

TRANSCRIPT

LEGISLATIVE COUNCIL ENVIRONMENT AND PLANNING COMMITTEE

Inquiry into Ecosystem Decline in Victoria

Melbourne—Thursday, 26 August 2021

MEMBERS

Ms Sonja Terpstra—Chair

Mr Clifford Hayes—Deputy Chair

Dr Matthew Bach

Ms Melina Bath

Dr Catherine Cumming

Mr Stuart Grimley

Mr Andy Meddick

Mr Cesar Melhem

Dr Samantha Ratnam

Ms Nina Taylor

PARTICIPATING MEMBERS

Ms Georgie Crozier

Mr David Davis

Dr Tien Kieu

Mrs Beverley McArthur

Mr Tim Quilty

WITNESS (*via videoconference*)

Mr Tom Crook, Facilitator and Programs Manager, East Gippsland Conservation Management Network.

The CHAIR: I declare open the Legislative Council Environment and Planning Committee's public hearing for the Inquiry into Ecosystem Decline in Victoria. Please ensure that mobile phones have been switched to silent and that background noise is minimised.

I would like to begin this hearing by respectfully acknowledging the Aboriginal peoples, the traditional custodians of the various lands we are gathered on today, and pay my respects to their ancestors, elders and families. I particularly welcome any elders or community members who are here today to impart their knowledge of this issue to the committee or who are watching the broadcast of these proceedings. I would like to welcome any members of the public who may be watching these proceedings via the live broadcast as well.

So at this juncture I will take the opportunity to introduce committee members to you. I am Sonja Terpstra. I am the Chair of the Environment and Planning Committee. Also appearing via Zoom with us today are Mr Clifford Hayes, who is the Deputy Chair; Dr Samantha Ratnam; Ms Nina Taylor; Ms Melina Bath; Dr Matthew Bach; and Mrs Bev McArthur.

All evidence that is taken today is protected by parliamentary privilege as provided by the *Constitution Act 1975* and further to the provisions of the Legislative Council standing orders. Therefore the information you provide during the hearing is protected by law. You are protected against any action for what you say during this hearing, but if you go elsewhere and repeat the same things, those comments may not be protected by this privilege. Any deliberately false evidence or misleading of the committee may be considered a contempt of Parliament.

All evidence is being recorded, and you will be provided with a proof version of the transcript, following the hearing. Transcripts will ultimately be made public and posted on the committee's website.

So could I just get you now for the Hansard record to please state your name and any organisation you may be appearing on behalf of.

Mr CROOK: My name is Tom Crook, and I am appearing today on behalf of the East Gippsland Conservation Management Network.

The CHAIR: Great. Thanks so much for that, and with that I will now invite you to make your opening remarks. If you could just keep them to approximately 5 minutes, I will give you a 1-minute warning as we approach the end of that time, and in that way it will allow plenty of time for committee members to ask questions of you. So thanks, Tom. I will hand over to you.

Mr CROOK: Thanks. My name is Tom Crook. I am the Facilitator and Programs Manager for the East Gippsland Conservation Management Network. I am science trained. I have got a science degree with a specialisation in biodiversity ecology, and I have lived and worked in the forests of East Gippsland for about the last 20 years. East Gippsland Conservation Management Network are a non-profit community environment group based here in East Gippsland, out of Bairnsdale, and we deliver a range of ecosystem restoration and education projects. We are currently the key delivery partner with the Department of Environment, Land, Water and Planning in the Lake Tyers deer management trial, funded by the Victorian government's biodiversity response program, and we work on a cooperative basis with a wide range of project partners, government agencies, traditional owners and others to achieve conservation outcomes for the region's rare, threatened and endangered plants, animals and communities. It is our contention that many ecosystems in East Gippsland are in a degraded state and declining in condition at the local, community and landscape levels, especially as a consequence of recent bushfires but also from ongoing forest management practices, the increasing pressures from feral animals, such as deer, and exotic plants, pest weeds and of course a fundamental lack of resource allocation to manage natural areas and the ecosystems they contain.

Twenty years ago when I first came to East Gippsland, NRE, the DELWP equivalent of the day, in Orbost was one of the area's largest employers. Now DELWP's natural environment team for the whole eastern region is only a handful of people. That is not because the forest management needs and the needs of the ecosystems to

be looked after have gone away, it is because governments have decided not to resource those needs or those areas. The task at hand is massive, yet we see a continued reduction in funding for natural area management.

Another example would be the Snowy River and Errinundra national parks. They are in excess of over 100 000 hectares, and we have got two rangers, who basically have to do all the work for those park areas—supplemented by some others, but that is their core responsibility.

I will just use a couple of specific examples—firstly, rainforests in the region. Look, rainforests in East Gippsland within the state forest sector of our forest estate serve a really good illustration of the types of problems faced by many ecosystems, where these problems are often systemic, almost wicked in nature, seemingly intractable and often quite political. Look, they really require long-term planning as well as decisive action to prevent and ultimately reverse the declines that we are seeing. Rainforests are suffering from a multitude of impacts, but the most severe appear to be fire, logging, sambar deer and the change in fire regimes under the changing climate. These factors are working in concert to degrade ecosystem processes, implicating specific species and species diversity of these communities, structural complexity of these communities and ultimately ecosystem function at a variety of scales, including the landscape scale.

Sambar deer, again, provide a really good illustration of the types of declines and the threats occurring to these systems, but they are also evident from other non-native pest species that are also known to impact other ecosystems, including rainforests, such as feral horses, pigs, dogs, foxes and cats. Deer in particular, and sambar deer especially, are decimating most of the region's coastal and hinterland rainforest ecosystems via a combination of selective browsing, antler rubbing, tracking, pugging and thrashing. This is something that I have personally witnessed over the last 10 or so years. Twenty years ago you would tell your mates if you saw a sambar deer. Now you cannot drive the backtracks out in the forested areas at night without seeing them. They are really just everywhere these days, and their impact is increasing. Impacts are really driving rainforest ecosystem decline in a lot of areas by changing stand species composition, removal or manipulation of recruitment, direct ringbarking of trees, subsequent decline in canopy cover and changing of light regimes within the rainforest systems, which are known to be critical to their maintenance, regulation and ultimately their ecosystem functions.

Look, another stark example of where ecosystems are declining is where these areas are being subject to forestry activity, in particular logging—clear-fell logging. I will start by saying here that I am not anti-forestry. I have got foresters in my family, and I actually support a native forest timber industry in East Gippsland. But unfortunately we do not have a sustainable native forest timber industry at the moment, and there are implications for ecosystems for how we currently manage forests. Logging is continuing to decline and in some cases drive ecosystem decline in East Gippsland. It is incorrectly assumed that forest ecosystems are adequately represented by our parks and reserves, when in reality that is absolutely not the case. Logging policies such as the regional forest agreements have failed ecosystem managers and the ecosystems themselves—

The CHAIR: You have got about a minute left, Tom.

Mr CROOK: in providing the legislative instruments to protect and manage those ecosystems. Forestry in complex multi-age, mixed species forest disrupts, degrades and destroys many natural ecosystem processes, such as the serial transition of communities in the absence of disturbance from wet forest to rainforest, the structural development of forests, habitat retention and habitat quality.

How we define 'rainforests' is also really problematic. We have opted for a purely structural rather than an ecological definition, and we see the same thing playing out with the definition, redefinition—or rather the field identification tool recently developed for the field identification for old-growth forests. The goalposts have been moved and now using the current identification method it is almost impossible to identify those old-growth forests. In theory they are protected, but in reality unfortunately that is not the case.

I would like to make comment, too, about the way we manage fire in the landscape and how native vegetation is managed on private land—things that have been addressed in this forum this morning—but I might just leave it there for questions. Thanks.

The CHAIR: Great. Thanks so much for that, Tom. All right, Dr Bach, question?

Dr BACH: Thanks, Chair, and thanks so much, Mr Crook, for being with us. I noted in your submission and also in your presentation to us this morning that you talked about pests, obviously principally deer. You briefly mentioned some other pests and the impact that they have on ecosystems as well. Would you mind expanding there so we could get a greater understanding of some of your views? We have heard at length about the impact certainly of deer but also, I am sure it will not surprise you to learn, of other pests on ecosystem decline.

Mr CROOK: Sure. Most of my direct experience in recent times has been with deer, running the deer control trial. That is something that I am probably the best versed in, but in terms of other pest animals, pigs are obviously a huge one, especially in alpine areas. We see their capacity to really be ecosystem engineers in the way they modify soil profiles and target specific species that have corms or specifically tasty roots. We see them digging up riverbanks along the Snowy and various other rivers, so they are definitely a wideranging pest that is having a range of negative ecosystem impacts and one that I understand there are some government programs in place to try and do something about, but I also do not believe that those existing systems or programs are adequate, and we really need to take a much more long-term view. Rather than just implementing a pig control program over year one or two or maybe three, we need a 20-year pig control program, and we certainly do not have that.

Otherwise I would suggest that our recent camera monitoring around the Lake Tyers area has picked up quite a few cats. We know that those coastal forests are some of the last refuges for small mammals. There are also foxes in there that are decimating those small mammal populations, and of course then we have got the feral horses in the alpine area whose populations are just absolutely out of control. Unfortunately those land management decisions seem to be governed by politics rather than science, so I think there is a lot of room for improvement in the way we manage those species in particular, not to mention invasive plants.

Weeds have a really significant impact on both agricultural production but also native ecosystems—so natural ecosystems, natural areas, rainforests. The problems are particularly acute in peri-urban environments, so around towns, because we see that a lot of the invasive plants are actually garden escapee plants—things like English ivy, wandering tradescantia, periwinkle, those types of plants that tend to be almost vine-like in structure and have the capacity to carpet the ground. They are ones we refer to in the industry as transforming weeds, so that is a plant that can get into a natural ecosystem and actually over time transform not only the species composition of those systems but the structural nature of the vegetation as well. We basically end up in an untreated situation over a long period of time with a huge, big patch of that particular species or one or two highly invasive, extremely competitive weeds to the exclusion of all else. So that is happening in some natural areas, but it does tend to be concentrated in peri-urban environments around towns.

There are obviously other ecosystems which are really affected by weeds that may be less so on the radar. I use the example of the Gippsland Plains red gum grassy woodlands. Less than 13 per cent of that ecosystem exists now, largely at the behest of agricultural clearing and such historical land use decisions, but where those ecosystems still exist weeds such as African lovegrass pose a massive threat to their ongoing condition, and they are in a state of rapid decline. I have been involved in managing some of those systems over the last couple of years, and it is really an uphill battle because there is just not the investment through government land management agencies, whether it be Regional Roads Victoria or the rail corporation—VicRail or whoever they are—managing the railroads. There is not an interagency or specific plan to make sure those areas are being looked after. The approach is patchy and sporadic, the investment is not consistent and it is very difficult to manage those areas without that continuity of funding.

Dr BACH: All right. Thank you very much.

The CHAIR: Ms Taylor.

Ms TAYLOR: Thank you—very interesting presentation. I think you probably ran out of time with regard to talking about forests and fuel loads and those kinds of things. There are a lot of different perspectives on that, I have noticed through this inquiry. It would be interesting to hear your perspective, so maybe you could just share that.

Mr CROOK: Sure. Again, it is hard to know where to start with that stuff. There is obviously a lot of conjecture and a lot of debate there, but certainly the ideas that we have heard this morning around burning our way to safety and the comparisons between Victoria and Western Australia are, I think, to be honest, pretty

misleading and a bit misguided. Look, we know fuel reduction burning is a tool, and it has a role to play in reducing rates of fire intensity and rates of spread—but only under certain conditions. We know that if the area has not been burnt in fuel reduction style in the last five years, then the effects of those fuel treatments are pretty negligible in being able to arrest either rates of intensity or spread. So fuel reduction burning can be used effectively, but its application is limited to the relatively short term, and clearly it is only really applicable right up against built assets and in protecting towns. And there are inherent impacts on natural systems and ecosystems from changing fire regimes and the use of prescribed fire, which ultimately, if it is going to be an effective tool, has to happen very frequently, and that is largely incompatible with a range of biodiversity values. So there is an implicit trade-off there that I think is often not recognised. It is assumed or people maintain that, ‘Oh, yeah, it’s the Australian bush. It loves to burn. We can burn it and we can have healthy ecosystems’. Well, that is rarely the case. There is that implicit trade-off there, so I would just make that point.

This magical 10 tonnes of fuel to the hectare in the McArthur fire danger index—look, my grandfather worked in the fire department of forestry for a very, very long time, so I am familiar with the research behind those ways of understanding things, and they have definitely got some merits, but these days there is a practical application to those tools. There is not enough money in government, even if we, notwithstanding the ecosystem impacts, were to burn enough of the landscape that we could ever hope to reduce the effects of those landscape-level wildfires. And we know—the science is really clear—when the fire danger index gets high and we are looking at those extreme fire weather days, no amount of fuel reduction burning slows down or has any real impact on those fires. I have witnessed that. Being in East Gippsland during those huge fires in 2009, 2014 and 2019–20, I have watched the fire weather behaviour. There are claims that those fuel reduction burns saved places like Nowa Nowa. I think you will find, if you look at the weather on the day, it was the weather patterns and a wind change, not the fuel reduction burn, that influenced fire behaviour around Nowa Nowa, and that is exactly the same as Bemm River. In Mallacoota, despite extensive fuel reduction burning occurring over many years leading up to that 2019–20 fire—it had had lots of fuel reduction burning—it did not make, really, any difference at all. And of course we saw those terrible impacts on the town irrespective of how the fuel loads were treated because fire weather is really the governing factor on those days, and when it is extreme fire weather behaviour the fuel reduction burning has very little, if any, moderating effect on fire severity or rates of spread.

The CHAIR: Mr Hayes.

Mr HAYES: Thanks, Chair. Thanks, Tom, for your very interesting evidence and the submission. I just wanted to ask you about something that you said. You said something like, ‘In theory old-growth forests are protected, but in reality they are not’, and also in your submission you say that logging is occurring in rainforests due to the way that logging is defined by the government. Could you flesh that out and maybe talk to some better ways of protecting rainforests from logging?

Mr CROOK: Yes, sure. So the way rainforest is defined is the principal issue there, and you will see the definition in its listing under the *Flora and Fauna Guarantee Act*. It is largely a structural definition, so it refers to the extent of—it looks at particular trees that have to occur, like rainforest canopy trees, and they have to be of such a specific spatial arrangement so as to bring about 70 per cent canopy cover; so if you are standing on the ground looking up, you can see less than 30 per cent sky. It is all the leaves you can see. And that is what really casts that deep shade and creates those unique rainforest ecosystems. In a functional ecosystem sense having a 70 per cent canopy cover is not required to be a rainforest. You can have the same species composition, and we look at littoral rainforest, which is not recognised under the state legislation but is under the federal *Environment Protection and Biodiversity Conservation Act*. It is a critically endangered listed rainforest community nationally. The structural component of its definition can require less than 20 per cent canopy cover.

So in reducing the definition or having a key component of the definition being reliant on the extent of canopy cover, what it does is allow all the areas that are in a functional sense a rainforest ecosystem—it is the same species composition but just not with such a large extent of canopy cover—to be defined as not rainforests and therein available for timber harvesting, logging operations, fuel reduction burns and other detrimental impacts, whereas if the definition was a truly ecological one, those boundaries would be drawn in different places. So, as it stands, the 70 per cent requirement is true really of only the best structural development—the last sort of stage in those community structural developments—rather than recognising them across a range of different structural developments, which are of course how they develop over time.

Mr HAYES: Could I have one follow-up question quickly, Chair? I just wanted to ask, Tom: I am very interested in sustainable forest industry too, but I just want to talk about the problems. The industry seems to be very dependent on clear-felling, with a lot of waste and a lot of woodchipping. I just wonder: is it possible to have a sustainable industry with selective logging practices, and how do you see that being done in an economical way? I mean, there may be more costs to it, obviously, but how could it be done?

Mr CROOK: I think you have touched on it there. Look, at the moment of course we see huge, big areas being cleared, with the majority of the biomass or the volume being left there and burnt and the majority of what is taken out being used for fibre and paper pulp domestically and for export. If we were to revert to a more selective harvest regime, as was done previously, that could potentially bring about a much more sustainable industry in an ecological sense, but I think you will find one of the reasons we have the clear-felled silvicultural system is that it is able to provide a revenue stream in the form of what they refer to as ‘residual wood’—that is all the logging slash and the trees that do not get used as sawlogs. It is supposed to be a sawlog industry, and there are certainly sawlogs coming out of the industry, but in terms of the revenue, the industry is extremely reliant on the revenue from the residual component or from the woodchipping part of it. So if you remove that, which you would if you went to a selective-based model and you did not have all those other trees lying around that were not going to get turned into floorboards, then the industry would struggle to be economically viable. And of course that is a real challenge because we are competing with countries who have invested more heavily in technology to make all sorts of dimensions of woods—laminated veneers and glulam and all those technologies. We are competing with them, and with free trade agreements that will not let us impose tariffs to provide a market incentive to buy local products, then it is very difficult for our industry to compete without the revenue from the pulp and fibre.

Mr HAYES: Right. Thank you.

The CHAIR: Dr Ratnam.

Dr RATNAM: Thank you so much, Mr Crook, for your really valuable evidence here today and in your submission as well. I think we had hoped we could potentially have a tour of the forest if we had been able to do a site visit.

Mr CROOK: I would be happy to take you around sometime.

Dr RATNAM: Unfortunately the circumstances at the moment mean that we cannot travel. But hopefully we can one day in the future, because you do have really great practical knowledge as well about the environment that you are working with. I wanted to take up one part of your submission, and I just wanted to say that I felt that your summary in your submission was really clear in terms of some of the reforms that could be undertaken now to improve biodiversity outcomes. So thank you; that was very clear.

Just taking up one point in your submission: you talked about the recategorisation of forests—the way in which forests have been defined using the term ‘advanced growth’ to enable logging of older forests. I would like you to expand on that and the impact that that is having. What do you know about this change, and what kind of impact is it having?

Mr CROOK: Sure—notwithstanding the fact that this is probably going to venture into some fairly technical forestry terminology and get a little bit confusing.

The definition of old growth is about a majority of the canopy being in the oldest growth stage of that particular system, and the definition is further about the proportion of regrowth trees, which is essentially a structural definition: if you are in a helicopter flying over and you look at the canopy of the forest, how much of the canopy, as a proportion or a percentage, is made up of trees in their oldest growth stage and how much is made up of trees in other growth stages, which essentially we refer to as regrowth. There are some other categories in between those—mature, overmature—and there has been a bit of debate historically about what constitutes a mature and a regrowth tree. Typically this work is based on research from forestry back in the 60s and 70s, or even the 50s. It really defines regrowth in a very specific way, and it is that conical-shaped tree, the form that those young trees take. We are talking about eucalypts here. There is obviously a variety of forest types, but it is predominantly eucalypts where the forest industry is based. A regrowth tree takes a certain structural form, typically sort of cone shaped, a big pointy thing, and as it matures it loses that cone shape and has more lateral branches and takes on more of the shape of a piece of broccoli, if you like, as a visual.

When we come to apply the definition of regrowth which came from the Woodgate study in the early 90s, it is about the proportion of the different growth stages in the canopy. Historically it has been about how much regrowth versus how much of that latest growth stage there is, and what has happened under this recent rejig of old-growth forest policy and the announcement that old-growth forests are all being protected is that there has been a redefinition of what constitutes regrowth trees. Previously, where a tree was 80 to 120 years old, it would have been classified as a mature tree and therein not counted as regrowth. It is now counted as a regrowth tree, and the definition relies on a proportion of regrowth in the canopy. So by moving what used to be a 'mature' into a 'regrowth' class, we now see a considerably larger proportion of forest stands not being defined as old growth on the basis that a majority of their canopy or a certain proportion of their canopy—and I think it is only 10 per cent—more than 10 per cent of the canopy is now made up of regrowth trees when in fact those trees under the old structural classification were mature trees. So they kind of moved the goalposts on what is classified as a mature tree and in doing so have manipulated the definition so as to provide, I would suggest, greater access to those areas which would have been excluded under the old-growth definition previously. That then allows the claims to be made, because the definition of those growth stages has been changed. It allows claims to be made around whether an area is or is not old growth. If you used the evaluation techniques from 20 years, you would say it is, but under the new field verification method developed by DELWP, you would say that it is not. Even though it is the same forest and the proportions are the same, the way they have defined the regrowth has fundamentally changed how those forests are now assessed through the new old-growth identification tool.

Dr RATNAM: And the timing of those classification changes—is that linked the government's announcement that old-growth forests are going to be protected? Is that what happened?

Mr CROOK: Absolutely.

Dr RATNAM: We had an announcement that old-growth forests are going to be protected, a big announcement around that, but then a change in the definition means that what was classified as old growth still gets to be logged, some of it.

Mr CROOK: Essentially, that is correct.

Dr RATNAM: All right. That is very troubling.

Mr CROOK: Yes, it is. I would not go as far as to say that was deliberate. I do not know what the decision-makers were thinking in that space at the time, but we certainly raised that as a big consideration. While DELWP, or the Office of the Conservation Regulator, were developing that infield identification tool for old-growth forests we pointed out this shortcoming to them. It was also the subject of a legal challenge, I believe, at the time, and these matters were forensically examined and demonstrated in that forum also. So I do not know. It just seems very convenient and possibly opportunistic that at the same time the government were looking to make an announcement on old-growth forests and the significant conservation gain—which would be viewed by some people as a positive and others maybe otherwise—that the definition of such things and therein the numbers of hectares and all that kind of stuff got a bit of a tweak and was fundamentally changed, essentially. But unless you looked at it very carefully and understood how we define these things and understood how the field identification tool operated, which a very small percentage of people would ever do, you were none the wiser.

Dr RATNAM: Thank you, Tom. That was really helpful. Very troubling to hear as well. Thank you.

The CHAIR: Ms Bath.

Ms BATH: Thanks, Chair, and thanks, Mr Crook. Mr Crook, you are coming to us as an ecologist, I see in your information.

Mr CROOK: That is what I get called, yes.

Ms BATH: Fantastic. Have you had that experience that the previous speaker Mr Packham has had—50 years of bushfire experience at the CSIRO, at Monash University, at the Emergency Management Institute and at the Bureau of Meteorology?

Mr CROOK: Well, obviously not being of the same age I would not claim to have the same experience, and I dare say we have lived different lives. So our experiences are obviously different. What I can say is that I have spent in excess of the last decade as an active, involved member of the CFA and working in forested environments in a range of different roles, including the Statewide Forest Resource Inventory, fire management, ecosystem management and threatened species management, that kind of thing.

Ms BATH: Thank you. But not to the level of Mr Packham. My next question is, and you have talked a lot about forestry here: are you aware that VicForests now almost exclusively goes to a variable retention rate and that that occurred probably a bit under two years ago?

Mr CROOK: Yes.

Ms BATH: And are you aware that within that system, within that model, within that operation, approximately 50 per cent of trees are left?

Mr CROOK: Yes, I am very aware of the terminology there. And as you would understand, variable retention harvesting is just that: it is variable. It was really implemented around the increased concern around the greater glider is my understanding and the scientific requirement or some research that suggested a 40 per cent retention of basal area within a logging coupe would provide additional levels of protection for greater gliders, as opposed to a clear-felling silvicultural system. But we certainly see, again, where we used to have clear-felling but now have variable retention harvesting, in some circumstances—in fact in quite a lot of circumstances, especially where it is a salvage logging operation on the ground, and I have seen many, many of these instances in the last 12 months going back the last couple of years—that on the ground there is actually not very much difference between the two systems at all. You end up with an area that has largely had the trees cut down and removed or burned, either-or. Certainly in some circumstances the move to variable retention harvesting sees more trees retained at a coupe-by-coupe level, but I guess it is fair to say that to achieve the same kind of volume output from the forest estate it just means more area has to be subject to that silvicultural system than if it was clear-felled. I think, too, it is probably—

Ms BATH: Have you got evidence on that, that there has been more? Because clearly the new model is not clear-fell, and there are really stringent regulations about the amount of area that is harvested and regrown every year.

Mr CROOK: No. What I am suggesting is that to achieve the same level of volume produced under a clear-fell silvicultural system under variable retention harvesting, you would need to log a larger area. Now, it is not my understanding that volumes have in fact increased. I do not think that they have. I am not sure what the sustainable yield figure for East Gippsland is currently—probably about 140 000 cubic metres, is it? I do not know. Maybe you know that. But it is certainly the case that we see in a variety of circumstances that the end product under whether you want to call it clear-felling or variable retention harvesting is in fact the same or a very, very similar outcome.

I think what has really happened is VicForests have tried repeatedly to get Forest Stewardship Council certification over the years, and they have not been successful in doing that. In an attempt to try and increase their level of environmental credentials, they have moved to what is more widely accepted in the international forestry scene, if you like, to variable retention harvesting, because it is more reactive to other forest values rather than just wood volume, much more so than clear-felling is, but it does not imply that that silvicultural system results in a better outcome for biodiversity in all cases. In my experience it does not.

Ms BATH: Thanks. Thanks, Chair. And one final one: what evidence do you have, Mr Crook, that forest-dependent species have become extinct as a result specifically of, we will call it, harvesting or logging?

Mr CROOK: I cannot point to any species that have become extinct as a direct result, but there are certainly a number of species which are experiencing significant declines, and we know that forestry operations have a major impact on some of the critical habitat resources required for those same species. So you cannot say that logging has caused the extinction, but it has certainly been a contributing factor. For the masked owl, the powerful owl—any of the large forest owls—long-footed potoroos, greater gliders and various other species, forestry operations, by virtue of their impact on those critical habitat resources, particularly hollow-bearing trees, are having a detrimental impact where those animals occur and so are contributing to their declines at a landscape scale.

Ms BATH: Thanks, Chair. And finally, let us finish where you started in your presentation. We have had this year in East Gippsland about—no, it was not this year, it just feels like it is still flowing on—1.5 million hectares of out-of-control bushfire. That has to have a significant effect on the population, health and species. But I am interested to know: have you in your experience engaged with the Indigenous Firesticks workshops? They have been going for 10 years. Victor Steffensen is a key fire practitioner. Has that been something that you have engaged with? And any learnings from that if you have?

Mr CROOK: Look, yes, it has, but I have not been heavily engaged in that. I have been to one of his workshops, and I work quite closely with the Gunaikurnai Land and Waters Aboriginal Corporation here in Gippsland, who are increasingly involved in implementing traditional land management practices, including cultural fire. So there is certainly a lot of room for improvement in the way we manage fire across the landscape, and it will be really interesting in coming years to see the incorporation of Indigenous land management techniques. I think there is definitely a role for them to play in both hazard reduction and the ecological management of forest ecosystems.

The CHAIR: Great. Thank you. Mrs McArthur.

Mrs McARTHUR: Thank you, Chair. And thank you, Tom. Now, we heard from the previous witness that only 11 per cent of, I think it is, DELWP are actually out in the field. The rest are in basically offices, probably in the CBD area, really. We are always being told that we need a lot more funding to manage our forests and our ecosystems and our environment, but actually, wouldn't it be better if we had more people out in the field and out of the offices? That is my first question.

Mr CROOK: Look, I think there is a balance to be struck between people writing the reports and filling in the spreadsheets and people out in the field actually doing the hanging on shovels and measuring things and doing things out in the forest.

Mrs McARTHUR: Is 11 per cent the right ratio, do you think?

Mr CROOK: It does not sound like it to me. I think there is a lot of room for improvement in the amount of resources we put into managing ecosystems, whether that is through controlling weeds or doing surveys around threatened species or other ecosystem elements or elements of forest management. Certainly out in East Gippsland the on-ground staff are pretty stretched. They are few and far between, and we could do with a lot more of them. Whether that is at the expense of the people in the offices in Collins Street or wherever, I do not know, because I could not speak to exactly what they all do. But yes, certainly more boots on the ground—

Mrs McARTHUR: That would be interesting.

Mr CROOK: and certainly more research and understanding of what is happening in our forests is most warranted.

Mrs McARTHUR: Thank you. Now, you are also obviously an expert in all these feral species. Can you just tell us how many litters a pig would have in a year and how many within a litter—same for the deer and the cats, the foxes and the wild dogs?

Mr CROOK: I could not tell you that just off the top of my head for all those species. For pig gestation I would be almost guessing, and I would say eight to 10 months. I think they can have up to 12, maybe even more, at a time. I think cats are about three months, dogs are about six and deer are about 11. Deer typically only have a single offspring, but sometimes they have twins. As you would know, for most domestic cats and dogs they are not much different. Their litters can be quite large, but survivorship is really based on the level of resources around when they breed. They certainly cannot do what our native species do and put off reproduction until the times are good. Once they go into heat they breed, and quite often a lot of them do not survive. But I can certainly assure you, irrespective of their reproduction rates, they are all doing extremely well out there.

Mrs McARTHUR: Yes, that appears to be the case. Can you tell us how successful this aerial shooting is of deer? Are Parks Victoria shooting pigs in the same way?

Mr CROOK: I think that the work we saw immediately post fire through the BBRR, whatever that stands for—theme 4 of the government’s post-fire stuff—

Mrs McARTHUR: It is too hard, that.

Mr CROOK: Yes, yes, all of that. So the aerial culling stuff—I think that targeted a whole suite of different species. I am not 100 per cent but I am pretty sure that pigs would have been included in that, as would any of those listed feral animals—deer—except horses of course. How effective was that? Look, when coupled with the ground shooting activity that we have seen it has been quite effective at getting pretty good numbers of animals. It has not come at no cost of course, but it has been a good experimental trial of, again, a tool that I think has its place in the overall range of management techniques that need to be implemented. So the ground shooting that has occurred on deer, for example, around the deer control that I help run—they have taken about 500 sambar deer out of that area in about 15 months.

Mrs McARTHUR: Out of what is the total amount, would you estimate?

Mr CROOK: The total amount of deer shot?

Mrs McARTHUR: No, the population.

Mr CROOK: Of sambar deer?

Mrs McARTHUR: Five hundred out of what?

Mr CROOK: Well, that is only out of a very small area. So if we were to talk about the population in Victoria of sambar deer, we would be looking at in excess of a million, but the aerial culling program coupled with the ground shooting—I am not sure what the numbers are, but they have certainly hit in the thousands. It is about the localised impact that those animals have on specific ecosystems and that program’s capacity to ameliorate those impacts in that post-fire environment. So, for example, with rainforests that has been quite successful. The fire itself of course killed an awful lot of deer, and that immediate protection work post fire on culling deer in those especially sensitive areas like the rainforest areas—I know of a couple of examples that have been quite effective. I cannot speak to the broader program.

Mrs McARTHUR: And tell me: when these—

The CHAIR: Last question, thanks, Mrs McArthur.

Mrs McARTHUR: feral animals are shot, are they left there, and is that then food for the dogs and cats? What rate do you estimate that population is growing at?

Mr CROOK: So it depends on the program as to what happens to the animals. We have certainly seen commercial utilisation as a part of this broader landscape control of deer. So, for example, they had a shipping container coolroom up at Bindi station, out towards Omeo. They put 900 deer through that coolroom, and they were all used mostly for animal consumption—exported to the US. A lot of the other animals that are shot in more remote areas, obviously their carcasses are left there. The limited amount of research—

Mrs McARTHUR: And wouldn’t that encourage the dogs and cats, though?

Mr CROOK: So it is an interesting one. The limited amount of research that has been done on that—and that was done by Dave Forsyth and others—really suggests that it does not feed wild dogs to any great extent, because while they might gorge themselves on a single carcass under a particular control program, what populations of feral animals really need is a consistent food resource through time, and culling operations do not provide that. They provide a pulse in resources, and populations cannot persist on a pulse. It may increase breeding success temporarily, but what we do understand is that a vast majority of those animals that are shot are actually broken down by insects and bacteria, not eaten by dogs.

Mrs McARTHUR: Okay. So the dogs and cats prefer the native animals—

The CHAIR: Sorry, Mrs McArthur, we are out of time. Thank you very much, Tom, for your presentation and your evidence today. We really appreciate you coming in and speaking to us.

Mr CROOK: Thanks very much. Have a great day—tour you around East Gippsland whenever you like.

Witness withdrew.