T R A N S C R I P T

LEGISLATIVE COUNCIL ENVIRONMENT AND PLANNING COMMITTEE

Inquiry into Ecosystem Decline in Victoria

Melbourne—Thursday, 11 March 2021

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WITNESS

Dr Holly Sitters, Ecologist, University of Melbourne.

The CHAIR: I declare open the 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 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 who may be watching these proceedings via the live broadcast today.

At this point I will introduce the committee to you. My name is Sonja Terpstra, and I am the Chair of the Environment and Planning Committee. Clifford Hayes is the Deputy Chair. Here with us via Zoom is Stuart Grimley. There is Bev McArthur, and back up this end of the table is Dr Matthew Bach, Melina Bath and Andy Meddick. We may have other people joining us at later stages throughout the proceedings.

In regard to the evidence that you are going to be giving today, 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 you could just state your name and the organisation you represent for the Hansard record.

Dr SITTERS: I am Dr Holly Sitters, and I am at the University of Melbourne.

The CHAIR: Great. Thank you. So with that, I will invite you to make your opening statement. If you could just keep it to a maximum of 10 minutes—I will give you a 2-minute warning if you get towards the end of that time—that will allow plenty of time then for us to ask you questions. Over to you.

Dr SITTERS: Thank you.

Visual presentation.

Dr SITTERS: Firstly I would like to thank you for inviting me to talk to you today and also to acknowledge the traditional owners of the lands on which we are meeting and pay my respects to the elders past, present and emerging.

In my submission I highlighted five key drivers of ecosystem decline and biodiversity loss: habitat loss, exploitation, pollution, introduced species and climate warming. These drivers often act together, but they may also act independently of one another. And they affect all terrestrial ecosystems around the world to different extents. For example, in Victoria introduced species are a greater driver, a greater threat, to native animals than in many other parts of the world, and climate warming is a particularly crucial threat because of its effects on fire regimes. I am a fire ecologist. For the past 10 years I have been based at the University of Melbourne, where my focus has been on the effects of fire on animal populations, so that is what I will be focusing on mainly here.

I would first like to emphasise that Victoria really has been leading the way when it comes to ecological fire research and management. An ongoing partnership between DELWP—then DSE—and the University of Melbourne led to the development of a method called growth-stage optimisation as a means of working out how we can best use fire to benefit both plants and animals. This method involves measuring the abundance of

species in different vegetation growth stages. So if half of the species are more abundant in recently burnt vegetation and half are more abundant in long unburnt vegetation, we would want to try to ensure roughly even mixes of these two growth stages in the landscape to maximise biodiversity.

This method has been incorporated into fire management policy in Victoria because it has got several advantages. Firstly, a range of data types can be included and it can cater to the requirements of multiple species. It also provides a specific operational target for land managers. But despite this great progress, it is clear that our efforts are not enough to keep up with current rapid rates of environmental change. Our ecosystems are in decline, and some of them are considered to be in freefall decline or in a state of collapse. A lot of our most magnificent tree species are obligate seeders, which means that mature trees produce seed and that they are killed by severe fire. So more frequent, high-severity fire can stop young plants from reaching maturity and producing seed, and this can lead to broad-scale decline of these obligate seeder forests. This transformation may be irreversible because forests that are dominated by dead mature trees and vigorously regenerating young vegetation are highly flammable, and this can increase the likelihood of more fire.

Fundamental changes in ecosystem structure like this can have consequences for many other species. I am currently supervising a PhD student, Julianna Santos, and she has been reviewing the documented threats to the 99 Australian mammal species that are currently listed as vulnerable, endangered or critically endangered under the *Environment Protection and Biodiversity Conservation Act*. She has found that inappropriate fire regimes are considered a threat to 90 per cent of these species. And for some animal groups—so the first six groups listed here—every single species in that group is considered to be threatened by fire in some way.

One of Julianna's aims was to figure out exactly what aspect of fire regimes are causing problems for these species, and she has found that big, severe, frequent fires are often the problem. For example, swamp antechinus and greater glider are threatened by fires that are too large and severe and reduce the amount of available habitat and also make it really difficult for animals to move between remaining patches of habitat. So the surviving animals become isolated in small pockets, and this further increases their vulnerability to future fires. The koala is also threatened by fires that are too large and severe because flames, heat and smoke can kill many animals that are unable to move out of the way in time.

Julianna's work on the current threat statuses of species and ecosystems does not take into account the dramatic effects of the 2019–20 bushfires. The effects of these fires are estimates based on expert opinion, model data or extrapolation, and so it is estimated that 3 billion vertebrates were killed in last summer's bushfires. I find it really difficult to comprehend some of these numbers.

Ms BATH: Doctor, can you just say that again?

Dr SITTERS: 3.5 billion.

Ms BATH: Thank you.

Dr SITTERS: Sorry, 3 billion, not 3.5.

Ms BATH: Thank you.

Dr SITTERS: So 2.5 billion of these animals were snakes and lizards. Australia has more than a thousand species of snakes and lizards and more than 96 per cent of them do not occur anywhere else in the world. Prior to last summer's bushfires East Gippsland was considered a refuge for several species of reptile—for example, the threatened swamp skink was found in damp swampy areas which are not normally affected by fire. But during last summer's bushfires even those wetter swampy areas were burnt, and very few swamp skinks were found after the fires. In the case of invertebrates—fish and turtles—the numbers that were killed in those fires were entirely unknown. Insects are essential to terrestrial ecosystems because of their roles as pollinators and nutrient cyclers, but we really know virtually nothing about their fire responses. So these species and ecosystems are not only of intrinsic value, they also contribute to healthy ecosystems that are critical to human wellbeing and survival, and I think we often sort of forget this now that our lives are quite separate from nature.

So how do we go about stopping this ecosystem decline? I think that it is really critical that we take bold action to address these five drivers. In a fire context, key things here are: stopping clearing habitat and achieving net

zero carbon emissions. I think without doing so, any small-scale, more targeted conservation actions are only likely to be beneficial in the short term.

Zooming in to fire ecology, we are currently facing several glaring knowledge gaps, which means that we are struggling to keep up with the rate of environmental change. I think it is important that we fund strategic collection of ecological data so that we can address these gaps. For example, we do not currently have a good grasp of the combined effects of multiple threats—for example, the effect of fire in combination with introduced species. We also need to focus on the fire responses of lesser known species, particularly invertebrates, which are so diverse and abundant. We need to urgently update the threat statuses of species following the bushfires and keep in mind that the common species of today may be the threatened species of tomorrow.

We also need to get better I think at tracking changes through time. A lot of what we do is based on snapshots. This would allow us to build knowledge and awareness and in doing so build and engage diverse communities and networks, because these issues do not just affect a small number of researchers, managers and community leaders; they affect everybody. This would help us to better anticipate problems and take timely action well before tipping points are reached. So, for example, it would allow us to identify and channel resources strategically to protect biodiversity hotspots, and a biodiversity hotspot could be anything as small as a group of hollow-bearing trees to a wet gully or, you know, to a region.

Compassionate conservation has been gaining traction in conservation biology alongside shifting community expectations regarding animal welfare. Its founding principle is to, first, do no harm, and it prioritises the protection of individuals and populations. So currently I think that there is an urgent need to replace our reliance on toxic metabolic poisons to kill introduced species and replace them with things like immunocontraception and non-surgical sterilants.

The CHAIR: You have got 2 minutes.

Dr SITTERS: Okay. So I believe that we still do have time to conserve healthy ecosystems and stop ecosystem decline. Thank you.

The CHAIR: No worries. Okay, with that we will open up for questions. Mr Grimley.

Mr GRIMLEY: Thank you, Chair. Thank you, Dr Sitters, for your submission. I have just got a query in relation to, first of all, those numbers that you mentioned—the 3 billion vertebrates killed last summer, which is quite an incredible number. I may have missed it, but what geographical area does that include?

Dr SITTERS: As far as I am aware, that was across south-eastern Australia. So those numbers are extrapolated from known numbers within much smaller areas, and then there is a lot of guesswork involved, I suppose, in terms of extending those numbers across large landscapes. So that was a report commissioned by WWF.

Mr GRIMLEY: Okay, no worries. Just one more question, if I can. Do you have any comment on the current ability of the Victorian Office of the Conservation Regulator to perform its duties of compliance monitoring and enforcement?

Dr SITTERS: I am afraid I am not familiar with the details regarding the conservation regulator. In terms of the decline and the loss that we are seeing—just from that angle—something is not working effectively, I suppose. But I am not across the full details of the regulations.

Mr GRIMLEY: Just on that, I believe that in your submission you note that one of the problems with legislation protecting ecosystems and threatened species is that it affords discretionary decision-making powers, which has resulted in successive environment ministers choosing not to act. Could you just expand on this and indicate what legislative reforms you think could safeguard against these issues?

Dr SITTERS: Yes, I think that an independent conservation regulator, a completely independent body, would be required. They could be informed, I suppose, by a wide range of experts—so yes, completely independent.

Mr GRIMLEY: Okay, thank you. Thanks, Chair.

The CHAIR: Mr Meddick.

Mr MEDDICK: Thank you, Chair. And thank you, Dr Sitters, for your fairly substantial submission and your testimony today. I just want to focus on and come back to what you have written here in your submission about 1080 poison, for instance. For the benefit of those who have not read through the submission, it says here, and I quote:

> In conservation and ecology, myths about 1080 are pervasive. For example, I've heard state government and university employees say that 1080 occurs naturally in plants …

Now, just on that, I believe that it is not actually compound 1080 that appears in plants itself, it is the initial chemical compound. Is that correct?

Dr SITTERS: Yes, it is a related chemical. It is not the same.

Mr MEDDICK: No. I think one is called the poison pea, or something like that, in south-western Australia—

Dr SITTERS: Yes.

Mr MEDDICK: And that 1080 is in fact a lab-manufactured chemical compound. You have written here it has its roots as a chemical weapon devised in World War II. Is that correct?

Dr SITTERS: Yes. That is what I have been told, yes.

Mr MEDDICK: Okay. The effects that you have described here are absolutely horrendous—that animals take up to 20 hours to die and herbivores take up to 44 hours. That sounds absolutely horrendous to me. And the other things that you have listed about it—that it is flavourless, water soluble et cetera and stable under ambient conditions—also place it as a major environmental risk because it can be absorbed by other plants and then therefore be ingested by browsing animals. Is that correct?

Dr SITTERS: That is correct, although no research has been done as far as I am aware as to exactly where it ends up. So 1080 has been detected in waterways in New Zealand, for example. I think that New Zealand uses 80 per cent of 1080 worldwide and Australia 10 per cent or so, but there is really very little known about where it ends up once it is in the ecosystem.

Mr MEDDICK: And compound 1080 is used fairly extensively across Victoria in different programs—most commonly I think in terms of fox control and also what is commonly known as wild dog control, which is for me a euphemism for dingoes. Exactly how much at risk are dingo populations, in your opinion, from consistent 1080 baiting programs? And what risks are involved if we are eliminating or near eliminating dingoes from the natural environment? What effect will that have on other, let us say, introduced species? Does that increase the risk of introduced species coming in and taking over that environment?

Dr SITTERS: Yes, my understanding is that dingoes are apex predators and that they can control animals like foxes and cats, so keeping dingoes in our natural landscapes should help to protect those critical-weight-range mammals between 35 grams and 5.5 kilos, I think. Those animals are at greatest risk, so retaining dingoes in the landscape should help conserve other native species.

Mr MEDDICK: Great. Thanks. I will leave it there. Thank you, Chair. But I would like, if possible—Dr Sitters mentioned immunocontraception and non-surgical sterilants. If we could get you to submit a paper perhaps expanding on that later—

The CHAIR: I was going to ask a question about that too. I might just, if I can, ask a question. We have heard from other witnesses throughout the hearings about the effects of fire on the landscape. I note that you are a fire ecologist, so I am hoping you might be able to help me understand this. I noted your earlier comments about the frequency of fires and about how when a fire happens and then there is another fire it is hard for those forests to recover, and then of course with old logs or hollow logs or trees that are left behind it becomes a much more flammable situation. I think what we are hearing, and you can tell me whether you agree with this or not, is that obviously climate change is one of the things that is a driver behind why we are experiencing more frequent fires and the like, but how can we best manage that situation? I mean, it is hard to say, but from a practical level, how could we in fact manage that scenario better? Because we know the animals, for example,

need habitats, and some of the things they need are hollow logs to live in. I am not a scientist, so just from a very fundamental, rudimentary point of view, what is the correct balance? How do we manage that? Do you have any views on that?

Dr SITTERS: Yes. I think, big picture, it has to be tackling climate warming because that is what is fuelling these increasingly severe fires. At a smaller scale, something that we could do here immediately as fire managers is, I think, identifying those hotspots. Single trees can be really important for a family of yellow-footed antechinuses, for example, and also those wetter gullies support a greater number of mammals and birds than the drier parts of the landscape—ridges, for example—so identifying those key areas and doing what we can to protect them from wildfires. But of course with the sorts of wildfires that we saw during 2019–20 there is nothing we can really do when it is—

The CHAIR: Yes, catastrophic.

Dr SITTERS: that severe. So I really think that tackling climate warming is just critical here, and we do what we can in the meantime.

The CHAIR: What about involving and being more cognisant of the role of our First Nations people in terms of fire management? Have you got any observations about that?

Dr SITTERS: Yes. I think that it is essential that we conduct meaningful engagement with First Nations people as custodians of ecological knowledge, and I suppose balance that with the risk to human life and property—two-thirds of native vegetation in Victoria has been cleared over the last 200 years—so doing the best we possibly can to balance those things.

The CHAIR: Sure. And I might just pick up on Mr Meddick's point. You did mention this—what was it, immunocontraception?

Dr SITTERS: Yes.

The CHAIR: You may have to take this on notice, and like Mr Meddick was saying, you might want to provide more detail, but can you just unpack that a little bit more? How does it work, and what sorts of species is it suitable for? And just by way of background, we have heard from some submitters about the role of shooting as a means of control, but if you look at deer populations, for example, shooting has not actually worked, because their numbers are exploding. It begs the question—obviously it is not working—what other options are there? Can you unpack that a bit and let me know what species those sorts of things might work on?

Dr SITTERS: Yes. I think that immunocontraception is just incredibly exciting in terms of the way that it could really revolutionise conservation management. I am not an expert on the specifics of the technology, but my understanding is that it can be developed for any species. Immunocontraceptives have been given to goats, for example, in Europe, so there are a few examples worldwide where this has been applied already. It is still very much in the development stage, but we have the technology, and it is really just the will and the money to make it happen. Immunocontraceptives and non-surgical sterilants can be made species-specific, and then they could be delivered via some form of bait—like, whatever that particular animal enjoys eating. So that is how they can be delivered.

The CHAIR: Mr Meddick was talking about 1080 baits, and I am just really conscious that whatever you give to an animal there is going to be a flow-on effect, whether it excretes it or whatever out of its system or when it dies and something else eats it. I note you were saying it is still in its development stages. Is there research known about those sorts of flow-on effects, or not at this stage? Is it still developing and emerging?

Dr SITTERS: Yes. It can be completely targeted to an individual species. My understanding is that there is not a risk of, say, a native animal consuming it and then becoming—

The CHAIR: Ill or something.

Dr SITTERS: sterile. Yes.

The CHAIR: All right, great. Thank you. Dr Bach.

Dr BACH: Thank you, Chair, and thanks, Dr Sitters, for being with us. I thought your presentation was fascinating. I was also going to ask a question that links back to what you were talking about, Mr Meddick, and what you were asking about also, Chair. I thought your comments about immunocontraceptives and also sterilants was really interesting. As a layman—and again this may be something that you want to take on notice, given that other members of the committee are also interested in further information—I suppose I had queries about practicality and cost. Whether you would like to respond briefly to those issues now, that links very strongly to what the Chair was asking about before, or perhaps you would prefer simply to take that on notice.

Dr SITTERS: I am happy to make some brief comments about that. I have spoken to researchers at the University of Newcastle who apply similar technology in a human context, and they reckon that the cost would be something like $10 million for the initial laboratory testing, which sounds to me like not very much compared to what we spend on fox baiting using 1080 every year, which is about $16 million, I think. Then of course there would need to be another stage which would involve delivery in a field context, so again I think relative to what we are currently spending on 1080 it sounds to me quite cost effective.

Dr BACH: Thank you very much, Dr Sitters. That is great to have that level of information. If in what you provide us later there is any further modelling about the cost in the field, as you say, then that would be fascinating too.

Dr SITTERS: Yes, I could give that some more thought.

Dr BACH: Thank you. I was also interested in your reflections about data. That has been a real theme in the submissions we have received and the presentations from others. If I was taking notes correctly, in your presentation you talked about the need for more funding for strategic collection of ecological data, and I suppose I would just be interested in asking you to unpack that a little bit more—what in your mind that would look like. We have heard comments about some differences of approach when it comes to the collection of data in Victoria and other jurisdictions. I wonder if you have views there. We have had commentary about the appropriate role of DELWP here and the appropriate role of other bodies, perhaps independent bodies like the university that you work for.

Dr SITTERS: It is challenging because there is so much. I think some key things are to urgently reassess the status of the threatened species, because again we are just not keeping up, I think, with the rate of change, and also I think species that are perceived to be common may very easily not be so common in a very short time, so establishing a framework for that fundamental ecological field data collection—that is a really important one. Again going back to those hotspots, I think that that could be an effective way of prioritising some of our efforts both in terms of just collecting our fundamental data and prioritising fire management strategies and efforts.

I also think—I have not mentioned this before, but—the collection of genetic data should be undertaken much more frequently because it can provide early warning signs of future extinction risk long before we can see any decline in numbers of animals in the field. Those are the key things, but of course it is tricky because there are just so many. The invertebrates as well—that is a really key thing, but there are so few people even with the expertise to identify them.

Dr BACH: Thank you very much.

The CHAIR: Mr Hayes.

Mr HAYES: Thanks, Chair. Thanks, Dr Sitters. Just a couple of questions: I wanted to ask you about pollution. You talked about herbicides and glyphosate. I am just wondering if you could somehow expand—I am willing to take some of this on notice if it needs some more detail—on the role of glyphosate in ecosystem decline, because I know in urban areas it is sprayed around by land managers with pretty well gay abandon, and I am just wondering if you know or could supply any detail on the effects of it.

Dr SITTERS: I think I will take that one on notice, because I can make some brief comments but I probably would appreciate some time to think about it in more detail.

Mr HAYES: I would like that, then. The other thing you talked about was an independent regulator because of the discretionary decision-making by environment ministers and them choosing not to act. How could we design such a system that would give them some real powers? Because we do have an EES process which really has proved to be quite ineffective in protecting the environment and projects that are proposed.

Dr SITTERS: I think a fundamental thing is values, so really, truly valuing these natural resources and species and systems. As I mentioned briefly in my talk, we are so separated from nature with the way that we live now, and so I think it is about imbuing those values in the conservation regulator right down to kids in primary school. I think that is really, really key—just engaging diverse communities in these issues.

Mr HAYES: You would value it more than the economic considerations?

Dr SITTERS: Yes.

Mr HAYES: Okay, thank you.

The CHAIR: Ms Bath.

Ms BATH: Thank you. This is very interesting. Dr Sitters, you mentioned obligate seeders in terms of our forests, and I note that yesterday Dr Freeman from the Institute of Foresters spoke about the importance of seed collection and seed banks. She felt that there was not enough funding for it or availability of accessing seeds in national parks as well. So what is your knowledge in that space?

Dr SITTERS: I certainly think that it would be helpful to establish seed banks, but I also feel that it is sort of a bandaid approach. For example, south-west WA it is an extremely species-rich area, and quite a few plant species are absolutely on the brink, so they are heavily reliant on these seed stores. We are not quite at that level in Victoria yet, but I feel that we need to take the sort of action which does not rely on these sorts of bandaid approaches, I suppose. So it is well worth stockpiling seed, and yet I do not see it as a solution. For example, I have heard about aerial seeding in alpine ash forests, and that is extremely resource intensive and of only limited success, I think.

Ms BATH: Is there content knowledge that you have in terms of that success? How have you measured that, in regard to your last comment?

Dr SITTERS: I read that briefly recently, within the past few weeks, but it is not my expertise. I am more an animal ecologist.

Ms BATH: Thank you. Dr Sitters, in terms of the Snowy River National Park in East Gippsland, the fires were started in the west through lightning in hilly terrain—mountainous terrain—and then flowed across. Indeed there are many locals who are extremely concerned that there was no mitigation there in terms of back-burning along the river and then containment lines et cetera, and they felt very frustrated that Parks Victoria just had a hands-off approach. Noting that there is this vulnerability around certain species, I would like you to make a comment on that, but also I guess overlaid with your comment about big and frequent fires and then the importance of incorporating our First Nations people, our Indigenous people, and reflecting on potentially the opportunity for cool Indigenous burns. Now, that was a big topic, but I think it is a really important one, and probably one most of your subject expertise.

Dr SITTERS: I am sorry. What was the first point?

Ms BATH: I guess in relation to the flowthrough of fires and the commentary that there has been a hands-off approach by Parks Victoria to stop fires travelling through national parks, and then cool Indigenous burns.

Dr SITTERS: Okay. So my expertise is in animal ecology, and essentially what I do is observe the numbers and diversity of animals in relation to fire history, and then have a conversation with fire managers, and then I suppose it is their choice how they run with that. So I am not familiar with asset protection burning specifically, and I have not heard about that situation.

But I certainly think that Parks Vic and other fire managers are in an extremely difficult position because they are trying to balance so many different values. I am not sure what went into that decision not to do that

intensive burning in that location, but I think that it is just an extremely challenging position that they are in, trying to balance biodiversity values and human assets and property.

Ms BATH: I guess ultimately it was the fire that burnt through. It was started elsewhere, and there was no, I will say, preparation to halt it—that is my comment.

Dr SITTERS: Okay.

Ms BATH: But certainly we saw 1.6 billion hectares unfortunately go up in flames and 3 billion vertebrates, which is just astounding.

In terms of Indigenous burns and First Nations people, what has been your interaction with that space?

Dr SITTERS: It has been fairly limited, I would say, through my time in Victoria. Before I moved to Victoria I worked in an Aboriginal organisation in Alice Springs, and it was just a completely different context there. You know, I was working with Aboriginal people and engaging with Aboriginal people, whereas in Victoria it has been a very different situation I think because there are a lot of demands placed on First Nations people I suppose in this space—and yes, that the level of engagement has been much lower has been my experience. That is definitely something we need to work on.

Ms BATH: I guess there is an opportunity too, Dr Sitters.

Dr SITTERS: Absolutely, yes. There is great opportunity in this area.

Ms BATH: Thank you.

The CHAIR: Ms Taylor.

Ms TAYLOR: Yes, and apologies for being late. I would have liked to have seen your presentation, but I will do my best now to jump along. I am just looking at the issue of herbicides and pesticides and the damage that they cause to animals and for generations to come as well. So it says we should eliminate these kinds of pollutants. Do you have strategies for that? Because I sometimes think these pollutants are worse than the weed in the first place—depending on the weed; I mean, not all weeds are the same, so I want to be careful with that comment.

Dr SITTERS: Yes. Again, this is not my focal area, but my understanding—

Ms TAYLOR: Oh, sorry!

Dr SITTERS: I am so cautious, but—

Ms TAYLOR: No, no, no. That is good.

Dr SITTERS: My understanding is that excessive use of pesticides is what is driving what they call the insect apocalypse, I think—just enormous decreases in the numbers of insects we see. You know, driving along the highway, we do not get insects on our windscreens in the way that we did not very long ago. So I think finding alternatives to these chemicals is again critically important. And again, I do not know the details, but I understand that there are methods for mixing ecology with agriculture in such a way that far fewer chemicals are required.

Ms TAYLOR: Okay. Excellent. And on that note, talking about pollutants—and forgive me if you have already covered this—like, some of the poisons that are used to deal with pest control, does that fall into your area of expertise?

Dr SITTERS: Well, yes, I suppose I have opinions about it. In terms of I think—

Ms TAYLOR: Alternatives—that is what I am looking for. What are the solutions?

Dr SITTERS: I think that there are always alternatives. I think that we are very often much too quick to grab the chemicals as our solutions to everything, whereas I think that there are almost always alternatives.

Ms TAYLOR: Okay. And even if you have not got the time now, could you on notice submit some alternatives? The more constructive and the more detail the better for the purposes of the inquiry, I think. It is easier to act on that information—so perhaps we will take that on notice.

Dr SITTERS: Thank you. Brilliant. Sounds good.

The CHAIR: Dr Ratnam.

Dr RATNAM: Thank you very much, Dr Sitters. Apologies, I was not here at the start, but I was listening online, so I did hear your presentation and the questions. Thank you very much for your contribution and the submission. A number of areas have been canvassed already, and I wanted to ask specifically for your views on large-scale prescribed burning. I think we have had some questions around that area, but I want to ask about that more specifically. Do you have any views on large-scale prescribed burning? Furthermore, do you have views on post-logging burning and salvage logging? They are all things that kind of have an after-event-type impact, particularly on animal ecology, which is your field—so yes, large-scale prescribed burning, post-logging burning and salvage logging. What does that do to our animals?

Dr SITTERS: Yes. So large-scale prescribed burning is almost always of very low severity, which means that within the burn perimeter there are quite a few unburnt patches and depending on the forest type the canopy will be intact and so a lot vegetation structure remains—you know, logs and hollows. I have been working mostly in the Otway Ranges, a little in the Central Highlands and a lot in the heathy woodland of western Victoria, and so in those ecosystems the animals we have been focusing on—ground-dwelling mammals and birds—are very little affected by that sort of low-severity prescribed burning.

In terms of—sorry, logging?

Dr RATNAM: Post-logging burning.

Dr SITTERS: Okay. I cannot really comment on that because I have not really worked in ecosystems where logging has been undertaken recently. But generally, in terms of salvage logging, I think keep as much habitat structure in the forests as we possibly can, because it really is important for our native animals.

Dr RATNAM: Okay, good. Thank you.

The CHAIR: Mrs McArthur.

Mrs McARTHUR: Thank you, Chair, and thank you, Dr Sitters. Now, your submission is quite critical of the animal, meat and livestock production industry. I do not know whether you are aware of the actual efforts that producers go to to actually preserve their environment by carbon sequestration, tree planting and actual weed control. Their greatest problem is usually their neighbours, who are the state, that fail to take control of the weeds and noxious species that surround their properties. And that is also a major problem for native species, because if the introduced species are not controlled, like phalaris, like gorse, like blackberries, they create a major fire hazard but they actually suffocate the native species and these are prevalent along roadsides. You mentioned western Victoria. This is a—

The CHAIR: Mrs McArthur, I will just let you know we have got 2 minutes left.

Mrs McARTHUR: major issue. Well, others have had time.

The CHAIR: I know, but I am just letting you know that the session is going to end, so if you could ask your question.

Mrs McARTHUR: So do you accept that really the major problem we have got is the state, that fails to control noxious weeds and vermin in our state-controlled areas, not the farming community?

Dr SITTERS: I think that Parks Victoria and DELWP are under-resourced when it comes to weed control. There are a lot of weeds in many of our natural ecosystems. In terms of that they are the greatest problem, I do not necessarily agree with that. I think that we are all responsible for doing better across all these areas. And I agree that many farmers are practising fantastic initiatives to improve weed invasion, but I feel that we can all be learning and doing better in these areas.

Mrs McARTHUR: And do you accept that in the High Country, where areas had been grazed, they have created basically an oasis where native animals as well as others manage to escape to and survive? And that is how the Indigenous population, of course, looked after the environment. They burnt areas for the native animals to come, so they could spear them, effectively, for their food source. Is that not also a way of managing the environment properly to prevent fires?

Dr SITTERS: Grazing animals can reduce biomass and so by reducing biomass fuel loads are reduced and that can reduce the risk of high-severity fire spreading rapidly. However, grazing animals can also cause, you know, soil erosion and various other problems. So again it is highly context specific, I think.

The CHAIR: Thank you very much. That is the end of our session. Thank you, Dr Sitters, very much for your presentation. If any committee members have further questions, please feel free to submit them on notice, and they will be provided to you and then you will have an opportunity to answer.

Witness withdrew.