T R A N S C R I P T

LEGISLATIVE COUNCIL ENVIRONMENT AND PLANNING COMMITTEE

Inquiry into Ecosystem Decline in Victoria

Melbourne—Wednesday, 21 April 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
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Mrs Beverley McArthur
Mr Tim Quilty

WITNESS

Professor David Cantrill, Executive Director, Science, Royal Botanic Gardens Victoria.

The CHAIR: I declare open the Legislative Council Environment and Planning Committee 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 traditional custodians of the various lands which each of us 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 also like to welcome any members of the public watching these proceedings via the live broadcast today as well.

At this juncture I will just take the opportunity to introduce the committee members who are with us today. My name is Sonja Terpstra. I am the Chair of the Environment and Planning Committee. This is Mr Clifford Hayes, who is the Deputy Chair. Joining us via Zoom we have Mr Stuart Grimley and Dr Matthew Bach. Now back in the room, we have Mr Andy Meddick, Ms Melina Bath and Mrs Bev McArthur.

All evidence that is taken today is protected by parliamentary privilege as provided by the *Constitution Act 1975* and further subject 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.

If I could just get you now to state your name and the organisation that you represent, just for the Hansard.

Prof. CANTRILL: Professor David Cantrill, Executive Director, Science, and Chief Botanist at the Royal Botanic Gardens Victoria.

The CHAIR: Great. Thank you very much. With that, if I can get you to commence with giving your opening comment, but just keep it to about 5 minutes, if you can.

Prof. CANTRILL: Five minutes. Okay. I did notice you had given other people 10, but I will—

The CHAIR: No, not now, because there are actually so many of us on this committee we have had to cut it down because that means we get more time to ask you questions.

Prof. CANTRILL: Yes. That is great.

The CHAIR: So we have to be very streamlined.

Prof. CANTRILL: Thank you. I will keep it brief then.

The CHAIR: Yes. Thank you.

Prof. CANTRILL: Thanks very much for the opportunity. I guess for members of the committee, a bit of background on the gardens: the gardens, as we well know, are a beautiful place in Melbourne, but the thing behind the gardens is we maintain living collections, curated collections, which include about 2500 Australian species or Victorian species and about 981 that are on the Victorian rare or threatened list. So we curate and look after those. We also have bushland at Cranbourne, the Cranbourne Gardens, and there there are 42 taxa that are of concern. So we are sort of experienced in managing threatened flora.

The gardens has a science division, which currently has 57 staff, and about 25 of those are ongoing and the rest are on short-term contracts. Those staff members have expertise in ecology, conservation genetics, describing and documenting flora and a raft of other skills, including looking after the dead collection. The herbarium

contains pressed and dried plants from all over the world. There are about 1.5 million specimens in that collection, but of those there are 302 000-plus Victorian records and those records are fed into things like the Victorian Biodiversity Atlas and other national and international databases for use in management.

I guess the three real things that we work on are what I like to refer to as custodians of names, so that is we name and describe plants and we maintain a list of names. And of course if you do not know what something is called it is pretty hard to manage it, and equally if you do not know what the correct name is it is hard to protect other things from that particular taxon. We have a conservation seed bank where we are actively collecting threatened flora, conserving it for the future as an insurance policy against extinction and developing knowledge around it that allows us to put those things back in the ground. And in putting things back in the ground, we have things like our orchid conservation program. Orchids are particularly threatened. There are 1963 current taxa recognised in the country, about 10 per cent of the flora, and of those, 463 occur in Victoria. We currently work on about 80 taxa, or we have capacity to work on 80 taxa that are listed under federal or state legislation, not just in Victoria. We currently are working on about 35. We are also involved in recovery teams as well, so our expertise is going into recovery teams.

I guess that sort of gives you the background on what knowledge we have and how we might be able to help, but I would just like to conclude with a statement that sort of resonates with us. We had a marketing person starting with the gardens and they said, 'Why are you doing this science?', and one of my staff members said, 'Well, no plants, no life'. If we do not have plants, we do not have any life on the planet. That is sort of a really interesting statement and one that is really important to us. Thank you.

The CHAIR: Great. Thanks very much. I will go to questions. Mr Grimley.

Mr GRIMLEY: Thank you, Chair. Thank you, Professor, for your submission. I just have a couple of quick questions. Can you please describe how the Royal Botanic Gardens Victoria engages with the scientific community to pursue environmental conservation?

Prof. CANTRILL: Yes. Thanks for the question. We engage on a variety of levels. We have joint collaborative research projects with the university sector. We are involved in conservation offset research and we are involved through a number of national peak bodies in sharing data. The data that is in our database on the Victorian or on the Australian flora is shared through publicly accessible databases such as Australia's virtual herbaria, the Atlas of Living Australia global bioinformation facility and a range of other databases, and that data is heavily used. Just as an example, in the last 12 months we have had 57.1 million records downloaded through about 15 000 events, and they have been used for ecological assessments, ecological research and biosecurity.

Mr GRIMLEY: Wonderful. Impressive stats. Just one more quick one, and you may or may not have the answer to this; if not, we can take it on notice: can you elaborate on how the Royal Botanic Gardens educates the public about the importance of conserving native plants and vegetation?

Prof. CANTRILL: We have a division of the gardens, our engagement and impact division. They run education programs for primary and secondary students and broader members of the public in plants, botany, conservation and a whole raft of programs in that space. That is how we are engaging with the public. We engage through our public programs, through signage and other things in the gardens as well plus our web presence.

Mr GRIMLEY: Wonderful. How do you think the Victorian government could do this better?

Prof. CANTRILL: Do the education better, or—

Mr GRIMLEY: Yes, the education factor in terms of educating the public about the importance of conservation.

Prof. CANTRILL: I think that is a really important issue. How we can do it better, I am not really an expert in that space, but it is something that we do need to do. As we know, if people are not connected to things, then they are not interested in things and then it makes it more difficult to conserve those things. In the Bio 37 plan the goal that Victorians value and act for nature is a really key goal, and we look at ways how we can contribute to that.

Mr GRIMLEY: Wonderful. Thank you, Chair. Thank you, Professor.

The CHAIR: Mr Hayes.

Mr HAYES: Thanks very much, Professor. I was just looking at your submission this morning and I am just interested in where it says:

> … all projects to *avoid impacts rather than offset impacts* are required urgently.

And I just wondered if you could possibly comment on the use of offsets rather than conserving what is actually there.

Prof. CANTRILL: Yes. I mean, offsets by their nature mean that you are going to have an adverse impact in one area and you are going to have a hopefully positive impact in another area, but of course the impact you are having in the area was already there, and so offsetting by its very nature results in a decrease in the total area of vegetation for conservation matters. And I think, you know, one of the things that we need to look at is: is that really a good way to look at things in terms of offsetting? Do we actually get benefit by hopefully improving a small area when we have already cleared so much of the state? About 50 per cent of the state has already been cleared. Can we afford to lose more space through offsetting—

Mr HAYES: Are we really gaining anything?

Prof. CANTRILL: and are we really gaining anything? So it is a wicked problem, and I think one of the things that we do in the offset space is we are developing knowledge often for these offsetting programs. So in many cases, or in a number of cases, we cannot actually find land on the ground to act as an offset, so one of the other mechanisms that we have in that framework is to create knowledge that can then be used to inform conservation actions. So then you have got to weigh up: is that gain in knowledge actually of greater benefit than having lost that piece of vegetation with those particular species in it?

Mr HAYES: Yes. I am very interested in the idea of marketing to the public, too, and what that message sends. Social marketing and behaviour modification approaches you also talk about in there, and I am wondering if you have got any suggestions. Like, I think changing our numberplates from the 'Garden State' to 'Victoria on the move' was one way of marketing a certain direction.

Prof. CANTRILL: That is right.

Mr HAYES: Should we consider some sort of mass marketing similar to that to make us more aware?

Prof. CANTRILL: I think what we are seeing is our community is increasingly urbanised and increasingly disconnected from the natural world, and that is something that we are trying to raise awareness of in the gardens through our public programs and things. We want to connect people back to nature, because if we can connect them back to nature then they will value nature. So that is the challenge that we have in that space—to actually get that connection. If you look at other things that have been done in other areas—you know, public programs on anti-smoking or why people should give up smoking—those social engineering campaigns have been very successful, but it is not something that we really do for the environment. That may be something that we do need to think about just in terms of activating the Bio 37 plan and that goal 1—having some really hard thinking in that space.

Mr HAYES: Thank you.

The CHAIR: Dr Bach.

Dr BACH: Thanks very much, Chair, and thanks, Professor. It was fascinating to hear from you. I am particularly concerned—and this I think piggybacks nicely off the conversation you were just having in relation to the question from Mr Hayes—with the preservation of green spaces and more broadly ecosystem decline in metropolitan areas. I am a metropolitan MP from the eastern region, and we have got so many areas of, in my view, quite unique natural beauty like the Banyule Flats and also Blackburn Lake. I wonder if I might tease out some thoughts from you, sir, about the manner in which currently we are acting to seek to preserve especially flora in those areas and any thoughts from you about how we could do things differently or better?

Prof. CANTRILL: I think urban green spaces are really important for the public. Just forest therapy, which is something that we run at the gardens, is a concept that was developed in Japan and it is really that immersing yourself in the natural world is known to give health benefits. So having those green spaces is important. Whether the urban environments are the best spaces to conserve plants is another question, because there are a

whole range of pressures in the urban spaces and it varies from situation to situation. So it is a challenging one. It is possible in some cases, but in other cases where the environment is so heavily modified for the conservation of native things it is perhaps a little more limiting.

Dr BACH: All right. Thank you very much. I am noting and accepting your comments. I have a personal view that, given the kinds of pressures that you are talking about, it is really important to seek to preserve to the greatest possible extent the amount of space that we currently have, the amount of green space that we currently have, in metropolitan areas of the state. Do you feel similarly that that is important, and if so, why?

Prof. CANTRILL: Yes. It is important to me to conserve and to have as much green space as possible, and I think the other bit that is important is to have enough tree cover as well. We know that as tree cover declines you get urban heat island effects. Dropping canopy below about 30 per cent is a bit of a threshold. There are people at Burnley that work on this and have got data. Greg Moore is the person to speak to about that. But that urban canopy is a really important issue as well.

Dr BACH: All right. That is great. Thank you very much.

The CHAIR: Mr Meddick.

Mr MEDDICK: Thank you, Chair, and thank you, Professor. Boy, where do we start? I mean, I could sit here and ask questions of you for hours on a whole host of different things, so I will keep it quite short. I am interested in parts of your submission where you are talking about the prevalence of invasive plants and animals, and I am looking at that relationship. You know, a lot of the research has been around: where we have invasive species of animals, there is a greater prevalence of invasive plants, like weeds et cetera, that are encouraged by their presence and increase. Where do you see the role in the interaction of reintroducing native species in a return of the prevalence of native plant species to those areas? It has been stated that where we have lots of rabbits and lots of foxes, for instance, if you reintroduce the dingo who will take care of those and kill those animals off, there is an argument being made that a lot of native plant species will be free to return. Does that hold up under your estimation?

Prof. CANTRILL: I am certainly no expert on animal biology and those sorts of impacts. I guess where I can comment in that sort of space is that the orchid conservation work that we do is complex, and I think orchids are a good example of the complexities of the things that we are dealing with. In fact they are a little bit of a canary in the coal mine in a way because they are so specialised. They rely on a fungus in the soil to germinate the seeds. The seeds do not have any food resource, so if the fungus is not there, the seeds will not survive. They have very specialised pollinators. If the pollinators are not there, they become disconnected. So to reintroduce those sorts of threatened things we have to understand the whole biological system and then make sure all of those pieces are in place before we can even attempt to put them back in. Then, having put them back in, you really need to monitor what is happening—that is a really critical thing—so that you can either adaptively manage that situation or say, 'Well, it's not going to work. We've failed at this attempt, but we've learned something, and we can move on to the next thing'. So that is one aspect of it.

The other bit in that invasive species space is, to me, it comes down to how we value things and the different sets of values that we place in different settings. I think the invasive species people, when you spoke to them, talked about tall wheatgrass, and that is a really good illustrative example, because tall wheatgrass is particularly good in saline-damaged environments. It is a good pasture species. So introducing that would have economic benefit for the state and for the farmers because you increase the amount of arable space. You can start to generate income off the land that was once not so productive. So you can actually value, 'What does that mean to the economy?'. But on the other hand, because it is so good in saline environments, that grass will invade saline environments, native saline environments, which contain threatened species. So how do you weigh those things up? Because we are very focused on the economics, the environment often gets left behind. So we need to work out some way of better valuing that system when we are making those decisions.

Mr MEDDICK: So a legislative framework?

Prof. CANTRILL: I am no expert on legislation. I do not know how you would achieve those things.

Mrs McARTHUR: Neither are we. That is why you are here.

Prof. CANTRILL: I am here to talk to you about the science. What mechanisms you put in place for that, I think, is the challenge.

Mr MEDDICK: I understand. But certainly we could say, using your example of a saline environment, that only x amount of that land, for instance—and I am just spitballing numbers here—or an x percentage could be given over to that sort of thing, but with regulations in place to stop the spread of that into other areas where those threatened species are and have that done within a legislative framework so that there are actually penalties for not being responsible land managers and making sure that that happens.

Prof. CANTRILL: I think that is great in theory, but of course plants, which are our things, do not read the legislation. They just do their biology and so, you know—

Mr MEDDICK: Of course.

Prof. CANTRILL: it is very hard to legislate to deal with biology.

Mr MEDDICK: Thanks very much.

The CHAIR: Thank you, Professor, for your submission and your evidence so far. I note on page 4 of your submission you talked about 'the three most important actions to have the greatest impact upon halting decline'. I just want to talk to you about the first one. You said, 'Reverse the loss of vegetation through clearing, with reconnection of patches of vegetation across the landscape'. As a practical thing, how do you see that actually happening? How could that happen?

Prof. CANTRILL: I think we need to be nimble in this space. Farming practices change. There is a really great example at the moment—a program called 'conservation corners'. With the shift to broadacre farming, because of the machinery having to turn, it leaves the corners of fields—it cannot get in there to harvest. So that is an opportunity. Being nimble and looking at those sorts of things is another thing. I was up in the north-east recently through where the fires have been, and those patches of vegetation are really critical for enabling organisms to move across the landscape. One thing I did notice was because the fires have gone across the arable land they have taken out all those paddock trees; there are big piles of windrowed paddock trees now in those areas. So all of a sudden that landscape as a result of that event has lost a whole lot of connectivity. Really that is the challenge, because as the climate warms things will want to change their distribution—we already are seeing those shifts in distribution—and we cannot necessarily assist organisms to do that. So having something there that enables them to move through the landscape is important unless we want to spend a whole lot of money moving them ourselves.

The CHAIR: Are you suggesting then that there needs to be some kind of methodical or planned approach to perhaps doing what you are suggesting in terms of reconnecting? We have heard a lot about invasive weed species as well. Is that part of that reconnection—that you would somehow look at managing the invasive weed species and then regenerating? And another point that people are talking about, which is an interesting theme to me, is not just conservation or protection but restoration. When we talk about conservation, I think it is an interesting thing: people talk of conservation, but do we really mean restoration where some of those landscapes have been diminished?

Prof. CANTRILL: The restoration one is a really interesting space. We are not experts in restoration; there are people around that are. I think in terms of the outcomes you have also got to think of what the goals are in that space. So we can restore native grasslands at the moment and make them look like grasslands because they will have the key species in the kangaroo grass and the poas and things, but do they have the high conservation value species in them? They are the things that are more difficult to get back into those landscapes, because of the biology. They are rare for a reason. They are rare because we threaten them. They are rare because their biology means they are confined to a small niche. So the bigger challenge to me in the restoration space is: how do we get those rare and threatened things back into the landscape?

The CHAIR: Okay, great. Thanks very much for that. Ms Taylor.

Ms TAYLOR: Yes, and I just apologise: I was caught in traffic but still very obviously interested in what you are talking about now. I am just wondering about that important element of soil and how we foster it, because ecosystems obviously need healthy soil and I know that perhaps in years gone by both in cities and in the rural areas there was a focus on commercial fertilisers and other products which in the long run can leach out some nutrients in the soil. What is your perception about what might be needed in terms in enhancing soil quality in both cities and regional areas? And I do not want to just pick on farmers here; I think in the cities—

Mrs McARTHUR: Have you been to a farm, Nina?

Ms TAYLOR: Here we go.

Prof. CANTRILL: I cannot really comment on that because I am not an expert on soils. But what I can comment on is what we know about some aspects of biodiversity in soil.

Ms TAYLOR: Good.

Prof. CANTRILL: There is a program of work called Aus Microbiome that is sampling soils across the country, and they are using DNA technology to look at what is in those soils. When we look at those soils and the DNA that comes from them, we can identify how many species of fungi are within the soils, and it highlights really the gap in knowledge that we have, because staff at the gardens have extracted that and they identified over 44 000 species within Australian soils across Australia.

Ms TAYLOR: Goodness!

Prof. CANTRILL: Yet we have probably only described about 6000 to 8000 species. So there is an enormous gap in knowledge there just of what is in the soils, and then on top of that we do not even know what all those things do. They are in the soil, but what are they doing? What is their role in the soil? It is these enormous knowledge gaps that we have got that we have got to work out how to fill so that we can make informed decisions.

Ms TAYLOR: Great. We landed in a much more interesting place than I even thought we would. That was good. Thank you.

The CHAIR: Dr Ratnam.

Dr RATNAM: Thank you so much, Professor Cantrill. I am sorry I was not here for the start of your presentation, but I was listening online—the wonders of technology. So thank you so much for your presentation today and the incredible work the Royal Botanic Gardens do. I have a couple of questions which are kind of linked. Firstly, would you mind repeating—I just did not quite catch it—the numbers you gave of how many threatened species there are in Victoria and how many you are working on?

Prof. CANTRILL: I do not have the numbers of threatened species in Victoria, but what I do have are the numbers of species that we have in the gardens, so in what we call ex situ conservation. So we have currently got 2500 in round numbers across both our sites, and of those, 981 are in what we call the Victorian rare or threatened list. This is an old list that was created way back, but we still use it.

Dr RATNAM: Fantastic. My second question was: in an ideal situation, say, where funding was not a barrier to our conservation work, what programs or activities do you think the Victorian government should be undertaking and what role could you play in it to conserve our plant species?

Prof. CANTRILL: It is a great question. I would refer you back to the presentation that Brendan Wintle gave, Professor Wintle. He provided some estimates of what it would actually cost if we were going to look at really stepping up our effort in species conservation. I think he was talking of sums around $300 million a year for threatened species conservation, which is a big sum of money, but when you look at what the natural environment gives to the Victorian people and the Victorian economy, I would say it is trivial.

Dr RATNAM: My second part of the question was: if it was not a barrier, so the cost was not a barrier, what programs or activities do you think the Victorian government could be doing or doing more of, and what role could the Royal Botanic Gardens play in that in terms of conservation of species?

Prof. CANTRILL: So I think one of the things that was identified in the *Biodiversity 2037* plan is that goal 1, Victorians acting for nature. To me that is one of the really important bits to activate within that plan, because if we can get Victorians to value nature they are more likely to act and they are more likely to fund things. I think that is a really important aspect. The other thing that is important is the effort on monitoring. When I look at our herbarium records, we have a big peak of data in the 1980s. That was part of a concerted effort to survey what we had in the state and all the rest of it. That survey effort has dropped off over time. That is fine on one hand, but when you consider that that bulk of data in the 1980s is a big bit of data that we are using to evaluate what is happening now, in a way you question the data currency. Now, there are ways of dealing with that in terms of modelling and things, but modelling has not necessarily got all the data it needs underneath it. It is a model.

Dr RATNAM: Do you have any background in terms of what levers were around that got that surveillance work done? Do you know much about what happened then?

Prof. CANTRILL: It was a bit before my time, so I can take that as a question and dig that out for you.

Dr RATNAM: No problem.

The CHAIR: A question on notice, perhaps.

Dr RATNAM: Yes, because we are looking for solutions, and data definitely is becoming a dominant theme. It is interesting in terms of a number of our academics who have presented as well. There are contestations now because the data is not very good and it opens up this space where, you know—

Prof. CANTRILL: It is interesting in that whole space. The herbarium records—we have got records that go back to 1770 for the Australian flora. We get researchers that are trying to access the data to do longitudinal studies, so studies of changes through time, and often they will say, 'I'm really interested in this particular species because of the environment it occurs in. I think there are changes. I want to do a longitudinal study. What records do you have?'. And when we look at the records that we have got, going right back as far as we can, we have often got big data gaps. We have got good information, I would say, for the late 1800s, but then the herbarium was neglected really for about 40 or 50 years. The amount of data we have got in that period, from, say, 1900 to 1940, is really very sparse. It probably goes on a little longer than that. And when we get to the 60s we start to pick up and we have got good data coverage. So it is really hindering the researchers that want to do those longer time series studies. So that is why we are currently trying to up our data acquisition, but you are balancing all these competing resource requirements. We do what we can, but I think that is a really important aspect to look at, because the data we collect now is important for the future. It might be relevant to a particular study now, but institutions like the museum and us can have that longer time perspective.

Dr RATNAM: Great, thank you.

The CHAIR: Ms Bath.

Ms BATH: Thank you, Professor Cantrill. This is very, very interesting. I want to pick up on a point that you have got in your submission, and you spoke to it just then: when Victorians value nature, they are more likely to act for nature. There are thousands of Victorians, either paid or volunteer, including farmers, who care for nature and actively conserve and restore nature. There are others—millions—who just enjoy it and leave a footprint and nothing else. There is a small percentage who do not understand and do not care; they will pillage nature. I want to just ask about the work that the Royal Botanic Gardens does on species on riparian land, so on our river frontages, our lakes et cetera, et cetera, and I am doing this with an aim for your good suggestions. When government has legislated around camping on river frontages and is making regulations for those river frontages, what do we need to understand that is important to protect and conserve or enhance those areas?

Prof. CANTRILL: We are not actively working on river frontages and those riparian things, or we do not have a direct program of work in that space. We do collect in those environments to document the flora, and that goes back to the data question—it is where we are collecting and what data then becomes available for people that are looking at those sorts of things.

Ms BATH: Can I ask a supplementary on that one. Do you have a list of riparian vulnerable species and where you collect your information from—so what rivers or streams et cetera—and could you provide that to the committee after some research?

Prof. CANTRILL: Yes. There is a bit of a lag from when it gets collected to when it gets into the database, but I can certainly pull out where we have collected and what we have collected for you.

Ms BATH: What species are vulnerable.

Prof. CANTRILL: What species and those things, yes.

Ms BATH: That is good, just because it is important to track this and preserve. I think that is my request. The other line of questioning I have got: in your submission you speak about conservation activities on some public land, and I would really like you to unpack that there is passive conservation—we just stop and look at it and let it go for itself—but there is active conservation. I would like the Royal Botanic Gardens' position or thoughts around the importance of active conservation, and what would you like to tell the committee?

Prof. CANTRILL: Yes. I think the active conservation is an important aspect. Our expertise is in rare and threatened species. When a problem is identified we then look and see what we might be able to do to help in that space. We are not necessarily directly doing the actions, but we can provide expertise and knowledge about the requirements of those plants and what might be needed to support them. I will give one example. So, *Nematolepis wilsonii* is a plant that is only known from a few populations in the Central Highlands. It was brought to our attention that sambar deer were rubbing antlers on it and ringbarking the trees.

Ms BATH: Does it have a non-botanical name for the population?

Prof. CANTRILL: I do not know what the non-botanical name is. It is related to boronias.

Ms BATH: So it is a small shrub?

Prof. CANTRILL: Well, actually they get reasonably large, to a few metres. This was an old stand that was getting ringbarked by the sambar deer rubbing their antlers on it and effectively killing it. It would have taken that population out completely. So we were asked to conserve various germ lines. That meant taking cuttings from as many different individuals as we could to ensure we maximised the genetic diversity and then bringing those into propagation in our nurseries and then someone else being able to find another site where they might be able to go back in the landscape. But at the same time, that population was proposed to be fenced and fenced off. So you can do those sorts of things as well. Unfortunately it got burnt in the 2003 fires, I think it was; it was one of the bigger fire events that went through that area. So the whole population was then subsequently lost due to the fire rather than the deer.

Ms BATH: So you have touched on two main things—fires and then invasive species—that are the real threats or of significance, and we have seen it time and time again in this inquiry, to vulnerable species.

Prof. CANTRILL: Yes. I mean, fire regimes are one of the things that drive ecological processes, depending on your fire frequency, and determine what sort of species you might have in that space. So fire frequency is important. Things will just shift depending on what they are seeing.

The CHAIR: Mrs McArthur.

Mrs McARTHUR: Thank you, Chair and Professor. I want to get on the record that I am a passionate gardener, and like my local member, the Member for Polwarth, we own historic gardens, but we see ourselves not as owners but custodians of these spaces. But at the same time, I would like you to comment on whether it is appropriate. I see gardens as living, dying things. You cannot necessarily save every item within a botanical space. You may be able to replace it, or you may be able to replace it with something better because historically some of the plants that were available were very narrow in their extent whereas now we have a much greater variety and a better variety. So do we conserve at all costs? Is that the way to go, or should we look at how we preserve the aspect more than anything else? Secondly, I am interested also in local government management of public spaces. Particularly in my electorate, which is Western Victoria, there are some very historic and beautiful avenues that were planted with European trees and planted very well. There is a sort of passion of recent times to have everything planted with natives everywhere, which I find totally inappropriate mostly for public space planting because of their short life and also their dangerous aspect. They are not suitable for public spaces. So how do we better educate the custodians of public spaces in a local government area and say that there are places for native species, not necessarily in a streetscape or on a footpath?

And just to get on the record, there is often a criticism of farmers as not being good custodians of the land. Now, I am a farmer—or I live on a farm. Most farmers have to be very conscious of their environment, otherwise it is not productive, and they do work hard, I think, to ensure how they can better use the soil and their space. I know in our situation, and many farmers are the same, we plant hundreds of thousands of trees every year as wildlife corridors, and I think that is where they are, so comment on how you see farming practices integrating with the environment. If you had a magic wand, what is the wish list of money that we could give you? I am a small government person—

A member: You're out of time.

The CHAIR: Yes, just about. You have only got about 2 minutes to answer.

Mrs McARTHUR: but I want to give you all the money you need to have the botanic gardens flourish.

The CHAIR: Do your best.

Prof. CANTRILL: I am not quite sure where to start there.

Mrs McARTHUR: Start with the money.

Prof. CANTRILL: No, I will not start with the money; what I will start with is the garden question, because you are right: gardens are spaces where plants live and die, and that is a continual challenge for gardens, as you are well aware. For us at the botanic gardens, of course, we are looking to the long term and we have, probably like you, heritage landscapes that we are managing, and we need to keep the gardens looking and feeling in that Guilfoylean space so that they continue to resonate and the public likes them. We have recently developed a landscape succession plan. That landscape succession plan looks at what the climate might be like in 2070, and based on that we then look at what plants might be suitable for that climate. Then we try and work out what plants might be suitable for that climate that look like the plants that we currently have so that we can maintain that same look and feel in the garden, and I think that is the sort of thing that we need to do. So in public spaces or in private gardens or anywhere, they are the things that we need to be looking at for the future. What we plant now in public spaces, particularly in the trees, is going to be there for a long time.

I would disagree with the comments about natives versus Europeans. They both have their own aesthetics. What you need to do is you need to look at the actual attributes of individual species and ask those questions that you need to ask for a public space. You are alluding to limb fall and things like that. They are all the things that we need to assess when we put a tree into a public space, and it may well be that a native tree is as suitable as an introduced tree—a European tree—but it may not have the aesthetics that we are after, so there is a whole raft of things that you are trying to weigh up there.

The CHAIR: Great. Thank you very much, Professor Cantrill.

Mrs McARTHUR: Money?

The CHAIR: We are out of time.

Prof. CANTRILL: Keep it coming.

The CHAIR: Thank you very much for your presentation and your contribution today. It has been most interesting.

Witness withdrew.