmental Sciences, University of Sydney, and key environmental organisations such as the Nature Conservation Council of NSW, the National Parks Association of NSW, WWF Australia, the Total Environment Centre, WIRES and the International Fund for Animal Welfare.

Before we commence I would like to make some brief comments about the procedures for today's hearing. Today's hearing is open to the public and is being broadcast live via the Parliament's website. A transcript of today's hearing will be placed on the Committee's website when it becomes available. In accordance with the broadcasting guidelines, while members of the media may film or record committee members and witnesses, people in the public gallery should not be the primary focus of any filming or photography. I also remind media representatives that you must take responsibility for what you publish about the Committee's proceedings.

It is important to remember that parliamentary privilege does not apply to what witnesses may say outside of their evidence at the hearing and so I urge witnesses to be careful about any comments you make to the media or to others after you complete your evidence as such comments would not be protected by parliamentary privilege if another person decided to take an action for defamation. The guidelines for the broadcast of proceedings are available from the secretariat. There may be some questions that a witness could only answer if they had more time or with certain documents to hand. In these circumstances witnesses are advised that they can take a question on notice and provide an answer within 21 days.

I remind everyone here today that committee hearings are not intended to provide a forum for people to make adverse reflections about others under the protection of parliamentary privilege. I therefore request that witnesses focus on the issues raised by the inquiry terms of reference and avoid naming individuals unnecessarily. Witnesses are also advised that any messages should be delivered to committee members through the committee staff. To aid the audibility of this hearing I remind both committee members and witnesses to speak into the microphones. The room is fitted with induction loops compatible with hearing aid systems that have telecoil receivers. In addition several seats have been reserved near the loudspeakers for persons in the public gallery who may have hearing difficulties. Could everyone please turn their mobile phones to silent for the duration of the hearing.

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MICHELLE DUMAZEL, Executive Director Policy Division, Environment, Energy & Science Group, Department of Planning, Industry and Environment, affirmed and examined

TRISH HARRUP, Director Parks & Conservation Policy, Environment, Energy & Science Group, Department of Planning, Industry and Environment, affirmed and examined

JACQUELYN MILES, Acting Director Forestry, NSW Environment Protection Authority, affirmed and examined

The CHAIR: We welcome the first witnesses for this inquiry. Would any of you like to make a short opening statement? If so, please try to keep it to a couple of minutes so we can get to questions.

Ms DUMAZEL: Sure. You have heard that we are from the Environment, Energy & Science Group. It incorporates the previous Office of Environment and Heritage including the coordination of the implementation of the whole-of-government Koala Strategy and the Saving our Species program. In May 2018 the New South Wales Government announced a \$44.7 million Koala Strategy. This formed the basis of the New South Wales Government submission to this inquiry. The Koala Strategy acts on the recommendation of the Chief Scientist & Engineer's report into the decline of koala populations. The Koala Strategy is the beginning of our long-term vision to stabilise and then increase our koala populations into the future.

A core pillar of the Koala Strategy is to conserve important koala habitat. The New South Wales Government has allocated \$20 million to purchase and permanently conserve land in the national parks system that contains priority koala habitat. This land purchase initiative will assist in the long-term conservation of koala populations across New South Wales as well as other native plants and animals. The Koala Strategy also includes a commitment to set aside more than 24,000 hectares of State forests. I will quickly highlight the other three pillars of the Koala Strategy: We are investing \$8.9 million to build our knowledge and education about koalas, conservation through community action and we have committed \$5 million to local actions, and also improving the safety and health of koala populations. This includes \$4.5 million for rehabilitation.

The CHAIR: Thank you.

The Hon. PENNY SHARPE: Thank you very much for coming in today. You started with the machinery of government and the new changes within the cluster. Could you explain to the Committee how you interact with the Forestry unit?

Ms DUMAZEL: That is part of our department. We are in the Environment, Energy & Science Group. They are under the Regions, Industry, Agriculture & Resources Group. And we all report to Jim Betts, who is the Secretary of the Department of Planning, Industry and Environment.

The Hon. PENNY SHARPE: Given that there are quite divergent views internally within the department in relation to whether it is forestry or saving koalas, how are conflicts being managed within this new structure?

Ms DUMAZEL: I am not part of the leadership team process, but there is a leadership team that looks after and that meets regularly and then we meet with our counterparts on various issues and work through issues.

The Hon. PENNY SHARPE: So for example with the new land clearing laws obviously your part of the department would have views in relation to land clearing and its impact on koalas that would be a very different view to that of the Forestry group. How are you interacting in relation to providing information to each other if there is a singular focus on saving koalas?

Ms DUMAZEL: Our job here is to primarily implement the Koala Strategy. So what we are looking at is we work through the issues based on what the Government has agreed to implement on the Koala Strategy. With the Koala Strategy when we look at our four pillars that we have we have got the koala habitat conservation—

The Hon. PENNY SHARPE: I will get to that—

Ms DUMAZEL: We have our remit. What we are looking at is delivering on the actions of the Koala Strategy.

The Hon. PENNY SHARPE: But you do not have primacy in relation to any of the advice that is provided to Ministers or to your senior executive; you simply put the information up against the koala plan but you are not the lead agency within your cluster in dealing with koalas beyond the plan—is that right?

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Ms DUMAZEL: So we work with our counterparts across the department to deliver government policy—

The Hon. PENNY SHARPE: But beyond the Koala Strategy your advice does not have primacy compared to what Forestry would have within the department, is that right?

The Hon. CATHERINE CUSACK: Madam Chair, I am sorry to interrupt but she sort of indicated that there is a leadership group and that maybe we need to ask questions on notice in relation to this.

The Hon. PENNY SHARPE: I am happy for you to take it on notice, that is fine. I am not trying to be tricky; I am trying to understand the new arrangements within the Government?

Ms DUMAZEL: We work with our counterparts.

The CHAIR: I wonder if we could get something? If you could table the chart and the structure on notice for us so we are a lot clearer? Nobody is quite clear.

Ms DUMAZEL: I am happy to table the structure.

The Hon. CATHERINE CUSACK: Nobody is trying to catch anyone out.

Ms DUMAZEL: No, that is fine.

The Hon. PENNY SHARPE: I am really not trying to be tricky; I am just trying to understand how it works.

Ms DUMAZEL: That is fine. We are working in similar ways. We talk to our counterparts in Forestry and across the department so while there has been machinery and government changes, our relationships with all the different parts of the department remain the same. I am in contact with my colleagues around any issues that may arise and we deliver in relation to the land management and biodiversity conservation reforms. We deliver that for the Government.

The Hon. MARK BUTTIGIEG: Just to follow up on Ms Sharpe's question, it is a little bit unfair, isn't it, to send you in here if the clearing house between the competing claims of forestry and koala protection are done by a leadership team?

Ms DUMAZEL: My understanding is that after this session you will have some of my colleagues from the Forestry area

The CHAIR: That is correct.

Ms DUMAZEL: And they can answer information on that. What I am happy to discuss this morning and to talk about is to run through the parts of the New South Wales Government's submission that relate to the Koala Strategy.

The Hon. MARK BUTTIGIEG: Sure, but how is that tension that Ms Sharpe alluded to resolved in the department? Who actually makes a decision?

Ms DUMAZEL: We have a structure in place and issues get elevated and we work through them as a department.

The Hon. MARK BUTTIGIEG: But someone has got to make a decision sooner or later, so someone makes the call that "Forestry is saying this, the koala people are saying this. How do we come to a conclusion"?

Ms DUMAZEL: We have a secretary of the department. His name is Jim Betts. We have a leadership team and the deputy secretary get together to resolve issues and discuss issues based on the advice that we provide them. The advice that we provide them, we work with our colleagues across the department to provide that advice.

The Hon. MARK BUTTIGIEG: And this fellow, Mr Betts, he reports directly to the Minister, does he?

Ms DUMAZEL: He is the Secretary of the Department of Planning, Industry and Environment.

The CHAIR: This is a question for you, Ms Miles. Are you aware of the Environment Protection Authority [EPA] 2016 preliminary koala habitat mapping study?

Ms MILES: Yes, I am. That study was undertaken as part of a koala mapping program improving our knowledge of where koalas occur in New South Wales on State forests and to help inform re-entry settings.

The CHAIR: Did it show any correlation between koala activity, feed tree size and forest age class?

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Ms MILES: That report was undertaken to help us identify what would be an appropriate method for identifying where koala habitat occurs, so the purpose of the findings in that was really identifying what is the most effective and efficient way of identifying koala habitat.

The CHAIR: Did it show any correlation between koala activity, the actual size of the feed trees that koalas need and the age of the forest?

Ms MILES: I understand it made some findings. I do not have that information in front of me but it was a by-product of the purpose of that project and the report.

The CHAIR: Would it be fair to say that the study corroborates several other studies which show that koalas have a strong preference for large trees and aged forests, older forests?

Ms MILES: A lot of the findings in that report indicated that larger trees had a higher rate of scat detection. There is a range of other research going on at the moment around koala habitat use in forestry areas, including actions in the Koala Strategy.

The CHAIR: So in light of that work and other studies suggesting that, would you agree that the intensive logging zone in the North Coast forest area will result in a significant decrease of habitat quality for koalas?

Ms MILES: The New South Wales Government has set new rules for forestry operations on State forest included in those rules, which is the Integrated Forestry Operations Approval [IFOA], and is a range of new settings around protecting koala habitat during forestry operations.

The CHAIR: So clearing up to 45 hectares in the intensive logging zone, how does that protect koalas in that zone?

Ms MILES: So the IFOA includes requirements around protecting a range of habitat trees for koalas depending on the quality of the habitat. That is driven by two maps that have been produced by the EPA. That includes a map of where koalas are likely to occur plus a map of where koala habitat is likely to occur.

The CHAIR: Can you remind me how many trees and the size of those trees if, say, 45 hectares is cleared, remembering the EPA study that koalas prefer larger trees and old-growth forests. How many trees and what are the size of those trees in a 45-hectare area?

Ms MILES: It will be variable depending on the density of koala trees that actually occur in that forestry site. I would also like to point out that the IFOA also includes a requirement where koala high-use areas identified under the former IFOAs have to be protected permanently for the first time. In addition, where we are seeing high densities of koala trees, they will be prioritised within new permanent habitat protections called clumps.

The CHAIR: It is fair to say, though, that intensive logging zones in the North Coast is happening in some of the identified koala reserves and that up to 10 or 20 sometimes feed trees of 20 centimetres in diameter is all that is left in a 45-hectare zone with koalas present.

Ms MILES: The New South Wales Government has set new rules—

The CHAIR: That is the rules; what I have just identified?

Ms MILES: It could be. Supporting that will be a \$9.2 million forest monitoring and improvement program that will be independently overseen by the Natural Resources Commission. That will be assessing the effectiveness of these rules, including the koala settings. In addition, the Koala Strategy sets out a science action around research on intensive harvesting practices.

The CHAIR: Do you think intensive logging, which is called regeneration logging, is compatible with the desired objective as stated in the Chief Scientist's report into the koala of stabilising and starting to increase koala numbers on the North Coast? Can you see how that can happen with intensive logging zones?

Ms MILES: The new IFOA puts constraints on intensive harvesting practices for the first time so it is reducing the size of intensive harvesting and distributing that impact over time and across the landscape. There is going to be monitoring and research.

The Hon. PENNY SHARPE: But do you accept that the new IFOA is opening up parts of the forest that has previously been protected for logging?

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Ms MILES: The new IFOA is setting a completely different rule set for how koalas are identified and managed, including additional protections called wildlife and tree retention clumps and it is protecting koala high-use areas that were implemented in the past for the first time.

The Hon. PENNY SHARPE: I noticed in your evidence before you talked about that these things are going to be permanently protected. I think the general view was that the areas that are currently being opened up were permanently protected previously. Why have they been opened up?

Ms MILES: Do you mean in regards to koala high-use areas?

The Hon. PENNY SHARPE: The rulings around old-growth forests and the remapping of old-growth forests have meant that areas that were previously protected that have koalas in them are no longer necessarily protected and they are under this new regime, is that correct?

Ms MILES: The New South Wales Government has initiated a process to remap old-growth forests on State Forests. They have issued the Natural Resources Commission a terms of reference where they are required to prepare a method to—

The Hon. PENNY SHARPE: Yes, I understand that but does that mean that some areas that have previously been protected will no longer be protected, yes or no?

Ms MILES: The New South Wales Government has made no decision yet about rezoning State forests or previously protected areas as old growth for future logging. No decision has been made yet.

The CHAIR: Is there a reason the remapping is occurring then? If it is not going to be opened for logging, why is the Government remapping it?

Ms MILES: When the New South Wales Government undertook the reform to remake the Integrated Forestry Operations Approval [IFOA], they made that decision to progress as long as that IFOA maintained environment of values and had no change to woody supply.

The CHAIR: Is it because they needed more timber?

Ms MILES: The Natural Resources Commission [NRC] were engaged to undertake a review of the coastal IFOA koala settings. In that review they identified there is potential the coastal IFOA could have a wood supply impact.

The CHAIR: That is because they needed more timber?

Ms MILES: The NRC's advice was that some of the new IFOA settings may have a timber supply impact.

The CHAIR: The NRC also indicated that they may have an environmental impact if those old-growth forests are opened up, is that correct?

Ms MILES: I do not have that information available. That is not my understanding.

The Hon. MARK PEARSON: Have any logging programs been restrained and held while there is this review of the whole koala habitat issue unfolding? Your document says that the issue in relation to koala habitat is at crisis situation. One would think there would be a restraining by the Government on logging of certain areas. Has that occurred?

Ms MILES: The New South Wales Government permits timber harvesting within State forests so long as they comply with the rules set by the IFOA.

The Hon. MARK PEARSON: It states here that the management is guided by a range of national and international commitments which set out strict environmental safeguards. Can you describe or set out how the Government views strict environmental safeguards?

Ms MILES: In forestry operations?

The Hon. MARK PEARSON: Yes, particularly in relation to koala habitats.

Ms MILES: The IFOA sets out a range of landscape protections. This includes habitat corridors, stream corridors, old-growth forests, rainforests and a range of environmental protections. In addition to that it puts in place a range of settings for koalas. That includes identifying where koala habitat is most likely to occur and then putting in place an escalating rate of koala feed trees depending on the quality of habitat. In addition it requires

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formally implemented high-use koala areas to be permanently protected for the first time and priority be given to other areas that are important koala habitat for inclusion in new permanent landscape protections called clumps.

The Hon. CATHERINE CUSACK: Thanks very much for appearing today. I just wonder if we might rewind on the whole issue of mapping of habitat and if you would not mind talking the Committee through the old methodology and why there is a new methodology, what the advantages of the new methodology are and, if I could ask you in the process, to actually explain what koala habitat is? I have heard you refer to diversities in the State forests but I am assuming you mean that not all of the State forests is suitable for koalas. The mapping might reflect that. I just feel like, if you could explain that holistically, it might help everyone.

Ms MILES: Yes, no problem. I will start with the koala habitat, and Ms Harrup and Ms Dumazel can jump in too. Koala habitat is where there is appropriate food resources for koalas that is capable of sustaining populations. Koalas have specific food tree preferences, depending on where they are in the State. We also term koala habitat as where there is evidence that koalas occur; so where there is existing records or where there has been detections of them, including evidence of scats or markings on trees.

The Hon. CATHERINE CUSACK: Just being more specific about that, the types of trees and the type of environment. For example, you will not find koala trees in swamps.

Ms MILES: You can. It depends on where you are in the State. There is a list of koala trees that you set out. I think it is in the State Environment Protection Policy [SEPP].

Ms HARRUP: Maybe I could add to that. The existing State Environment Protection Policy 44, which is full koala habitat protection, does identify a short list of 10 koala feed trees. Through the NSW 4Koala Strategy we have done some quite extensive work in looking at what are the trees that koalas use both for food and for shelter across the State. We have developed a regionalised list of the trees that they use for feed and shelter. We have published that report on our website. It identifies, based on the best available expert knowledge, our understanding of what trees they are using—on a regional basis, because it does vary, depending on the regional environmental conditions. We are using that information to inform one of our key commitments under the New South Wales koala strategy, which is to develop a koala habitat information base. We will draw on that knowledge of where the koala trees occur in the landscape to develop information about koala habitat suitability.

The Hon. CATHERINE CUSACK: This is a new strategy, because we now have more data and more information. Would that be a fair statement?

Ms HARRUP: When the New South Wales Chief Scientist & Engineer released their independent review into koalas, she signalled that there was a range of knowledge gaps that we needed to fill. One of the knowledge gaps that we needed to fill is a much better understanding of what constitutes koala habitat and where it occurs across the State, which is a key action under the NSW Koala Strategy. The first step is we have published a report on koala trees for use and shelter. We are building information around that to better identify across the State where those trees occur and where the other environmental conditions occur that would constitute koala habitat.

The Hon. CATHERINE CUSACK: That is pretty much what is driving this new mapping exercise, is that correct?

Ms HARRUP: Under the NSW Koala Strategy we will release a State-wide koala habitat information base. That will include spatial information about where in the landscape you could expect to find the trees that koalas are using, and also spatial information about habitat suitability that will look at both the trees they are using and also other environmental conditions would help to identify koala habitat. That would be things like information about soil, topography, rainfall and a range of other environmental factors.

The CHAIR: Does that also include where koala populations are in terms of the evidence of koala populations, or is this solely habitat?

Ms HARRUP: The koala habitat information base will also include the available information about where koalas occur across the State.

The Hon. PENNY SHARPE: Does that include work by citizen scientists?

Ms HARRUP: Yes. BioNet is one of the basic sources of that information, and it includes a range of sources. We also recognise that there is still a lack of comprehensive data across the State about where koalas occur. We are investing in improving that dataset through surveys. Also, as part of the koala strategy we have recently released a State-wide survey where people can go online and add information about where koalas have been sighted, so that we continue to build that knowledge.

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The CHAIR: How does that fit in? I thought there has been quite a bit of work by the Office of Environment and Heritage [OEH] over the years into where koalas reside, there is koala hubs work, there's Areas of Regional Koala Significance [ARKS], how does all of this fit into this new work, how complete is it and when can we expect to see this reasonably complete information for where koalas are in the habitat in New South Wales?

Ms HARRUP: The commitment in the NSW Koala Strategy is to release the koala habitat information through the Sharing and Enabling Environmental Data [SEED] Portal. I expect that will occur this year. The work has been progressing and we expect that we will finalise and release it this year. It will include a number of layers. If I could talk through those, then I can explain how they will relate to the hubs and the ARKS that you have mentioned. It will include information about where across the State we expect that koala feed trees and use trees occur, it will include information about habitat suitability. So that will be modelled based on where we understand the trees occur and the other environmental factors. It will also include the available information about where koalas are known to occur in the landscape. Also, as part of that we will release the information we have formed as part of the Saving our Species program around where there are koala hubs.

That information is based on the koala occurrence information. It identifies where the data shows that koalas are known to occur, and the records show persistence over time. We know that is not a complete information set. There will be parts of the State where there may be highly suitable koala habitat but we have a lack of data. That is one of the reasons why we are trying to improve that data.

The Hon. CATHERINE CUSACK: Just coming back to the recommendation of the Chief Scientist that there are knowledge gaps, having tried to follow this issue for many years, it seems to me that a lot of the studies and the data are either coming from community groups that are working with volunteers in partnership with government or is driven by developers. I include RMS in that because often its roads will go through a forest, particularly if it is a specific motorway.

The Hon. PENNY SHARPE: Ballina.

The Hon. CATHERINE CUSACK: Ballina. In the development application process they are obliged to undertake koala studies and gather information as part of that process if it has not been undertaken before. The issue for me is that it is only when there is a threat, and it is being funded by proponents. That is good and it is a good process—that has always been the process—but would you say that that is one of the reasons why we have gaps in our information? Because these studies are being triggered by a proposal to disturb the habitat. Then you have the community. But there has not really been a holistic approach to all the other habitats to understand it.

Ms DUMAZEL: Certainly the State-wide information base will be a foundation piece for the strategy. It will bring together all that information. What Trish was saying before about having that survey, which has now been released, was that it also allows people to add to that base the information that they have gathered in collaborative groups. Then we just need to make sure we have a full scientific approach for what is included in the information, which will be peer reviewed. I think that will be a great source of information.

The Hon. CATHERINE CUSACK: Because it has been very piecemeal, has it not? In a nutshell that is what I am saying—it has been very piecemeal. Koalas do not know that they are in a State forest and not in a national park. They have their food trails—from what I can understand—so with their behaviour they just repeat, repeat and repeat.

Ms HARRUP: The koala is quite a widespread species. They are found on the north coast, the south coast, the Southern Tablelands, the Northern Tablelands and as far west as Gundagai and Pilliga. Because they are widespread and because they are also what is known as a cryptic species—which means they can be difficult to detect—it is very difficult to build up a comprehensive State-wide understanding of where they occur. We draw on a range of sources and essentially draw on all the available information to build that understanding. That information will come from, as you described, the statutory process as part of approvals processes. It also draws on the information collected by the fauna rehabilitation sector and in systematic surveys that are carried out.

As part of the NSW Koala Strategy we have funded further systematic surveys to build our understanding of where koalas occur. Last year, as another part of the NSW Koala Strategy, we delivered 13 community workshops across the State to work with local communities to understand what they saw as the local threats to koalas and what they would like to see done. One of the questions we asked at those workshops was what they saw as the information gaps in their local areas. That helped us to identify the areas where we would target that systematic survey effort. Also, some of the local projects that they wanted us to partner with them on and fund were about building the knowledge of where koalas occur and where koala habitats occur in the local area.

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The Hon. CATHERINE CUSACK: Would you mind providing the Committee with the list of surveys, where they are being undertaken and when they will be completed?

Ms HARRUP: I can provide that information.

The Hon. BEN FRANKLIN: I have a quick question. Just getting on to community issues, will you detail for us exactly what sort of engagement you do at a local level with the community?

Ms DUMAZEL: As Trish was saying, we have conducted 13 community workshops and we worked with the communities to come up with some initial actions that we are looking into. As I outlined at the beginning, there is \$5 million for this pillar of conservation through local actions. One of the projects that we have recently funded is funding for a drinking station near Moree that has been installed so koalas no longer have to cross the road to access the water. That came out of the community workshop. Another project up in the north-east is a wild dog impact study. That is looking into the interaction between koalas and wild dogs.

The Hon. PENNY SHARPE: Which is not good, presumably.

Ms DUMAZEL: What will be useful with this strategy is that it will track 15 koalas so we can really document and understand what is happening there. We are also preparing guidance for habitat restoration and that will be really useful for the different locations in terms of the best trees to plant as well. In the Coffs area we are also working to supporting Aboriginal involvement in the work that we are doing in the Koala Strategy. That is just the start of the community actions that we are undertaking. It is a really important feature given that, as Trish outlined, the population is quite dispersed across the State. It is really helping us to understand the threats within the local areas and to work with the experts in the area to come up with some solutions.

The Hon. MARK BUTTIGIEG: What strikes me about this conversation and the little bit of reading that I have done is that there seems to be a fairly strong consensus on the existential crisis of the koala population from environmental groups in particular. Yet the jury still seems to be out on the methodology and mapping to determine the extent of that crisis. Is there any reason why there seems to be a lack of urgency to get the methodology right and fund it to the point where we have an accurate snapshot of what is going on? Is there any reason for that delay or the lack of urgency? Correct me if I am wrong, but that is what seems to be happening. It seems that we are still working out what exactly is going on out there.

Ms HARRUP: The NSW Koala Strategy recognised that there was a need to match the need to address knowledge gaps with immediate action and there is a number of actions in the strategy that are focused on addressing immediate threats. But it also recognised that there is still a knowledge gap in a number of areas. One of the key knowledge gaps was around where the koala habitat occurs across the State and where koalas are known to occur. Significant work has been undertaken to advance our knowledge on that and we are close, as I said, to finalising that work. I would say that that will be released at some point this year. But we have also focused on delivering the immediate local actions where we can. One of the examples Michelle gave speaks to the knowledge gap around the interaction between wild dogs and koalas. Through the process of consultation and the research we did to develop the NSW Koala Strategy, we found that there was no expert consensus on whether wild dogs are a key threat to koalas. There is clear evidence that free-roaming domestic dogs are, but whether or not wild dogs are is still up for question. The first step is to better understand that. Then we can put in place the appropriate actions to address those threats if the evidence shows that they are—

The Hon. MARK PEARSON: What factors made the Government suddenly think that immediate, urgent intervention and assessment was required? What were the factors that caused the Government to move?

Ms HARRUP: Do you mean to develop the NSW Koala Strategy?

The Hon. MARK PEARSON: To, as you said, take immediate, urgent action. What were the factors that caused that to happen?

Ms HARRUP: The NSW Chief Scientist & Engineer released a report into the decline of koalas in New South Wales in late 2016. The NSW Koala Strategy was developed in response to that report from the NSW Chief Scientist & Engineer. The overarching recommendation was that the Government should develop a whole-of-government New South Wales koala strategy and that it should be based on a mixture of action and building of knowledge and understanding of koalas to better inform future action.

The CHAIR: Can I check how much koala habitat area that koala strategy is going to protect?

Ms HARRUP: One of the pillars under the NSW Koala Strategy is koala habitat conservation. There is a couple of key actions under that pillar. There is \$20 million available to purchase private land with priority koala

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habitat and reserve that as part of the national parks estate. A hectare target has not been set but there is \$20 million available and, to date, we have purchased three properties that will be gazetted as national park.

The CHAIR: How much of those three properties have been identified by the Office of Environment and Heritage in the past as koala hubs?

Ms HARRUP: I would probably have to take that question on notice to see if it has been identified as a koala hub, but the three properties— One is in the Tweed area on the North Coast which is a known koala population and the other two properties are in the Southern Highlands. They are also an area of known koala habitat and activity and they are also key connectivity corridors, so those two properties will add to the connectivity in the landscape.

The CHAIR: With respect, though, Ms Harrup, it has been reported that those areas that the department has purchased are not koala hubs. You would be aware whether they would be koala hubs or not.

Ms DUMAZEL: Any kind of land acquisition, because it is going into the New South Wales national park estate, is guided by the "CAR" principles that we have got—comprehensiveness, adequacy and representativeness. For it to be considered as part of this, it is a high priority for purchase for koalas: must contain koala habitat; evidence of use by koalas; be well-connected to surrounding vegetation or enable better management of threat to koalas in that location. It is an acquisition as part of the parks estate and that is what we have been looking at.

The Hon. PENNY SHARPE: Can I follow directly from that, just to do with the koalas in the south-west of Sydney? You would be aware that the only disease-free koala population runs along the Georges River there, from Holsworthy out as far as Picton, and that there is considerable concern about the development that is happening at the Mount Gilead estate. Given there is money around to purchase land and there is a key corridor that connects koalas that has been well demonstrated over many years, is there any plan for, or thought to, actually trying to use those funds to protect this particular bit of land and this very precious koala population that is the only disease-free one in New South Wales?

Ms HARRUP: Last year the New South Wales Government—the planning part of our department—released a draft Macarthur 2040 plan which indicated the intention to set aside around 800 hectares of koala habitat for conservation. It also foreshadowed that the department is developing a draft Cumberland Plain Conservation Plan. That will be released for public consultation. The draft Cumberland Plain Conservation Plan will include a proposal for how koala habitat and koala habitat corridors will be preserved in that region.

The Hon. PENNY SHARPE: You do not believe that the koala strategy will have the funding to pick up some of those if that was recommended within that plan?

Ms HARRUP: That would be a decision to be made after the draft Cumberland Plain Conservation Plan has been released for public exhibition.

The Hon. PENNY SHARPE: And your area of the department will have direct input into recommending whether that should be the case?

Ms HARRUP: We are working with our planning colleagues to provide input into the development of the draft Cumberland Plain Conservation Plan.

The Hon. MARK PEARSON: Are there any development applications that are going to be rescinded or blocked as a consequence of the purchasing of these reserves for koalas?

Ms HARRUP: That would be a matter for the planning part of the department or the planning Minister.

The Hon. MARK PEARSON: Are you aware that there will be or that there is a rejection of any development proposal, either for roads or for land development?

Ms HARRUP: None that I am aware of. I am not aware of any.

The Hon. CATHERINE CUSACK: Can I just ask: Is there an expected time frame on when that will be available?

Ms HARRUP: I understand that it is likely to be available for public exhibition in early 2020.

The CHAIR: That is well after any koala corridors identified around Gilead and other developments would be cleared, I would assume.

The Hon. CATHERINE CUSACK: But you have indicated that there is—

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The CHAIR: Can I just get a response? Sorry, Catherine.

Ms HARRUP: Sorry. I do not know the sequencing. It is a matter for the planning part of the NSW Department of Planning, Industry and Environment.

The Hon. CATHERINE CUSACK: In the meantime there is work going on with your planning colleagues—

Ms DUMAZEL: Correct.

The Hon. CATHERINE CUSACK: —that is informed by the work that is being prepared in drafting the strategy. Yes?

Ms HARRUP: Correct.

The Hon. CATHERINE CUSACK: Forgive me this indulgence, but Dharawal National Park contains koala colonies and has significantly assisted in the protection of those koalas and koala habitats down there. Would you agree with that? I just think we need a fuller picture about what is going on with that koala community which, as my colleague has indicated, is a very precious one.

Ms HARRUP: Correct. I would agree.

The Hon. PENNY SHARPE: And Dharawal has been pretty important.

The Hon. CATHERINE CUSACK: I want to introduce a new issue here that I am anticipating will arise for this Committee, and that is the new approach to classification of endangered, vulnerable species. There used to be a provision to categorise a local community as being endangered or threatened—vulnerable—and that has been removed, as I understand it, under the new approach. I wonder if you could talk the Committee through that change in approach to classification because, I think, so much misunderstanding has been generated. I would also like to understand, given that we are talking about locally endangered communities and we are taking a localised approach, what implication that does have for those locally endangered koala communities.

Ms DUMAZEL: Under the Biodiversity Conservation Act—I will talk specifically around koalas—koalas are listed as vulnerable. That listing is a statewide listing so that is the overarching approach.

The Hon. CATHERINE CUSACK: Who does the listing or who recommends it to the Minister, just to be clear?

Ms DUMAZEL: So it was—

The Hon. CATHERINE CUSACK: I am talking about if I wanted to make an application that a species was vulnerable, what would that process be?

Ms HARRUP: The scientific committee makes a recommendation to the Minister.

The Hon. CATHERINE CUSACK: The scientific committee? And then they make recommendations. So these are independently assessed and recommended?

Ms DUMAZEL: Correct.

The Hon. PENNY SHARPE: Can I follow up quickly on that?

The Hon. CATHERINE CUSACK: Yes. Absolutely.

The Hon. PENNY SHARPE: Isn't it the case now, though, under the new Biodiversity Conservation Act that local populations are unable to have an increased identification of vulnerability? For example, the Port Stephens koalas. The scientific committee was forced to reject its own recommendation that Port Stephens' koalas were endangered. Can you just respond to that please?

Ms HARRUP: Correct. Under the new Biodiversity Conservation Act there is one listing for the species.

Ms DUMAZEL: So there is one listing across the State. Koalas are listed as vulnerable across the State. What we are doing with the koala strategy is, that is why that pillar around local action conservation is important. What we can do is actually tailor and target our responses for individual communities, but, overarching, the koala is listed as vulnerable.

The Hon. PENNY SHARPE: Yes, but there are higher levels.

The Hon. CATHERINE CUSACK: I am supporting what you are saying, but it is just where I was coming from because I suppose those communities in Port Stephens and in Ballina would say, "Our koalas aren't

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vulnerable, they are very much in danger of being wiped out." So, while it is a statewide classification, the koalas might be thriving in Gunnedah but not in Port Stephens. I guess that is the nuance. I am not asking this in an aggressive way, obviously.

Ms DUMAZEL: I understand.

The Hon. CATHERINE CUSACK: And I do understand there are reasons for it, and I wondered if you could just explain that.

Ms DUMAZEL: The Government has made the decision in terms of that the koala has the status of vulnerable across the State. What we are then looking at is in terms of a management response from a local aspect.

The CHAIR: What are the impacts of not being able to list local populations? What are the impacts on these local populations of not being able to increase the classification to a more threatened status?

Ms DUMAZEL: Through the Saving Our Species program and the Koala Strategy there is a lot of activity at the local level to work in partnership with local government, with the community around specific populations and that is what we are doing.

The Hon. MARK PEARSON: Would it not be effective to raise the category—this is what I think the Hon. Catherine Cusack is trying to say, that in certain areas they would be categorised as more than vulnerable but highly threatened? Why not have different categories for specific areas rather than an umbrella category of vulnerable?

Ms DUMAZEL: I think the important thing is, when we were talking before about the information base and around us really understanding across the State around information in terms of koala trees, koala habitats and where koalas are, that that is going to be a really important piece. The Koala Strategy is a foundation piece that is helping us to in the long term stabilise and increase the population of koalas across the State.

The Hon. MARK PEARSON: Are there not areas that at the moment are urgent that need a higher category of protection, for example as Ms Cate Faehrmann said, that while we wait for this report, early 2020 there will be bulldozers going through certain areas which are considered high-risk areas to the sustainability of this species? Surely we should be identifying them, even to give the benefit of the doubt, not necessarily absolutely, but if it looks like that area is going to be a high-risk area for koalas should we not be urgently placing that category there now to protect them, rather than say well, they are all vulnerable across the State?

Ms HARRUP: The Biodiversity Conservation Act does set out the Government's approach to listings, but in addition to that, as Ms Dumazel said, there is the capacity to target local action based on a need and the understanding of the threats to a local koala population. Also, one of the things we are delivering under the NSW Koala Strategy, which was based on recommendations from the Chief Scientist & Engineer, is a comprehensive monitoring program. We want to monitor koalas on an annual basis across tenures. We have set out in our submission and in the Koala Strategy what we will be monitoring, and with that monitoring program we expect to gather the information that we would need to get a good understanding of the population dynamics, the trajectory of that population and therefore indicators of a need to act if the monitoring data signals that.

The Hon. BEN FRANKLIN: Can you let us know how the Biodiversity Conservation Trust [BCT] has been involved in the strategy?

Ms HARRUP: The Biodiversity Conservation Trust is managing a significant amount of funding, \$340 million for conservation of biodiversity values on private land. The koala habitat was signalled by the minister as one of the priority areas for that investment. The Biodiversity Conservation Trust has prioritised securing koala habitat on private land as part of its work. To date a number of properties or landholders have entered into conservation agreements to permanently protect the habitat on their properties. To date they have entered into 10 agreements protecting 254 hectares of koala habitat on their properties.

The Hon. PENNY SHARPE: How much has that cost?

Ms HARRUP: Can I take that on notice? They have also run a number of expressions of interest to indicate to landholders that the program is available. The Biodiversity Conservation Trust representatives attended a number of our local community workshops so that they could further build the awareness that this program is available and is an option for landholders.

The Hon. BEN FRANKLIN: Do you envisage much more land will be protected under this program?

The Hon. PENNY SHARPE: I hope so, 254 hectares.

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The Hon. BEN FRANKLIN: That is why I am asking the question.

Ms HARRUP: Overall over the next five years there is an investment of \$350 million for the private land conservation. I think this is an aspect of the land management and biodiversity conservation reforms that is really, in terms of across the country the investment into private land conservation is quite significant. Given that the BCT has prioritised koala habitat, we are expecting more private land conservation.

The CHAIR: Ms Harrup, what level of input did you and your colleagues in the Office of Environment and Heritage and Parks have to the coastal Integrated Forestry Operations Approval [IFOA] remake?

Ms HARRUP: I would probably have to take that question on notice and ask my colleagues across the former OEH what level of input they had to the coastal IFOA. I am aware that the agency had input but the lead agencies in developing that work were the Department of Primary Industries-Forestry and the Environment Protection Authority.

The CHAIR: I am aware that the north-east branch of OEH stated in a submission to the coastal IFOA remake that the comprehensive, adequate and representative reserve [CAR] system was established in conjunction with selective logging regimes that maintained structurally diverse forest throughout the harvest area, and that the draft coastal IFOA appears to increase the area of public forests on the north coast that would be legally available for intensive harvest with the risk that large areas of forest will be reduced to a uniform young age class that would take many decades for full ecological function to be restored. Is this what the new coastal IFOA has done?

Ms HARRUP: I think that the Environment Protection Authority is best placed to speak to the coastal IFOA.

The CHAIR: This was the north-east branch of the Office of Environment and Heritage's submission from an environmental perspective to the coastal IFOAs.

Ms HARRUP: That was a submission to the draft coastal IFOA. I think that the EPA is best placed to answer what the current settings will achieve.

Ms MILES: I am happy to take it. Previously intensive harvesting was unrestrained. The coastal IFOA has put some limitations on where it can apply in New South Wales as well as make sure it is distributed over time and across the landscape. It is also being balanced with additional protections, including permanent protections called wildlife clumps and tree retention clumps.

The CHAIR: Thank you, Ms Miles, from your perspective that is good. But considering, Ms Harrup, that you were talking about the NSW Koala Strategy and the objectives of the Government to stabilise and then increase koala numbers—which I think was in your opening statement, Ms Dumazel—are the koala prescriptions in the new coastal IFOA adequate for the desired objective of the NSW Koala Strategy and the desired objective of the New South Wales Government to stabilise and increase koala numbers?

Ms HARRUP: One of the immediate actions under the NSW Koala Strategy is to invest in further research into that particular area. There is funding that has been provided to the Natural Resources Commission to independently oversee a research project to better understand how koalas are responding to regeneration harvesting on the North Coast of New South Wales.

The CHAIR: The OEH is putting money into understanding how clear felling 45 hectares and leaving 10 to 20 trees at 10 centimetres diameter is good or bad for koalas?

Ms HARRUP: We are investing in research to understand how koalas are responding to the regeneration harvesting—

The Hon. PENNY SHARPE: And logging helps koalas.

Ms HARRUP: —in the North Coast. The Natural Resource Commission has published their research plan on their website and they have also commissioned a number of studies and they have published details about those studies. We expect the work will be concluded with results within the next three years so that when the Koala Strategy is reset after three years we will have that information available to inform future actions.

The CHAIR: After much of the coastal area that is potentially koala habitat has been logged?

Ms HARRUP: We expect that the research will be completed within the time frame of the first stage of the New South Wales Koala Strategy.

The Hon. PENNY SHARPE: The Chief Scientist's report from 2016 recommended that the Government improve outcomes for koalas through changes to the planning system.

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Obviously State Environmental Planning Policy 44 [SEPP 44] is the key planning instrument. I understand from your submission that really nothing has been done with SEPP 44 since 2016—there has been some consultation. Have there been any changes within the planning system that have moved in any way towards the Chief Scientist's recommendation about dealing with saving koalas through planning?

Ms HARRUP: As we have spoken about, through the New South Wales Koala Strategy we are building a comprehensive koala habitat information base. That will give us spatial information about where there is koala habitat across the State. There is a commitment through the strategy that the information base will be used to inform the planning system, including review of the SEPP 44—

The Hon. PENNY SHARPE: Basically you are confirming that nothing has happened with SEPP 44 since 2016?

Ms HARRUP: My understanding is that SEPP 44 has not been altered since 2016.

The Hon. PENNY SHARPE: Yes, that's right. With all of this work that has been done to develop more information there is nothing that attaches to that information that would then say these areas should have protections through planning and other environmental laws?

Ms HARRUP: That would be a decision for Government. However, the information base will—

The Hon. PENNY SHARPE: It is going to be a map.

Ms HARRUP: It will provide spatial information about koala habitat suitability across the State on a regional basis.

The Hon. CATHERINE CUSACK: The Government's koala strategy has been released. What did it replace? What was the framework prior to its release that was driving koala protection policy?

Ms HARRUP: Prior to that there was a New South Wales koala recovery strategy. It was produced under the previous Act. They are no longer a requirement of the new Act.

The Hon. CATHERINE CUSACK: What was the date of that strategy? You can take that on notice—

The Hon. PENNY SHARPE: It was 2009. It is alright, I know: 2009.

The CHAIR: The date being when it was published or when—

The Hon. PENNY SHARPE: When it ran out.

The Hon. CATHERINE CUSACK: Perhaps you can take this on notice, but in terms of funding for koala strategy within the department could you possibly give us an indication of what the funding has been annually and how it has changed over the past 10 years? So that the Committee can understand—

Ms HARRUP: We could take that on notice, but we could provide—

The Hon. CATHERINE CUSACK: —what resources have been put in and whether the trend is up or down. Thank you.

The Hon. PENNY SHARPE: One more question. There are media reports in relation to the Government moving towards privatising State forests. From your perspective with the policies in your department, do you believe that is a threat to the ongoing ability to manage their koala population in New South Wales?

Ms HARRUP: I do not think that I am able to comment on that. The New South Wales Koala Strategy works across all tenures to address impacts on koalas.

The Hon. PENNY SHARPE: Okay. Thank you.

The CHAIR: Ms Dumazel, I am wondering how many areas of outstanding biodiversity value have been established under the Biodiversity Conservation Act 2016 or Local Land Services Act 2013?

Ms DUMAZEL: There are four existing—I do not have the list in front of me—but there are four existing. At the moment we are preparing guidelines to work through so that we can have some information available on that process. We are developing guidelines for consideration.

The CHAIR: So you are still developing guidelines for landholders to identify areas of outstanding biodiversity value, is that correct?

Ms DUMAZEL: Yes. We are obtaining advice from the biodiversity advisory panel. We have obtained that advice and we are just in the process of finalising the guidelines for that.

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The CHAIR: Who is on that panel?

Ms DUMAZEL: I do not have the list in front of me. I am happy to provide that.

The CHAIR: Could you provide that to the Committee? Could you also provide to the Committee who is on the Native Vegetation Panel? Unless you know that information now.

Ms DUMAZEL: That is not part of—I do not have that information. That is not part of my responsibility.

The CHAIR: You are suggesting that four areas of outstanding biodiversity value have been established before the guidelines have been established?

Ms DUMAZEL: No. I will take the question on notice. There were four existing areas that have moved across.

The CHAIR: What you are saying is no new areas, because the guidelines have not been—

Ms DUMAZEL: The guidelines are being finalised at the moment. We are making sure that the process is robust. We expect that to be finalised and available in the new year.

The CHAIR: I have one last question before we finish. I have seen a report that suggests Eco Logical Australia has estimated that 2.2 million hectares of koala habitat is at risk of being bulldozed under the equity code on private land under the Local Land Services Act. Are you aware of that report?

Ms DUMAZEL: That will have to be a—I am not—

The CHAIR: Do you agree that there is—

Ms DUMAZEL: I am not aware of the report. The equity code is not part of my responsibility.

The CHAIR: Okay.

The Hon. PENNY SHARPE: One more quick question. There are a lot of koalas being killed by cars on Appin Road. There is a plan in relation to using exclusion fencing along the eastern side there to prevent koala movement to the west. Have you had any input with Roads and Maritime Services and others that are doing this planning about proper overpasses and maintaining vegetative corridors as a better way of managing this, rather than basically stopping the koalas getting where they need to be?

Ms HARRUP: An Environment, Energy and Science group has provided input in terms of knowledge of koala movement and koala habitat in that area. I have not been directly involved in that but my understanding is that they have provided input. However, Roads and Maritime Services—or now Transport—have committed to put in place fauna mitigation measures as part of the upgrade of Appin Road.

The Hon. PENNY SHARPE: That's what I am saying—that is the fencing. My understanding is that the best practice and the advice that has been provided previously is about overpasses and vegetative corridors. Has anyone in your department provided advice that would basically confirm this rather than just the fencing that is being adopted?

Ms HARRUP: I would have to take on notice the question of the nature of the advice that they have provided.

The Hon. PENNY SHARPE: If you could provide it, that would be great. Thank you.

The CHAIR: Thank you very much for attending this hearing. The Committee has resolved that answers to questions on notice be returned within 21 days. The secretariat will contact you in relation to the questions you have taken on notice. Thank you very much.

(The witnesses withdrew.)

(Short adjournment)

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BRETT SLAVIN, Manager, Strategy and Engagement, Local Land Services, sworn and examined

JACQUELINE TRACEY, Director, Strategy and Engagement, Local Land Services, affirmed and examined

JUSTIN WILLIAMS, Manager, Strategic Planning, Hardwood Forests Division, Forestry Corporation of NSW, affirmed and examined

DEAN KEARNEY, Senior Manager, Planning, Hardwood Forests Division, Forestry Corporation of NSW, affirmed and examined

NICK MILHAM, Group Director Forestry Policy, Research and Development, Department of Primary Industries, affirmed and examined

BRAD LAW, Principal Research Scientist, Forest Science Unit, Department of Primary Industries, affirmed and examined

The CHAIR: Do any of you have a short opening statement to make?

Mr KEARNEY: I am making this statement on behalf of the Forestry Corporation of NSW. We are the appointed land manager for around 2 million hectares of forest in New South Wales, which includes both native forest areas and plantations. That represents around about 9 per cent of the forested land in New South Wales. From that area we produce a range of timber and wood products, and they are important products; they are sustainable and renewable products for our community and for industry. We have done this on the same forest area for 100 years. Our purpose is to deliver ecologically sustainable forest management and to that end our native forest operations actually have quite a small footprint. In any given year, we harvest around 1 per cent of the area we manage. Those areas are always replanted or regenerate naturally.

Our submission provides a broad outline of our understanding of koala populations and habitat. It is a complex and incomplete picture. As with all species, koala abundance is something that is quite dynamic and cyclical and subject to a lot of historical influences. We do want to acknowledge that we understand that koalas are in decline in some areas of the State. We would say, though, that the impacts and the threats and the risks to koalas are not uniform across the State. Some of the key threats—like permanent clearing, road deaths or intense wildfires—typically do not occur on the broad forest areas that we do manage. I would like to start by making it abundantly clear that sustainable forestry that we practice is not land clearing, and I am happy to elaborate on that during evidence. As acknowledged in the Chief Scientist's report, there is not yet a systematic monitoring program for koalas across New South Wales, and that is something that we would support being put in place urgently.

Ms TRACEY: First of all, let me thank you for giving us the opportunity to speak to this Committee. We recognise the importance of the issue to stakeholders in the community. Local Land Services is a rural customer service organisation and our key role is to ensure landholders are aware of and implement land management practices consistent with their obligation under both the private native forestry [PNF] and the Land Management Framework. In both cases Local Land Services is responsible for the approval and advisory services. The compliance and enforcement responsibilities rest with Environment, Energy and Science [EES] group and NSW Environment Protection Authority. In respect to the private native forestry, the PNF codes include clear protections for koala and koala habitat in each of the PNF code regions. Forestry operations are not permitted within any area identified as core koala habitat under the koala State Environmental Planning Policy [SEPP]. Additionally, trees containing koalas or trees where koala scats are found underneath must be protected and exclusion zones put in place. Finally, for every record of a koala within a PNF plan area or within 500 metres of an area, koala feed trees must also be protected, and that is within the codes of practice that cover the State and all the PNF operations across the State.

Under the Land Management Framework, the code includes a range of protections for koalas and their habitat. For example, the application of the code is not permitted under Category 2 sensitive regulated land. Sensitive land includes core koala habitat; under the koala SEPP, no clearing is allowed in this land. Additionally, on all land clearing is not authorised by the code if a person who carries out the clearing normally harms threatened species. So there are a couple of mechanisms within the Land Management Framework to ensure that koalas are protected. Probably more importantly—Local Land Services being a key delivery arm and a key engagement arm with landholders—we work very closely with farmers and one of our key aims is to assist them and provide extension material so that they understand their roles and responsibilities as land managers and land stewards. We take a collaborative approach with the landholders and engaging with them on how to better manage their koala habitat and populations. This is critical because farmers hold significant amount of land and we need to work closely with them.

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As part of the koala strategy, Local Land Services is working with EES to develop targeted landholder information and support packages, including the implementation of on-ground landholder partnerships in key koala habitat areas. We also have a key role in referring landholders to the Biodiversity Conservation Trust where their land contains significant habitat and important ecological communities. I think that was commented on at the end of the last session. Finally, Local Land Services has partnered with EES and Dr Brad Law, who is here today, to undertake koala research as part of the New South Wales koala strategy. We are very keen to get a better understanding of the populations, koala habitat and the impact of private native forestry, for example, on koala populations and occupancies. We will be working closely with Dr Law and EES on that with the view that that would inform both our extension work with landholders, but also any subsequent revisions to the land management and private native forestry codes of practice.

The CHAIR: Thank you. Dr Law, I am particularly interested in your Song Meter research. Can you explain to the Committee what that is all about?

Dr LAW: Yes. It is a new method that we have been using to survey koalas, and it basically is new recorders that are available to be deployed in the field that can record for a number of nights. We typically record at a site for seven nights. They can pick up koalas from about a 300-metre radius around that Song Meter. It really capitalises on new methods of recognising calls of different species. We collaborate with the Queensland University of Technology [QUT] to scan all our recordings. In the three-year study that we did, we had over 14,000 hours of recordings. There is an algorithm that QUT have to look for male koala bellows, and so we are able to extract that data and then look at occupancy rates on those sites. Over the three years, we surveyed 171 sites scattered throughout the hinterland forests of the north-east New South Wales.

The CHAIR: Did your research show that there was no impact of logging on koalas?

Dr LAW: We surveyed a range of different sites and we particularly wanted to look at different harvest intensities and different times since harvest. We had sites that were recently harvested, moderate time since harvesting and an older age class; and we also had old-growth forests as a reference. What we found was that there was no difference in occupancy rates across those different forest treatments. Also, we looked at the number of bellows—so the number of calls that were produced per night; there was also no difference across those different categories. So for those two response variables, we found no effect of the different forest treatments.

The CHAIR: How many sites did you say?

Dr LAW: One hundred and seventy-one sites, and these were sites that were in moderate to high-quality modelled habitat.

The CHAIR: How many areas of that had been intensively harvest or had regeneration logging gone through them recently

Dr LAW: We had about 20 sites for each of those treatments. There is about nine treatments in total—old-growth being one of those treatments, recently heavily harvested being another treatment. There was roughly 20 sites per treatment.

The CHAIR: You did say in your 2018 paper that the resilience of koalas to recent heavy harvesting is most likely explained by the landscape mosaic of forest types and disturbance history in north-east New South Wales, especially the level of harvest exclusion in the landscape. Are you suggesting that heavy logging to a certain extent can have a negative impact on koalas, or that the mosaic area is important? I would like you to comment particularly on the new coastal Integrated Forestry Operations Approvals [IFOAs].

Dr LAW: At present I do not think we quite know the answer to that question. The method that we used is a landscape survey method. We do not know the position of the koalas that are calling in the local landscape. We do know that we are sampling a 300-metre radius. So within that 300-metre radius of the Song Meter, there is a mosaic of harvest exclusion zones, areas that had been harvested; and we do not know exactly where the koala is. We suspect that the exclusion zones, which are areas that are excluded for the purposes of conservation, are important and likely could be refuge areas during those early stages of the forest regenerating after harvest. From that data, we cannot conclude where the koala is. We are now doing further research to try and answer that question by GPS-tracking individual koalas so that we can see where in the landscape they exactly are—how much time do they spend in that regenerating forest versus in those exclusion areas.

The CHAIR: Those exclusion areas, you are suggesting, are potentially important refuges for koalas. There is an active process now to open up some currently protected areas for logging that have been mapped as old growth for 20 years. Will that impact on koalas in the North Coast forest region, in your opinion?

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Mr LAW: We estimated that about 40 per cent of the landscape is comprised of these exclusion areas and we think that that is an important thing not just for koalas but also the conservation of other species. A reduction in that area, I do not think, would be a good thing. We did look at the fact that old-growth forest did not support high occupancy rates compared to other forest treatments and we also looked at the extent of old-growth forest in the surrounding landscape and found no relationship with koala occupancy. It is probably not surprising in terms of old growth because koalas are not really old-growth dependent; they do not use hollows and they can occupy a range of different habitats.

The CHAIR: So you are suggesting 40 per cent of areas protected and that is important now for koalas. Therefore, the new coastal integrated forestry operations approval [IFOA] has reduced the area of stream buffers, for example, protected. Does that concern you?

Mr LAW: I am not sure what the change in the total extent of that area is under the new coastal IFOA.

Mr KEARNEY: We did some analysis of that during the discussions around what the buffering might be. It is equivalent. There has been a change but the change in terms of some of the buffering widths is made of for in terms of the new mapping that is actually much more extensive in the landscape. The difference between the area that is actually protected in riparian buffers is equivalent but this longer extent for some smaller exclusion zones I do not know.

The CHAIR: Mr Kearney, do you believe that logging has a negative impact on koalas?

Mr KEARNEY: I believe that the protections that we have in place for timber harvesting in New South Wales mean that we actually can have sustainable harvesting and koalas in that landscape. As you were just directing those questions to Mr Law about the areas that are already protected, in my opening statement, I said we manage two million hectares. Around half of that is actually protected in landscape protections. On top of that we have rules around dispersing harvesting over time. We have teams of people that go out and search the forest ahead of harvesting. The collection of all those factors together, I think, means that we can actually have both robust koala populations and a sustainable timber industry based on our forests.

The Hon. MARK PEARSON: Are you saying that you can have sustainable timber industry and not harm koalas?

Mr KEARNEY: I think that question might be slightly different. There may be instances where individual koalas may come into harm but in terms of a landscape management paradigm, having timber harvesting and koala populations—

The Hon. MARK PEARSON: So you do not know; you say "may". Do you know or do not you know whether you can have a sustainable timber industry and not harm koalas at all?

Mr KEARNEY: I do not know if I could definitely say that.

The Hon. MARK PEARSON: Moving on to you, Dr Law. How do you know that this sound mechanism is not recording other male koalas moving into the area if another koala has died or moved away?

Dr LAW: The approach we take is a fairly standard approach in ecology where you look at occupancy rates across many sites. If you are focusing on a couple of sites that might be a possibility but across 171 sites to have a very high level of occupancy would suggest that transient individuals is not the explanation for the patterns that we find. Koalas occur at a naturally low density so we would not expect more than probably one male koala in the radius of the song meters.

The Hon. MARK PEARSON: Did you back up that research with scat counts?

Dr LAW: We did some scat counts in the first year of our study but they were fairly unproductive so we stopped after that.

The Hon. MARK PEARSON: What does "unproductive" mean?

Dr LAW: We recorded few trees with scat. We were failing to detect koalas commonly by using the scat method at sites that we were detecting them with song meters.

The Hon. CATHERINE CUSACK: It is not as accurate and comprehensive. Is that what you are saying?

Dr LAW: It is a different method. A lot of the terrain that we work in is rugged, difficult to access and has dense vegetation. Scats can be difficult to find in those locations and the song meter, as I say, is picking up a

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koala somewhere in a 300-metre radius, which is quite different to going out there and looking for scats under some small sample of trees that a survey would target.

The Hon. CATHERINE CUSACK: Three-hundred-metre radius, 600-metre diameter, 20 listening posts, if I can call it that. How much would be the rough area covered in each study?

Dr LAW: It is around 70 hectares, that 300-metre radius.

The Hon. CATHERINE CUSACK: How do you select those areas?

Dr LAW: The study was designed around selecting these different forest treatments because we wanted to compare forests that had been heavily harvested against forests that had had more of a selective harvesting regime against old-growth forests. We also had the three different times since harvest. Our survey was structured around those nine different forest treatments. We used maps of forest histories to show us where they occurred and that was also overlaid with our koala habitat model. We focused on the moderate- to high-quality habitats.

The Hon. CATHERINE CUSACK: To me, this would be the most comprehensive study ever undertaken. Is there anything like it that has been done like that before?

Dr LAW: For a landscape assessment for koalas, no. But landscape assessment is different to site-based assessment so the two are complimentary. You have to take some care in how those results are interpreted.

The Hon. PENNY SHARPE: My apologies: I missed some of the beginning of this. Can I clarify: With the listening to the koalas are you able to distinguish between different koalas or one sound is one koala but it could be four or five koalas? Are you able to distinguish between the two?

Dr LAW: At the moment, we cannot distinguish individual koalas; it is possible that we will be able to do that in the future.

The Hon. PENNY SHARPE: That would be great. I have a couple of questions. My first question is to Ms Tracey. Thank you for coming. The NSW Woody Vegetation Change 2017-18 report shows substantial increase in the rate of vegetation loss. The figures, I believe, said that from 2009-10 to 2014-15, it was around 32,000 hectares but in 2017-18 that was up to 58,000 hectares. There is an 80 per cent in the destruction of forests and woodlands attributable since the new biodiversity conservation laws came in. Can you explain that, please?

Ms TRACEY: Yes, I will do my best. As you are aware, monitoring clearing of woody vegetation is quite complex and there is a fair number of variables to take into account. First of all, clearing rates detected through the New South Wales Government Statewide Landcover And Trees Study [SLATS], which is undertaken by Environment, Energy and Science [EES]—they have the responsibility for monitoring clearing of woody vegetation, not Local Land Services—

The Hon. PENNY SHARPE: Sorry, EES?

Ms TRACEY: It is part of the Department of Planning, Industry And Environment. The former Office of Environment and Heritage [OEH] have responsibility for monitoring woody vegetation and are producing the report.

The Hon. PENNY SHARPE: So they are looking and we have lost more of it.

Ms TRACEY: I am commenting only on their figures and the context in which Local Land Services [LLS] operates; I am not the expert in terms of how the clearing satellite imagery is managed. But I do know that there is a number of factors you need to take into account when you are looking at the SLATS stats, which I am assuming it is this sort of table that you are referring to, that is on the public register. A number of things that come into those are natural events such as fire and flood, approved clearing as well as management clearing such as regrowth management, and INS clearing, which is for managing invasive native species. Obviously, unexplained clearings require further investigation, which is the responsibility, once again, with the former OEH in terms of the compliance and enforcement. Effectively the authorised clearing undertaken since the land management reforms were implemented under the LLS Act and by the code, effectively the Natural Resources Commission [NRC] looked at our approvals and they found that the indicated 16 per cent of approved treatment areas were actually cleared as of March 2019.

By comparison that figure is 73 per cent for the approved clearing under the native vegetation act. This appears consistent with the anecdotal evidence given by landholders that there was a spike in clearing pre the changes in the land management reform as well as again at the 2019 State election. So what we are hearing from landholders is that some of those spikes can be explained through landholders managing what they view as regulatory risk and historically I understand that has been the case through the native vegetation act as well in

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terms of land clearing going up and down. Also, in terms of the significance of INS, a large area of clearing had occurred under the native vegetation act and not all of that clearing has happened. There is a latency between approvals and clearing.

The Hon. PENNY SHARPE: I understand that part of it. What I do not understand is why there has been such a massive increase other than are you just attributing that to people pre-clearing after the change in the law?

Ms TRACEY: It is a combination of that and the latency impact of previously approved clearing. Quite often clearing can take many years before it occurs.

The Hon. PENNY SHARPE: I understand that.

Ms TRACEY: It is a combination of those figures.

The Hon. PENNY SHARPE: And do you believe then that clearing will slow over time or do you believe we are now on an upward trajectory as a result of changes to policy and law?

Ms TRACEY: That is a hard question to answer, it is like looking at crystal ball.

The Hon. PENNY SHARPE: Well, the figures are looking pretty strong.

Ms TRACEY: Certainly in terms of clearing what you also need to consider is the land management code had put in place, based on the independent biodiversity panel's report, a triple bottom line approach to managing native vegetation on land holders. You need to take into context we may have had increased clearing but we have also had other mechanisms in place such as the Biodiversity Conservation Trust.

The Hon. PENNY SHARPE: So far has protected 254 hectares.

Ms TRACEY: In terms of approvals, which is the area that I can comment on more definitively is the amount that has been set aside is 31,288 hectares. When you combine that with the amount set aside in the BCT you are looking at over 60,000 hectares that have actually been set aside and put into management reserves, which is greater than the level of approved clearing. Over time the integrated package should come out where you have got areas set aside matching the areas that are cleared so overall on a landscape basis the impacts of that clearing are mitigated.

The Hon. PENNY SHARPE: You would hope that would be zero essentially, that is what you are saying? No net loss.

Ms TRACEY: That is the aim of the biodiversity conservation reforms and that is what we are working towards and we are putting in significant effort in terms of extension with landholders to identify those set aside areas. We are working very closely with the BCT to ensure that we refer appropriate land and landholders to those bodies and programs, saving our species. We also, in terms of broader management of habitat and native vegetation we work very closely with Landcare and Catchment Action NSW. There are a range of programs in place to offset the clearing that the New South Wales Government had, not necessarily increase but certainly wanted to avail multiple pathways for farmers to be able to better manage their land and many of those pathways are actually to protect and manage their native vegetation.

The Hon. BEN FRANKLIN: Just to confirm, you said that more land has been set aside than has been cleared to this point in time?

Ms TRACEY: That is my understanding from the figures that I have, yes.

The CHAIR: Can I clarify: Did you say 60,000 hectares had gone to the native vegetation panel to be assessed or was approved?

Ms TRACEY: No. those are areas that have been set aside through the set asides as part of the land management codes as well as through the Biodiversity Conservation Trust.

The CHAIR: And how many hectares did you say had been cleared?

Ms TRACEY: The amount of vectors that had been cleared—

The Hon. PENNY SHARPE: Fifty-eight thousand.

The CHAIR: Can I ask whether that was approved to be cleared or cleared?

Ms TRACEY: I do not have those figures with me, in front of me.

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The CHAIR: So clearing under the equity code and the farm plan code, as I understand that occurs without approval, is that correct?

Ms TRACEY: Approval is required for land management codes, certification.

The CHAIR: There is clearing that is taking place in New South Wales that you would not be aware of, that has not been approved because they do not need to seek approval?

Ms TRACEY: There is notification.

Mr SLAVIN: Within the land management code there is essentially two tiers of risk. Those types of vegetation management activities which are deemed as a lower risk have a notification process where notification is given from the landholder to the local land services. There is then a 14 day wait period where local land services can review that notification. Then the landholder may continue with what is proposed. The high level of risk vegetation management activities: The landholder approaches local land services, a regional service officer will go out on site, sometimes multiple items to the land holding. They will work collaboratively with the landholder and then at the end of that process a certificate will be issued and that is the process.

The Hon. PENNY SHARPE: We know that the Chief Scientist has indicated it is not just about habitat when it comes to koalas, it is fire, drought, climate change, pests and predators, be that wild dogs or people's domesticated dogs. Can you provide information to the Committee since 2011 how many pest and firefighting officers you have through State Forest to deal generally with these issues? Take that on notice if you need to.

Mr KEARNEY: I might have to take that on notice.

The Hon. PENNY SHARPE: I appreciate that. I am wondering in relation to managing fire trails—I know it is a key part of what you have to do—how are koala populations managed in relation to fire trails?

Mr KEARNEY: Fire trails are an important of maintaining our land management and allowing us to do fuel management, fuel reduction burning and wildfire management as well. I would suggest that koalas benefit from having good fire management, good fuel management, throughout our forests. But when you are doing the fire trails and burning what are the considerations in relation to koalas that may be in the area as you are doing that preventative work?

Mr WILLIAMS: Basically, those activities can operate either under an integrated forestry operations approval, so there will be a set of conditions spelt out in there and considerations we have to take; or, we can conduct those activities under the bushfire environmental assessment code. Depending on which path we are going down—generally where the burning is associated with harvesting we will be operating under an IFOA and if it is just landscape burning then it will typically operate under the bushfire environmental assessment code. We follow those procedures. When we operate under the code it is largely habitat based or record based, whereas when we are operating under the IFOA there is generally a higher level of surveys required as well.

The Hon. PENNY SHARPE: The Chief Scientist made recommendations about identifying the target areas for dog control. What specifically are you doing about that?

Mr KEARNEY: We are not the people that manage pest control within Forestry Corporation so I think we will have to take that on notice.

The Hon. PENNY SHARPE: Who does that?

Mr KEARNEY: We have a stewardship group, they take care of all our land management and our partnerships, tourism and recreation, that sort of thing.

The Hon. PENNY SHARPE: You can get that information.

Mr KEARNEY: We are more focussed on planning for the timber management side of business.

The CHAIR: Can you please outline for the Committee what process you undertake to assess whether koalas are present in a logging coop before you go into that coop or when you assess the forest before logging?

Mr KEARNEY: We apply the IFOA. I probably have to give two parts to the answer. The first part about the old IFOA, which we are still operating somewhat under and the new one where we are just transitioning to that at the moment. In terms of the old IFOA, there are two levels of survey. The first one is what we call targeted ecological surveys. We have a team of ecologists. There is around about 60 to 20 ecologists in the State that work for us that undertake targeted surveys. They do transect, some spotlighting, call playback work. Looking for koalas is part of what they do when they are doing those transects. They produce a report that informs a harvest

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plan. The harvest plan is then taken to the field by what is called our forest technician team and they undertake an activity that is called mark up.

Mark up is where a team of technicians walk through the forest. They are marking out individual trees that need to be protected for habitat value. They are searching under trees for koala scats under the old IFOA. They are marking out areas to be retained for the exclusion zones and generally making sure that when harvesting activities occur, that all those protections are in place and identified in the field. They do that both through physically marking in the field and also electronically marking in the field. We have developed that technology in the last few years. Under the new IFOA it will be a slightly new set of procedures. Instead of searching under trees for scats and using the results of those scat surveys to determine as you go through the forest what protections will be put in place for koalas, we will be putting in place those protections from the start. There will be a rate of tree retention that is required for koala browse trees that needs to be met on each patch. A patch can be no more than 10 hectares. Each 10 hectares is identified on their iPads. They go through, they select—

The CHAIR: Just to interrupt, how have these areas been identified as koala habitat for you to do?

Mr KEARNEY: Taking a step back, the IFOA uses a combination of two products, being the Office of Environmental Heritage [OEH] habitat mapping and the Department of Primary Industries [DPI] habitat model that I think Brad produced. It is a combination of those. It gives a rate of retention that is required. Effectively, there are areas that are outside of koala habitat where there is no specific prescription unless a koala is identified. Then there is a moderate protection, that is five trees per hectare, then a higher protection, which is 10 trees per hectare and that is reconciled, as I said, at a patch scale, where we walk through and identify those trees. Secondary to that there is also what we are calling wildlife habitat clumps and tree retention clumps, which we can both use to identify patches of good koala habitat to make sure those are not disturbed during harvesting as well.

The CHAIR: You are no longer looking for individual koalas in forests before you go into log forests?

Mr KEARNEY: No, that is not quite true. We are no longer counting scats. Instead of looking for scats under the base of trees and letting that determine what prescription we put in place, we will be looking for koalas and there are protocols in place if we find an individual koala, but when we talk about putting in place either clumps or patches of habitat or the tree retention prescription, they will be put in place regardless of whether or not we detect a certain number of koala scats or see a koala. Those protections are put in place upfront.

The Hon. CATHERINE CUSACK: More precautionary?

Mr KEARNEY: It is more precautionary, that is correct, yes.

The CHAIR: If you see a koala, you said there were measures that you take. What do you do, leave that logging coupe and go to another one?

Mr KEARNEY: There is a code of practice that exists where you do withdraw from the area. Koalas are mobile, so you can come back and check that area, if the koala has moved on, subject to the conditions you have to put in place, you can harvest timber from that area.

The CHAIR: I draw your attention to an article that was in the *Bellingen Shire Courier-Sun* last week. In fact, I have seen this draft harvesting myself for the Kalang headwaters. It has essentially got one solitary location marked with a pink diamond that is for koalas or a koala there. Are you aware recently a team of citizen scientists went into a couple of logging coupes in that part of the State and they not only found quite a few scats under 25 trees, but they put in place camera traps and they photographed a large healthy adult koala in a tree in areas that Forestry Corporation has marked with no koalas? We have citizen scientists going in and doing the research, putting up camera traps and looking for scats, who are finding evidence of more koalas than Forestry Corporation has been able to find with this method.

Mr KEARNEY: I am well and truly aware of that, yes. I guess it is worth making the point that our ecologists have done some traverse surveys as part of targeted survey requirements. We have not actually undertaken our own mark up search yet. That is where the majority of the koala searching and survey takes place. We actually have not had our forest technicians in that area yet. We would expect that they would go through and find that sort of evidence as well. We have not actually been provided with the records from that community group yet. They have not provided that directly to us.

The CHAIR: This is compartment 128 of Roses Creek State Forest. There is a lot of evidence around there that Forestry Corporation are due to start logging in various coupes around there within the next week or month. Citizen scientists said one tree had more than 90 scats; others had between 20 and 50; some were a mixture

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of mother and joey scats. What do you do in that situation where we know that there are more koalas than is being recognised by your mapping to date?

Mr KEARNEY: As I said, we still have not done our koala search yet.

The CHAIR: But you are preparing to log there anyway. Do you just not log?

Mr KEARNEY: The thing is, we do our koala searches right in front of harvesting deliberately in order to find where koalas are currently using an area. The whole reason we do that survey at that time is so that we have a contemporary picture of where koalas might be in the landscape. We have not done that survey yet. We will do that survey. We can take into account other people's information. The fact that there was only one historical koala record there or one detected previously, it just simply indicates that that is something that needs to be looked for when the mark up search is done.

The CHAIR: Do you wait for the koalas to move out of that logging coupe or do you say koalas are there, we need to move on. This area has significant koala population and possibly should not be logged. Where do you draw the line?

Mr WILLIAMS: I think what we do is identify that koalas are actually in almost all of our coupes along the coast. The work that Dr Law did showed that koalas occupy 70 per cent of the sites and we have got thousands and thousands of records that we have collected over the last 20 years of doing these surveys. What we recognise is that the koalas are out there. If there is koala habitat there, then the koalas are there. What we want to do is put the protections in place that mean koalas will continue to occupy those forests after harvesting. That is again the work that Dr Law has done, shows that to be the case, that there was no difference in koala occupancy regardless of that recent harvesting history. We go, we are expecting to find koalas, we do find koala scats. We retain koala browse trees. We put in koala habitat corridors. Our expectation is that we have got lots and lots of koalas out there, so we need to put those protections in place. It is not unusual, it is the norm.

The CHAIR: Mr Kearney or Mr Williams, do either of you accept the findings of the study by the Forestry Commission that found when it investigated the Eden woodchipping regime, that clear-felling eliminates arboreal mammals from the logged area? Do you accept that?

Mr KEARNEY: I am not actually aware of that report, but clear-felling and arboreal mammals do not go together. Arboreal mammals in particular that require hollow bearing trees, if you remove those, then you will be removing arboreal mammals from the landscape. We do not practice clear-felling in New South Wales.

The CHAIR: The north coast has adopted the intensive harvesting zone model from the Eden region though, is that correct?

Mr KEARNEY: Not entirely, correct.

The CHAIR: From the Eden Alternative coupe regime?

Mr KEARNEY: There is a form of what is being called intensive harvesting that is in the coastal IFOAs. I would suggest that that this a long way from clear-felling. There are a number of protections in terms of both the landscape and site scale, individual trees that have to be retained throughout our harvest area that make it quite distinctly different from clear-felling. It is intensive in so far as it allows for regeneration of those species. The silvicultural prescriptions we put in place, we do so in order to, I guess to some degree, mimic the natural regeneration of those forest types. Some forest types regenerate with lower levels of disturbance, others with much higher levels of disturbance, but through all the areas we harvest we do set aside hollow bearing trees, clumps, feed trees for koalas, feed trees for other arboreal animals as well. There is an exclusion zone network that overlays that whole landscape as well.

The CHAIR: Because I visited Wild Cattle Creek State Forest recently, just outside of Dorrigo, and I visited coops that had been logged maybe a week before as well as one that had just been logged that day. I'll tell you what, it did not look like there were many. There were few spindly trees and a couple of really big trees that had been knocked over, including hollow-bearing trees. From a koala's perspective, those little spindly trees with so much clear-felling around them, I am not sure whether that looks very desirable for them to continue living there?

Mr KEARNEY: The only thing I would say is that Wild Cattle Creek has a large area of hardwood plantations in it, so it may have been that what you were looking at was a hardwood plantation.

The CHAIR: They were not plantations. This was not plantation.

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The Hon. BEN FRANKLIN: Just a couple of questions, if I may. Ms Cate Faehrmann raised the issue of citizen scientists. My question is, what sort of processes have you got in place whereby citizen scientists and citizen science can interact with your processes, and you can actually utilise the information that they provide? Do you have any? If so, what are they?

Mr KEARNEY: Well, no. Unless there is anything I am missing. We do not really have an interaction with citizen scientists on any design level. When we look at the implementation of the harvesting rules on State forests, we use staff to do the work, such as searching for koala scats, because it has to be done in a robust and systematic way. It needs to be done in front of harvesting with a minimum time frame. We cannot really rely on just asking people to interact with us on that.

The Hon. BEN FRANKLIN: I am not suggesting you would rely on that.

Mr KEARNEY: Having said that, we have received and used information from members of the public if they find koala scats and provide that information to us. We have taken that into account in the past.

Mr MILHAM: If I might, another key interaction is that community reports of sightings of koalas, records of populations or individual koalas in the landscape that are reported to the Office of Environment and Heritage [OEH], the former OEH, now that part of the industry cluster, go into the database that informs the mapping—

The Hon. PENNY SHARPE: That's BioNet?

Mr MILHAM: Yes, BioNet. Those records go into informing the mapping and you made mention of the pink triangle. That is a record that may well have been by someone in the general community reporting that, and then that is taken into account in the planning.

The Hon. BEN FRANKLIN: Thank you. My other question to Mr Kearney relates to your opening statement when you mentioned how important it was for your industry to make it clear that you were doing sustainable forestry, not land clearing. You said you were happy to speak to that a little more. Obviously, there is a lot of emotive language used in this debate. I would be interested in your perspective on this issue, please.

Mr KEARNEY: Yes. I was keen to make that differentiation, simply on the basis that we are often put in the same basket as land clearing. The paradigm that we have is that we are a long way from that. If you look at the planning mechanisms we have in place for timber harvesting in New South Wales, my team have a strategic plan, which is 100 years long for every area. That is informed by modelling and measurement plots of how the trees are growing in our forests. We model those for 100 years to simulate both growth and timber harvesting. We then design all our wood supply agreements around the potential sustainable long-term yield from that area, which requires that we both harvest and regrow all of those sites. On every level we have a process that is designed to be sustainable, from 100 years' worth of timber harvesting through to our site planning, which looks at ensuring that, to the greatest degree possible, both flora and fauna are taken into account when we do harvest any sites.

Mr MILHAM: If I can contribute to that answer. I think, in a sense, the proof of the pudding is in the eating. These forests have all been harvested before. They only harvest regrowth forest—in other words, forests that have previously been harvested. The fact that they now, or at different points in time, demonstrate to the community a wide range of values, including high levels of native fauna occupation, is evidence that the arrangements that have been put in place actually work over that long planning horizon.

The Hon. CATHERINE CUSACK: Thank you. Dr Law, have you looked at practices in other States in terms of research and regulation, and how would you compare where New South Wales is?

Dr LAW: I guess, as part of the work that we do, we review practices worldwide and in other States. In our published koala paper we do refer to a review of retention forestry. That is the practice where there is a particular landscape retention forest as part of the mosaic that comes about after harvesting. That is adopted in a range of different areas. In New South Wales, from what I am aware of, some of the higher rates of landscape retention—so that 40 per cent figure that I mentioned before.

The Hon. CATHERINE CUSACK: It sounds like everyone is trying to do best practice. I suppose, looking around other States, would you say that New South Wales is playing a leadership role in funding this research—

The CHAIR: Leading question. Sorry, keep going.

The Hon. CATHERINE CUSACK: —just in terms of the level and resources and effort that is going into it? You would be aware of the standard of research and practice in other States, I am guessing?

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Dr LAW: Yes.

The Hon. CATHERINE CUSACK: Where does New South Wales stand on that?

Mr MILHAM: I would be happy to comment on that. Within the Department of Primary Industries, the forest science group sits within my team. In my view, we have the strongest forest science capability in that one team probably within Australia. We have research scientists, Dr Law among them, who are internationally recognised for their capability and their leadership within that science community.

The Hon. CATHERINE CUSACK: I would like to ask another leading question to Dr Tracey. Just in relation to your engagement with farmers and landholders, my experience is they love koalas. They are not out there trying to kill and destroy their koala populations. I wonder if you could comment on that. Often they are portrayed in a different light, and I wonder if you could reflect upon the level of collaboration you are having with these people and what their issues are?

Ms TRACEY: I will share that answer with Mr Slavin but, certainly, in terms of our engagement with both farmers and landholders more broadly—both across the Land Management Code as well as the Private Native Forestry Code—most landholders want to do the right thing by their land. Most landholders, farmers and their families want to protect the threatened species on their properties. They actively seek out Local Land Services to get the information that they need to do that. Local Land Services have a strong extension program in place to ensure that people are out on the properties, that they are talking to them about the habitat that they have, about the threatened species that they have and the multiple pathways that they have in terms of getting assistance to help them manage their native vegetation and habitat.

My experience with landholders has been very positive. Mr Slavin can comment as well. He has probably had a longer history with the Land Management Code. Certainly in the private native forestry space, we are in the middle of a private native forestry [PNF] review and we have engaged with a lot of private native forestry users. Their feedback to us has also been that they are quite keen to have a better understanding about threatened species, koalas and a whole range of other species, and how they can protect it. Many of them are also very keen to participate in the study with Dr Brad Law in terms of getting a better understanding of koalas on their properties. My overarching understanding of farmers in New South Wales, as well as landholders more broadly, is they want to do the right thing. I think the focus for the New South Wales Government is to give them the information so that they can better manage their properties and to make certain that in places we have regulations and exclusion zone so that these threatened species can be managed and that they know what the responsibilities are in this space.

The CHAIR: Thank you.

The Hon. CATHERINE CUSACK: The other aspect of that was, in terms of that small group who are doing the wrong thing, is it fair to say that they are being reported by other landholders, and that is a major source that you rely on in terms of compliance?

Mr SLAVIN: The former OEH managed the compliance process but, to our understanding, there is and always has been a citizen involvement in reporting noncompliances, whether that is from landholders or people driving down the road and seeing something occurring. There is a level of citizenry proactivity in reporting noncompliance.

The Hon. PENNY SHARPE: I am not quite sure who is the best person to ask but I want to ask about the Private Native Forestry Code of Practice. That would be you, Ms Tracey?

Ms TRACEY: Yes.

The Hon. PENNY SHARPE: Thank you. I am interested in understanding the different regimes around monitoring and looking after koalas. I know that Forestry Corp and Mr Kearney have gone through that in great deal of length, but in your own submission you state:

The PNF Code of Practice does not require pre-harvest surveys for koalas or any other species.

Do you think you could take us through that and explain the differences, and why we have different regimes?

Ms TRACEY: Certainly. Private native forestry [PNF] is sustainable forest management on private property. This is land that is owned by private individuals. The scale of operations on private native forestry is obviously quite different than what it is for State forest. It is much smaller scale and much less intensity, and the codes are designed as such. Effectively, there are a number of quite stringent protections for koalas and koala habitats within the private native codes. The key one is that if the property falls within core habitat, as defined by the koala SEPP, there is no PNF planning allowed.

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The Hon. PENNY SHARPE: Can we just be clear that SEPP 44 currently is not being applied, is it?

Ms TRACEY: Yes, it is.

The Hon. PENNY SHARPE: That is actually not what the submission says—your own submission, the Government's submission.

Ms TRACEY: Effectively, what happens is in instances where there is core habitat as defined under the koala SEPP and the koala plan of management [KPOM] is put into place and identified, there are no PNF plans in those areas. The planning activity cannot occur.

The CHAIR: Do you know the percentage of PNF areas that that covers where there is what you just said, the KPOMs and SEPP44 in core koala habitat. What is the percentage of that that applies?

Ms TRACEY: I will have to take that question on notice. Effectively, in each of the PNF code regions, the forest operations plans, which sit under PNF plan, must be prepared consistent with the listed ecological prescriptions for each of the PNF code regions. They cannot harm any animal.

The Hon. PENNY SHARPE: Who monitors that?

Ms TRACEY: That is monitored by compliance and enforcements.

The Hon. PENNY SHARPE: In which—

Ms TRACEY: That would be the Environment Protection Authority [EPA]. We go out on-site as well to monitor and assist and provide extension services to landholders and contractors.

The Hon. PENNY SHARPE: Would you be able to provide, obviously on notice, the number of times that that has occurred in, say, the last two years?

Ms TRACEY: Yes.

The CHAIR: Do you mean visits?

The Hon. PENNY SHARPE: Yes, visits; but also, obviously, you can speak to your colleagues in your other part of the cluster around the EPA as well—

Ms TRACEY: In terms of the compliance activities.

The Hon. PENNY SHARPE: —in relation to the number of times there has actually been compliance activity specifically to do with this code and the harm or otherwise of a threatened animal.

Ms TRACEY: Yes.

The Hon. PENNY SHARPE: Thank you.

Ms TRACEY: The other prescriptions that are in the PNF codes or where a koala is found in a tree, or where there are scats underneath that tree, that they are retained and there are exclusion zones around it. For example, it is 20 metres on the North Coast and the South Coast codes.

The Hon. PENNY SHARPE: Why is it different between the two different parts of the State?

Ms TRACEY: Because they represent different ecological forest systems.

The Hon. PENNY SHARPE: Koalas are treated differently based on the forest that is there—

Ms TRACEY: Yes.

The Hon. PENNY SHARPE: —as opposed to whether their presence is there or not.

Ms TRACEY: Yes.

The Hon. PENNY SHARPE: There is no interaction between all of the work that has been happening around the koala populations within those areas. They are not necessarily being applied through these codes. They operate in parallel. Is that right?

Ms TRACEY: Effectively, what we are doing—and that is one of the reasons for the PNF reviews; to take on board the new science that is available—the codes we developed in 2007. There was a review in 2012 but very limited changes to those codes, so we are reviewing those codes and taking on board the information from Dr Brad Law and elsewhere as well as any changes in regulations.

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The Hon. PENNY SHARPE: Your expectation in relation to the reviewing of the codes is how much extra wood supply you are going to get. Are you able to provide that to the Committee in terms of the modelling? It will have been done.

Ms TRACEY: On private native forestry, there is limited information in terms of sustained yield. The modelling that is available on State forests is not available on private native forestry. We are working very closely with the Nature Conservation Council [NRC] in terms of a forest monitoring and improvement program and are hoping to be able to put in place a much more extensive monitoring program on private native forests. These are individual landholders. We do not have that level of information. The Department of Primary Industries [DPI] Forests—and Mr Milham might be able to comment—has done quite a lot of research on this area, but we do need some more monitoring plots out there.

Mr MILHAM: Yes. Where the situation is of private native forestry, as Ms Tracey indicated, the fact is that we know some of the supply that is particularly coming out the north-east of the State, but we actually have very little information on the potential supply from those forests across New South Wales. It is very much dependent upon landholder interest and engagement in that sector. We have very little information on that as well. However, it is an area of interest for us, naturally, and we are putting some resources into trying to investigate that now. But, no: an assessment of the potential contribution to timber supply from those private forests has not been done.

The Hon. MARK PEARSON: There is Forestry and the timber industry and Landcare services. When you give advice or when you look at this issue, putting aside the need to protect species under the environment legislation, do you take into account that it is actually an offence to kill an animal, maim an animal, or injure an animal unjustifiably, unnecessarily and unreasonably? If a tree with a koala is felled, it is injured and it dies, that could be seen as an offence under the Prevention of Cruelty to Animals [POCTA] Act.

Mr MILHAM: I would be happy to speak on behalf of my colleagues in the Forestry Corporation and say we are actually well aware of the animal welfare protections. In fact, the integrated forest operations approvals are formally under law a licence to harm. A licence to harm is what they are actually called. They are actually a licence to harm under the relevant legislation. That is the approval that is given to the Forestry Corporation to operate in those forests.

The Hon. MARK PEARSON: But you are not exempt. It does not give exemption.

Mr MILHAM: No, it is not exempt.

The Hon. MARK PEARSON: It does not give exemption under POCTA, does it?

Mr MILHAM: It does not. It does not. That is exactly true.

The CHAIR: The time is up. Thank you all for attending the hearing. I think you did take some questions on notice. The Committee has resolved that answers to questions taken on notice be returned within 21 days. The secretariat will contact you in relation to any of those questions that you have taken on notice. Thank you so much for appearing before the Committee. We might see you again.

(The witnesses withdrew.)

(Luncheon adjournment)

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MATHEW CROWTHER, Associate Professor, School of Life and Environmental Sciences, University of Sydney, affirmed and examined

The CHAIR: Would you like to make a short opening statement?

Dr CROWTHER: Yes, I would. Again, my name is Dr Mathew Crowther. I am an Associate Professor in the School of Life and Environmental Sciences at the University of Sydney. I study the ecology and evolution of the Australian fauna, particularly koalas. I have studied koalas for the last 10 years. My main research areas are the Liverpool Plains and in the town of Gunnedah in the north to north-western New South Wales although I have worked on koalas in other parts of the State as well. I represent both myself and my fellow koala researchers at the University of Sydney, including fellow koala ecologists Associate Professor Clare McArthur and koala veterinary pathologist, Professor Mark Krockenberger and Associate Professor Damien Higgins. Again, here I am representing as researchers. We are saying that the decision needs to be based on good data collected by rigorous methods. We support any research that leads to better koala management in New South Wales.

The CHAIR: Thank you. To begin questions, I mention we heard a fair bit this morning from forestry officials regarding logging and koalas. Could you explain to the Committee whether koalas prefer more mature trees, more old-growth forests—this is particularly in relation to the North Coast forest and logging zones? We are hearing from some of the forestry operations that they are doing sustainable forestry management and that what they are doing essentially does not really harm that many koalas. I think that was the take-home message. What is your view on that?

Dr CROWTHER: Okay. It is quite hard to decide those types of things because, again, the research is only being done at the moment. I know you had Dr Brad Law speaking before and he is doing that type of research. Koalas certainly need older trees. The problem is they might be able to eat nice, younger leaves but koalas need shelter as well. We found that they always go back to larger trees because they get protection, whether it is protection from things on the ground, but particularly protection from the elements. Older trees provide better shelter, they are much better for the koalas to regulate their temperatures. For example, on very, very hot days they need substantial cover that is often provided by older trees, and sometimes they can even hug the trunks and get rid of heat, dissipate heat you could say, via those methods. The problem is especially during the day and especially when they are not eating, they need the larger trees, and larger trees are older trees, and they need those trees for shelter

The CHAIR: Are you aware of the tree retention rates within the coastal IFOAs within the intensive harvesting zone of sometimes 10 trees per hectare, and they can be, say, 20 centimetres in diameter, are you aware of that type of prescription?

Dr CROWTHER: I have read that type of prescription. Again, I am not an expert on the effects of logging on koalas but I have heard those descriptions.

The CHAIR: From the evidence you just gave in terms of koalas preferring larger trees for shelter and everything you just said, what do you think the, what are called intensive harvesting zones or they are renaming them regeneration logging, do you think koalas would find those areas attractive, or would they try to relocate themselves outside of those areas?

Dr CROWTHER: The whole thing is when it comes to study of koalas, we might say koalas do prefer certain areas, and then they will surprise you by going to areas that they should not. I work on the Liverpool Plains and they are on isolated trees on farmland. Again, it is not necessarily the density of the trees, it depends on what other threats are around. To say that they would or would not use, although we need the research to show that. Again, they certainly can use fairly isolated trees and it is actually quite surprising how isolated trees are. I think the more critical issue for koalas is about how high quality the habitat is in the first place. The unfortunate thing for koalas in New South Wales is that they like the same type of land that people like. Eucalyptus trees produce more nutrients and less toxins on higher, productive, fertile soils.

The problem is that is where people want to put farms. The prime koala habitat is on the flat areas and the secondary stuff is the stuff that has been left. Again, it depends on the quality of the habitat. It depends on the quality of the leaves on the trees within that habitat, it also depends on what the koalas are going to use in that area. It is very difficult to say. You have to look at almost a case by case area for where those koalas are within areas that are going to be managed for forestry. They are the studies that need to be done about koalas in those areas. Koalas really like being on the productive landscapes, which is unfortunately the history of European colonisation in Australia, that is also where people want to be.

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The Hon. MARK PEARSON: You say in your submission that you believe disease is currently a major threat to the koala populations, in particular chlamydiosis, cryptococcus and koala retrovirus. Do you have any knowledge as to whether these diseases are occurring naturally or partly or at all because of human impact?

Dr CROWTHER: This is the latest research that has come. Unfortunately my colleagues, the veterinary pathologists, could not be here to say in more detail. But, for example, in an area where I work on the Liverpool Plains we have around 70 per cent, if not more, of the adults positive for chlamydia. That is for a disease that causes infertility and eventually death, is very high. Whether that is helped by stress within a population, there have also been heatwaves in that area which could also contribute to I suppose immune deficiency. That link is not quite there yet. But koalas certainly do show high stress responses towards things such as heatwaves and when they are water limited and so forth.

The other thing is the strains of chlamydia, and that is the recent work. The strains of chlamydia found in koalas are the same strains that are found in sheep and cattle. So, chlamydia is not just a sexually transmitted disease it is also a gastrointestinal disease. It is quite common in livestock, though it does not cause that many problems for livestock, compared to koalas. Koalas are particularly susceptible to it. If it did cause a lot more problems in livestock we would probably have seen much more advances on treating it. Koalas are particularly hard to treat for things when you have got such a complex micro bio for dealing with, as well as a lot of toxins, plus you have got those really good livers that can deal with all those toxins as well, means it is very hard to treat. But within cattle and sheep it certainly does occur and they are the same strains and there are a number of publications out recently, including work from what we have on the Liverpool Plains, that shows the same strain in koalas is the strain that is in sheep and cattle.

The Hon. MARK PEARSON: It looks like agriculture is probably one of the main carriers for koalas, that is what it appears to be at the moment.

Dr CROWTHER: It would be. It is koalas crossing landscapes, they are probably exposed to the faeces of cattle and sheep and that is probably how they get it. Within koalas they are spreading it themselves because it is also a sexually transmitted disease and it can also can be transferred from mother to offspring. It could have come in, and it looks like multiple times, multiple crossover events from sheep and cattle.

The Hon. MARK PEARSON: We heard evidence that greater land clearance is not occurring as a consequence of the Local Land Services Amendment Act 2016. But in your submission you State that you believe that it is certainly a serious factor on the impact of koala habitats. Can you expand on that?

Dr CROWTHER: I suppose there has been data produced on whether land clearance is higher since those new reforms came in. The problem is the self-assessment. It allows landholders self-assessment for land clearing, so there is not that check and balance. No trees, no koalas basically. Anything that increases land clearing would not be favourable for koalas. We cannot say yet that koalas have been negatively affected, because we do not have that sort of data. We do know in areas that koalas live, including a lot of agricultural land, and that is most of the work where I have been, there is certainly koala feed trees and koala habitat trees that have been cleared. I cannot see it as a positive for koalas.

The Hon. MARK PEARSON: Even if they are given a directive for an exclusion zone of 50 or 100 metres around an identified tree? Is that sufficient, do you think?

Dr CROWTHER: Koalas live in a matrix of habitat. They do not live in individual trees. Anything that encourages increased land clearing is not going to be favourable for koalas. I want to preference that by saying we do not have the data as yet, so I do not want to say that these reforms have caused increased decline in koalas, but again increased land clearance is a negative effect for koala populations.

The CHAIR: You mentioned chlamydia before in terms of affecting 70 per cent of koalas around the Liverpool Plains. Of course, most of us in this room now have heard about the 500 or so population of chlamydia-free koalas around Macarthur. What is your view of the future of that koala population and what that means for the State's koala population if Gilead goes ahead and if that critical habitat in that area is not protected for koalas?

Dr CROWTHER: There is a problem when you have a restricted population, like populations need to expand. Being chlamydia-free means it can expand. The worst thing that chlamydia does to the population is not to kill the koalas, though it does eventually, it sends a population infertile, sends individuals infertile and that is the real problem for the population. So if you have got a population that is chlamydia free and it appears to me chlamydia free and colleagues who have worked on it have not found any traces of chlamydia in recent years so it seems to be the case, it is probably chance that that has occurred because maybe it has been isolated from other

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koala populations so it has not had the chance to contract the chlamydia, so the populations like that are essential to keep.

Again, koalas need places to live and so increased development or anything that decreases habitat is not going to be positive for koalas. And if the population is expanding, which it is likely to because it is chlamydia free, then that is not going to be very good for the population. The other thing is isolated populations are always risky. A fire or some other event can cause a massive dramatic impact on an isolated population so you have to be really careful about connectivities to populations and give them room to expand and move, particularly as conditions will change into the future.

The CHAIR: So it is a really important population for the koalas of New South Wales, the Macarthur population?

Mr CROWTHER: Yes.

The CHAIR: What would you be recommending to this Committee then to ensure that that population remains healthy, increases and becomes a critical stable population for New South Wales koalas?

Mr CROWTHER: Again we would recommend that those koalas have habitat to move. The effect of development is not just loss of trees. The threat of development and particularly in the Macarthur region—and if you look at the mortalities on Appin Road—is that there is a real problem with traffic killing koalas. You can create what is like a sink of a population. You might have a nice source there but they all go and die because they need to disperse. Koalas are not social animals. They need to disperse. They fight if they are close by. They need to go into disparate areas. So if you want to maintain populations into the future, you want to have adequate habitat into the future. However you do that habitat I do not want to go into specific details but you need to have habitat and you need to reduce the threats. And threats in that area include not only loss of habitat but the threats of road traffic. And if you are putting more and more people into an area, especially when you are not putting more and more public transport into an area, you are going to increase the threat of road traffic to that population.

The CHAIR: Is the Macarthur koala population at risk of becoming extinct as a result of the south-west growth centre and the development occurring around its habitat and in its habitat?

Mr CROWTHER: I cannot answer that question because I do not have the future predictions and the model of that population. I would not like to say that it is going to be extinct. That is a prediction that I am not prepared to make because I do not have that data. But again you would want to maximise the chance of that population's survival by increasing the habitat, so increasing the carrying capacity of that population, and decreasing the threats to that population. And that is going to guarantee your highest chance of success for future survival.

The CHAIR: And so because the habitat is decreasing and the threats are increasing—because that is what is happening with the south-west growth centre—if we do not address that the future of the Macarthur population of koalas cannot be guaranteed or is dubious at best.

Mr CROWTHER: Again I do not want to predict the future but I would not put a high probability of a population surviving if the threats are increasing and the areas that they have to live in area decreasing.

The CHAIR: Thank you.

The Hon. PENNY SHARPE: I want to ask you about relocating koala populations and the success or otherwise of some of these strategies. They are obviously being used around some development consents. Are you able to comment on the success or otherwise of trying to relocate wild koalas from one area to another?

Mr CROWTHER: It can work very successfully sometimes, as it did in Victoria—perhaps too successfully in that they have overpopulation now. However, it can also be disastrous.

The Hon. PENNY SHARPE: What makes a good relocation and what makes a bad relocation?

Mr CROWTHER: A bad relocation is the animals all die—that is pretty bad.

The Hon. PENNY SHARPE: Yes, I understand that, but I suppose what are the factors that contribute to a good relocation and what are the factors of a bad relocation?

Mr CROWTHER: Firstly, for a good relocation you have to understand if you are going to locate the animals knowing that they are not social animals, so you have to make sure that you have empty habitat, but why is that habitat empty? There is the famous case in the Gold Coast in Queensland where they moved a whole lot—they said, "Here's some perfect habitat. It's got the right trees in there. Everything is there." They moved the koalas

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in and they all died because of dog attack because they did not know that that factor was there in the first place. You have to know why something is not there and then that can be very difficult sometimes. Because you cannot just say, "Oh, the habitat looks the same—same species of trees." You have to look at whether there is a historical reason or a fire that wiped them out or some other event or some historical event that means koalas are not in that area. So the first thing you have to know is why are koalas not there now in the area that you want to translocate them to. And it could be the threats there. It could be close to a major road. Again, dog attack could be in the area.

You also have to realise, "Is the habitat the same?" Again, with eucalyptus trees what happens on different soil types is that the carbon-nitrogen ratios are different and so the ratios of nutrients to toxins are different. So in a certain habitat they might look like the same species and all that but they are not as nutritious, and if they are not as nutritious a koala cannot expend the energy trying to get the energy out. If the energy expenditure is more in trying to eat something than the energy gained from it then it is not going to be successful. So sometimes even the species could look the same.

The Hon. PENNY SHARPE: That is good. You obviously know a bit about the Liverpool Plains koalas and obviously the plan if the Shenhua mine goes ahead is to relocate those koalas there. Is that something that you are able to speak to in terms of the plan for that and whether that is adequate?

Mr CROWTHER: All I know of the plan so far is that I think they are going to try to encourage koalas to nearby offset areas. I do not know the details at this moment about exactly how many they are going to do. So again there are koalas throughout that whole region. I know that region quite well and yes there are koalas throughout that region. Again it depends on habitat in that region too. Liverpool Plains has very fertile soils hence it is very good koala habitat. So again it depends on where you are going to move them to.

The Hon. PENNY SHARPE: You do not know the specifics of the plans that they have relied on to get the exemptions Federally around this—you cannot speak to the detail of what the plan is.

Mr CROWTHER: I do not really like predicting the future in any way. I like data. If you were to do it you would have to monitor the survivorship of those animals and the reproduction of those animals. Can they go on to survive and reproduce? Again with 70 per cent chlamydia if you do not get on top of that it does not seem to matter where you move them to—they are on the way out. Again that is work that my research is working on at the moment, trying to test vaccines to see if they work in the wild. So there is some hope for that—but that is research at the moment. It seems to be it does not matter what you do to the Liverpool Plains population; with a reproductive rate of about 15 per cent of females having young, a population cannot reproduce.

The Hon. PENNY SHARPE: It cannot replace at that level.

Mr CROWTHER: The population is going to extinction anyway. It does not really—

The Hon. PENNY SHARPE: Given that we only have one disease-free population in New South Wales, does your group have modelling on the likelihood of these populations surviving in New South Wales?

Mr CROWTHER: A lot of the populations probably have a much higher chance. The Liverpool Plains has a very high chlamydia rate and that is a chlamydia rate that started when I first worked there at about 8 per cent and it has gone to 70 per cent within 10 years. It is an unusual situation and that is why we are looking at that situation. It was a population that was very, very high at one stage. It is still quite a lot of animals, it is just that it does not have the rate of increase it had. Again, other populations seem to be doing okay. Populations can cope with some chlamydia within the population; it is not a death knell for the population. It is just when it gets so high that there are not enough animals that can reproduce in the population to keep the population going.

The Hon. PENNY SHARPE: So, you need a population by population approach? In terms of managing the disease, given the impact it could have?

Mr CROWTHER: Yes and there are also different strains. We are only learning now that maybe different strains might have different effects.

The Hon. MARK BUTTIGIEG: So that problem of disease, which sounds like it is predominating in the whole State, aside from this isolated population, is that likely to become problematic in other areas? Is it inevitable that that rate, that percentage you were talking about in those other more benign areas, lifts over time? And, therefore, that is actually the priority?

Mr CROWTHER: Again, that is a difficult question to answer because it does not seem to be such a problem in other areas—and we are talking about Australia wide, or the east coast of Australia, where koalas live—that have had chlamydia for quite a long time. We have known about chlamydia in populations of koalas for quite a long time. I do not want to say that it is definitely the problem in all populations. In the Liverpool

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Plains population it is probably the main one—that and heat waves are the two main things in that population. But New South Wales wide, not necessarily. Sometimes the populations can cope with that type of thing—there is a process whereby sometimes diseases within populations are kept at a very low level. It sends some animals infertile but it does not necessarily have a population effect: animals can become infected and still have offspring; infertility works over time. So, it is not necessarily a death knell for all populations in New South Wales; it is for some.

The Hon. MARK BUTTIGIEG: Just to follow up—I apologise if this is already in one of the submissions. Has there been any studies done on the constituent proportions of cause and effect? Effect being reduction in population by cause—land clearing, chlamydia, all the various causes. Have there been any studies done on the contributory elements to the declining populations?

Mr CROWTHER: There are a number of studies, including the study I am talking about—that is why I know the population is declining because it is a study I am undertaking myself on the Liverpool Plains. But there have been studies in Port Stephens and studies at Iluka, where the population did go to extinction but apparently it has been re-colonised since then. Again, they used population models and there were different reasons in each area. Some areas seem to be more to do with dog attacks—and how you work that out within a population, you work out what is driving it. Is it survivorship of adults? And you can measure that by doing ongoing studies. It is actually very easy to work out how many koalas are having offspring because you can see which ones have offspring at different times of the year. For the ones with chlamydia, we can tell that it is not enough juveniles in the population; they are not being reproductive.

It is not done for every population in New South Wales but it seems to be a population by population type effect. The Liverpool Plains' populations have very different threats to populations on the coast. The one we are talking about in the Campbelltown region—very different threats, again: there is no chlamydia but there is much higher population density, much higher road traffic; there is development along the north coast. That is not really a big problem on the Liverpool Plains. On the Liverpool Plains the really big problem is that there is disease and it is getting days upon days of 45 degrees with no relief. Again, it seems to be a population by population threat. You cannot just say, "This is the main threat." We have done many workshops of many scientists to show that the main threat to the koala populations depends on where you are in the State.

The CHAIR: In terms of the eastern population of koalas—the north coast right through the mid North Coast—we have had a huge amount of submissions to this inquiry, which argue that deforestation is the number one threat. Is that correct?

Mr CROWTHER: The threats on the coast are because there is a lot of development that also brings along impacts such as road traffic; there are more roads being constructed so there is more traffic on those roads, which has a higher impact on a population. So, on the coast, deforestation and the impacts that go along with deforestation, which include increased traffic and increased risk of dog attacks—includes all of these things that are connected to each other. Again, inland it seems to be much more to do with climate and disease.

The Hon. MARK PEARSON: Just on the impact of clearing, does the sound and presence of large machinery coming and going cause any stress or trauma to koalas, that you are aware of?

Mr CROWTHER: We are starting to get some idea. Koalas do not show stress very well—they just look pretty much the same. But we now measure the cortisol in the droppings, showing that yes, they seem to show more stress in peri-urban areas on the urban fringe. That said, koalas are quite adaptable: they lived right near the Tomago sand mining; they lived right near the Williamtown airbase, which is very noisy. They can cope with that sort of noise and they have got very good hearing—they are remarkable because they can make sound at such low frequencies. They are antisocial but there are times of the year when they have to be sociable and they can send sound across very long, large areas. They have a special structure inside of them so that they can send—they should be the size of an elephant with the low frequency that they can send. So again, whether sound does—the impacts of urban areas certainly has caused more stress and that is the latest research that is coming out—with the cortisol research, at least. But again, is that sound? We are not 100 per cent sure.

The CHAIR: What is your best assessment of koala numbers in their entirety in New South Wales?

Mr CROWTHER: Numbers are very difficult. Again, they range from people who have done very good, localised surveys to people who just make it up. The problem is, I would never want to give an estimate in New South Wales. In most of our research as ecologists, we look at changes, rather than absolutes because it is much easier to take a survey, to take a sample, than to count every individual in the population. I know that on the Liverpool Plains, in certain areas where I have done multiple survey techniques—I have sent people counting koalas; I have looked at overlap and home ranges of koala movements; I have looked at mark and capture, where,

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when you see a koala again you can estimate numbers from how many new individuals you see compared to how many you've seen before. They give very similar estimates. Again, I would not want to give one for New South Wales because we do not know. Many populations are very low density and very hard to estimate. Many of the methods rely on having so many koalas to count for some accuracy of the estimation.

The Hon. MARK PEARSON: Is that why you are concerned that the precautionary principle is no longer applied?

Mr CROWTHER: That was applied especially with the offsets. Again, we should have the precautionary principle. There are knowns. The problem is, without knowing these things into the future—no knowing changes that are occurring—all of our estimations, including various climate change estimations, we have to reassess them all the time. There are freak weather events because of these changes. I think we have to apply more of the precautionary principle because I think that is lacking—there is a lot of literature on offsetting, particularly. Again, you are setting something aside here but you are already losing something because of the development there. Is that going to be adequate for the future? Sometimes, we do not know that.

The Hon. CATHERINE CUSACK: In your submission you talked about the difference between core koala habitat and potential koala habitat, particularly bearing in mind challenges like climate change. I wonder if you could talk us through that and what your thoughts are on a good policy response from government.

Mr CROWTHER: Okay. That is within SEPP 44, Koala Habitat Management, where they divide it into core habitat and potential habitat. It can be problematic in that it has not, apparently, worked very well in certain areas because, again, tree species differ quite throughout New South Wales and the species that you are using.

The Hon. CATHERINE CUSACK: I do not mean to interrupt you, but can you kind of be more specific about where it has not worked and maybe where it could work?

Mr CROWTHER: Again, koala populations have declined, so we cannot say it has worked. If you are looking at it from that point of view, whether the core and marginal habitat is the way to go in making those types of assessments, apparently in the south-west of Sydney, the Wollondilly region, the Southern Highlands region, apparently the tree species were not appropriate for that document. So again, it might not work as a good assessment of koala habitat in that region. It could be refined. I do not necessarily think that potential and core would be necessarily the way to go, because again, it depends on how you manage those different habitats into the future. Koalas do exist in low densities in habitat that might not necessarily be considered core, but they certainly still live in those areas and not all populations are in high densities. Many populations are not. I think the problem is if you make the decision as to whether to remove or clear that habitat because it is potential rather than core into the future, you could be eliminating something that is much more important than you currently know at current assessment.

The Hon. CATHERINE CUSACK: I know that there is a really big focus in the department and also many conservation groups on the impact of climate change, particularly on the coast—and I am in a coastal community—that potentially—and you know we have had some terrible fires in the Tweed area in particular.

Mr CROWTHER: Yes.

The Hon. CATHERINE CUSACK: That potentially not only koalas, but all of our coastal wildlife—which is under terrible pressure, including the emu—that potentially there need to be areas that could be better habitat for them in the future, given the impacts of climate change?

Mr CROWTHER: Again, there could be areas that are certainly sheltered. Koalas do use the landscape a lot for temperature. There could be gully areas. There could be other areas such as that that need to be in the future. There are areas that might be protected from bushfire, as you were talking about then. Bushfires, again, are predicted to increase in intensity and frequency with climate change. And, certainly, that is not good for koalas or many other fauna. And that is not just on the coast; that is inland, too. Inland is even worse because we are feeling it. Forty-five degrees is not a good temperature for anyone, including koalas.

The Hon. CATHERINE CUSACK: Especially not bats.

Mr CROWTHER: In 2009 we found animals dead or dying at the base of trees. We took one koala to the vet and put a litre of water into it via a drip. We are talking about an animal that is 8 kilograms. They do not do well with those really, really hot temperatures, so they will need areas—again, you need areas and you need connectivity to areas. You need areas that will satisfy them into the future. They may even, because of carbon

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dioxide levels, change the carbon/nitrogen ratios within the leaves and certain trees may not be as palatable into the future as they are now.

The Hon. CATHERINE CUSACK: How adaptable do you think the koalas can be? And I just ask this from the context—I am on the North Coast and kind of the advice that I get from people who work closely in the area is that koalas are actually not that adaptable, that they just follow the same food path that their mum taught them and that has problem been going on for hundreds, if not thousands of years, and that it is very difficult to change their behaviour. It is very difficult—if you put an obstacle in front of them, rather than just going around it they will just keep trying to go through it and not really—

Mr CROWTHER: Koalas can learn. That is something.

The Hon. CATHERINE CUSACK: They can learn?

Mr CROWTHER: They can learn.

The Hon. CATHERINE CUSACK: That is good.

Mr CROWTHER: They have shown that with getting them to use underpasses. I think it was in Queensland, which was demonstrated because people thought they could not learn—cannot learn.

The Hon. CATHERINE CUSACK: But they can?

Mr CROWTHER: But there are some problems. Even the changing of diet was a problem. In Victoria there was a recent study that showed—they were trying to get them to move from one habitat that they had over-browsed to another habitat where the densities were much lower. So they changed the microbiome. They basically developed these pills with the microbiome. They get the microbiome from their mother. That is the pap that they take from the mother and so they can deal with the tree species in that area. They managed to change the microbiome but they did not change their behaviour. So they wanted to eat the old species even though they were adapted to the new species. It was a limited study because it was only done over a couple of days.

So in some ways, the behavioural changes might take a bit longer. But again, we are talking about very rapid changes, and I think koalas are not alone in that, that the rapid changes that we are experiencing, we are experiencing them now. I am not talking about the future—it is something that is happening right now with the increased heat waves and the effects such as bushfire and all of that. So we need to basically give them every chance that they can by having those refugia habitat as well as the habitat that they have got.

The Hon. CATHERINE CUSACK: I guess what you seem to be suggesting is that there is a program that needs to go around that. You cannot just sort of stick them in cages and release them and see what happens, because you need to consider their behaviour and their—are you saying that they actually prepared their stomachs for the new diet?

Mr CROWTHER: Well, it is the caecum, the microbiome, the little microorganisms that allow them to deal with those—eucalyptus leaves are very tough.

The CHAIR: For Hansard, it is their what? You said something at the beginning. Could you—

Mr CROWTHER: The microbiome?

The CHAIR: Before that. Did you catch that?

Mr CROWTHER: Caecum. That is the organ where the microbiome sits.

The CHAIR: Right. I could see confused faces—probably including mine.

Mr CROWTHER: Yes. The caecum is where the microbiome sits in a koala. And they have got a really large caecum compared to other species. Koalas are remarkable animals. So they deal with a really, really tough diet. Eucalyptus leaves are full are so many different toxins like formylated phloroglucinol compounds [FPCs] and tannins and they are very fibrous. Again, they have got terpenes, which gives them that lovely smell but again is not necessarily great to eat. So koalas can deal with all these things. So they require these microbiome, these complex microbiomes. But we do know now that the microbiome changes depending where the koalas are, because of what species they have available to eat. They get that microbiome, basically, from the mother and it goes to the young. So that is one thing we have to think about into the future. Again, koalas can eventually move and change, and a lot of the microbiome is influenced by what they eat, what the mothers eat, and so that will change over time. Again, we are talking about rapid changes, but they are thinking that this is one of the reasons why a lot of translocations might have failed is they had the wrong microbiome.

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The Hon. CATHERINE CUSACK: This is my last question. Failure is when all the animals die, of course, but also the introduction of koalas to Kangaroo Island in South Australia and also I think Cape Otway in Victoria has been maybe not successful because of overpopulation.

Mr CROWTHER: Yes.

The Hon. CATHERINE CUSACK: And I just wondered do you have any information on that, why that happens or what can be learnt from that?

Mr CROWTHER: Again, it is as interesting case, is not it, because they were from a very low population. They are a very genetically important population and they actually have quite high instances of genetic abnormalities. But again, they still have a very high reproductive rate. They spend so much of their budget in Victoria and in South Australia on controlling koalas because they are over-browsing those areas. Again, there are a couple of factors that have gone on there. It is the increased fragmentation of habitat that occurred at the same time. Koalas were basically shot out of Victoria and just introduced onto French Island. That is what has happened there.

Again, we do not seem to have that problem in New South Wales and Queensland. We have a genetically diverse population that is just not increasing—it is actually declining. What is going on differently there? It is a different habitat, the trees are different, they might be much better for the koalas, much more nutrients for them—again, the landscape configuration is different. So there are a few things that are going on there. However, those Victorian koalas seem to be quite different to our New South Wales koalas.

The Hon. CATHERINE CUSACK: Are there different species of koalas?

Dr CROWTHER: They are the same species of koalas but there is quite a variation. A big male here in New South Wales is like nine, 10 kilos; you have got 14 kilo males down there. They are big animals—big, short-eared, dense-furred animals down there. Again, it is clinal, because they are down in the south and then in Queensland they are even smaller. It is more of a clinal variation; it is not a species variation. They could interbreed with each other if you put them together. They are adapted to their environment down there.

The CHAIR: I think Cape Otway is also a national park and has no logging industry within quite a wide area. That is true, isn't it, Dr Crowther?

Dr CROWTHER: Again, I am not an expert in the Victorian population. However, there is a lot of work on plantations there.

The Hon. CATHERINE CUSACK: Have you been there, by any chance?

The CHAIR: Yes, I have been there. It is incredible.

The Hon. CATHERINE CUSACK: They are in the trees all over the—

The CHAIR: They are everywhere. Thank you very much; we are out of time.

The Hon. MARK PEARSON: Dr Crowther, could you indulge us with an example of the low call from the koala?

Dr CROWTHER: No, I couldn't—

The Hon. MARK PEARSON: You are an expert. I am sure you have heard it.

Dr CROWTHER: I am not very good at that type of thing.

The CHAIR: We do need to move on to the next witness. Thank you very much, Dr Crowther. I do not think you took any questions on notice. However, if Committee members choose to submit some would you be happy to answer them?

Dr CROWTHER: Yes, I certainly would be.

The CHAIR: The Committee has resolved that answers to questions taken on notice be returned within 21 days. We will contact you in relation to that if we have any questions. Thank you.

Dr CROWTHER: Thank you.

(The witness withdrew.)

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JACK GOUGH, Policy and Research Coordinator, Nature Conservation Council NSW, affirmed and examined
GRAHAME DOUGLAS, Executive Member, National Parks Association, affirmed and examined
OISIN SWEENEY, Senior Ecologist, National Parks Association, affirmed and examined
STUART BLANCH, Australian Forest and Woodland Conservation Policy Manager, World Wildlife Fund (WWF) Australia, sworn and examined

The CHAIR: Thank you. Would any of you like to make a short opening statement?

Mr GOUGH: Thank you for the opportunity to give evidence to this important inquiry. Koala populations in New South Wales are in crisis. Ensuring their survival, as well as that of over 1,000 other species threatened with extinction in New South Wales, is an issue that must be beyond politics. That is why we have 12 leading conservation organisations that have come together as the Stand Up for Nature alliance to provide a consensus submission on what is needed to protect the future of our koalas. The key message we want to convey to the Committee is this: Saving koalas is possible, but we cannot save koalas unless we save trees.

Koalas face a range of pressures—climate change, disease, cars and dogs—but the number one threat and a contribution threat to all of those issues is habitat loss and fragmentation. The New South Wales Government has recognised that koala populations are in steep decline and developed a strategy to begin to address this. Unfortunately, this strategy and current government policy fails koalas because it fails to protect trees. In fact the opposite is occurring. New laws have allowed koala habitat to be cleared at an increased rate on agricultural land, native forest logging in core koala habitat is still permitted and mining and infrastructure projects are approved despite significant impacts on koalas.

Before the new native vegetation clearing codes were introduced in March last year the Office of Environment and Heritage [OEH] warned the Government that less than 1 per cent of identified koala habitat in New South Wales is protected from clearing under them. Since then the data shows landholders have given notice of shocking 51,000 hectares of clearing in 17 months and Local Land Services has approved a further 288,000 hectares of clearing for agriculture. Research shows this includes thousands of hectares of koala habitat—and that is just the clearing we know about. The OEH has completed valuable work to identify over 100,000 hectares of core koala habitat—called "koala hubs"—across New South Wales; however, currently only 16 per cent of this land is protected in the National Parks estate.

Under the current O'Farrell-Baird-Berejiklian Government we have also had the lowest rate of additions to our national parks network. We think this is a shameful legacy but one that can be changed. The Liberals and Nationals do have a proud history of protecting our precious places. Liberal Premiers Tom Lewis and Bob Askin started the National Parks and Wildlife Service and many of our iconic national parks like Barrington Tops, Jervis Bay, Bouddi, Biamanga and Sydney Harbour were protected under Coalition governments. Protecting koalas will require visionary leadership and political courage. We think establishing a Great Koala National Park on the mid North Coast is the perfect opportunity to create a lasting environmental legacy.

The New South Wales Parliament faces a choice: Continue with business as usual and oversee the rapid decline and possible extinction of one of our most iconic Australian animals or make urgent changes to protect vital habitat and restore our native forests. The Stand Up For Nature alliance urges the New South Wales Government, this Committee and all members of Parliament to work together to save koalas for the future.

Dr SWEENEY: I will make an opening statement on behalf of Dr Douglas and myself and the National Parks Association [NPA]. In order to properly appreciate the scale of the challenge of reversing koala declines, NPA considers it important to reflect upon the contemporary numbers of koala compared to recent history. Hunting koalas was once sport and business here in New South Wales. As recently as the early 1900s millions of koala pelts—the Australian Koala Foundation estimates about 8 million—were exported from eastern Australia for Europe and North America. Now it is estimated that there are perhaps 300,000-odd left throughout Australia and perhaps 15-20,000 in New South Wales. Population declines over this short a timeframe are precipitously rapid and the trajectory is undoubtedly one towards extinction.

The Bega Valley offers a particularly sobering case study. This area once supported the aforementioned pelt industry. Now as a result of land clearing, woodchipping and climate change there are estimated to be between 60 and 80 animals belatedly protected in the Murrah Flora Reserve. Bega is a lesson to all of us as to where complacency leads. There is a term for this: It is called the shifting baseline. This term describes how successive generations perceive the environment that they experience as normal, but in fact it is significantly degraded when

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compared with historical states. The shifting baseline is a phenomenon of the human brain, and therefore is a very difficult thing to overcome. But attempt to overcome it is exactly what the Committee must do if it is to get good outcomes for koalas.

With ambition this can be done. The Chinese giant panda is an excellent example—another species as globally iconic as the koala that was heading for extinction. That decline has been turned around. We can turn around the decline of koalas as well, if we show some ambition. NPA believes—as we always have—that the first step to protecting any species is the protection of habitat. Koalas are no different in this regard. Unfortunately, this key issue has been almost completely ignored in the NSW Koala Strategy.

One of the key things we need to do is to reverse the historic bias that sees the reserve system align poorly with koala habitat, and that is what we have tried to do in our submission to the Committee. This bias is a result of a simple truth—koalas and humans like the same places. Koalas prefer a forest growing in more fertile soils because they get better nutrition, but loggers and farmers prefer those soils too because they grow better trees and crops. Koalas like coastal forests, which is where most of us choose to live, so we have to take some tough choices and permit koalas some places of their own to live if we want them around for our grandkids to marvel at.

NPA's reserve proposals that we have presented to you seek to do this, and they focus on four key areas: south-west Sydney, focused on the upper Georges River Regional Open Space proposal; the Great Koala National Park and a network of other park proposals on the New South Wales North Coast between Port Stephens and Queensland; the Pilliga forest, covering the Pilliga State Forest and additions to the Pilliga Nature Reserve and national parks; and south coast forests, including the Murrumbidgee Flora Reserve reserved under the National Parks and Wildlife Act. Finally, we thank the Committee for the opportunity and the invitation to give evidence. We wish the Committee luck in its deliberations.

Mr BLANCH: I guess I am puzzled why people seem to hate koalas. I have never heard anyone say they hate koalas so it is puzzling why we seem to be so keen to drive them towards extinction. They are such beautiful animals. Koala numbers have fallen. They were estimated to be about 10 million at the commencement of British colonisation and invasion, and there are perhaps as few as 200,000 nationally today. So it is about a 90 per cent decline. It is very significant. It is a national icon. It is the face of our forests. It is an ambassador. It is hard to find a thing wrong with koalas, yet most people now only see them in zoos or in souvenir shops.

My colleague, Martin Taylor and I, used the best statewide authoritative published datasets to project that koalas could become extinct across most or even all of New South Wales by as early as 2050. That is very sobering. It brings us no pleasure to make those predictions. Koalas are our orangutans. Both face extinction because of deforestation. And koalas are our polar bears. Both face extinction because of climate change. Yet there is hope. They do not have to go extinct. There are solutions. To save koalas we need to protect their trees and stop destroying so many forests. They need a safe, stable climate like us. We need to protect their homes in sanctuaries where they can survive, particularly during difficult times.

Farmers, traditional owners, land carers and regional communities who save and grow forests for koalas should be rewarded financially. They are doing an important job, and they need to be encouraged and paid to look after koalas. To illustrate a solution that is working—over the last three decades a lot of revegetation around Armidale on the New England tablelands has seen koalas recolonising into areas where they have not been seen for a long time. There is greater awareness, greater engagement and more research by the universities and farmers wanting to see koalas come back. Importantly, koalas are recolonising particularly in the hotter west up the river valleys through the national parks on the ridge lines into areas which are climate refuges, which are important for us to protect this century.

So, in conclusion I think we have two options. The orangutan options is to keep destroying their habitat with unsustainable agriculture leading to big fires, and putting them into smaller and smaller reserves where they cannot survive. This is, in some ways, what we are doing. The other option is the giant panda option, where a government says, "No, we are not going to allow a national icon to go extinct." They have created major protected areas. They have legally protected core habitat. They worked with people who had pandas on their land to encourage them, and they World Heritage listed both the bamboo forests and the pandas. They have greater global protection because of that. We could do the same for koalas. Thank you for the opportunity. I urge the Committee to adopt the panda option.

The CHAIR: Thank you very much for those very sobering statements indeed.

The Hon. PENNY SHARPE: Thank you very much for coming along. We have heard quite a lot of evidence this morning from the Government in relation to the management of forests—State forests in particular—and the alleged care that is taken in relation to protecting koala habitat and also managing the koalas that live

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within the forests. Would any of you care to comment on that or respond to the adequacy or not, as you see it, of the way we are managing State forests and koala population?

Dr SWEENEY: Sure. I can kick it off. First of all, in our submission, when I was mapping our reserves, we went 100 per cent for public land because we feel it is more tractable. It is already publicly owned so it is a more tractable option. When mapping for the Committee I deliberately overlaid the forest management zones. What you will notice is that many of the koala hubs that are on those maps overlap really closely with forest management Zone 4, which is where most of the timber comes from. That goes back to my earlier statement of koalas and loggers liking the same areas. So there is immediately an inherent contradiction.

Moving on from that, I will table two documents for the panel, and I will talk very briefly to them. This document *Clearing Our Koalas Away* was written by Dailan Pugh of the North East Forest Alliance. It outlines the impact on our State forests on the North Coast as a result of regeneration harvesting or logging that was occurring from approximately 2010 to late last year, at which time it became a legal approach to forest management, which is now enshrined as regeneration logging in the intensive harvesting zone.

The second document I tabled was an article from *The Bellingen Shire Courier-Sun*, which appeared on 7 August. It is about koalas in the Kalang. Right now there is a group of dedicated citizens in the Kalang headwaters who have been undertaking a lot of surveys and have found a hitherto undetected population of koalas in an area that is proposed to be logged imminently. The Forestry Corporation harvest plan had a single record on it, and these citizen scientists were able to go out and readily find evidence of mothers, babies and several individuals. So our view is that there is not adequate care taken through logging operations. The new integrated forestry operations approvals are a huge retrograde step because they essentially allow virtual clear-felling—so-called regeneration logging—in some of the best koala habitat in State forests on the north coast which, in our view, is unconscionable. If you remove 80 per cent to 90 per cent of the habitat for koalas you have a very predictable response. Without any trees there are no koalas. So we very much view current forestry practices as extremely damaging for koalas, and unfortunately that is set to get worse.

The CHAIR: I asked some of the witnesses this morning from Forestry Corporation about the Kalang situation and coup 158, which was mentioned in *The Bellingen Shire Courier-Sun* that you were just talking about. They were assuring the Committee that the prescriptions of 10 trees per hectare and some other clumps of trees—or whatever they said—would be sufficient. That is their sustainable forestry management in practice. What is your view in terms of what that does to koala populations that are in that vicinity. Would that wipe them out? Would they return at some point?

Dr SWEENEY: If you look at where that prescription came from the Natural Resources Commission [NRC] has a report. It was commissioned to come in and essentially iron out a problem between the EPA and the Forestry Corporation. The Forestry Corporation wanted X and the EPA said, "No, that is not good enough you need Y." The NRC came down clearly on the Forestry Corporation's side to give that prescription of 10 trees per hectare in high-quality habitat and five trees per hectare in moderate-quality habitat. The EPA's recommendations were way higher than that. From memory I think they were 25 or 30. The prescription for private native forestry is higher than that. You need 15 trees and they have to be a minimum of 30 centimetres in diameter, rather than the 20 centimetres. It is too little and the trees are way too small. When you are removing via this regeneration harvesting technique 80 per cent to 90 per cent of all the trees, what that looks like from a koala's perspective is a sea of destruction with a few small scattered trees. They may be scattered throughout the coop, but there is nothing in the legislation that says it has to be. They could be clumped in a corner. Logging of that form will simply wipe out all the koalas in the area, whether it is because they move away or are killed during logging operations. As to whether they can recolonise, it is going to make it terrible habitat for koalas and other forest wildlife for a long, long time—many decades if not centuries.

Mr GOUGH: One of the key issues has been around the Forestry Corporation's compliance. It is pretty interesting—and it has not really been explored much on the public record—to look at the levels of non-compliance over the past few years that have been found by the EPA. For example, in 2014-15 there were 236 non-compliances with threatened species licence conditions, nine non-compliances with Protection of the Environment Operations Act conditions and 10 non-compliances with environment protection licence conditions. That led to 78 requests for audit actions plans, advisory letters and formal warnings and six penalty notices. For other years it was very similar. In 2015-16 there were 190 non-compliances. For 2017-18 they have not told us the number of actual non-compliances, but there was a similar number of advisory letters and cautionary notices.

I have been looking through a lot of the audit reports from the EPA and they show that the majority of those non-compliances are to do with the protection and retention of required retained trees. A lot of them show that the Forestry Corporation has damaged trees that it is supposed to retain to the point that they probably will

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not be retained; it has put too much vegetation up close to the trees that are meant to be retained, which means they are susceptible to fire; or it has failed to retain the trees. One of the key things that comes out of the Integrated Forestry Operations Approvals [IFOA] protections for koalas is that the demonstrated response from the Forestry Corporation over a long period of time has been to ignore those prescriptions and flout them. And there has been very limited response from the EPA to actually deal with that. The second thing I thought would be useful—

The CHAIR: Just before you do, I was wondering if you could table that information for the Committee in terms of the breaches so that we have those.

Mr GOUGH: Yes, I can. The second thing was from a Government Information (Public Access) Act [GIPAA] request. In the Office of Environment and Heritage's response to the draft IFOAs it said—and I can table this as well—that "The scientific basis for proposed tree retention rates in the coastal IFOA is not clear and rates are less than half of those originally proposed by the expert formal panel. While Koalas will use small trees research has shown that they selectively prefer larger trees. In our experience the proposed minimum tree retention size of 20 centimetres will be inadequate to support koala populations." That is coming directly from the Office of Environment and Heritage to the Government in the development of those new standards.

The CHAIR: You said that was a GIPAA request. Would you be comfortable tabling that for the Committee?

Mr GOUGH: Yes, we can. I might table it at the end because there are a couple of other things in here that might be of interest.

The Hon. PENNY SHARPE: Fundamentally your opening statement was that if we want to save koalas we need to save their trees. That was a fairly straightforward proposition. In your submissions you made a number of recommendations about the ways in which we could do that. Could you comment on what I think is really the pointy end of this discussion, which is how we manage forests and koalas with the intensification of the use of our forests for timber supply that we are seeing, whether it is through private native forestry or through State forests, because of a general lack of timber supply? Could you comment on that? It seems to me that there is always a competing set of facts. The Government says one thing and your organisations, which I am very familiar with, say another. Could you comment on how we ultimately resolve the issue of whether we are all working with an agreed set of facts? That is what I am trying to get to.

Dr SWEENEY: The fundamental issue is that the Government has got itself into a problem with the new IFOAs because of the twin commitments of no reduction in wood supply and no reduction in environmental protections. Those commitments were made before there were any studies done on how koalas are doing, how great our gliders are doing and how the litany of fantastic species that are hosted by these forests and that occur nowhere else are doing. A much more logical approach to finding out how you can manage forests to get timber and protect species would be to work within the ecological limits of the forests. They are not plantations; they are actually native forests and they were always intended to be managed as such, so that the natural values persist over time.

The Hon. PENNY SHARPE: The Forestry Corporation would argue that these are forests that have been logged previously. Could you comment on that as well? We are not talking about native forests, necessarily; we are talking about forests that have previously been logged?

Dr SWEENEY: Do you mean plantations?

The Hon. PENNY SHARPE: Yes. When I say native I mean previously unlogged forests.

Dr SWEENEY: Well, there are very few of those. But the form of industrialised logging that goes on now and that is taken to an extreme level by the regeneration logging is very, very different to the old days when timber cutters had to walk in for three miles, put two guys up a tree, saw for a half a day to fell a massive tree and then get that out and onto a bullet cart and away. That is serious work and that generally involves selective logging. If you look at the old photos of that the tree diameters that they were taking out are enormous. The forests have completely changed and they have changed because we have been cutting them down over time. We are in situation where we have moved from foresters having saws, and then chainsaws, to a situation where harvesters can take out several hectares in a day. We have moved into a massively industrialised framework with regard to logging. What is indisputable is that many of the species that depend on those forests are in decline. Koalas are obviously the one we are talking about here, and are a flagship, but it is not only koalas; it is also things like greater gliders, quolls and the large forest owls in Victoria.

The Hon. PENNY SHARPE: I get that. But how do we get to the agreed facts? What do you recommend that this Committee does so that we can agree that we are talking about the same thing? We never get passed the

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fact that environment groups say that there is not enough wood to supply the contracts we have got and the Forestry Corporation says there is.

Dr SWEENEY: You mean the other way round? They say there is enough?

The Hon. CATHERINE CUSACK: They say there is enough for sustainable logging and they are saying there is not enough.

Dr SWEENEY: There is a wood supply quota that the Forestry Corporation is obliged to fill unless it is purchased back. If it is saying itself that it does not have enough to meet that quota then that is why we are now looking at a paradigm of remapping and rezoning old growth forests. That is a perfect example. If it is such a sustainable, well-managed industry why are we talking about opening up protected areas to get at big timber?

Dr DOUGLAS: Can I also answer that, if I may? But I will use two different examples, if I might. The Boyd Plateau was logged very heavily. It is now part of the Greater Blue Mountains national park and is a magnificent area because time has allowed the vegetation to come back and provide the habitat. It will still need more time but it will happen. I do not think anyone would suggest that we revoke Boyd Plateau for logging. That is just not a realistic issue and it has World Heritage values. The other issue I want to point out is by turning my attention from the coast to the inland and looking at the Pilliga. The Pilliga has very little resource left and it is very clear that there is an issue about—can we start thinning the existing national parks estate.

The Hon. CATHERINE CUSACK: You mean timber resource?

Dr DOUGLAS: I am talking about timber resource, yes. I am particularly talking about timber resource. Not long ago—and I will table it and at the end you can have a look at the detail, but the Baradine Sawmill had a huge argument with Forestry for a number of years, saying, "There isn't the resource left. You're requiring us to take timber out of an area which is not of size, is not of capability. We can't run this business on this." Forestry said, "Yes, you can. There is enough resource," and all the rest of it. Baradine Sawmill no longer exists as a business. It had to go out of business because the resource was not there. The problem we have is in drier climates the vegetation needs longer to recover. The removal of the vegetation increases the effects of climate change and all the rest of it by the removal of the canopy.

Koalas are spreading out of those areas in the Pilliga, trying to find water to adapt to the climate change. If the vegetation was allowed just to get back—that is a complete opposite to the management regime that Forestry Corporation intends to do. They are in a business and they need to try and run it as the business, but it is competing with the ecology of the area—not just for koalas, but for many other species. That area needs to recover. Ironbark has been largely removed from the Pilliga and it is needing time to recover. The other species which are trying to provide food resource for koalas have been greatly diminished. It is a really good example of removing the vegetation changes the microclimate of the area. It dries out; koalas have to disperse, find water. Where do they go? And yet the Pilliga is a nicely contained 3,000 square kilometre area that, if it was all reserved, progressively koalas would start to come back and to adapt to that climate.

The Hon. MARK BUTTIGIEG: So what we are saying in a nutshell is that—I think one of you mentioned that false dichotomy at the start and the parameters were set by the Government: no reduction in koala population—

Mr GOUGH: No reduction in wood supply.

The Hon. MARK BUTTIGIEG: And no reduction in—

Mr GOUGH: In environmental values.

The Hon. MARK BUTTIGIEG: It is unachievable, based on what you are saying, because it is an unrealistic parameter to have.

Dr SWEENEY: Correct. It is the magic pudding approach.

Mr GOUGH: I think the point that needs to be made is that while wood supply and environmental values can be in conflict, a timber industry based on plantation timber and a thriving economy in the areas where this logging is currently going on and well protected koalas are not in conflict. There does need to be some level of choice between our existing levels of native forest destruction and the protection of koalas. We have got 1,000 species that are on the road to extinction in New South Wales. But the transition can be made; the communities can be supported. Tourism, and environmental tourism specifically, are huge opportunities for areas on the coast. There is a really good airport at Coffs Harbour, which a lot of people are increasingly moving to and travelling to that region. There are opportunities around where the proposal for the Great Koala National Park is to make this

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a centre for people to come to and see some of the best forests that we have left in New South Wales. The cheapest way for us to do that is actually to buy out the wood supply agreements and support the communities to transition. That is not the end of the timber industry, but it does mean a change to the type of timber that we have.

The Hon. MARK BUTTIGIEG: The obvious response—to play devil's advocate—from a logger would be "I'm 55 years old. I don't want to become a tour operator."

Mr GOUGH: I think one of the things to look at within the Natural Resources Commission's advice on the coastal Integrated Forestry Operations Approval [IOFA]—the new forestry rules—was on page 48 of it they have a projected wood supply profile. There is basically no increase expected in hardwood plantation out to 2109. So there is no planning going on around planting the plantations of the future that can provide us with the hardwoods. It is a good graph to look at. There is basically no change expected in plantation numbers for hardwood timber, which is pretty poor planning. It is an opportunity for the industry.

The Hon. MARK BUTTIGIEG: So there is a way through this, but we are being let down by poor planning, basically is what you are saying.

Mr GOUGH: And also not taking the hard decision to say we do need to transition out of native forest logging and we need to have the resources of the public service and the leadership of the Government to take those communities on that journey and support them through that process.

The Hon. PENNY SHARPE: I have a question about the impact of land clearing—the land clearing laws. I do not know who wants to take that one on. I think that was one for you, Dr Blanch. Obviously there was a lot of predictions around the impact of land clearing. We have got some pretty solid figures in your submission that that has really skyrocketed—increased by 80 per cent. Do you want to speak to the impact of land clearing in relation to koalas and their ability to survive?

Dr BLANCH: Yes. I might advise I have left some materials with the secretariat: the Koala Habitat Conservation Plan. It quotes that we have modelled that around 8½ million hectares of likely koala habitat has been cleared in the last 230 years in New South Wales. Obviously that has to have an impact, even without climate change impacts.

The Hon. CATHERINE CUSACK: I beg your pardon. How many million hectares did you say?

Dr BLANCH: It was 8.5 million hectares.

The Hon. CATHERINE CUSACK: Of koala habitat has been cleared?

Dr BLANCH: Likely koala habitat. There will always be—I think we were talking about what is accepted truths. It is hard to model back over the last 200 years, and there are different of views amongst koala experts now how you would model or map current koala habitat. But it is a lot of land and that has had a big impact, and particularly isolating populations. Our estimate is from the BioNet data maintained by the New South Wales Government: 67 per cent of koala records are on private land. Obviously there is bias in the survey data, but two-thirds of koala records are on private land: most of the inland and where it is more over-cleared, particularly in the sheep/wheat belt—very high productive farming country—and also bearing the impacts of rising climate impacts.

In terms of the land and biodiversity reforms, I think it was never going to work well. You cannot greatly increase agricultural productivity when you have got so much cleared land already and the premise is you can keep clearing land, protect some of the Biodiversity Conservation Trust and still enhance biodiversity. It was never going to work. I think the Government realises that. The Audit Office report into managing native vegetation identifies some of the real problems there, and the Government's own woody vegetation report for 2017-2018 shows increasing land clearing rates and forestry rates. So I think there has to be a reckoning that they cannot achieve both objectives. It was never going to happen. I think there is a realisation in some parts of the Government that is true. I think a way to quickly at least protect koala habitat would be to, in advance of maybe a major rewrite of the Local Land Services Act and the Biodiversity Conservation Act, release and update the Native Vegetation Regulatory Map—we want it; the farmers want it for clarity and certainty—and include koala habitat as Category 2 sensitive regulated land.

That does not have to address all the other areas of the bush that should be protected, from our point of view, but at least it will protect koala habitat. To give you an example of the area that might need protecting, we commissioned Eco Logical Australia, very good consultants, a couple of years ago to map how much koala habitat would be at risk under just the equity code of the Local Land Services Act. They came up with a fairly conservative—they said in their algorithms 2.2 million hectares of koala habitat could be at risk of clearing under

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the equity code. Ideally the equity code and the farm code would be removed and we would come back to a sensible centre on land clearing laws like we have had in the past. But in the interim, a good way to protect koala habitat, particularly in areas where it is down to two, three, four, five or maybe ten per cent of native vegetation left, a lot of it is endangered communities anyway and koala habitat places that in category 2-sensitive regulated land. There will be some pushback, but most farmers I talk to do not want to kill koalas. I think there would be more support than most people in government think for that, so I guess it is time for re-correction on land clearing, and in terms of koalas we can use existing regulatory framework and use the mapping releaser and protect koala habitat under that. And SEPP 44 mapping would go a fair way in reducing or halting the decline of koalas.

The CHAIR: Just to explore that a little bit further—and Dr Sweeney I will come to you in a second—with the koalas, you said 66 per cent or 60 per cent are on private land and a lot of that is inland.

Mr BLANCH: Well, 67 per cent, and that is based on just the New South Wales Government BioNet data overlaid with tenure, so there are biases in that data, but it is the vast majority, yes.

The CHAIR: In your opening statement you mentioned the situation of some koalas being found travelling along creek lines and trying to move in terms of climate to places that are climate refuges. To save or to protect and save into the long term the koalas out west, connectivity is so important, so you are talking about protecting koala habitat but if there were recommendations from this Committee to ensure that those populations of koala are protected in say 2100, the Government would also have to look at ensuring that there were connected reserves all the way through to the east coast, would it not?

Mr BLANCH: We cannot save all the koalas in the inland. They are dying out. A great koala carer at Moree thinks there are five years left of koalas. When she rescues a koala, she generally has to drive up to Inverell to release it. It is hard yards for those people and there is a real mental health toll on those carers. I would say there are some big areas—we talked about the Pilliga, but anywhere with a large area, we are talking at least a couple of thousand hectares. It has to have river valleys for water, and near elevated areas—Mount Kaputar, the Warrumbungles. They still have terrible fires, but you need water, big areas and a mix of species because not all of those tree species will survive a century of climate change and you need an altitudinal escape route.

I think we do have to work out how much we can relocate koalas because they are going to die out in the inland. Not to allow development, that is a separate issue, but we do not know the success rate of relocating koalas 300 kilometres towards the coast, 500 metres high altitude. Will they survive? I think we need to do some research on that. But for many koalas in the inland, they do not have a long future. Their habitat has gone. The climate is cooking them. I still talk to people who think people are shooting koalas to destroy the evidence of land clearing. There are some difficult cultural ideological barriers as well in parts, particularly in the north west, over koalas.

The CHAIR: Dr Sweeney, did you want to talk?

Mr SWEENEY: Yes, I wanted to elaborate on a couple of points around the land clearing legislation. First of all, the Government has actually marked koala hubs, they have called them, which are areas where there are koalas, there are records, but also a record of persistence over time. Stuart's organisation actually took that hub's data and did an updated version of it early this year. Those hubs could be quite easily transferred towards protection via the use of the areas of outstanding biodiversity value, which exists in the Biodiversity Conservation Act, so we would really urge the Government to consider that approach while going down the path that Stuart said of looking at the land clearing laws and getting them back to the sensible centre and identifying the other key areas that koalas need but are currently not considered as part of koala habitat, which are things like climate refuge and movement corridors. So that is the first point.

The second goes to this concept of category 2-sensitive land. The Government's submission on page 16 says that core habitat has been mapped to help protect koalas and it talks about mapping under SEPP 44, which is then mapped as sensitive regulated land on the native vegetation map where clearing is not permitted. The problem is that on page 11 the Government also highlights the fact that only six LGAs have done that mapping, so only koala habitat in six LGAs is translated through to category 2-sensitive. There is an enormous black hole there between the tool that the Government is using to protect koala habitat and the maps that it is using to inform that, so that really needs to change.

The CHAIR: Thank you. We are almost out of time. Do you have something to add?

Mr GOUGH: I just wanted to add because I think it is important for the Committee in terms of the Biodiversity Conservation Act and the Local Land Service Act and where we are at now, 17 months into it. I went back to one of the GIPAs that we did in terms of the concurrence that the Minister for the Environment provided to the primary industry Minister on the native vegetation codes. When she provided that concurrence it was on

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the basis that agricultural clearing is likely to return to the long-run clearing rates towards 15,000 hectares per annum over the period 2017-18 to 2019-20, up from 9,000. We are almost double that. We are at 27,000. I also had a look at the public register that the LLS has put out in terms of the notifications of clearing that have gone on in that 17-month period—and this is on top because this is after that 27,000 that came under the woody vegetation data—there have been notifications of an additional 51,000 hectares of clearing. So it gives, I think, the Government and this Committee a very good reason to be able to say, "We need to suspend clearing under some of these codes, and do so urgently."

The CHAIR: Thank you. Very quickly, this is the New South Wales Koala Strategy and it has a goal of saving New South Wales koalas in the wild in the next 100 years. Do you think it will meet that goal?

Mr BLANCH: I do not think it can. It is the wrong tool. There is some good stuff in it. We did an assessment of it and it fails to address land clearing on private land and excessive forest logging. So it is certainly not a whole of government strategy because it does not reflect the environment agency's view that they have to cut down on land clearing and logging in koala forests.

Mr DOUGLAS: I agree with that and I think one of the strategies that we have to look at is picking these really important areas that actually are in government ownership and which actually can be made protected areas now. We have submitted that the Campbelltown area has a significant population. The Government has announced about a 500-hectare area. It is about 5,000 that needs to be protected. The Pilliga could be repaired and brought back, and the north coast and south.

The CHAIR: Thank you for attending this hearing. I do not think anybody took questions on notice, but there may be questions by members in the next few days. If so, the Secretariat will contact you in relation to those and we have resolved that answers to those will be needed to be given within 21 days.

(The witnesses withdrew.)

(Short adjournment)

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JEFF ANGEL, Director, Total Environment Centre, affirmed and examined

SAUL DEANE, Urban Sustainability Campaigner, Total Environment Centre, affirmed and examined

JOSEY SHARRAD, Wildlife Campaigner Oceania, International Fund for Animal Welfare [IFAW], affirmed and examined

KRISTIE NEWTON, Campaign Manager, Wildlife Information, Rescue and Education Service [WIRES], affirmed and examined

The CHAIR: Would any of you like to make a short opening statement?

Mr ANGEL: I think we are all going to speak very briefly.

The CHAIR: Very briefly, please. If you could keep it to a couple of minutes each?

Mr ANGEL: Yes. The Total Environment Centre has been particularly concerned about the urban plight of koalas. They are an iconic species much valued by the community. I think that many people in Sydney do not know that we have healthy koala colonies on our borders and when they find this out they are incredibly impressed. The urban environment of course creates a number of challenges for the planning and conservation of koalas. Our view over the many years is that existing instruments such as biobanking and offsets do not perform or have sufficient capacity to conserve koalas. There was this warning some years ago when the concept of offsets and biobanking was introduced that there is so little left of natural bushland in and around Sydney that it is extremely hard to find an offset that replicates the habitat and therefore allows the continued preservation of that species. Mr Deane is going to give some examples very briefly on the detail of the Gilead development, which we have been working on.

Mr DEANE: Yes, I am going to be looking at Gilead and I think it is really interesting as a case study of how koala protections in the face of some sort of pushback start to crumble. That is what I am going to be looking at and because of that it is a really interesting case study and sort of a masterclass in how these biobankings and so on break down. I would invite the Committee to come and have a look at Gilead and around Wilton as well, which I will not go into as much detail but there are quite a few issues in that area too. One of the things that becomes really important and what Gilead really shows up is that biobanking is really the hanger upon which koala protection is used in New South Wales. For biobanking to be successful you have really got this idea where at least four things have to be substantially behind them.

I say the ZAPS, an acronym to hang my hat on there. One of them is zoning. It has to be zoned appropriately; so it has to be zoned "environmental" and it has to be "A", it has to be additional; there has to be added protection to what has been taken away. That is the whole point of it. Then "P", it has to be proximate, it has to be near where that land has been taken away so that it is relevant to that area. The other thing obviously is that it also has to have a certain shape, it has to be contiguous, it has to be joined so that we are not throwing confetti spaces across the landscape that koalas are meant to find their way to. Those things are really four important points. Each of those biobanking principles have all been subverted when you look at Gilead and Lendlease in different ways. We will talk to them and they are in the submission that I put forward.

I think the real farce that becomes really important when we are looking at Gilead is that Lendlease has also been involved in the road that is being built beside it and part of that road that is being built has basically got exclusion fencing along the whole way and that seems to have been pushed through by Roads and Maritime Services [RMS] and Lendlease so effectively even these compromised biobanks that we have in Gilead are now going to be completely cut off from koalas getting in or out of them so it is a complete farce. They are not even being able to work as a biobank at all. The next really concerning thing, which is where we get to the next stage of really problematic issues, is that now this is being applied to the Environment Protection and Biodiversity Conservation Act [EPBC], so at the Federal level. So far at the Federal level they have been pushing on additionality so when we look at the difference between not accepting Noorumba as a biobank because there was no additionality to it, now it looks like Lendlease are trying to push that through regardless, even though they have excluded it, so that is really where we are up to and very concerned about it.

The CHAIR: Thank you. Ms Sharrad?

Ms SHARRAD: I would like to thank the Committee for launching this inquiry and the invitation to this hearing. IFAW, as an animal welfare and conservation organisation, rescues, rehabilitates and releases animals into secure habitats around the world, from elephants in Africa, tigers in India and koalas in Australia. Koalas are to Australia what elephants are to Africa. We have had orang-utans and pandas as well today. They

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are all iconic species that garner international attention and like elephants, koalas are also a flagship species so by protecting them and their habitat, we are also protecting thousands of other animals too. We acknowledge that koalas face very different threats both within the State and also from State to State but there is one unifying driver that has been pointed out by previous people too and that is habitat loss.

I welcome the Koala Strategy and the funding allocated to wildlife groups, as well as research, vet training and wildlife hospitals. However, we feel the strategy treats the symptoms rather than the addressing the cause, which is habitat loss. The Government is effectively cutting down trees with one hand while picking up sick and injured koalas with another. Volunteer wildlife groups like WIRES next to me work around the clock to rescue and rehabilitate as many animals as they can but there is no secure habitat really to release them back into, so without that, it is a mere bandaid and that cycle will continue. If we do not address this elephant in the room—the solution to habitat loss is habitat protection—and continue to allow irresponsible development like Gilead to go ahead, we are literally paving the way for the extinction of koalas. Research shows that land clearing is the number one cause of stress in koalas, and stress, as Matthew Crowther pointed out earlier, was sometimes difficult to detect and it is a long-term silent killer. Research also shows that we can actually live alongside koalas if we allow them the green spaces that they need to survive.

So volunteers and communities, I think, are getting pretty fed up with Government inaction and have lost faith in the system. They are literally taking things into their own hands. Local communities are taking on big developers, putting up road signs, rescuing koalas, planting trees. I would like to urge the Committee to not allow the findings of this Committee to be sitting on a shelf, gathering dust in a year's time. I think that is a concern that has been passed on to me. I would like to go back to people and reassure them that is not going to happen and that there will be action taken because koalas cannot wait. It is time for bold, transformative, and cross-party action if we are to save this species for future generations. Thank you.

The CHAIR: Thank you.

Ms NEWTON: Thank you for the opportunity to speak here today. Wildlife care is, as my colleague Josey mentioned, we are really on the forefront and on the frontline of koala conservation in New South Wales. We witness the impact that human activities are having on this species every single day. We are gravely concerned at what we are seeing. The Wildlife Information Rescue and Education Service [WIRES] holds the largest single database for rescue reports which currently has over one million records. This information has been reported to the National Parks and Wildlife Service consistently since 1986. The monitoring of koalas should have been undertaken vigorously by this agency on the data available to them, which was showing the decline of this species.

Our data indicates that calls to assist koalas in New South Wales have doubled in the last 10 years. In 2018, 600 reports of koalas needing assistance were reported to WIRES. Of those reports, unsuitable environment accounts for 41 per cent of koala cases, where the cause of the rescue was known—41 per cent. This means that koalas were found in areas which they could not be returned to upon release. I want to talk to you about a typical week in the life of a koala carer. It is one of sleep-deprivation and distress. This week, for instance in the Clarence Valley, we had two urgent calls for koalas. On Monday, we had an urgent call for a koala that had been found by a member of the public, that was dragging itself along the ground.

I would like to table the photo of this koala for you to see. This koala had burns to 40 per cent of its body and was immediately euthanised. It had been caught up in a wildfire that had also destroyed over 2,000 hectares of native koala habitat. In the same week, we had a young male koala come into care. He is 240 days old, currently being called Junior. He weighs 700 grams. His mum was killed in a vehicle collision. We expect our wildlife carers to endure being in the presence of these animals in the last moments of their lives. We expect our carers to go without sleep, to feed the joeys that need feeding around the clock and manage their complex needs.

We expect them to invest their time, their money and their effort, into raising and caring, and rehabilitating these animals, when at the end of the day, when it comes to release, there is nowhere for them to go. They have to release them back into unsuitable, unsafe environments, where they really are not confident that they are going to survive. In return, we expect that our Government will protect their habitat—the koalas' homes—so that our efforts are not in vain. Thank you.

The CHAIR: Thank you. That was extremely depressing for everybody, I think. But thank you for tabling that. I think it is important that the Committee hears it. I will start with Gilead. Would you like to expand a little bit, Mr Deane or Mr Angel, on the biobanking situation with Gilead and the south west growth centre? Why that will fail so dismally to add additional habitat or to protect koalas' habitat?

Mr DEANE: Thank you for the question. This is the latest plan—Lend Lease's plan—that I just tabled before.

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The CHAIR: Is that in your submission as well? Or is that an additional—

Mr DEANE: That is an additional one that they just put up today. You can get it online. If you look at this plan for Gilead there is not one thing in this plan that says it is any different from any other subdivision. Therefore you cannot see what is it about koala protections that has influenced the way this plan has been developed because it is not there. One of the things that you can start to see, and this goes back to those four important points about establishing a biobank, the things that we can look at when we look at this plan is, the zoning. The zoning for this biobank for koalas, one of them is Mount Gilead, Macarthur. Sorry it is Macarthur Noorumba, so it is up the top.

That has been zoned public recreation. There is another one, which is on the bottom, which is Gilead Macarthur. That one has been zoned rural. Therefore we have biobanks which have been put aside in order to protect koalas, which have actually been used under a different zoning. When that happened, I could not understand quite why? It seemed strange and we asked about it. They said it was just a mistake. Then we realised that what it allows Lend Lease to do, is to put all the infrastructure that they need to do anyway into the biobank zones. Therefore we have water retention, we have play equipment, we have recreation zones and so on. So they are not actually anymore essentially about koalas, they are about making sure that subdivision works.

The next thing that becomes really important, is this idea of additionality. Lend Lease went to, and firstly started to get, a biobank with Campbelltown Council for Noorumba. Noorumba is an existing bush reserve that has been there for 30 years. It has koalas in it already. It is looked after every second week by bush volunteers. It is already well established koala habitat in that area. So when you take away habitat in the Gilead site itself, and you say, we are going to protect this extra area over here, you are not actually protecting anything new. You are not actually protecting anything extra.

That is why the Federals put in this idea that, we are not going to accept that, you will have to put in land in West Appin—land that is not protected at the moment. Therefore that will establish extra protection. The key part of that is proximity. One of the areas we are looking at was a biobank in Fernhill, that is 40 kilometres away—occasionally it might have a koala in it, or whatever. It has got nothing to do with this area at all. The last one obviously, is, when we are talking about contiguity. We can see in the middle of this plan, these two red-flagged areas. Areas they could not biobank because they were so precious in terms of koala habitat.

They do not even come under the biobank, they are red-flagged. They have basically become islands, sitting in a subdivision, rather than having a continuous link, that links it back into either Noorumba and down into Bulla, it has just become islands. So eventually over time, obviously, they will just become a park, the trees will be removed, and it will be established that way. So I think that is where the regulatory failure in biobanking has fallen over.

Mr ANGEL: Just to slightly expand on the Noorumba issue. The NSW Environment Protection Authority [EPA] offset consent, said they could not use Noorumba as a koala offset because it was already a koala protection area and the State legislation failed to reflect that. In these very tight situations in the urban environment, we have to do more, and different things to protect that koala habitat.

The CHAIR: Could you explain to the Committee simply why the Gilead development poses such a risk to that koala population?

Mr DEANE: This comes down to the location of Gilead. Gilead is an incredibly important location. For a subdivision it is neither here nor there—in fact it is a little bit inconvenient. It is out in the middle of nowhere. There is no public transport to it. There are no schools around there. It is a little bit annoying. It is just: "Oh, we'll put it somewhere." But for wildlife this is an incredibly important spot because this is the most northern, closest spot between the Georges and the Nepean rivers. It is actually incredibly remarkable in a city like Sydney you can actually almost circumnavigate the whole of Sydney—if you just cross over at Gilead you can actually make it.

So therefore for all this wildlife along riparian zones along the Georges River and riparian zones along the Nepean-Hawkesbury this is the area that they can connect up to. And we know—the Office of Environment and Heritage [OEH] has done multiple studies—that we have a primary koala corridor going right up the Georges River and we have a primary koala corridor going right up the Nepean, up to Gilead. And then at Gilead where is the connection? It has been taken away by this subdivision and it has been confirmed and definitely taken away by this exclusion fence which is obviously going to kill off that area. So especially on the Nepean River side that will slowly die over time—it is undoubted; it has to.

The CHAIR: Thank you. That was a very good summary of the situation.

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The Hon. PENNY SHARPE: Thank you. I am quite familiar, as you know, as are members of the Committee, with this issue in relation to how we protect this koala population. What are the options that you are aware of with the current proposal around Gilead? Is it too late to reconfigure and put rules in place to deal with this matter?

Mr DEANE: No, it is not too late.

The Hon. PENNY SHARPE: Because there has been court action, hasn't there?

Mr DEANE: There has been court action to stop the rezoning in the first place. The farcical nature of it is when you open up areas to be developed you normally put in a big regional park. They did that between Greater Macarthur and the Wilton area. It is all protected—that primary koala corridor in there is protected. And obviously it should have happened across at Gilead as well. I guess that is the problem sometimes with desktop planning—things just look very easy on the paper unless you get down there. This area is also incredibly historically significant, right back into 1812 and the frontier of this area, so it has this double bind too. I guess the importance of that is it is the tourism potential—it is a tourism goldmine in terms of what could be happening out there. An hour away from Sydney if you are commuting every day is a bit of a drag; an hour away from Sydney if you are coming as an international tourist is nothing—it is just next door. And that is what is going to happen around Gilead if we allow that potential to open up.

I guess the things we can do are obviously underpasses and overpasses. They were identified in the very rigorous original Campbelltown koala plan of management that looked at overpasses and underpasses and showed this idea of enclaving so that you set up all the corridors for the koalas—it was well known at this time—and then within that area you then start to say subdivide. So you deal with the koalas first and make sure those corridors are working and then you think about subdivision. This is putting the horse before the cart. This is making sure that subdivision works and koalas be damned.

The Hon. PENNY SHARPE: Can I just clarify? Not one house has been built in this division yet.

Mr ANGEL: No.

The Hon. PENNY SHARPE: We are still going through the planning process. So there is absolutely the opportunity to create wildlife corridors—

Mr ANGEL: Yes.

The Hon. PENNY SHARPE: —and allow the developer to do some developing work, it is just whether there is the will to enforce that. What levers does the Government have to enforce a change on this?

Mr ANGEL: In the second-largest development, which Mr Deane has tabled, Lendlease is seeking an accelerated biocertification permission.

The Hon. PENNY SHARPE: That is as a result of recent changes to the law, is it not?

Mr ANGEL: Yes.

The Hon. PENNY SHARPE: I can remember them going through.

Mr ANGEL: Yes, but at the same time the Government is undertaking a Cumberland Plain Conservation Plan and it has been our firm belief that that plan needs to be finished before any further development. Because you have got this intense pressure for development, and I think some of the departments are still feeling the weight of instructions—"Get more houses, regardless,"—that they are unfortunately finding ways to get around the best principles of conservation. I think Campbelltown council unfortunately has acceded to this accelerated biocertification application—clearly that should be delayed until the proper plan is finished.

The Hon. PENNY SHARPE: Can I also just clarify, on the map that you have given us have they changed the name of the development? Is no longer Gilead? Is it now Figtree Hill?

Mr ANGEL: Yes.

Mr DEANE: Yes.

The Hon. PENNY SHARPE: Just so we know that we are talking about the same thing. I did wonder how long Gilead was going to survive as the name. I just wanted to clarify that so that we are not confused into the future.

The Hon. MARK PEARSON: On that, I gather that the legal action was not successful.

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Mr DEANE: The zoning legal action was not successful, no. Because the biobanking that they have in place does not meet Environment Protection and Biodiversity Conservation Act [EPBC Act] requirements I do not see it proceeding. The integrity of the Federal regulations will come into play here and it will be very interesting to see how they step up to that or they duck it. There are also lots of other things to do. What has been good, I guess, is that OEH is really looking—it seems serious about putting down an Upper Georges River koala national park idea. That will confirm the north-south. So there are some good things happening and we commend that, but without east-west connections what are we doing? We are actually feeding. Koalas are like any mobile species. They need massive connections in the way that we need roads and so on. So when Roads and Maritime Services [RMS] puts in a road it has to first ensure that the existing tracks and connections are kept in place. At the moment that is not happening.

The CHAIR: Ms Sharrad, did you want to comment on something?

Ms SHARRAD: Yes, I just wanted to say that Mount Gilead still has to go through Federal EPBC approval. It has had a conditional approval. One of those conditions is for Lendlease to draft its own koala plan of management. They have apparently submitted that to the Government and we have asked for a copy. We have not seen it. We think that should be transparent. Associated with that they were also asked to contribute \$100,000 a year over five years to a koala recovery fund and the statement of reasons that we requested shows that Lendlease actively negotiated that figure down to halve it effectively so they are only paying \$50,000 a year over five years. We think that is pretty cheap. Lendlease pride themselves on their corporate social responsibility. This is a drop in the ocean and it really demonstrates how much they really care about koalas, so I just wanted to put that on the record. We have asked for further freedom of information [FOI] information around that as well. Also we would like to see this koala plan of management that Lendlease have drafted. It should be transparent and open to community consultation.

The CHAIR: Is this a standard practice or has this happened before, to your knowledge, of a developer or a private company undertaking a plan of management to protect a koala in an area that they are clearing? Is that usual?

Ms SHARRAD: I am not sure.

Mr ANGEL: There are not that many places with koalas, so I am struggling to find another example.

The Hon. MARK PEARSON: Can it be a condition of a development application?

Mr ANGEL: Certainly.

The Hon. CATHERINE CUSACK: I think in Byron they might be doing that—in West Byron.

The CHAIR: They probably are. You are probably right.

Mr ANGEL: Yes, quite possibly.

The Hon. CATHERINE CUSACK: It is to mitigate—it is part of the development application process.

Mr ANGEL: Campbelltown council were supposed to finish their koala management plan ages ago and it too has been put back on the priority list so that this particular development can push ahead.

Mr DEANE: Certainly in other States, if you are going to do some subdivision, you need a koala management plan of some sort. I guess sometimes the failing of that, and what we are seeing in this, is they get to write their own koala management plan. So as far as I can see it could be, "Hug a koala when you see one and put it in another tree." I do not know.

The CHAIR: But the council has not finished its koala plan of management.

Mr DEANE: No. The Campbelltown koala plan of management is what was going, and it was pretty good. I would commend it, actually. It seems that was junked and then—

The Hon. CATHERINE CUSACK: Sorry to interrupt. Can you take us step by step through what has happened? I understand that there was a plan submitted. I am interested to understand how it came undone. So it went to the Government in 2016?

Mr DEANE: It is complex.

The Hon. CATHERINE CUSACK: I do understand. This is the insight I would love to get: What were the problems?

The CHAIR: The floor is yours, Mr Deane.

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Mr DEANE: It seemed to be that there was a koala plan of management and then with the Greater Macarthur urban release what had actually been a scenic protection zone across Gilead, not because of koalas but because of its historic significance that we have not talked about: the massacre of Appin; where those troops assembled on Gilead before they went off; the convict shutdown areas that they were kept on; this is the first place of a water dam; the first home where, I think, wheat was sown in Australia, and you can still see those furrows in the rolling hills of that area. That is why it was protected. With this urban release that was done—I think that was the Greater Sydney Commission—all of a sudden that scenic protection zone is gone and it comes under urban release area. Into that space, therefore, was different ways of trying to develop it.

They could have gone through what we were talking about before this, the Cumberland Plain Conservation Plan; this idea of the bilateral agreement between the State and the Feds in order to work out how it all goes together, and the whole landscape would be configured, and that is a really good idea—to work out how the landscape works as a whole—because the problem that was seen previously was this site by site rezoning. Every time something was done site by site, it does not take into its sense the greater context. That was put in place, and just before that, as that urban release was enacted, we had the Threatened Species Conservation Act working. That process was still on the books at that stage, so therefore Lend Lease moved in using that system. That then became the Biodiversity Conservation Act, so we moved in the same system, but essentially that was still about BioBanking, and therefore it meant they did not have to wait in order to make sure that the landscape scale works.

In this particular site, the landscape scale is so important, which is the shame about it. Therefore, they have been pushing through under that. Under that, they got their rezoning, and that was through Campbelltown City Council. Campbelltown City Council had the option of not rezoning it: They decided to. I think the cherry of new roads in that area seemed to weigh upon them quite a lot. Therefore, that has then moved through that sort of process. And so it has been that sort of catch-up stage; trying to make sure, as the tide changes, that we just get in before it, and that seems to be the process.

The Hon. CATHERINE CUSACK: As I understand it, the council put a koala management plan forward.

Mr DEANE: Yes. We have a koala management plan—pretty good or good as far as I can see. Lend Lease obviously looked at it and thought, "That doesn't work." So then the Office of Environment and Heritage [OEH] and the department of planning created this "Conserving koalas in Wollondilly and Campbelltown LGAs". I am not sure if it is a report or a plan or what it is, but all of a sudden exclusion fencing is a really good idea because koalas cannot survive apparently—

The Hon. CATHERINE CUSACK: Sorry about this, but I am just really keen to understand how we got from a council document to an OEH document in terms of the koala—

The Hon. PENNY SHARPE: That is why it does not make sense: We do not know why OEH did that.

Mr DEANE: There are a lot of questions that it is very hard to—

The Hon. CATHERINE CUSACK: When the koala management plan gets submitted to the Government, what is supposed to happen, as you understand it? It is an instrument so—

Mr DEANE: This is the big problem with koala management plans: They do not seem to be mandatory.

The Hon. CATHERINE CUSACK: No. They are not, and a lot of councils do not have them, but Campbelltown City Council did do one. I am just trying to work out—

Mr DEANE: It got sidelined.

The Hon. CATHERINE CUSACK: What is its status? Is it still on their website? Is it still what people—

Mr ANGEL: It is a document that Saul likes, but it is not a document that the council is implementing. Council keeps doing deals subdivision by subdivision.

The Hon. MARK PEARSON: Unlike a kangaroo management plan, it does not have to be signed off by the Minister.

Mr ANGEL: Under SEPP 44, I don't think so.

Mr DEANE: At some point it would get department approval. Whether that was—I am not sure.

The CHAIR: What is clear is that it is all very confusing.

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The Hon. CATHERINE CUSACK: I am just really keen to understand this because I had believed that when a council does one of these plans, good on them for doing the plan—

Mr DEANE: Yeah.

The Hon. CATHERINE CUSACK: —but that then had an impact on all koala habitat that had been mapped and, in terms of development, it was really "no go". Clearly, that has not happened, and that is what I am trying to understand.

Mr DEANE: Maybe part of the failing is—and sometimes this is a big failing, I think, with the koalas—things can be ambiguous. It shows you corridors and something, but it is not saying that you put aside exactly this land here. That would be part of the things that we would say is a bit of a failing. In many respects, to create transparency, if you say something is koala then you need to have minimum width in terms of koala habitat and corridors and so on.

The Hon. MARK BUTTIGIEG: Are we essentially saying that Lend Lease have just simply bypassed the council and gone straight to the department to try and get—

Mr DEANE: That is what I think has happened. Yes.

The Hon. MARK BUTTIGIEG: Can I ask something that is a bit tangential to what we are talking about? We have got a projected population growth for Australia of, I think, about 40 million by 2050. Sydney is projected to have about 8 million people by then. Has anyone thought of that longer sweep of—

The CHAIR: Just before we go there, were you finish with your line of questioning, Catherine? Catherine has just indicated that she—

The Hon. MARK BUTTIGIEG: Sorry, Catherine. I have got a bad habit of jumping in when things occur to me.

The CHAIR: Then we can go to you, Mark.

The Hon. CATHERINE CUSACK: That is okay. I am nearly finished. I do not mind, but if it is on a new topic I will just quickly finish this one. What is your understanding of the regulatory status of a koala management plan submitted by council to a State government? What is the standing of that document? Is it just an information document or does it have a role in the development application?

Mr ANGEL: Perhaps we should take further advice on this, but my understanding is that it does not necessarily influence future development decisions. That is the problem.

Mr DEANE: And in this case that has been what has happened.

The Hon. MARK BUTTIGIEG: The mind boggles when I think of those numbers and what we are dealing with here in 2019. Let's face it, those pull factors that drive that population growth are not going to go away. I do not think that we are going to have either side of politics restricting our population growth to the extent that those numbers are going to change dramatically. Has anyone thought about how we are going to deal with this in the longer sweep? It seems to me that even if we implement a lot of these things that we are talking about here and now I do not know that that is going to be enough to deal with it because population has got to go somewhere.

Mr ANGEL: I guess this is not a population committee. We are concerned about the koala population, but I almost only need to echo what the current planning Minister is saying: We need new development with green spaces, not only because bushland species can survive but because the people who are going to be living in that region do not get assaulted by urban heat, do not get assaulted by lack of open, green space in which to relax and recreate, and they would like to have some big, mature trees that would shade their areas. Western Sydney is going to be hell, given the way temperatures are rising.

I think it becomes not only a question of protecting koalas but also we are protecting people's living conditions and health. If, as it turns out, the Government says there are more and more people coming in, they had better be honest—people are going to live in unhealthy environments and they should be told that. I can fully anticipate that, as development goes on, people are going to be putting more and more pressure on the health budget. We do not have a balanced debate about population. We do not have a balanced debate about what is the best type of development for future residents. If the koala is the totemic species that helps propel that debate, then we should.

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The Hon. MARK PEARSON: My question is to Ms Newton. Speaking of pressure, as you have explained this crisis for koalas is certainly causing your volunteers in NSW Wildlife Information, Rescue and Education Service [WIRES] and others a great deal more work. Do you feel that the Government is recognising that and offering the appropriate support? We are having this inquiry, the Government has got a strategy. Is any part of that strategy assisting you and WIRES?

Ms NEWTON: We appreciate that a strategy was done. Rehabilitation groups did receive some funding from that strategy. It is actually the first time that we have ever received funding for rescue equipment, so that was definitely welcome.

The Hon. MARK PEARSON: How much is it?

Ms NEWTON: It was dependent on the group but for WIRES it was around \$70,000 dollars but it was extremely restricted and we could spend it on. And as much as we appreciated the money we believe that it is a Band-Aid for a bullet hole, really. As Josie said, they are cutting down trees over here but giving us money to go collect the koalas. Even though the money is great we would prefer the efforts to be put into habitat as well. And I want to point out as well, the koala code of practice which is what we are guided by states that a koala has to be released in a suitable environment and by that code of practice a suitable environment has adequate food trees, it has to have koalas in that area, and the koala cannot be put into place where it is at high risk of injury.

As I said before 41 per cent of the koalas that we rescue are in unsuitable environments and by that code of practice we actually have to put animals that we rescue back to where we found them. The restrictions on that is causing our carers enormous amounts of stress, they are spending months where we are spending money on vet bills and food and then we get to the final piece of the puzzle and the koalas are healthy and they can climb and are ready to go and there is no habitat to put them in. One of the biggest challenges we are actually facing is adhering to this code of practice because we can only allow for a 10 kilometre radius of where we find that koala to find this suitable appropriate habitat and that is getting near impossible, especially in south-western Sydney.

The Hon. MARK PEARSON: Sorry, why is that 10 kilometre radius a requirement? Or is it a recommendation?

Ms NEWTON: I cannot answer that. It is within the code of practice. It is 10 kilometres from where the animal was found. You have to basically release them as close to their original location as possible but if you cannot release them just there you have a radius of 10 kilometres to find suitable habitat for adult koalas. For hand-reared koalas we have 30 kilometres but there are more complications with that, we cannot release a young male koala in a territory where we know there is another adult male koala. It is becoming extremely difficult for us and we are worried that we will not be able to adhere to these restrictions.

The Hon. CATHERINE CUSACK: Can I just say that that code is widely supported by the rescue organisations that I am aware of.

Ms NEWTON: Absolutely.

The Hon. CATHERINE CUSACK: And the reason for it is because the koala is familiar with that environment.

Ms NEWTON: Yes.

The Hon. CATHERINE CUSACK: Obviously there has been an issue, like it has been a dog or traffic or something along those lines, but where there are exceptional circumstances like the same koala comes in three times, they can work with the department to release into a new area. If the koala continues to cross the same road and keeps coming back into care there are exceptions. But my understanding is first of all that the vets provide free care to these injured animals.

Ms NEWTON: To an extent, yes. And I am not—

The Hon. CATHERINE CUSACK: Sorry. It is just when you were talking about all their vet bills I just was not clear on that because I did not think that they, I take nothing away, I mean the work that they do is remarkable but it is a community-wide effort and vets are part of that.

Ms NEWTON: Absolutely. I am not taking anything away from the vets. We would not exist without the vets. Most things are free of charge for us and we are extremely grateful for that, others are not. Surgeries, x-rays, particular medications are often paid for by the carers, by the volunteers. I am not also arguing that the code of practice. We are very supportive of the code of practice and we are largely involved in their creation. What I

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am saying is that because of the habitat loss and the degradation of the habitat, we are finding it harder to be able to release them into suitable habitat.

The CHAIR: Thank you. I thought I would jump in because you were about to explain how it is particularly difficult in south-west Sydney. I was just wondering because we have talked about Gilead Macarthur whether you could tell us examples of why that is particularly difficult in terms of the pressures in south-western Sydney for your volunteers?

Ms NEWTON: From my own personal experience and looking at our data, 28 per cent of all the koala calls that WIRES receive is actually from the Macarthur region. It is a huge amount. It was 175 koalas last year and again from my own experience of answering those hotline calls the vast majority, and I suspect over the 41 per cent in Macarthur, is unsuitable environments. We find them on roads, we find them in people's backyards, up palm trees because there are a lack of appropriate trees for them so it is definitely more difficult in that region.

The CHAIR: And getting worse you would think because of the increasing—it will get worse as a result of Gilead. If you had 175 last year, how much could you expect once Gilead?

Ms NEWTON: Exactly and we are seeing increases year-on-year. As I said, it has doubled in the last 10 years. It is tricky and it puts a lot of pressure on us. I suppose with those codes of practice, and again this is not anything against the code of practice it just is what we are licensed under and this goes for most of the species we care for, if we cannot release an animal within those guidelines they have to be euthanised. With koalas especially, because they are a special species, we can talk about different options with national parks and we certainly do but that is the base rule. If you cannot release it within those guidelines that animal should be euthanised. And that is really serious we do not want to be putting animals down who are healthy and ready for release.

The Hon. MARK PEARSON: Just one last question that I think you might be able to assist us on as well is that we heard some pretty grim evidence just amongst the last lot of witnesses in relation to what is happening with koalas out towards the west, heading west in New South Wales. Just through your experience, if we were to have a crisis intervention that the Government funded, can koalas survive on food drops? Let us say for a period of time we are trying to ensure the habitat becomes much more protective of the species, in the meantime would it be possible to do specific types of food drops to see them through for, say, six months to a year?

The Hon. CATHERINE CUSACK: What do you mean "food drops"?

The Hon. MARK PEARSON: Food drops from above.

The Hon. CATHERINE CUSACK: Like aerial food?

The Hon. MARK PEARSON: Like aerial or delivery.

The CHAIR: Just quickly if you had a quick answer to that because we are just about to go over time.

The Hon. MARK PEARSON: A quick answer or you can take it on notice if you like.

Ms NEWTON: I will take it on notice. I do have one thing about that especially the population in Gunnedah there were recently things called "Blinky Drinkers" put up which were basically put in the trees as a water source for the koalas. As the leaves are so dry there is no moisture in them so koalas were coming down from the trees and then they would be faced with threats, predation, all of those things. That was one thing that is working, putting water sources up in the trees that stopped them from coming down. We definitely can do things in the West to help.

The Hon. PENNY SHARPE: Very quickly. I meant to ask this before. We used to go through a process of koala recovery plans which were five-year plans under legislation about how we were going to save the species, that is a longer the case. Do you think that the current koala strategy is adequate compared to the process that was dealt with and planned for under recovery plans for koalas?

Mr ANGEL: I do not think any process we have tried previously has been adequate. As the honourable Buttigieg said, we are under incredibly increasing pressure and I think we have to elevate the instruments to be used or should be used to protect the koala particularly at the urban interface. The fact that koalas are on a trajectory to at least local extinctions means nothing has worked so far. We need something a lot better.

The CHAIR: Thank you. We need to leave it there. Thank you so much for attending today's hearing. The Committee has resolved that answers to questions on notice has to be returned within 21 days. The secretariat

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will contact you in relation to the questions you have taken on notice. Also members may submit further questions to you if you would be happy to take those as well. Thank you very much.

(The witnesses withdrew.)

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RACHEL WALMSLEY, Policy and Law Reform Director, Environmental Defenders Office NSW, affirmed and examined

CERIN LOANE, Senior Policy and Law Reform Solicitor, Environmental Defenders Office NSW, affirmed and examined

The CHAIR: Would either of you like to make a short opening statement?

Ms LOANE: Yes, I would. I thank you for the opportunity to engage with the Committee on this important inquiry into koala populations and habitat. Environmental Defenders Office [EDO] NSW is a community legal centre and we specialise in public interest environmental law. Today we are hoping to assist the Committee to understand how the laws in New South Wales currently operate and how they interact to protect or hinder the protection of koala populations and habitats in New South Wales. We will try to focus on the law. Other questions you may have about koala populations and habitats specifically might be best directed to the scientific experts that we understand you have heard from today or will be hearing from.

We have provided a written detailed submission to the Committee. We are happy to answer any specific questions you have about our submission. We would like to start off by pointing out some overarching deficiencies with the laws in New South Wales and the way they relate to koalas. The first is in relation to the contradictory policy settings in New South Wales laws that undermine efforts to protect koalas. On the one hand we have things like the Biodiversity Conservation Act, which have mechanisms to do things like listing threatened species and key threatening processes. So, koalas are listed as a threatened species. The clearing of hollow bearing trees is listed as a key threatening process. That is under one piece of legislation with the aim to conserve biodiversity.

On the other hand, we have legislation for forestry, agricultural activities and development and planning which facilitate those types of activities. Often the policy settings between those laws and the way they interact is contradictory. On the one hand you have one piece of legislation trying to protect paddock trees and on the other hand you have legislation that allows paddock trees to be cleared. The second is in relation to the actual clearing of habitat. There is no law in New South Wales that prevents you from clearing habitat. National Parks provides high level protection but other than that the way the laws work in New South Wales is rather than outright prohibiting that clearing of habitat, they instead create additional obligations for decision makers when assessing and considering the impact on koalas.

But it retains discretionary decision-making powers that often allow economic or social considerations to trump environmental considerations. The result is that koala habitat is often allowed to be cleared for development in infrastructure and agricultural purposes because there is no outright prohibition on clearing koala habitat. Thirdly, the current policy settings for biodiversity offsetting in New South Wales does not meet best practice and it undermines what protections there are for koala habitat. For example, the rules do not mandate like for like offsetting and they allow supplementary measures and monetary payments to be made in lieu of genuine offsets. This means that local populations of koalas can be offset by indirect measures that do not always benefit the population.

Next, many laws in New South Wales rely on the concept of core koala habitat which is established through the koala SEPP. That concept is then also used in other regulatory rules such as land management and forestry rules. But, in our view, the definition of core koala habitat is somewhat deficient in that it is quite narrow and it does not always capture the type of habitat that we want to be protecting. Also, mapping of core koala habitat has not been done in all the relevant areas of New South Wales. It is not just the koala SEPP that relies on that definition but the other laws in New South Wales as well that are meant to be protecting koala habitat rely on that deficient definition and so the consequences carry through.

There is an increased reliance on self-assessable codes. For example, the native vegetation code allows landholders to self-assess clearing and increases the risk that habitat needed for koalas might be inadvertently cleared or cleared due to the lower standards of environmental oversight. There is not legal mechanism for addressing or monitoring cumulative impacts on koalas. Overall, you have forestry legislation, land management legislation, planning legislation and biodiversity legislation but there is no overarching mechanism for considering the cumulative impacts of clearing through all those different regimes. We also have concerns about poor compliance and enforcement of the laws in New South Wales, particularly in relation to forestry and land management which can also impact on koalas.

Finally, we are also concerned that the laws in New South Wales as a whole are not climate ready and more needs to be done to make sure that climate change is embedded into New South Wales laws. This can have

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particular impact on koalas who may need to rely on climate refugia areas that can be identified but not yet protected by the laws we have here. We do acknowledge that there have been efforts to try and improve koala conservation in New South Wales recently. We have had the Save Our Species program under which the koala is an iconic species, and we have the New South Wales koala strategy, that was released in recent years. Our take-home message to you today is that all these efforts are falling short of providing real and tangible protections for koalas and their habitat and it is actually legal reform that is needed across a suite of New South Wales laws in order to make sure we have real protections for koalas.

The Hon. MARK BUTTIGIEG: I was interested to hear you say there is no legal prohibition on land clearing per se, only a check box thing of what have you done to mitigate, to put it in layman's terms. Is that sort of check box approach subject to litigation? In other words, if things have not been done according to whatever parameters are specified would that be something that could be prosecuted legally?

Ms LOANE: It would depend on exactly where and what legislation it falls under. Ms Walsmley might be able to answer that better. For example, if it is a breach of the local land services act there is offences and provisions to enforce breaches of that Act. The forestry legislation has offences but does not have the same types of provisions that allow breaches of the legislation. It depends on the exact scenario as to whether that clearing could be enforced through litigation.

Ms WALSMLEY: A lot of the land clearing that is going to affect koalas on private land, now under the local land services act, a lot of that is code based clearing. So actually getting information about what clearing is happening when is very difficult to do now because there is aggregate totals that are published but there is not that same degree of information made public. So EDO, on our advice line, we get a lot of calls from people who see clearing and are concerned and say what legal action can be taken? First of all you have to see what the land tenure is, what law the clearing is coming under, then you have to try and get information about what exactly is being cleared and if that is consistent. One of the big problems now is that the law is so broad, so much actual broad scale clearing is permitted under the codes that there is often no legal avenue to challenge it. **Even** if it is koala habitat, there may actually be no legal option to challenge that.

The Hon. MARK BUTTIGIEG: It is an academic provision that does not have any real practical effect for someone wanting to pursue that avenue.

Ms WALSMLEY: You mean open standing provisions?

The Hon. MARK BUTTIGIEG: In terms of if those parameters have not been satisfied because of the difficulty in ascertaining the land clearing you have identified, plus all the overlapping legislation in different jurisdictions, it is for all intents and purposes not a very good clearing house for making sure the right thing gets done, is what you are saying?

Ms WALSMLEY: For civil enforcement by a third party it is extremely difficult. That is why we rely on the EPA, the government, to do the enforcements and compliance. We have some serious concerns about how compliance and enforcement will be done under land clearing laws these days. As you would have seen, there is an amnesty for compliance issues under the former laws and that kind of attitude. Any precedent that undermines the rule of law is extremely dangerous in our view. The audit office has noticed this. There is a serious question mark hanging over how these laws are actually going to be enforced by government, let alone a third party or a concerned koala group trying to take action to protect their local patch of habitat.

The Hon. CATHERINE CUSACK: What do you understand the role of a koala management plan produced by a council, what is its function in the system?

Ms WALMSLEY: So under the koala SEPP that you may have heard about in detail already, there can be quite comprehensive koala plans of management made at the council level. There can also be individual ones made for a development by a developer. But the idea of a comprehensive koala management plan is a good idea. And the handful of local government areas that have done it, they are ahead of the game in terms of protection. But as you will see in our submission, we are saying that the SEPP is actually ineffective. That mechanism of doing a plan, while good in itself, is not mandatory and not comprehensive enough—

The Hon. CATHERINE CUSACK: This is what I want to understand: The role of the plan once it has been produced by the council. Does the Government consider it, change it or just accept it? And then if someone is putting in a development application, do they have to look at that plan or is it just an information document? I am just trying to understand its actual—

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Ms LOANE: So once the plan has been made, then the SEPP provides that the development application that is being determined must not be inconsistent with the plan that has been made. So the decision-maker has to consider it and make sure that the decision is not inconsistent with what the plan says.

The Hon. CATHERINE CUSACK: So it does have clout in that sense?

Ms WALMSLEY: It does, in the limited number of areas where there is actually a plan in place.

The Hon. CATHERINE CUSACK: I understand that. Thank you. The second question I wanted to ask is, in your opening submission you talked about the definition of core habitat. And I just wondered if you could be more specific about, I guess, what that definition is and where the problems are and if you have any thoughts about how that could be improved?

Ms LOANE: I do. We would say that the definition would need to be reviewed in consultation with experts and scientists based on the current knowledge. Just briefly, our concerns relate to the fact that the current definition relies on being able to identify resident populations of koalas and recent sightings and historical records of koalas. And that is not always accurate. So there are concerns about relying on records that are not accurate. And then it also does not anticipate having to recognise or identify areas where koalas may not be, but habitat that might be important in the future or for moving populations. Particularly when we are talking about impacts of climate change, habitat corridors and climate review here that might be needed in the future may not be captured by the current definition.

The Hon. CATHERINE CUSACK: Isn't that caught by "potential habitat", though?

Ms LOANE: That is right. So then you have also got potential habitat. And then the current schedule only has a limited list of trees that fall within the definition of koala habitat. The proposals to amend the SEPP expanded that to—I think it was up to 65 additional trees, which was something that we had supported. So there are lots of issues. I do not think it is our area of expertise to say exactly what needs to change. I think that we recognise that there are problems and the problems mean that because it is operating in such a narrow way at the moment, laws such as the land clearing laws which say you cannot do code-based clearing in core habitat mean that there are other areas of habitat that are falling outside the definition, which we think should be protected. So we think that the overhaul of the definition is needed based on our current understanding of koalas and koala populations with experts from scientists.

The Hon. CATHERINE CUSACK: So are you saying it is not—in a legal sense, not a scientific sense—but you are trying to apply this in court, I presume? Or you have not yet had that opportunity?

Ms LOANE: No, what I am saying is that for example when you go to the land clearing codes, you cannot clear under the codes in certain sensitive land. And the sensitive land adopts the definition of core koala habitat. Similarly, when you go into forestry areas, private native forestry cannot be done in core koala habitat. But because that definition is so narrow, those laws are actually not functioning to protect the range of core koala habitat that is needed.

The Hon. CATHERINE CUSACK: Okay. So it is a smaller—I understand. Thank you.

The CHAIR: Just going on with the core koala habitat issue, do you have any idea of how much core koala habitat has been identified across the State in areas that—on private land? Do we have any idea of how much that is compared to the—is there a percentage? Is it 3 per cent that has been identified? Is it 5 per cent?

Ms WALMSLEY: I think previous witnesses have said 66 per cent of koala habitat is on private land, and I think World Wildlife Fund [WWF] identified 2.2 million hectares.

The CHAIR: In terms of the Government's definition of core koala habitat? Its own?

Ms WALMSLEY: We would have to take that on notice, to see the amount of core. But what we are hearing from the other experts is it is far greater numbers of hectares of actually important koala habitat that is now susceptible to code base clearing. But we will take that on notice about the amount of core.

The CHAIR: I think it was more the regulatory definition of core koala habitat and so how much has been—

Ms WALMSLEY: If you look at the maps that have been released so far under the native vegetation laws, there are the pink bits on the map that are sensitively regulated. And you will see there is a very small amount of that area that is actually mapped. Core koala habitat is a very small component of that. So you can see that it is certainly not comprehensive.

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The Hon. PENNY SHARPE: I wanted to ask about the third party appeal rights, which we sort of started to touch on before. Could you just let the Committee know, given the concerns about monitoring and compliance, what areas of the law there are third-party rights in relation to it, how it applies to koalas and where it does not?

Ms WALMSLEY: I will start by saying third-party rights are an absolutely essential accountability mechanism in any legislation. They have existed for several years in planning legislation, native vegetation legislation and water management across a range of Acts. I think we can certainly find the exact number in New South Wales, but it is a common theme. The one exception that is glaringly important for koalas, as Cerin mentioned, is forestry Acts. And after a series of successful cases by third parties against the Forestry Corporation, those third party rights were removed from the Forestry Act to avoid that kind of degree of enforcement and scrutiny and transparency even though those rights exist in plenty of other Acts.

The argument you will hear against them is that they open up the floodgates of vexatious litigation and so forth. At the EDO we can clearly tell you they do not. There is no evidence to support that argument. Our clients are tiny environment groups or individuals. The effort it takes to actually bring a case to court—there are significant cost barriers and you need to have strong legal grounds. There are enough filters in the court system to make sure only the good cases get through, but it is an absolutely essential, essential back-up when a government fails to enforce legislation. And we are seeing governments shy away from enforcing their own legislation, so I think civil enforcement and third-party rights are becoming even more important. We currently have a third-party rights civil enforcement case on water management in the Murray-Darling Basin because the Government was not bringing that case. It is absolutely critical in natural resource management.

The Hon. PENNY SHARPE: We heard from the one of the previous panels this afternoon about, as a result of that, we now have the issue where it is really just up to the Environment Protection Authority [EPA] as the only people who can bring issues and deal with breaches, and that they gave us a long list of—the numbers of noncompliance are pretty bad. Can you just comment on the adequacy, you think, and the resourcing available to the EPA to actually do that job?

Ms WALMSLEY: From what we have seen, there is a need for more resourcing for the EPA to take a stronger compliance role. Certainly, we would recommend a review of compliance policies across forestry and native vegetation. The preference for the Government is to work at the lower end of compliance and enforcement where you send a warning letter or an information letter and then, you know, you escalate compliance action. So you have a handful of prosecutions a year. The importance of actually having a compliance presence and doing those prosecutions is to send a message that breaches will actually be followed up and breaches will be prosecuted. We are seeing a situation now where the message is that actually compliance and enforcement may not happen. You may get away with it. We have actually got to the point where the New South Wales Government is condoning former potentially unlawful behaviour in terms of land clearing. So I think reviewing compliance and enforcement policy and certainly resourcing the EPA to take that active role is really essential. Also a bit more transparency and accountability on how enforcement and compliance is being done and exactly what is being done would actually restore public confidence.

The Hon. CATHERINE CUSACK: I thought those figures were evidence that it is being done, actually. That is how I took it.

The Hon. PENNY SHARPE: That is what I am sort of trying to get a sense of, of how many there are. It depends who you ask.

Ms WALMSLEY: There is evidence of certain things being done. But if you look, for example—and it is not just EDO. If you look at judgements in the Land and Environment Court, Justice Pepper has noted consistent and repeated breaches by the Forestry Corporation. There is evidence. It has to be fairly egregious by the time there is a prosecution. Certainly there are client groups of the Environmental Defenders Office [EDO] up on the North Coast that have consistently pointed out where there are breaches. These are scientists who have gathered evidence of evidence-based breaches. They no longer have the right to bring that before a court but actually they now have to provide that to the Government who may or may not have the resources in the EPA to then prosecute.

The Hon. MARK PEARSON: Or the will.

Ms WALMSLEY: There is not that safeguard of having third party back up there.

Ms LOANE: I would add that our submission refers to a report that we did in 2011. It is a bit dated now but it looks into the issue of compliance in forestry matters. It outlines concerns at the lack of compliance and

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talks about a lack of prosecutions undertaken. There was also an upper House inquiry into the EPA in 2012 which looked specifically at a forestry case study. Both our report and the upper House's inquiry's report would be useful background reading in terms of concerns for compliance and enforcement in forestry matters.

The Hon. MARK PEARSON: Has the Environmental Defenders Office considered the instrument of the Prevention of Cruelty to Animals Act in terms of if there is about to be logging occur or any impact upon habitat that is likely to cause harm, injury or death to the animals and therefore falls under the Prevention of Cruelty to Animals Act which, I understand, all other Acts or legislation pertaining to this would be subservient?

Ms WALMSLEY: We will have to take that on notice because I am aware that we have been asked for that kind of advice, but where we have a client we need to check with the client whether we can provide that advice. I will say in terms of the land-clearing laws, under the code-based clearing there is a bit of a get-out-of-jail option for landholders. There is a kind of defence if they did not knowingly harm the threatened species or that there is koala habitat. They can claim that they did not know that there was koala habitat there that they have harmed. There are kind of exemptions like that that are of concern.

The Hon. MARK PEARSON: That certainly is not a defence under the Prevention of Cruelty to Animals Act.

Ms WALMSLEY: No. It is not, but you do not hear of that—the cruelty element coming in—unless you hear about it more through the media and through organisations like the Wildlife Information, Rescue and Education Service [WIRES] in dealing with the cruelty side.

The Hon. MARK PEARSON: Just quickly, it might be of interest to you, as you are taking that on notice, that in the Tasmanian and Western Australian jurisdictions there is an aspect of "likely to".

Ms WALMSLEY: Yes.

The Hon. CATHERINE CUSACK: The comment on eight, because it is not clear to me, is that I do not think it applies to native wildlife. I think that Act, which is administered by the RSPCA to investigate, would be dogs, cats and introduced species.

The Hon. MARK PEARSON: No. It is "animal": It is the Prevent of Cruelty to Animals Act, so it covers it.

The CHAIR: We have only five more minutes. Can we take this one off-line and continue questions to the witness. I do have one.

The Hon. MARK PEARSON: Great.

The CHAIR: I want to keep going in relation to biodiversity offsets. I was rather alarmed actually—I did not realise this was the case—when reading your submission that you have talked about the like-for-like offsets and that basically that ability has been removed. Also on page seven of your submission you state:

Requiring like for like offsets, including by removing the ability for proponents to offset impacts on koala populations with another animal ...

I did not know it was the case that there is something called species credit—that if you are impacting koalas you can offset by protecting another animal or species. Can you expand on that for the Committee?

Ms WALMSLEY: Yes. Under the Biodiversity Conservation Act there are new offsetting rules that are weaker than we have previously had. The concept of like-for-like is, obviously, if you impact upon koalas you should offset with the koala population. There are variation rules that we can send you. They set out requirements that a developer must take reasonable steps to try to find the offset, but they can apply to use these variation rules before an offset is decided. There are two different sorts of credits. There are ecosystem credits and that is vegetation types. Where those ones are varied, it does not have to be the same plants community. There are some requirements that they can use a different plant community and there are some requirements around a location—you know, the next door if a subregion or within 100 kilometres. There are some limits but basically it has to be the same vegetation formation, which is hugely wide. You can offset anything with anything, really.

When it comes to species credit species, they are for animals that cannot necessarily be defined by the vegetation type so you are talking about a specific animal there. If species offsets—if it is koalas being offset with koalas—then that population of koalas can be offset with koalas from anywhere in the State. That is our understanding. If they go down the road of offsetting a koala with the different species, there are some limitations—like, it has got to be a species that is either as endangered or more endangered and it has got to be in a neighbouring either subregion or within 100 kilometres. But still, even though there are these little qualifications,

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what they are basically saying is, "You can vary the offset rules." That has no ecological credibility whatsoever. If you are having an impact on a koala population and you are offsetting that with koalas hundreds of kilometres away, or if you are offsetting with a different species a little bit closer, that is not an offset. That is a trade-off. That is a compensatory mechanism.

Under the new rules you can also pay money in lieu of an offset. If it is too hard to find your koala offset, you can pay money to the Biodiversity Conservation Trust. They also have variation rules. If they cannot find a like-for-like offset, they can fund some research or an indirect offset instead. But there are so many ways within the legislation that you can water down what should be a like-for-like offset that, I mean, if you add up the cumulative impact of all those excuses on koalas, it is a pretty bleak picture. The last one I will add for illustration under the new laws is that mining rehabilitation can get offset credits up front. Say you have a mine up in Gunnedah and a koala population there, you can get up-front offset credits for that. You can say, "Okay, at the end of the mine, we'll rehabilitate that koala habitat." But if that is 30 or 40 years ahead, that might be too late for that population of koalas living in that mine.

The CHAIR: Probably.

Ms WALMSLEY: That is what the experts are saying. The degree of wriggle room around offsets means they have no ecological credibility under the new scheme.

The CHAIR: It sounds like the Biodiversity Offset Scheme is a bit of a sham, actually. Would you agree with that, or maybe using the word?

Ms WALMSLEY: Our concern is that everything is amenable to offsets. The only red lights you ever get are if it is a local project where you can show that there is a serious and irreversible impact, which is an even higher threshold than the precautionary principle suggests. For major projects, there is wriggle room and everything is amenable to offsetting.

The CHAIR: I wish we had more time, but we have already gone a couple of minutes over. Thank you both so much for attending the hearing today.

The Hon. MARK PEARSON: Very helpful, yes.

The CHAIR: It was very helpful. You have taken any questions on notice.

Ms WALMSLEY: There are a couple.

The CHAIR: The Committee has resolved that answers to questions taken on notice period within 21 days. The secretariat will contact you in relation to the questions you have taken on notice, or if members have any supplementary questions. Thank you so much for appearing.

Ms WALMSLEY: Thank you.

The CHAIR: That is the end of our hearing today.

(The witnesses withdrew.)

The Committee adjourned at 16:32.