COMMONWEALTH OF AUSTRALIA

Proof Committee Hansard

SENATE

ENVIRONMENT, COMMUNICATIONS, INFORMATION TECHNOLOGY AND THE ARTS REFERENCES COMMITTEE

Reference: Invasive species

MONDAY, 28 JUNE 2004

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SENATE

ENVIRONMENT, COMMUNICATIONS, INFORMATION TECHNOLOGY

AND THE ARTS REFERENCES COMMITTEE

Monday, 28 June 2004

Members: Senator Cherry *(Chair)*, Senator Tierney *(Deputy Chair)*, Senators Lundy, Mackay, Tchen and Wong

Participating members: Senators Abetz, Allison, Bolkus, Boswell, Brown, Buckland, George Campbell, Carr, Chapman, Conroy, Coonan, Eggleston, Chris Evans, Faulkner, Ferguson, Ferris, Harradine, Harris, Humphries, Knowles, Lees, Mason, McGauran, Murphy, Nettle, O'Brien, Payne and Watson

Senators in attendance: Senators Cherry, Tchen and Wong

Terms of reference for the inquiry:

To inquire into and report on:

1. The regulation, control and management of invasive species, being non-native flora and fauna that may threaten biodiversity, with particular reference to:
   (a) the nature and extent of the threat that invasive species pose to the Australian environment and economy;
   (b) the estimated cost of different responses to the environmental issues and associated with invasive species, including early eradication, containment, damage mitigation and inaction, with particular focus on:
      (i) the following pests:
         (A) European fox *(Vulpes vulpes)*,
         (B) yellow crazy ant *(Anoplolepis gracilipes)*,
         (C) fire ant (*Solenopsis invicta)*,
         (D) cane toad *(Bufo marinus)* and
         (E) feral cat *(Felis catus)* and pig *(Sus scrofa)*, and
      (ii) the following weeds:
         (A) mimosa *(Mimosa pigra)*,
         (B) serrated tussock *(nassella trichotoma)*,
         (C) willow *(Salix spp)*,
         (D) lantana *(Lantana camara)*,
         (E) blackberry *(Rubus fruticosus agg.)* and
         (F) parkinsonia *(Parkinsonia aculeata)*
   (c) the adequacy and effectiveness of the current Commonwealth, state and territory statutory and administrative arrangements for the regulation and control of invasive species;
   (d) the effectiveness of Commonwealth-funded measures to control invasive species; and
   (e) whether the Environment Protection and Biodiverstity Conservation Amendment (Invasive Species) Bill 2002 could assist in improving the current statutory and administrative arrangements for the regulation, control and management of invasive species.
2. That the order of the Senate adopting Report No. 4 of 2003 of the Selection of Bills Committee be varied to provide that the Environment Protection and Biodiversity Conservation Amendment (Invasive Species) Bill 2002 be referred to the Environment, Communications, Information Technology and the Arts References Committee instead of the Environment, Communications, Information Technology and the Arts Legislation Committee.

WITNESSES

Committee met at 10.09 a.m.

RAMSEY, Mr Mark David, Executive Officer, Animal and Plant Control Commission

WICKES, Mr Roger Barrington, Presiding Officer, Animal and Plant Control Commission

CHAIR—I declare open this public hearing of the Senate Environment, Communications, Information Technology and the Arts References Committee in relation to its inquiry into invasive species, and I welcome people here today. This is our fourth public hearing in relation to this inquiry. We have already visited Brisbane and have had two hearings in Canberra. I thank you for allowing us into South Australia today.

I welcome the witnesses representing the South Australian Animal and Plant Control Commission. Thank you for your time today; it is much appreciated by the committee. The committee prefers all evidence to be given in public but should you at any stage wish to give your evidence, part of your evidence or answers to specific questions in private you may ask to do so and we will consider your request. You are reminded that the evidence given to the committee is protected by parliamentary privilege and that the giving of false or misleading evidence to the committee may constitute a contempt of the Senate. Finally, those of our witnesses who are public officials shall not be asked to give opinions on matters of policy and shall be given reasonable opportunity to refer questions asked of them to superior officers or to a minister. We have already published your submission. Do you wish to make any changes to the written statement at this stage?

Mr Wickes—No.

CHAIR—I now invite one of you to make an opening statement before we move to questions.

Mr Wickes—Thank you very much for the opportunity to talk about this. We are from the Animal and Plant Control Commission, which is a statutory authority here in South Australia that looks after the area you are talking about. As such, we are representing that authority and not necessarily policy issues of the state government. The Animal and Plant Control Commission has a long history in South Australia. The first weeds were discovered here in 1852 and the first act, the thistle act, happened at about that time. Pest animals were similarly recognised later on. They were very much part of the settlement of South Australia.

The commission recognises that anything to do with pest management goes hand in hand with protecting agriculture, protecting the environment and public safety. At the moment we are looking at bringing animal and plant control issues in with other integrated natural resource management issues. Before parliament at the moment we have a bill which will bring animal and plant control, soil conservation and water resources into an integrated framework for South Australia, because you cannot deal with one of these issues without dealing with the others.

The commission is a statutory authority that looks after vertebrate pests and weeds. These are proclaimed, so there is a law that fits behind that. It is based on scientific investigations and the best information that we have. I think the advantage in the way we do the business is that there is that scientific work and also at a local level we have animal and plant control boards that work out what is going on in their area and bring the two together, so there is a very good framework

for local action using the best knowledge that we have from across the state and the community. These policies mean that a lot of local issues can be immediately tackled locally, and there are quite a number of examples of that happening around the state.

The act recognises that land-holders have primary responsibility for looking after animal and plant control and looking after the species on their land and that they have a responsibility for making sure that those species are controlled. We also have funding to look after the crown land areas. There is a lot of crown land in this state, and the commission manages a lot of the crown land areas.

Looking at what is affecting South Australia, a lot of the species that we are dealing with have been here for quite a long time. We saw what happened with European rabbits when they were first introduced and the RHD virus and myxomatosis. We are working hand in hand with local boards at keeping our rabbit numbers down and together we are providing very good control over rabbits. But even at less than one rabbit per hectare we still have rabbits that are causing problems for the environment by taking seedlings out. This issue in our pastoral country is improving but we still have enough rabbits around to do some damage.

We have been tackling the European fox now for many years. We have some programs going, such as Operation Bounceback in the Flinders Ranges where, working with some of the other agencies, we have been able to look after some of the species up there that we want to look after and to get the number of foxes in that area right down. By working with not only the parks but the land-holders we have created very large fox-free areas. That is a way of tackling that and looking after some of the rock wallabies that live in that area. We are trying to get very big areas of control.

Feral goats are a major problem in the Flinders Ranges and in the outback, and we have got various programs to try to control them. There are small populations of feral deer throughout the state, and we are increasing our deer program. Feral camels that come down from the north are a problem, and feral cats are an issue in our regions—although we believe cat numbers have fallen as rabbit numbers have fallen quite dramatically, because the cats often live on rabbits. We have got feral pigs in the north, particularly up along the river, and we know these populations rise and fall with the drought. Those are the major animals we are tackling.

There are quite a number of weed species, obviously. A lot of them are agriculturally based, but we have also been working on a number of the environmental weeds. One of those is bridal creeper, and, due to some of the biological control methods that are around now, we are getting a good start on bridal creeper. Feral olives—olives were introduced here a long time ago—are causing us a fair issue, particularly along the Mount Lofty Ranges and the escarpment behind us. They are fairly well adapted to that area and are expanding quite rapidly across the hills. Broomrape is an incursion that we discovered in 1992; we are not sure when it came in, but we do have a major program trying to eradicate broomrape. That is a national program and we believe we are making quite a bit of gain there.

I think that gives you an idea of where a lot of our programs are at the moment. We try to introduce a whole lot of strategies—particularly risk management strategies—when we are looking at animals and weed pests that come in. We work very much nationally with the Vertebrate Pests Committee and the Australian Weeds Committee to try to work out the risks of

various species adapting to this area. At a state level, we have tried to make sure that our programs under the Animal and Plant Control Act are consistent with the national ones in terms of what species people can keep and what species can come into the state. We have tried to make sure that we are on top of that. The WONS system under the ministerial council is one that we have been adopting, and all of our proclamations reflect that. It is the same with animals that people want to keep. We have tried to make sure that there is a consistent arrangement across our state and that that is consistent with what has happened in the wider community.

We believe that pest animals and plants are quite a threat to our biosecurity in this state. Often, as you can see by the ones that we are tackling, they have a long-term effect on agricultural production, the environment and also on the safety of the public. New incursions are expensive to manage, but that is where we spend our time—trying to manage those if they come in—and we do have some cost-sharing arrangements on broomrape, for instance, with the Commonwealth and the other states to manage that incursion.

We need to continue the research input into both animals and plants in terms of managing the incursions, and a lot of our broomrape program currently is based on getting new science to be able to manage that. In fact, we are testing some of the science at the moment with a major drenching program with a new product from New Zealand which we hope will actually control broomrape in a way which is more environmentally friendly than some of the fumigants that have been around for quite a number of years. So we are looking at science all the time and appending our program with science. We have very strong relationships with the CRCs, because that is where a lot of the science is developed. We need to keep that working and we are keeping up our relationships there.

The risk assessment system is something that one of the people here behind me has been working on both nationally and in the state to try to make sure that everything we do is based on risk assessment rather than on a prohibition. There is quite a lot of technology now in risk assessment, so you can assess where you can keep species and the chances of their posing a threat to the environment, and then you can make some decisions about them.

Biological control is obviously a better means of controlling a lot of these things. We have invested in biological control over time. Some of those results are starting to be shown, having regard to some of the weeds that have been tackled. It is something that we need to keep working on. Of course, communicating to the community at large that this work needs to be done and that people should be part of it, and making sure that we have a very strong connection at a local level, are very important for managing any new incursions and these very historical incursions that are causing us the largest amount of damage. Thank you for the opportunity to make this short presentation.

CHAIR—I have a few quick questions before I hand over to other senators. The South Australian Weed Society is very critical of the poor level of funding for weed management in South Australia. In particular it laments what it says have been the successive declines in operating budgets for the Animal and Plant Control Commission and that the National Parks budgets for weed control works have similarly been cut to only thousands of dollars per park. Can you give the committee any information on the extent to which the commission has been funded over the last, say, five or six years?

Mr Wickes—We can provide that. The funding for the commission has changed a little bit over time but in general we have tried to maintain a constant level of funding, particularly at the board level and at the local level, where a lot of the work is done. We have also gone into strong partnerships with the CRC on weeds and have put more people and more time into those research organisations than previously occurred. We have good, strong relationships between the CRC on weeds and our people in the field, so that we get some synergies in working together. In fact, we won a prize the other day for some of the work we have been doing in connecting the science with what is actually happening in the field. We have probably increased our effort in making those connections, particularly in the scientific area.

CHAIR—Can you give me a rough idea of your current budget in terms of breakdown between field management, research and the total budget. What are we talking about per year?

Mr Wickes—The Animal and Plant Control Commission has a state budget of about $3½ million. Of that, about a million dollars goes into the scientific support area and the rest goes to the local community, which is part of the local board programs. That funding for the field area is matched two to one by local government. I think about $4½ million is spent at the local level.

CHAIR—With respect to the two to one ratio that you mentioned, does the state put in two and local government one?

Mr Wickes—No, local puts in two and we put in one.

Mr Ramsey—It is important to note that, while the funding for the commission may have changed over time, the amount spent on managing invasive species has probably either stayed constant or increased. The commission's function is really around managing those proclaimed species and enforcing the act, but a lot of work is happening under NHT and through catchment management boards. Increasingly, we are seeing that weeds are part of an outcome. You have to manage your weeds to achieve the outcome that you want to achieve. Seeing the control of weeds as a separate issue from having good biodiversity or good agricultural systems is incorrect. The philosophy is changing with time. You have to look at funding in the context of the total grab bag of all the money that is spent on the environment, not just in the context of the small amount that is spent on managing proclaimed species.

CHAIR—Reading through the material on broomrape depresses me in terms of how potentially uncontrollable it will be. Does the government have any confidence that there can be an eradication program or are you talking about management at this stage?

Mr Wickes—No, we are talking about eradication. We have confidence that we will eradicate it. We have been doing a very strong survey to make sure that we know where it is. We have spent a lot of energy on surveying it. A lot of the weed incursions break down because people concentrate on where they see it rather than where it might be. So we have had a very strong program of looking in the area and also doing links—surveys we call them—of where people move farm machinery to. A lot of surveying is being done in Victoria, and some is being done in New South Wales and, of course, across South Australia. We are continuing to do that to make sure that we are not missing something. If you look at some of the other weed programs that have fallen down—overseas as well; John Virtue will be going over to look at Texas in a couple of months time—you will see that they forgot to look around to see what was happening

elsewhere. We reckon we know where it is. We know what the return load of it is and, with the science we have been working through, we believe we can pull its numbers right down. We have a very comprehensive integrated program, so we are looking at fumigation on the edges or those high-risk areas, because fumigation is quite expensive and, unless we get an alternative like this pine oil, it is something that you do not want to do much because you do not want too much methyl bromide in the atmosphere.

Then we have a very strong program working with the land-holders in the area, because good farm practice means no broomrape. Broomrape grows on really weedy species; it does not grow on the grassy species. If we can keep people with good cropping systems going, we will run the seed numbers down. We are doing tests on how quickly we can run that down, and we believe we can run it down quite quickly. We think the broomrape seed lasts about 12 years, so we have a program to run the seed numbers down. In large paddocks that is what we really need to do.

Then we have quite a strong quarantine program, with people working seven days a week. They were working yesterday and I was out there with them yesterday looking around. They are making sure that people coming and going or machinery being moved around is sprayed and any potential seed on them is killed. So it is quite a comprehensive program, running from agronomy through to whole of science, about what sorts of things should be used. There is some work on trying to eradicate those areas by fumigation where appropriate and in working very much through the survey system to make sure we know what we are looking for, where it is and how we can contain it.

CHAIR—What is the total cost of the program to date and how much of that is state, federal and local money?

Mr Wickes—I do not have in my head the exact, total cost of the program. To date, the program, with all things in, all the in kind, is a bit over $4 million a year.

CHAIR—I had in my head $54 million; I do not know why.

Mr Wickes—You may be right, but I have not added a few things up.

Mr Ramsey—No, I do not think it is that much.

Mr Wickes—You are thinking about the long-term outcome?

CHAIR—Possibly.

Senator WONG—On broomrape, in the hearings we have had so far, a consistent theme has been that this is an area of policy where if you do not spend a bit of money early the actual costs to the economy, to the environment, are going to be far greater. I understand from your submission—and I think it is reasonably well known in Adelaide—that broomrape has the potential to significantly affect our export markets and that a substantial 43 per cent, I think you said, of our export markets will not take wheat from areas where there is any infestation or where there could be any seed. That is a reasonably significant proportion. Were any estimates done as to what this might cost the state?

Mr Wickes—Yes, costings have been done, and we have done some economic work to show that we are getting an eight to one benefit cost ratio, basically, from the program.

Senator WONG—What does that mean? What did your modellers say to you—if you do not control this, this is what it will cost us?

Mr Ramsey—I did not bring those figures. The modelling said that there is an internal rate of return—this is a brief summary—for the program of about 22 per cent, a benefit cost of eight based on an investment of $4 million a year for the first eight, followed by $2 million for possibly up to 20 years to eradicate the weed. But the estimate was based on a couple of assumptions. The first one is that the weed spreads across suitable habitats in about 40 years. It takes 15 years to achieve maximum yield loss and the maximum yield loss is 30 per cent in the crops.

It also made some assumptions about the way farmers would operate, assuming that they would move from, say, growing carrots, which are very susceptible, to growing crops like onions, and just use that gap. Experience overseas would suggest that in many cases people will persist in trying to grow carrots on land that is infested.

One of the major impacts is extraordinarily difficult to measure—that is, a secondary impact on markets where seed is potentially found in infested grain. The issue there is that you cannot find out what the market will actually do with a product without going to them with the actual situation. If you just go on a speculative hunt and say, 'What would you do if you found broomrape in a sample of grain'—

Senator WONG—I appreciate that you do not want to do any hypotheticals, but isn't it the case that a number of countries have stated that they will not take it where there is any broomrape seed?

Mr Ramsey—Yes.

Senator WONG—You put in your submission that the countries were Malaysia, New Zealand, Indonesia, Iran, the United States and South Korea. So you would know with them that you do not have to check.

Mr Wickes—That is right. Currently we do not have to check, no. But that is part of the trade arrangements that you have to have at the time.

Senator WONG—Mr Ramsey, going back to your figures: perhaps on notice you could let us know what the modelled cost or impact is. Are we looking at hundreds of millions? I have done a rough calculation predicated on the expenditure and the one-to-eight return.

Mr Ramsey—We can get you the figures from the analysis that was done and provide them to you. I think that would be the best way.

Senator WONG—You are not able to give us a broad—

Mr Ramsey—The broomrape program is not directly run under the Animal and Plant Control Act. It is not a direct commission function, so I did not come here intending to provide information directly on broomrape other than what we have already provided.

Senator WONG—I am sure that some other witnesses could assist. Just to go back: given your answer to Senator Cherry, could you also take on notice the break-up of funding, state and federal.

Mr Ramsey—For the broomrape program? Yes.

Senator WONG—Is there any federal regulatory mechanism which has been actioned in relation to broomrape?

Mr Wickes—No. All those agreements are just general agreements that have been struck under the ministerial council. The cost-sharing, like a lot of these things, is under the Primary Industries Ministerial Council.

Senator WONG—Is it a weed of national significance?

Mr Ramsey—No.

Senator WONG—So it is not listed as a WONS?

Mr Wickes—No.

Senator WONG—Is there a reason why that is not the case?

Mr Wickes—When we were starting to work on it, it was very early on in the WONS system. It is a weed that has come forth since then.

Mr Ramsey—The WONS system was based on existing damage caused by a weed, not projecting a hypothetical damage into the future. So it was excluded on those parameters when the original list of 20 weeds was put together.

Senator WONG—And there is no regulatory mechanism that has been enacted under the EPBC Act? That is, federal not state.

Mr Wickes—It is a state issue to manage, because the incursion is here and we do not know where the incursion came from or how it started. So it is managed under state legislation. But, as I said, there are agreements between the Commonwealth and the states. It is done on a cost-share basis where the Commonwealth puts in 50 per cent and the states put in a share according to the impact that this weed could have on their environment. The program is worked out and reviewed nationally, annually, and funding comes forward. That happens with any of those incursions; that is how it is managed.

Senator WONG—Could we deal briefly with the control of the movement of exotic species, both plant and animal, between states. One of the things you raise in your submission is that there are 'insufficient means, under quarantine legislation, for controlling the keeping and

movement of exotic vertebrates already in Australia'. Can you explain what those insufficiencies are?

Mr Ramsey—I am looking for it in our submission. What page is it on?

Senator WONG—My notes from the committee say it is on page 7.

Mr Ramsey—I am trying to find what you are referring to.

Senator WONG—Rather than trawl through the submission, do you think there are sufficient controls regarding the movement between states of invasive or exotic plant and animal species?

Mr Ramsey—We do have some concerns about the interaction of some of the other pieces of legislation that underpin our national federation. My understanding is that, if a species can legally be sold in New South Wales but not in South Australia, we cannot prevent a person from purchasing that species and bringing it into South Australia. We can manage them and prevent them from on selling it under our legislation—and if it is an animal we can pursue them for possessing the species—but we cannot stop them from purchasing across state borders. So that is always going to be a major issue. That is why the uniform proclamation of WONS, through the Australian Weeds Committee, was one of the objectives of the original system that we are talking about to try and overcome those loopholes and prevent the sale of a species in every state so that it cannot be on sold in another state. It is the same for vertebrates. If it can be sold in New South Wales it can be purchased in South Australia but our Animal and Plant Control Act allows us to seize the animal because possession of that animal is illegal in South Australia without a permit. So there are some controls in that way. You look as though you are not quite sure where I am going with my answer. Am I answering your question?

Senator WONG—I think so.

Mr Wickes—The issue we have been working on nationally is to deregularise all those things so that each state has the same thing.

Senator WONG—We are a long way from that though, aren't we, Mr Wickes?

Mr Wickes—That is what we have been doing with the WONS system—we have put up and proclaimed all the plants that are in the WONS system so that it is consistent.

Senator WONG—From the evidence we have had to date—and Senator Cherry will know more about this than I do, because Queensland seems to have a lot of problems—

CHAIR—A lot of weeds.

Senator WONG—Yes, and lots of rain which, as we said, is more problematic, but—

CHAIR—You have got some good weeds down here, though.

Mr Wickes—We have excellent weeds!

Senator WONG—We do.

Mr Ramsey—I would like to make another comment before we leave that issue. One of the reasons each state commits an effort to committees like the Vertebrate Pest Committee and the Australian Weeds Committee is to try and get some national coordination on these issues. Through that system we have adopted a standard risk assessment process for assessing the threat of vertebrate pests around the country. We are making progress, but it is made complex because each state's legislation is different; the requirements under that legislation for how a species can be proclaimed, put into regulations or whatever is different. For example, we are aware that Victoria have had problems in proclaiming some of their species. They have to go through a public consultation process which is not very responsive and takes time. They have had difficulty in getting all the species proclaimed because their legislation was not set up to make that process simple. For us it has been quite simple to proclaim species. The 20 WONS were all proclaimed to prevent their sale in South Australia. I think that 12 of those species are weeds in their own right in South Australia. So other parts of the Animal and Plant Control Act were implemented against them. We are making an effort to try and get a uniform approach to all these species.

Senator WONG—I do not discount your effort. What I was going to say was that the evidence we have had thus far—apart from WONS, where there is still work to be done on regularising the framework, for some of the reasons that you have raised—is that there are a great many plants species which are prohibited for sale in one state but not in another state and there is no regulation to prevent their carriage into another state.

Mr Ramsey—That is right. There is always an issue with sale of produce containing contaminants. At the end of the day, there is only so much you can do. Most of the weed species we have in Australia came in as contaminants and were not deliberately introduced. They will continue to spread because we have trade in produce. Unfortunately, that is one of the realities.

Senator WONG—On Natural Heritage Trust funding, 'complaints' is probably too strong a word to use but a number of recipients of that funding have raised with us concerns about the short-term nature of the funding given the sort of work involved. The nature of your work, by necessity, is very long term. I think you said that you are looking at 20 years in terms of control and eradication.

Mr Wickes—With broomrape we do the major aspect and then we have to do the monitoring.

Senator WONG—Correct. Management, control and, if possible, eradication of an invasive species involves a fairly long time frame over a number of years. NHT funding is generally annual only. You have received NHT funding—is that correct?

Mr Wickes—Yes. NHT funding has some time frames in it. Most of the funding gets supplied to projects that people are into at the time. A lot of that funding has gone into those integrated programs, so you actually get a good outcome. The longer-term stuff—for example, we have major programs with goats and things like that—are NHT funded. We even do some work against a program of which the community are particularly a part. The longer-term stuff that you are talking about, I guess, would be underpinned by the state.

Senator WONG—Right. So the state has funded that more so than the NHT?

Mr Wickes—Yes.

Senator WONG—So the ongoing work is being funded by the state rather than through federal funding?

Mr Wickes—That is right.

CHAIR—I have three questions. My first question is about one of the Weeds of National Significance—bridal creeper. Being a member of the asparagus family it is still legal to import it into Australia. Has South Australia lobbied the federal government to try to get it banned as an import into Australia? Why is it that, four-odd years after the Weeds of National Significance list was promulgated, it is still legal to import it into Australia, at least until next month?

Mr Ramsey—We have not lobbied to have bridal creeper prohibited from import. I was not aware that it was still permitted, to be honest with you. But we can take that on notice and give you a response, if you want a more detailed response than that. I think the reality is that bridal creeper is well-established in Australia, and it is unlikely that additional introductions of it would cause major problems. I think the key point there is that we are striving to have uniform proclamations, so all states would be able to prevent it. As I said, I was not aware that it was still permitted under the EPBC Act.

CHAIR—Is it being sold legally in any states in Australia that you are aware of at the moment?

Mr Wickes—My understanding is that it is sold in New South Wales. I know that only because my son, who lives in New South Wales, saw it in the supermarket.

Mr Ramsey—We have had an issue with bridal creeper in that it has been brought into South Australia, through ignorance, for sale through several nursery chains. It was able to be purchased in New South Wales. So there is an issue there, as I said, and that is the whole process of trying to get uniform proclamation. So long as it is sold in one state, it can be on-sold into another.

CHAIR—Have you banned any of its close relatives, like bridal veil or climbing asparagus?

Mr Ramsey—Bridal veil is proclaimed. I am not sure about climbing asparagus. I have the list here.

Mr Wickes—No, it is not on it. We have a botanist here to help us.

Mr Ramsey—It would be nice to be able to turn around and ask the botanist questions.

Mr Wickes—I did.

CHAIR—My final question is about Operation Bounceback. It has caught my attention. We have received a lot of evidence about the fox, the incredible damage that it has done and the difficulty of baiting on the east coast as opposed to the west coast. I think it has been mentioned

that Western Australia has probably done better than any other state in terms of bringing fox numbers down. What are the elements of success in Operation Bounceback? Do you think it is sustainable?

Mr Ramsey—I think Operation Bounceback has been a fantastic program in the state. The same model has been used on Eyre Peninsula to try and introduce species there. The whole concept is that, firstly, you cannot have successful reintroduction of threatened animal species so long as you do not have fox control. That is the principal underpinning logic of those sorts of programs.

The second issue is that you cannot be successful unless you have your community on side. So Operation Bounceback has been successful because it combined an environmental management framework with an integrated pest management framework. It put those things together to get all of the stakeholders involved. Once they were involved, it was able to draw in volunteer groups—such as the Sporting Shooters Association—to provide that extra bit of control and management. So it has been very successful. The program continues to expand and take on new areas where there are opportunities to reintroduce species. It is a good model. It is all based on our ability to control the fox with baiting.

Mr Wickes—The farmers have taken it on quite strongly and expanded the areas because obviously there is an advantage to them in having a proper program, an integrated program, across a large area.

Mr Ramsey—The key thing there is also that with these sorts of processes for pest management, as I said before, we are increasingly moving away from the notion of simply using the powers of the act to enforce control towards the notion of actually promoting the benefits of control to land-holders to get them more and more involved and looking more at the outcomes we are trying to achieve and less at just killing the pest species for the case of killing it. I think that fits with a lot of the shorter-term funding. Perhaps one year might be too short for many of the programs but many of the things we are looking at—for example, with olives—

CHAIR—That was my next question.

Mr Ramsey—With olives we look at using a risk assessment process to identify areas of priority. We use that process to prevent people planting commercial olives adjacent to areas of good native vegetation we want to protect. Also, using that model will allow us in future to target where we are going to put our control effort, because control is extremely expensive.

CHAIR—I am just worried because for the last decade in this country we have all have been inundated with ads for tax planting schemes to plant for olives. Given a lot of those have not made much money, I wonder whether there are a lot of olive plantations not being managed around Australia. I think your submission actually says that: that areas in several states will develop olive infestations as a result of olive production.

Mr Wickes—We have been managing where olives go through the risk assessment process. The biggest issue we have got in this state with olives is the feral ones that have been here for a long time. Trying to manage those infestations is quite a big job. We are looking at targeting

where we actually do that work. There has been quite a bit of targeting already done, and we are just expanding that at the moment.

Mr Ramsey—I think you are right, Chair. I think there is a risk in other states from olives establishing. South Australia had olives introduced basically with the buffalo. When the buffalo first arrived in the state, we had our first olives introduced. By 1900 it was one of the first feral species included in the botanical records, so it had established and spread very early, and of course the collapse of the early industry meant that there were a lot of feral olives, particularly up in Beaumont and areas around the city.

It is one where we have a real conflict. We have both heritage listed olive trees and feral olives and we have an industry that is trying to develop. In South Australia, under the policies of the risk assessment process we have implemented, if an olive grove is not managed for two years, it can be proclaimed as a feral planting and removal can be enforced. Obviously we are always concerned about the fact that foxes and starlings spread olive seeds over large distances. When we are looking at new applications, we request that they consult their local boards and develop a management plan for those species. Providing a place for the birds to defecate before they fly off is at least a good start, so we ask the local boards to do something to manage the feral olives.

One of the areas where feral olives are a major problem is right in the foothills behind Adelaide. So it is very much a focus for the city. Really the community needs to work out how they are going to approach it. As I have said several times, simply removing the feral species is not going to achieve a good outcome unless you know and plan what you want to achieve at the other end. So we are suggesting that people really need to start planning for the outcome they are trying to achieve, not just remove the weed.

Senator TCHEN—This might sound a bit frivolous: can you actually get the starlings to defecate in particular locations?

Mr Ramsey—The idea we have is if there are trees around the outside of the block of olives that allow the birds to land and rest then hopefully they will void most of the seeds before they fly on. Obviously they will carry seeds over long distances. For a commercially managed olive grove there are several criteria, including the size of the olives. Large kalamata olives cannot be consumed by a starling and carried. Also olives are harvested. The real issue is still the ferals. We have got stacks of ferals. They fruit abundantly. Those fruit are small, they are easily carried. There is no pest management. So they pose by far the greatest threat.

Senator TCHEN—I was looking through your submission and I came across the feral olive. I have heard of this problem before. It tends to skip my mind. Do you think that a story like Johnny Appleseed should be banned?

Mr Ramsey—I am not sure of the story, so I cannot answer that.

Mr Wickes—He spread apples all across America. We are not spreading olives everywhere. If people want to put olive groves in, they have to go through this risk assessment. The ferals that have been here a long time are the ones we are battling with.

Mr Ramsey—The spread of blackberries in Victoria was a case in point of your Johnny Appleseed, wasn't it?

Senator TCHEN—Yes. I was in Germany earlier this month and they have not exactly cultivated blackberries but it is not regarded as a pest; it is just on the hedges. People have blackberry picking parties. I am showing my lack of general knowledge: earlier you referred to the broomrape as being a parasite for weedy species but not a problem for grassy species. I take it that when you say 'weedy' you use it in a different context from that in which we use the term 'weeds'. Can you explain the difference between weedy species and grassy species?

Mr Wickes—The weedy species I am talking about are the broadleaf weeds, which tend to grow in paddocks or disused pastures. They do not attach to weedy grasses. If you plant barley, wheat or oats or something like that, they are a grass. The broomrape does not attach to those sorts of plants. It attaches to Salvation Jane and plants of that nature. Obviously there are a lot of different types of broomrape. This one has learnt to attach to things like canola and a lot of the vegetable species and things like that, which is why it is economically a problem. If we can work and we have agronomers working one-to-one with farmers in the area, and if we can get them to spray their fence lines—where you tend to get these broadleaf weeds—and keep them clean, which is something they do not tend to do, and also to look after their pastures pretty well, then there is nothing for the broomrape to germinate on. It requires a root exit to come from its host, the plant, and then it will germinate and connect into that host. If you have got daisies or those sorts of plants around you will find it will connect on to them quite well.

Senator TCHEN—Why is broomrape a problem for your wheat production? There should not be any broadleaf weeds in the wheat field anyway, should there?

Mr Wickes—No, there should not be, but managing a weed-free environment requires quite a bit of good farming practice. That is what we have to get all the farmers up to speed with. We have farmers who have not seen broomrape in their paddocks for a number of years now. They are at the top end of farm management practice. We have a program at the moment, which works with a lot of the other farmers to train them in agronomic solutions so that they can be just as effective. Not every farmer has a weed-free environment. It all requires a lot of good farm management—the time of spraying, the type of spray you put on and the level you apply. Also, as I say, not many farmers would clean up their fence lines. We are giving them some funding to help buy the chemical to tidy their whole farm up. They have their operation, which they pay for, and then we provide some funding to make sure the rest of the operation is tidy as well.

Senator TCHEN—So that, in the case of broomrape, the program will not involve the physical eradication of broomrape as such but educating and persuading farmers to adopt good practice?

Mr Wickes—With some areas, such as roadsides, we are physically going out and eradicating it by fumigation methods. We have been using methyl bromide, which is quite expensive, we use a lot of plastic and you have to wait until it rains before you can get it to inject. That is why we are trying this new compound, which is pine oil from New Zealand. When you put that on the ground, as you will find under pine trees, nothing grows. It actually denatures or does something to the lipids in the seeds. When they make paper, they crush the pine trees and it is the extract

that comes out of that. They have fractions for different things. They have a fraction that they use as a weedicide.

Senator TCHEN—That is probably a good outcome from paper making.

Senator WONG—It is better than methyl bromide.

Mr Wickes—It is better than methyl bromide. It is slightly cheaper but it is still expensive.

Senator TCHEN—You answered the question that Senator Wong raised with you earlier about the problem of particular vegetation being banned from sale in one state but it can be transported in from another state. The real problem is that the different states have different legislative processes—is that right?

Mr Wickes—Yes.

Senator TCHEN—You said that a national coordination plan is being worked on and you have made a submission. Can you tell the committee how you think it is proceeding? Are we getting there slowly or are we not getting there at all?

Mr Wickes—I think the National Weeds Strategy was the first big step in making that happen. There is a lot of agreement across the nation. The Vertebrate Pests Committee are undertaking a similar sort of strategy and they have been working continually at that level. At the moment, we are looking at a strategy across that whole pest management area which would then direct how each of the jurisdictions would interact. But we actually need to go through that process which has now started.

Senator TCHEN—What is the problem holding it up? I know Mr Ramsey said that in Victoria there is a particular process of consultation which slows things down. Does each state have similar problems? Are the states marching in step?

Mr Wickes—As I say, all the states are marching in step. They have all agreed to do a national and state strategy about what the drivers are. It is from that that you get collective action. That has started at that level in the last six months. Of course we have had the Vertebrate Pests Committee and the Australian Weeds Committee working in this way for quite a while. They tend to be more at a technical level rather than at the major policy driving level, which is what is happening at the moment.

Mr Ramsey—The Weeds Committee reports on progress with the proclamation of the WONS at each of its meetings. It is kept on the agenda and all the states are working towards achieving uniform proclamation. The main issue there is proclamation for sale of course. That is the target for all states. It depends on what is in the legislation for each state and what the requirements are.

Senator TCHEN—Are the states showing signs that they are prepared to look at each other's legislation so that they get some uniformity?

Mr Wickes—Yes, that is part of the strategy that has been developed. The same thing has just happened with the integrated natural resource management across Australia. We have our bill in the house, New South Wales has made a move, Victoria did quite a while ago and all the other states are looking at where they are. You need a good policy driver and then you get a good outcome.

Senator TCHEN—You indicated earlier that broomrape is at the moment exclusively a South Australian problem—it is localised—but you are getting Commonwealth funding to support you. Can you comment on the adequacy of the current Commonwealth response to invasive species incursions? Are you satisfied with the way in which the Commonwealth has responded to the state's needs?

Mr Wickes—Yes. In these types of incursions, I think you have to do a very good assessment of the risks and the directions to calculate the economics involved, which is what we did, and take that to a forum. The Commonwealth and the states have responded and have put funding on the table. They have made us jump through a lot of hoops, but then I think that is important—because it is a lot of money—in working out where you invest your money and why you should be doing that. Yes, the Commonwealth responded quite well. We had to round up a few states towards the end, but the Commonwealth were beside us all the way. We have funding from the Grains Research and Development Corporation. The Commonwealth government helped us very much in discussing with industry their funding contribution. I think if any issue is being sorted through at the moment it is the industry's response when these incursions happen. I think the state and Commonwealth governments are responding quite well.

Senator TCHEN—I think you indicated that some of the states might be showing reluctance in a situation like this one. Did I hear you correctly? Is their attitude: 'It is none of our business'?

Mr Wickes—You often have to round up your colleagues because of various things that they are dealing with and how you are treating them. It is like any issue in Australia where you have a number of governments all getting together and being convinced that it is the right thing to do. We do that by having them involved in technical assessments of our programs, in the same way that we have our people do technical assessments for them. One example is the fire ant program. The person running our broomrape program went to Queensland and did a technical assessment of their program. So I think it is all very good for learning from each other as well.

CHAIR—Is there compensation for land-holders? When I was last out in the quarantine area for broomrape, a lot of the land-holders were facing quite substantial losses due to the quarantine restrictions. How has the government dealt with that general issue?

Mr Wickes—When we first put in quarantine we looked at some of those losses, but since the quarantine protocols have been in place and we have a system through which farmers can sell all their product, it seems quite good. We then introduced a system that, if they were doing a lot of the quarantine arrangements themselves, we would give them, I think, $2.50 per hectare as an incentive cost for them to do that extra work and to look after a lot of that themselves. But they have to do some training and have a plan to be able to do that, because we have to be sure that they are controlling broomrape. As I said, where they are doing a break crop like canola or doing their fence lines, we are providing some funding to help them keep their places tidy. We have done an economic analysis of the area to see whether we are affecting their property values or

their income, and that does not come forward. While we have a good quarantine protocol there, with people on the ground assuring them that when a crop that has been done properly leaves, they will have market access. If we were not there doing those sorts of things, then I think the industry and the farmers together would have a bit of a problem. It is important that when there is an incursion there is a good regime that the state can apply, like this one, that helps farmers keep trading their product.

Senator TCHEN—In your submission you listed seven feral animals and two feral weeds plus broomrape. Obviously you have a longer list than that of proclaimed pests in South Australia. I will not ask you how long the list is, but can you briefly tell the committee what processes you use to declare an animal or plant to be a proclaimed pest, and what happens after that.

Mr Ramsey—There are about 109 species of plants proclaimed in South Australia. To get a proclamation, the process that we have adopted is that a board will write to the commission and ask for the commission to consider proclaiming a weed species.

Senator TCHEN—A local board?

Mr Ramsey—A local animal and plant control board. The idea is that this is driven from the ground up. The commission will then consult with all the other boards and see whether this is supported by other boards. We then ask them to put together a management plan showing what they are trying to achieve by having a species proclaimed. Just proclaiming a species does nothing if you are not going to do something to manage it. When they come back with a management plan, the commission members then consider it. If it is appropriate, they will make a recommendation to the government that it be added to the list of proclamations.

Senator TCHEN—What happens after that?

Mr Ramsey—The board will then implement the plan. The concept under the Animal and Plant Control Act is that responsibility for local action is driven locally, so the state proclaims the species in the board areas where they have a management plan for that species. They will then implement the plan. The plan will involve what their attitude will be whenever they see it—whether they are going to enforce eradication on the land where the weed occurs, because the ultimate person who is responsible is the land-holder, or whether they will say that it be controlled or that control be maintained. Usually they would not control sales within a local area because that would have very little impact. Generally, if it becomes proclaimed, we proclaim the sale of it across the state, but they will then manage movement and other things within their area, depending on the sections of the Animal and Plant Control Act that they want to implement under the management plan.

Senator TCHEN—So if a plant or animal is proclaimed, it has an effect across the state in terms of sales?

Mr Ramsey—Yes.

Senator TCHEN—But the actual eradication program will be carried out in a particular board area?

Mr Ramsey—That is right.

Mr Wickes—With the scientific support of the commission staff, because that is where you have all the base science, and the fact sheets and publications on a particular weed come from the commission as well.

Senator TCHEN—Do you also have controls with respect to people transporting those species across board borders, either knowingly or unknowingly?

Mr Ramsey—We are moving more towards a vendor declaration system. That has been incorporated into the new act in order to give an ability for the recipient of infested produce to take legal action—remediation, if you like.

Mr Wickes—We do check produce coming across the borders. The borders are managed for fruit fly and they check hay, headers and those sorts of things for contamination by weeds. That is done regularly.

Senator TCHEN—But the redress is through civil action rather than criminal sanctions?

Mr Wickes—Yes.

Mr Ramsey—Stock sales are a key part of this as well. Boards inspect sales within their local area where they give priority to the issue of weeds coming in on livestock. There are differences between the way boards will approach a problem, depending on how strongly they feel about it.

Senator TCHEN—What about incursion from interstate? I know we cannot take fruit and vegetables into South Australia, but that is more for the prevention of fruit fly infestation. That is a traditional approach. Do you conduct quarantine screening at the border? We understand the Western Australian government conducts quarantine screening of domestic mail. I am not sure how they go about doing that.

Mr Ramsey—No, it is beyond our resources to inspect all the produce coming across state borders. Boards will inspect it where they have a priority. If they are aware of a potential problem they can go and inspect the produce, but that is based on their own local plans and policies rather than ours.

Mr Wickes—We rely on the border protection to check hay and machinery to make sure they are not bringing fruit fly in, which is a major problem.

CHAIR—Thank you very much for your evidence this morning.

Proceedings suspended from 11.11 a.m. to 11.26 a.m.

FULLER, Mr Geoffrey, Chief Executive Officer, Nursery and Garden Industry South Australia Inc.

KESKULA, Ms Edda, Nursery Industry Development Officer, Nursery and Garden Industry South Australia Inc.

CHAIR—I welcome witnesses representing the Nursery and Garden Industry Australia. Thank you for giving us your time today; it is much appreciated. I note that Mr Richard de Vos, the CEO of Nursery and Garden Industry Australia, has advised the committee that he regrets that he is unable to join us today because of other commitments. He has provided the committee with a written submission. I also understand that NGIA has provided the secretariat, at its request, with a brochure entitled *Grow me instead*. Do you want the committee to formally accept that as a formal exhibit?

Mr Fuller—Yes.

CHAIR—It is so ordered. We have already published your submission. Did you wish to make any corrections to the written submission at this stage?

Mr Fuller—No. The submission that was written on 24 February covers, in a very basic form, what we plan to do as an industry. Our industry covers a very wide area. It is one that we are tackling as solidly as we can. It comes down to a national issue but it is very much driven by the states. We support the initiatives to reduce the invasive species but we need to have a very good look at the types of plants that are on the proclaimed list. We were talking earlier of lavender, which is on the proclaimed list. If we stop that, we stop a whole industry. That is a genus. The gun then comes down to the species and the cultivars. The cultivars of lavender are the ones we buy in the shops, which is a non-invasive, easily controlled particular plant. So we have a lot of work still to do on getting up a definitive list from some of the plants that are listed as proclaimed.

We have to have a localised and very cooperative approach to this list. At this stage we have a number of lists. Keeping to South Australia at this stage, we have gone through a number of lists as an industry and identified plants that are on an invasive list and looked at alternatives. The little brochure that was presented this morning from New South Wales is a brilliant brochure and one that we must all aim towards. A lot of money is spent on doing those types of things, and funding is available, but the problem with our lists is that there are so many lists in each state and they contradict each other. We need a concerted and controlled approach by the one organisation to work through them.

Each state has different government departments. The major one here is the Animal and Plant Control Commission of South Australia. In Western Australia it could be the Department of Environmental Protection. There are so many different government departments that we report to in each state that it becomes a problem of collating the correct facts. We work through CRC Weeds here, which is one that we would probably like to work through on a national basis.

The spirit of our submission and the positive feedback that we have had since we have published these fact sheets has been very encouraging. We have got a huge education process happening in our nurseries, particularly the wholesale nurseries, of growing. While we can control our industry and put submissions to the nurseries who are members and to responsible nurseries, our problem is that our industry is also a cottage industry—Paddy's Market, the council markets and the whole lot—and this is where we get what we call the garden escapes. We have a major problem with that. But, all in all, we are working on it and we have taken it very seriously. It is costing our industry a massive amount of money to control. If we go ahead and do the carte blanche banning of plants, then we have got a problem in our industry. It is one where we have got to go through it, plant by plant, and work out just how invasive it is, in which area it is invasive and in which states it is a problem. It is not going to be a short-term project.

CHAIR—What lists, if any, does your industry work to? Do you have a list of plants to avoid that you talk through with your wholesale nurseries in particular?

Mr Fuller—We do. It is mainly a localised list. We had the one that was sent out by mail.

CHAIR—In South Australia there would be the list of prohibited plants from the government and you are saying there is also a voluntary list of plants that you encourage people not to sell?

Mr Fuller—There is one that we have developed. There is that proclaimed list that came out of the National Weeds Strategy that covered thousands of plants in real terms. We had a look at the serious garden escapees in South Australia and we named a number of them—the wattle, which is a bit disappointing, was not proclaimed in South Australia; it is in New South Wales where it is a major problem, but here it is not. We named asparagus, which is an extremely good crop. The species that come from ornamental plants can be a problem in some states and in others they are not. As an industry, we speak with the wholesale nurseries when we are advised that they are selling an invasive species and try and talk them out of it. It is purely and simply a state based control. Nothing is directed from the Commonwealth or from federal parliament—or, for that matter, from our national body. It is one where we have the responsibility.

CHAIR—Would you like to see the federal government use its powers under the federal environment act to declare these lists so there is a clear national list?

Mr Fuller—We do need a clear national list that we have to work from. It is very easy to list plants that are invasive, but it is an area issue. We were talking about this earlier. In South Australia we can look at the problems of the hills. We have got an excellent publication that handles the coastline, but we look out at the Murray Mallee and it is an entirely different area with a different problem. Old-fashioned English ivy is a problem in the hills, but it is not a problem out in the Mallee. In the south-east it would be a problem because it would get into the swamps and all those other areas, but if you go far north or to Eyre Peninsula or York Peninsula, then it is not a problem.

But we need a national coordinated list. We need a national coordinated process of reporting, and we need to have it in each state. We work through the CRC in South Australia. Edda is a member of the committee that is looking at weeds in South Australia. We have been party to a lot of submissions on drawing up these lists and what we can do with it. We are very supportive of

the Weedbusters group in South Australia and on the national front, but it is so nebulous in where we end up going and that is a problem.

CHAIR—Looking at the inconsistencies between the various state lists, how do you deal with that as an association? One weed might be banned in South Australia but not in Western Australia and another one might be banned in New South Wales but not in Queensland. As our previous witnesses have suggested, in some states the processes are extremely slow to declare weeds. Does the association try to keep ahead of that game in terms of getting information out? How do you deal with those conflicting lists from different states?

Mr Fuller—The problem we have is that we can almost control the type of invasive plant that comes through our wholesale industry.

CHAIR—Almost?

Mr Fuller—Almost. Peer pressure does put a lot of pressure on some of these people. It is the nonmembers we have problems with. We get a lot of reports that such and such a supermarket or hardware chain is selling. The problem we have there is that they are not buying through accredited nurseries. I do not believe that the accredited or member nurseries—it would be in the minority—would be growing a problem plant. The problem we do have is that we might speak to them and say that such and such is banned in South Australia or is proclaimed in South Australia but, because we deal with so many Victorian, New South Wales and Western Australian nurseries, they could come over in those shipments. We have no real controls on the border to stop that because we do not have a weed police officer, so to speak. So they can come in and go straight to the nurseries or the garden centres that have purchased them.

The garden centres have a lot of commitment to sell the right thing. We have cut out all this very invasive German ivy and all these other things which just take over and run riot throughout the gardens, but we still see in some of the major nurseries and garden centres some product in a pot or hanging basket that is proclaimed.

CHAIR—In terms of the big retail and hardware chains, would they be sourcing from wholesale nurseries, which would be your members? Or do they have their own source?

Mr Fuller—Some source through our members but they source an enormous amount interstate. They have a network that is based mainly on the cost factor but also on the amount of product they can get. Our nursery industry in South Australia is small. We have some that can provide all but, because of the turnover of some of these hardware stores, they need mass amounts. Continuity of stock is important so they will buy from New South Wales and Victoria, and some from Queensland and Western Australia.

CHAIR—What percentage of the nursery and garden industry would be covered by NGIA and your protocols?

Mr Fuller—In South Australia or nationally?

CHAIR—Nationally, if you have an idea, and then South Australia.

Mr Fuller—I would suggest—and this would be a rough guess—that probably 40 per cent of the nurseries in Australia would be covered under the NGIA umbrella.

CHAIR—What about in South Australia?

Mr Fuller—We would have about 55 to 60 per cent, as a rough figure.

CHAIR—Could you take that question on notice?

Mr Fuller—Could I get back to you?

CHAIR—Yes.

Senator WONG—Going back to your membership, and major supermarket and department store chains that do sell plants—we have had some evidence from the Weeds CRC, I think, about some of the things that get sold in that context—do you have any involvement with those sorts of chains?

Mr Fuller—We do not. They are not members. We find it very hard to bring them under the membership or umbrella of a national organisation. They march very much to their own tune. When we are advised of a problem—and we have a lot of retailers who are aware of that because they are looked at very strenuously—either Edda or I will approach them and say, 'You're selling a problem plant.' They are usually very receptive to that, but we do not see it all. The major ones are very responsible in that aspect. The buyers they have are not experienced. They see that it is a beautiful looking plant. It has lovely flowers on it and they say, 'Give me 100 of those,' and they whack them in. They have not got the expertise or the knowledge to know what is on. We have sent out lists to them but whether they are read or not is another issue.

Senator WONG—Isn't this an argument for more effective regulation—mandatory regulation as opposed to—

Mr Fuller—On invasive weeds?

Senator WONG—Yes.

Mr Fuller—Yes, it is on a national basis, but it would have to be reviewed on a state basis because some of the plants that are invasive in New South Wales are okay here.

Senator WONG—But then you have the on-selling problem.

Mr Fuller—We do have the on-selling problem.

Senator WONG—Essentially what you are arguing for is that you would have different regulatory regimes supplying in different states. Is that what you are arguing?

Mr Fuller—Yes. It is difficult but it is the type of plant that is not invasive and the type of climate that we do have.

Senator WONG—But if you are doing a risk analysis what is the disbenefit of banning something, even in a state where it is not necessarily invasive, given the problems with on-selling, Internet selling and movement between states—someone buys something and then moves states? Is the need for them to have that plant so important that you should not have a national regime?

Ms Keskula—I think to some people it probably is, and it is really important that there is a national framework that we can all follow; you would know who to contact in that state to know whether or not the plants that you are selling are going to cause a problem there. So I do not think you can stop growing one particular plant all the way across Australia, because it might not be a problem at all in three-quarters of the country and it might be a really beautiful specimen for some reason. If it is fine in three-quarters of the country, it is difficult to then say, 'Well, you can't grow it there' because it is a problem in one tiny bioregion. But, as long as there is some sort of consistency in this whole process, we can refer back and people will know where a plant is not to be sold and not to be grown.

Senator WONG—But then how do you deal with the issue of movement between the states?

Mr Fuller—That is a problem.

Senator WONG—You have got to find an answer to that if your organisation's position is that people ought to be able to grow these things, even in states where it is supposedly not a problem because of the particular weather—

Ms Keskula—At the moment that happens with pest and disease issues anyway. There are state boundaries, and if there is a problem with any of the plant material that is coming into those states then it is held up at that point. If everyone is working off the same information then it is really easy to be able to prevent that from happening.

Senator WONG—How is it easy?

Ms Keskula—It just means that the people at those control points know what they are looking for. They know exactly what it is that is proclaimed in the area that they are regulating, so they are able to turn it back at that point.

Mr Fuller—At this stage we have no-one trained to sit on the checkpoints. We can stop them from coming in from New South Wales, but we have no checkpoints in from Victoria—there are too many areas for them to come in. So we are looking at the nurseries growing responsibly and acting responsibly. They have very strong associations in the major garden states, which are New South Wales and Victoria. But I take your point: why not do the whole lot? We have a list of 20 plants that came out of the national weed strategy which are totally banned, totally proclaimed and not to be used in real terms.

Senator WONG—But there are a great many other invasive species which are a problem in one particular area or another in Australia.

Mr Fuller—Yes, there are. But it is a commercial decision, I suppose, that we override. It is something that is very much in its infancy in controlling these types of products.

Senator WONG—Are you aware of the WWF submission to this committee?

Mr Fuller—The W—?

Senator WONG—The WWF—the World Wildlife Fund.

Mr Fuller—No.

Senator WONG—I do not want to verbal them, but as I understand it, they are saying there has to be more effective prohibition and control of ongoing trade—that is, distribution of ornamental plants which are invasive.

Mr Fuller—We are starting that process.

Senator WONG—Yes, but that is self-regulation.

Mr Fuller—That is self-regulation, yes.

Senator WONG—That is right—and you do not cover the entirety of the industry.

Mr Fuller—No, we do not.

Senator WONG—Even within your membership there will be compliance issues, because you cannot force them. I am not trying to verbal the industry—

Mr Fuller—No, it is a matter of fact—yes, certainly.

Senator WONG—but, for commercial reasons or reasons of ignorance, that kind of self-regulation is obviously going to leave some holes.

Mr Fuller—Yes, it will, because of the diversity of the types of people we have in our industry, and that is something that I do not think we will ever be able to control. I spend a lot of time heading around to the local markets, Paddy's Markets, and there are some very good plants; but 90 per cent are just garbage and rubbish. It is somewhere you can go up to these people and say, 'You're selling weeds,' and they will say, 'So? I got 50c'—or a dollar—'for it; you can't touch me.' We see that as the major area of distribution.

Senator WONG—But that is an argument for some mandatory regulation, Mr Fuller.

Mr Fuller—Certainly. But, if I may, how do we police that when we go out to a Paddy's Markets and state that you have got that? There has got to be some fine structure or deterrent so that it is not done, because they will just sell it at another market. That is one of the major problems in Australia. I do not want to use the term 'black market', but outside of the nursery, retail and hardware chains it is an enormous market—

Senator WONG—It certainly is.

Mr Fuller—and we could only hazard a guess about its size. We did a very rough estimate of some of these markets and their value and we suspect that it would be almost equal to what we turn over. It is just massive in the plant area and everybody is into it.

Senator WONG—I think you might have had this question from Senator Cherry: can you remind me what proportion of the industry you cover?

Mr Fuller—I need to go back and work on the figures.

Senator WONG—But it would be less than half?

Mr Fuller—It would be less than half, yes. It would be very much less than half.

Senator WONG—And you would agree that that would be another argument against self-regulation?

Mr Fuller—Yes. In the industry we have looked at registration of nurseries and an accreditation scheme. Ms Keskula is our nursery industry development officer in South Australia and we have a national development officer scheme in garden centres and wholesale nurseries. The majority of that is for the hygiene process, because pest diseases are very much an issue, but we also have to look at the regulation of weeds. We have recognised it as a national problem—we always have—but the question is how we formulate these lists to work throughout each state and how we make certain that the nurseries abide by those lists. Manpower to do that is a problem. If they knew Edda was coming to their nurseries they might push away somewhere the plants that they think may be problem plants but which they know are good sellers—I do not know; I would hate to think that. Self-regulation is the only way we can do it.

CHAIR—In Mr de Vos's submission, he talked about the international bodies appointing a national weeds program manager. What do you envisage that position doing?

Mr Fuller—I would like to see that position being similar to the water program manager, who has recently been appointed, and doing a little bit of the same functions as the national industry development manager. They would oversee the officers in each state to make certain that the lists are relative—national based and state based—and they would coordinate all those lists to make certain that we can put out a definitive list for the industry. The program manager of any national issue has problems with states, which are very guarded in what they allow—as we all are. It turns out that Edda and I work for South Australia but in a sense, while reporting to our state board, she would also report to the national board or to the national coordinator who would report to the national board. We need a person to coordinate the process and to coordinate all the other types of lists that are pushed out by different government organisations in each state. Everybody has a list—each council has a list and each region has a list—and it would not be a small job.

Senator TCHEN—I would like to follow up on that question. How would you see resolution of conflicts between local or regional awareness of what needs to be on the list and a national or state coordinator who is probably inundated by a large number of lists? Who would make the decision on what goes in what? I notice that in Mr de Vos's submission he recommended a

national management committee; however it is also based on regional groups. Which comes first? Which would have ascendancy if there were disagreements?

Ms Keskula—The *Grow Me Instead* brochure you have got in front of you is probably the best example of how that can work.

Senator TCHEN—That is a regional list.

Ms Keskula—That was compiled by a group of stakeholders. Basically, they realised that in the Sydney region there was an issue with weeds. They got together all the local council people and the local weeds officers and weeds committees from that region. They all sat on that committee and they decided on it. They are the actual stakeholders for that region, and they decided for their region what those weeds would be. They argued that out between themselves so that they were all satisfied that the list they have and that they have now published is the best list for their region. That has ensured that all the people who were actually involved in that process of regulating within their region had an opportunity to comment.

Senator TCHEN—I am looking at Cootamundra wattle, which is the first on the list, which is regarded as one of the top invasive species in the Sydney basin. Yet, obviously around the Cootamundra area, it would be very appropriate and could not possibly be on the Cootamundra list.

Mr Fuller—That is right. We are touching national icons here.

Senator TCHEN—On a national list, how would you see the Cootamundra wattle placed? Would that be on a national list?

Mr Fuller—It is. We have listed it in our particular state.

Senator TCHEN—You have listed a national icon?

Mr Fuller—Yes, we have touched on it. Although we have not proclaimed it in South Australia, it is a real problem in New South Wales, and it is a problem in most other states.

Senator TCHEN—How would you place it on a national list?

Mr Fuller—Put it on as a reference only or define the regions where it is. I think we can do that. I think if we put up from A-Z and put it up through there. We have it in a basic format already, but it has not been pushed out to any extent. We need to make the reasons why it is a problem in each state. It would be a fairly hefty document. Once you had that, you could come back to just the top 20 or 40 and we would know in each state how to control it and what we are looking at in each area. We all have our different fact sheets. The Animal and Plant Commission has developed this particular one here as an example. I do not need to table it. It has the environmental weeds of the Mount Lofty Ranges area. We have Cootamundra wattle on there, but it is listed because it is a reference from the national body.

To answer your question, it is a fairly hard issue to self-regulate on a state basis something that is proclaimed on a national basis. But commonsense will prevail through all that, because we

must list all the problems that we have, define them on a state basis and, unfortunately, we are going to have to do it on a regional basis. However, I think if we do it on a regional basis, it will just take it one step too far. We have coastal, we have Mount Lofty and we have Adelaide and environs. Those are just three that we brought with us today. For Sydney, there is Sydney, outer Sydney and Hawkesbury. For New South Wales, there is Blue Mountains, west, north, south, Riverland—there would be six or eight different types of booklets. It would be very expensive.

Senator TCHEN—Basically, what you are saying is that a national list would comprise compendiums of regional lists, which you would regard as a reference document rather than a mandatory rule.

Mr Fuller—True.

Senator TCHEN—Reflecting Senator Wong's question, would you favour self-regulation and education rather than mandatory sanctions?

Mr Fuller—Yes.

Senator TCHEN—In their submission, the World Wildlife Fund, which, unlike your organisation, is the representative body of all environmental groups—at least that is what they say; I will question them on that one day—claims that the voluntary approach to reduce trade in invasive ornamental plants by the joint CRC for weeds management systems and the Nursery Industry Association of Australia's strategy for invasive garden plants has had no impact in substantially reducing the trade in invasive ornamental plants. Do you wish to comment on this claim?

Mr Fuller—That is a very strong claim.

Senator TCHEN—Yes. That is why I asked you whether you wished to comment on it.

Mr Fuller—What they are stating is that we as an industry have not been responsible or even recognised the fact that we have a problem with plants. I reject that on the basis of what has been tabled today from New South Wales and what we have here. We have recognised the problem. Nothing is going to happen overnight. The WWF is an organisation that I respect. I have been in the industry for 30 years and this is the first time that I know of that it has made a comment against the industry. I have no problems with that. But I think where they are getting their facts from needs to be looked at. I reject that notion. We have been responsible; we are working towards it. There is certainly still an enormous amount of work to go, but we are looking at it.

CHAIR—Do you want to table any of the lists of plants that it is recommended should not be cultivated by nurseries and the Adelaide equivalent of the Sydney list?

Mr Fuller—We have the Adelaide ones here. I can ring the associations and get their lists and table the lot of them at the one time if that would suit you.

CHAIR—You can deal with that through the secretariat. I was just wondering what was best for you. It would be interesting to have that additional material to look at. As you can imagine, we have lots of lists so far. We have national lists, AQIS lists, northern alert lists and state lists,

so we might as well get some industry lists as well. The secretariat is going to enjoy reading them and collating them all into a table at some stage!

Mr Fuller—The secretariat is going to have a very large file. Regarding the WWF comments, we have looked at it very seriously because it is affecting our industry. We get a lot of feedback. The gardening shows and the radio programs are very responsible in what they are doing; they have made a lot of people aware of what is invasive. They love to tell you what is wrong. We look at that; we take it very seriously. But the list side of this requires a national coordinated approach that sets guidelines on what is and invasive and what is not, and how that is looked at. We do not need something frivolous put on it for no reason; we need a list that is serious and can be worked through.

CHAIR—It certainly is difficult. When we were in Queensland the Weeds CRC took us for a few tours of gullies around Brisbane to see the most recent generation of escapees and pointed out that they are still being planted in gardens. Golden durata was one of them. It is the preferred landscape hedge in Brisbane, but in the wild it grows in thickets 15- to 20 metres high and it is starting to clog up the creeks around Brisbane. It is ages away from being proscribed, but it is already becoming a problem, and you can see that it is part of the next generation of problems coming through.

Mr Fuller—Yes. But we will plant it until we are told not to, because it looks good and it fills in pots.

CHAIR—And it is very popular.

Mr Fuller—Absolutely.

CHAIR—But birds love it, and once it starts fruiting it is gone.

Mr Fuller—I listened to the earlier part about olives. Birds fly all over the place and we cannot get them programmed to do what they should naturally do in certain areas. It is a problem, and it is not just with seeds. If a twig breaks off, it can self-generate. If it is washed down a creek and starts off again, it can lead the whole thing. It is a problem that we are looking at very seriously but, with so many lists, it is taking its time.

CHAIR—Thank you very much for your evidence this morning. It has been very helpful to the committee. We look forward to getting further material from you. We might even approach some of the retail chains at some stage and get some material from them as well.

[11.59 a.m.]

BAX, Dr Nicholas John, Senior Research Scientist, Commonwealth Scientific and Industrial Research Organisation Marine Research

CHAIR—Welcome, Dr Bax. Thanks for travelling from sunny Hobart to be with us today; it is much appreciated by the committee. I invite you to make an opening statement before we move to questions.

Dr Bax—Thank you, Senator, for the opportunity to address the committee. I was proposing to show you an overhead but it looks like we are not set up for PowerPoint presentations here. I will give you a rather dry talk instead.

In recent work we have identified 1,600 species worldwide which, in the marine environment, have had economic and environmental impacts. Of those, between 135 and 700 have invaded Australia. Of those, we would classify about 50 to 70 as pests in that they have had economic and environmental impacts. We have also identified 36 more on the way, which we see as having severe economic or environmental impacts, which means they have had invasive impacts overseas and are in the major trading ports of our partners.

Senator TCHEN—Dr Bax, could you go over the numbers again in sequence?

Dr Bax—There are 1,593 invasive species worldwide; 135 to 308 have already invaded Australia; 53 to 73 we would classify as having had economic and/or environmental consequences; and 36 more we have seen as having caused damage overseas and are in the ports of our trading partners.

Senator WONG—Dr Bax, unfortunately the secretariat was not aware that you wanted to make a PowerPoint presentation; otherwise we would have made arrangements accordingly. It might be appropriate for you to provide us later with a document, if you can print off a hard copy of your presentation.

Dr Bax—Yes, I can do that. One way that they arrive here is through ship visits. Australia has 22,000 ship visits per year; half of them are from international sources and half are domestic. At any one time there are about 10,000 species being moved around the world in ballast water. The implication of this is that, in areas like Port Phillip Bay, the port of Melbourne, it is estimated that there is about one invasion detected every year. Not all of those are pests, of course, but it does represent an overseas species establishing in Australia. The rate of invasion is increasing.

A major source of these is international ballast water. This was addressed in July 2001 when ballast water management was put in place by AQIS. That was a world first in putting such a tough regime in place, and that has now been followed by the rest of the world through an IMO convention which was signed this year. Ballast water is just one of the vectors. They also come in in many other forms—recreational yachts, fishing boats, aquaculture and the aquarium industry. One example mentioned in the CSIRO submission is the black striped mussel, which arrived on a recreational yacht in 1999 and basically was eradicated—it was a world first

eradication of an established marine species. It took three weeks, involved 280 people and cost over $2 million.

In response to that invasion in 1999, the Consultative Committee on Introduced Marine Pest Emergencies was set up. This was based on a terrestrial disease model. It is chaired by DAFF. When a state or the Northern Territory recognises an invasion into their ports or their environment, they can call on $50,000 to scope the extent of the problem. If the problem seems to be severe and it is eradicable, they can call on a further $5 million to eradicate that species. These funds are on a cost sharing basis between the states and the Commonwealth. CCIMPE has responded to six invasions since 2001, including Caribbean tube worm in Cairns, Asian green mussel in Cairns, and caulerpa in New South Wales and South Australia, which did not fall under the CCIMPE guidelines because it was not clear that it came from overseas—it may have spread from Queensland. So that is an area of marine pests which is not being picked up by the national system. It has also responded more recently to the Northern Pacific sea star when it reached Inverloch in Victoria.

The area which so far has not been addressed to the same level is the ongoing management and control of species. A good example is the Northern Pacific sea star. The threat of the Northern Pacific sea star was recognised in 1975 in a Tasmanian Senate committee. It arrived in Tasmania in the 1980s but was not identified until 1993. Nothing substantial was done at that point and it reached Port Phillip Bay in 1995. There are now in the order of 100 million of these sea stars in Port Phillip Bay, or a weight of 3,000 tonnes, which is broadly equivalent to the weight of bottom feeding fish in Port Phillip Bay. An interesting thing about the Northern Pacific sea star is that its natural spread in the currents will take it from Port Phillip Bay and possibly along the east coast of Tasmania, possibly as far as Sydney, but the natural currents will prevent it going all through the Great Australian Bight and up through Western Australia. The only way it is going to get in these areas is through human assisted vectors—ballast water and fouling on ships. So really we have the opportunity to do something about it now.

I suppose the way the response is going at the moment is that there has been work on a national system for the prevention and management of marine pest incursions. The outline of that system is in the CSIRO submission, so I will not elaborate further on that. I believe that at the moment the national committee is hoping that something will be given to the standing committee to sign possibly in October.

I can probably summarise there that the threat is worsening. Australia has a good record in international ballast water management and in emergency response, but the management of other vectors, both international and domestic, has been lacking and also the long-term management and control has been lacking. In my opinion, it is imperative that the national system gets up and is adequately resourced so it can do its job. In that regard, it is worth while noting that the research and the management that has been done is cutting edge as far as the world is concerned. We really lead the world in this instance in many issues. Therefore, we can put a system in but it will not be right the first time. It is going to require ongoing monitoring, evaluation and adaptation to account for the errors we make when we first implement it.

The management of marine pests has the opportunity to provide major environmental benefits to both industry and other areas. An interesting thing in the marine environment is that a lot of effort now is being put in to establishing marine protected areas around the country as a way of

protecting biodiversity. But if those marine protected areas get invaded by marine pests, as some of them are already, then that significantly reduces their environmental value. So marine pests need to be one of the suite of management actions which occur in the marine environment.

CHAIR—Thank you. There is good news and bad news in all of that, I suspect. As a matter of interest, I noticed that Port Phillip Bay pops up a fair bit in your submission. Because it is such a confined place, is it a particularly bad test tube in terms of marine pests getting established, or is it just an area that has been studied?

Dr Bax—Partly it is an area which has been well studied, but we have studied 36 ports around the country. Port Phillip Bay is particularly bad. It has a long history of transport coming in, so it has a lot of international shipping coming in bringing ballast water. Previously, there were wooden vessels bringing in their suite of pests attached to their hulls. The other thing about it—you are right—is that it is a semi-enclosed body of water. The water inside has a very long residence period so, when a species comes along, it spawns and releases its larvae into the water column and, instead of them being washed along the coast to somewhere else, they stay in Port Phillip Bay and develop a second generation.

CHAIR—How does the CSIRO or even the country prioritise the great long list of pests and threats that you have identified in your submission? Where do you start with all of that?

Dr Bax—I think our best opportunity is to look overseas, and that is what we are doing at the moment through NHT funds from DEH. We have a project to look at both the pests coming in from overseas and the pests already in the country—with the idea of prioritising them, and that would be based on their perceived economic and environmental damage here—and also at what could be done to manage them. Some may be so widely spread now that there are very few management options available, with the exception perhaps of protecting some iconoclastic ecosystems.

CHAIR—I remember seeing TV programs on the Northern Pacific sea star 10 or 15 years ago. Was there ever a point at which that could have been contained, do you think?

Dr Bax—I think we are still at that point now. We have a good opportunity now of reducing the risk of it spreading west of Port Phillip Bay.

CHAIR—By somehow monitoring the heads, essentially?

Dr Bax—It is not going to naturally spread west of Port Phillip Bay in the currents, so for a spread west of Port Phillip Bay it is going to have to be transported by a ship.

CHAIR—But it could spread east, as you say?

Dr Bax—It could spread east; that is right.

CHAIR—Do you think there is any way of stopping it from spreading east?

Dr Bax—This is quite a new area of research. We are looking at potential biological control. We have also considered the option of genetic control of this species. At the moment long-term

funding has been rather restricted for management and control, so we have not progressed that very far. However, we are working with the PAC CRC, looking at the genetic control of carp in freshwater rivers, and that is providing us with a lot of information on what techniques might work in the marine environment.

CHAIR—Is carp on your list or the Pest Animal Control CRC's lists?

Dr Bax—We are part of the Pest Animal Control CRC so—

CHAIR—Of course, right.

Dr Bax—we are doing some of the genetic work on carp and have been involved in that area, I suppose, since 1996.

CHAIR—Are you optimistic about the biological or genetic control of carp?

Dr Bax—I think it is a very new, exciting area. There will be no silver bullet, I imagine.

CHAIR—No.

Dr Bax—But, put together with a suite of other techniques, I think it offers great potential. I think we are really just at the beginning of understanding what kind of potential genetic control actually offers us.

CHAIR—The Darwin Harbour incident that you spoke about in your submission is, as you said, a world first for a marine pest eradication program. Are you optimistic that we can eradicate any pests as they come in? You mentioned several pests coming into Cairns Harbour. Are you optimistic that we can eradicate some of these pests in the future?

Dr Bax—I suppose with the black-striped mussel it was a unique situation in that it was a closed environment and one which did not have huge environmental value, and it was also detected early on in its invasion. But there have been other cases—for example, not the Caribbean tube worm but the Asian green mussel in Cairns; that was detected quite early, and a lot of work is now going into trying to remove all of those specimens from the harbour. It is very difficult, but at the moment the numbers seem to be being kept low enough that they are not exploding. Recently, through a community effort they appear to have certainly reduced, and will perhaps eradicate, the Northern Pacific sea star from Inverloch, which is about 150 kilometres east of Port Phillip Bay.

So there are cases where that is working. Probably the best example is *caulerpa*, which here in South Australia they spent $6 million to $8 million eradicating from West Lakes through pumping freshwater into those lakes. So it does appear that eradication is possible, especially in areas where the environment is semi-closed, but as you commented earlier with regard to Port Phillip Bay it is those kinds of environments—those semi-closed environments—where the species seem most likely to establish. So in a way we do have other opportunities.

Senator WONG—What was the example you gave of West Lakes? What was the invasion there?

Dr Bax—That was *caulerpa taxifolia*. It is a green algae and it has caused a huge amount of trouble in the Mediterranean, where it spread to cover 10,000 hectares. It has now invaded southern California as well. It basically covers surfaces; it almost looks like an underwater golf course, I think, when it comes. It covers reefs, it covers seagrass and it is basically noxious to most species, so not many species eat it. It is seen as a major threat to nursery areas—for fish, for example—so the South Australian government went ahead and looked at various solutions to eradicate it from South Australia. It is spread by the aquarium industry, which is an interesting vector. Up until very recently it was still available—you can still buy it on the Internet, for example—and up until very recently it was exported from Queensland.

CHAIR—So it is now banned nationally, is it?

Dr Bax—I think the state legislations are quite different on how they respond to *caulerpa*. I believe it is banned in New South Wales and South Australia, but I am not quite sure of the situation in Queensland or Victoria.

Senator WONG—Is this in your submission?

Dr Bax—I do not think there is anything on *caulerpa* in the submission. One thing that may be of interest about *caulerpa* is that, whereas the national system and the cost sharing which has been set up by the states and the Commonwealth addresses introduced marine pests, because it cannot be demonstrated that *caulerpa* is introduced—and it appears that it comes from Queensland—it falls outside of the whole cost-sharing arrangement.

Senator WONG—So it was funded totally by the state government?

Dr Bax—Yes.

Senator WONG—When was that carried out?

Dr Bax—Ongoing. I think they believe they got success about a month ago.

Senator WONG—There are a number of questions I want to ask you, but I will try not to take up too much of your time. In the submission that we had I just wanted to clarify the actual state of the funding. In appendix 2 there is a discussion of a national system for the prevention and management of marine pest incursions. What is the status of that? It refers to a high-level officials group which the ministerial council formed in late 2002, which reported or submitted last year for the October 2003 meeting. Was that signed off on—the funding that is set out at page 27?

Dr Bax—No, the process there I believe was that the standing committee signed off and also the Australian transport committee signed off on the report, at which point I guess the states and the Commonwealth were sent away to develop an intergovernmental agreement. That was the form of which it was seen a national system would develop. I believe that, as part of that intergovernmental agreement, there will be a fully costed model of what the implications are.

Senator WONG—We do not currently have a national system?

Dr Bax—No, we don't.

Senator WONG—And even if that were funded, your submission made some comments that the nature of the funding does not fund ongoing management and control research in the area of marine pests?

Dr Bax—Yes, that was certainly the case for the budget as laid down by the high-level officials group. Whether that is saying the budget moves through I guess is a different question.

Senator WONG—If you are not asking for it I do not suppose that it is likely that you will get more.

Dr Bax—We try to ask at some of these meetings. One of the difficulties I believe is that it is seen as a quite expensive system. As the Commonwealth and the states have to sign on to cost-sharing agreements, industry does as well. I believe there is some question of how much can be asked from those organisations.

Senator WONG—So what happens? Does it essentially mean, even if the national system is signed off on, that you are looking at threat response rather than research into ongoing control and management methods?

Dr Bax—Not just threat response. Most of the national system is directed to prevention and therefore there are management standards and protocols; legislation will be introduced to reduce the risk of further spread of the species around Australia and also more species coming into Australia. The area which I see as lacking is the response to those species which are already here. Could we, for example, develop techniques to reduce their abundance and therefore reduce their spread around the rest of the country?

Senator WONG—Is the attitude currently, 'Well, the cat is out of the bag, as it were, and it is a bit too expensive to even address that scale of problem'?

Dr Bax—I think the attitude is more one of: 'Prevention is a pretty hard task. Let's get that fixed first and then we can look at prevention and control later on.' I suppose my perspective as a scientist is that it took us seven years to produce the science which went into the ballast water risk assessment for the ballast water management plan introduced in July 2001. It is going to take us equally long to develop management and control techniques for existing species, and we really need to start now if we want to have a response in the next 10 years or so.

Senator WONG—You made some comment about the Northern Pacific sea star. Is that the right title?

Dr Bax—Yes, that is right.

Senator WONG—Did I understand you to say that there is no current management action?

Dr Bax—Right. There is no current management action for the sea star. A control plan was developed and gave various recommendations, including for research. We are doing some research funded through NHT to compare different management actions to see which would be

the most effective. But the only real management actions going on at the moment are on a state-by-state basis—the state being Victoria, where they are introducing their own ballast water management plan on, I think, 1 July.

Senator WONG—That might deal with some of the vectors that you described between Port Phillip Bay and, say, Western Australia but that is not going to deal with the problem where it is, is it?

Dr Bax—No, it is not.

Senator WONG—That is a containment issue.

Dr Bax—Right. It is a containment issue and purely through ballast water.

Senator WONG—Was that control plan developed by your organisation?

Dr Bax—We had a part in it, and the Victorian government was also involved in its development. The national task force that was set up included it in their final report.

Senator WONG—But it was not acted upon?

Dr Bax—There was no real way to enforce or enact the plan. As I understand it, it did not have any legislative role or any particular way forward. Working with NHT, we have looked at various parts of it and have tried to do some of the research recommended in it, but no funding was associated with it or anything like that.

Senator WONG—That is what I meant: the task force report was not picked up by governments. Is that correct?

Dr Bax—The control plan was not particularly picked up by governments. That is right.

Senator WONG—What sort of funding was provided for the NHT research specifically on the sea star that you referred to earlier? How much are you getting over what period?

Dr Bax—The work on the sea star has primarily been in two projects where we are trying to evaluate which management strategies would work best. It is a computer based simulation approach. Off the top of my head, we have received in the order of $150,000 covering about three years of research.

Senator WONG—For both projects?

Dr Bax—Yes.

Senator WONG—What are the economic costs of this pest?

Dr Bax—The economic costs are quite hard to establish. At the moment scallop farmers in Tasmania are certainly having a lot of difficulty. They lose a lot of scallops. I think some of the

economic costs are yet to be realised when this pest moves into the open environment of Bass Strait and places like that and consume what remains for the scallop boats out there.

Senator WONG—Have you done much modelling on the environmental and economic costs of any particular species or more broadly?

Dr Bax—We have not ourselves done that. There was a consultancy project which went to look at the various economic and environmental costs of marine pests, and it has proven quite hard to get a good handle on those costs. It really needs a very detailed study, and that has not been done.

Senator WONG—Who did that?

Dr Bax—I do not remember the name of the consultants, but it was done for the Department of Agriculture, Fisheries and Forestry.

Senator WONG—Are you able to provide some details about that project to the committee or at least to the secretariat so that they can speak with the department?

Dr Bax—I can certainly give you the contact that I obtained it from.

Senator WONG—Are you able to tell us what the Commonwealth's funding for R&D in invasive marine pests is on an annual basis? Do people other than you do research and development in this area that is funded by the Commonwealth?

Dr Bax—To begin with, it was primarily us starting in 1994. We received money through both NHT and the shipping industry. Our research went through a bit of a hiatus, in a way. We reduced our research in the late 1990s as a few staff left and things like that occurred. More recently, other states have started to become involved. Victoria has been very active in this area and other states are building their capacity to respond. Now with the national system getting close to being up, there has been approximately $3 million of NHT money set aside to implement the national system. At the moment, the funding situation for the next two years looks quite good for implementation of the national system.

Senator WONG—If that proposal gets funded. Are you talking about the national system proposal? Is that what you are referring to?

Dr Bax—Yes. So the funding is good for the national system but whether at the end the national system gets signed off by the states and the Commonwealth is a political question.

Senator TCHEN—As you said earlier, something like 10 per cent of the worldwide recognised invasive marine species are identified in Australia. It seemed to me that the invasive marine pests issue is really an international matter. Earlier witnesses also indicated that. Could you speak about the international aspects of the control of marine pests? Are there any international forums that exist that Australia participates in? Does Australia have a role in such forums? Do we participate actively in any of them, and in the research area as well? Can you give us some outline on that?

Dr Bax—I will try to go through those. Australia was one of the first countries to look at the problem of species being transmitted by ballast water and it introduced guidelines for ballast water management in 1989. Those were subsequently adopted by the International Maritime Organisation, but these were voluntary guidelines. Since that time, Australia has been very active in promoting the ballast water convention. This was signed this year, 2004. So Australia has been very active in that area.

The other area where we have had a role is through APEC where Australia and Chile, primarily, now run two risk assessment workshops to look at the problems of marine pests in the APEC economies and try to work out what needs to be done to improve the risk assessment and the response to risk in those areas. That is all I will say about that.

The other area I think you mentioned was international research. We have quite a good connection with the Smithsonian. We have had Smithsonian scientists working in Tasmania. When we developed a national database for introduced marine species, we made sure that it mirrored the one developed by the Smithsonian so they could both be joined together. We have been involved in quite a few national committees. We have quite a high international profile. I am on the Global Invasive Species Program representing marine species there. Mark Lonsdale is now the chair of the board for that program.

So we are quite well interconnected both nationally and internationally. One reason for that is that a lot of the problem in marine species and marine pests is in our trading partners' ports. If we can act to improve their capacity and reduce the risk of species reaching those ports then that will in turn benefit our own ports.

Senator TCHEN—You said that Australia initiated the control of ballast water issue back in 1989. I assume that there would have been a fair bit of research carried out in Australia on the ballast water and marine pest problem before 1989.

Dr Bax—I do not believe that much research on ballast water moving marine species around was done before 1989. It was a bit before my time, so I am not sure exactly what happened. As far as I know, we started most of our research in 1994, after that initial precautionary management.

Senator TCHEN—So we went to the international forum in 1989 without a very big science base—just with a political agenda?

Dr Bax—There was science in other countries. It really involved one paper by Jim Carlton, who has led the whole movement of ballast water management around the world. I believe that had come out about a year earlier. So the threat was recognised overseas, and there had been some work by museums looking at the marine pests, or invader species, in Australia, but there was not a coherent research program backing it up at that time.

Senator TCHEN—Did you say that our domestic research effort started in 1994?

Dr Bax—That was when the main research—at least, the CSIRO research—started.

Senator TCHEN—Has there been a consistent pattern of investment into funding this research, or have we slowed down? Are we maintaining or increasing the tempo?

Dr Bax—I think when the CSIRO set up a centre for research on introduced marine pests in 1994 that allowed quite a vigorous tempo of research. As we went to co-investment models, there was not a huge level of co-investment, so I think the CSIRO reduced its commitment to some degree. Now we are in an area where it looks as though there are more co-investment opportunities. Perhaps one could say that co-investment is taken as an indication of how seriously the nation treats the problem. Therefore, I am hopeful that we will be increasing our research capacity. An important aspect there is that, over the last three or four years, the states and the Northern Territory have started to increase their own capacity to respond to marine pests, so it has become less of a one organisation response, but there has been far more response now by the states and universities.

Senator TCHEN—You speak of this co-investment model which was introduced in the late nineties as a sharing of costs, a national involvement rather than just government involvement. From the experience that you have had, do you see it, in the longer term, as a successful model? I know that you lost some funding for a while, but you say that it is picking up a bit now. In the longer term, do you see this model as fulfilling its expectation?

Dr Bax—I speak from quite a low point in the organisation, but from my own perspective co-investment does have the advantage of sharpening your research towards deliverables which are needed by the community. The downside of it is that sometimes your deliverables are posed on the short term and there is not sufficient opportunity to carry on long-term research. That can be a problem. Long-term research in these areas means setting up research programs for three, five or seven years, and sometimes those can suffer from looking at co-investment models which are typically concentrating more on short-term research.

Senator TCHEN—That is something you need to focus on.

Senator WONG—Dr Bax, I found the reference to caulerpa in an article by one of your colleagues, a Dr Thresher, in *Waves*, which is the Marine and Coastal Community Network's newsletter.

CHAIR—You have done very well. Thank you for that excellent evidence, Dr Bax. Keep up the good work. If there is any material which you could forward to us regarding the questions people have raised that would be much appreciated.

Proceedings suspended from 12.34 p.m. to 1.50 p.m.

ALLEN, Mr Timothy John, National Coordinator, Marine and Coastal Community Network

CHAIR—Welcome. Thanks for travelling from Melbourne to be with us today; it is very much appreciated. For the benefit of witnesses this afternoon I have to run through some procedural items before we get going. The committee prefers all evidence to be given in public, but should you wish at any stage to give your evidence, part of your evidence or answers to specific questions in private you may ask to do so and we will consider your request. You are also reminded that evidence given to the committee is protected by parliamentary privilege and that the giving of false or misleading evidence to the committee may constitute a contempt of the Senate. I now invite you to make an opening statement before we move to questions.

Mr Allen—Thank you for giving me the opportunity to present to you this afternoon. I will run through a brief presentation relating to introduced marine pests, if I can seek your indulgence for about 10 minutes, and then we will move to questions. I work for the Marine and Coastal Community Network. We are a non-government project that is coordinated by the Australian Marine Conservation Society with money through the NHT, and our role is to increase community involvement in marine and coastal policy initiatives. We have been in existence now for over 10 years and we have a very broadly based network with over 10,000 participants. They include people involved in commercial and recreational fishing and diving, the scientific community, tourism organisations, conservation interests and state and local government agencies. People are not members of the network, they are participants. They share information and views through the network. They do this through a number of fora, including publications that we produce on both a monthly and a quarterly basis.

A PowerPoint presentation was then given—

Mr Allen—In relation to the issue of invasive species, it is interesting that a survey in 2001 highlighted that 600 of the MCCN participants who provided feedback identified ballast water and introduced marine pests as the priority issue—above water quality and water pollution and above commercial fishing issues—facing Australia's marine environment. People who are in tune with marine and coastal issues see introduced marine pests as a highly significant issue that requires greater attention. It was also considered as the priority issue for the network to work on over the five years from 2001.

In terms of Australia's ocean wealth—and I think we do need to put into context the values that we are talking about—Australia has 11 per cent of the world's marine species. Over 85 per cent of the marine species found in our southern Australian waters are found nowhere else in the world, so there are very high levels of endemism in this region. The region that I am talking about extends from Jervis Bay through to Rottnest Island and covers Tasmania. To compare that to the Great Barrier Reef, 12 per cent of the species found in northern Australia are largely endemic to that region. The species that we find in our coastal waters, while perhaps not as diverse as those in tropical areas, are highly unique to our particular region; for some groups it is over 90 per cent.

The total value of Australian fisheries production is $1.8 billion. Marine farming, an expanding industry, generates $440 million annually and marine tourism, diving and snorkelling and recreational fishing, is worth billions of dollars to the Australian economy. I will go over what sort of impacts introduced marine pests can have on these values. This photograph I am showing is of the Pacific oyster, which became feral in the Tamar estuary. It was a calculated introduction for marine farming practices but it has gone feral. The photograph shows that it is colonising the intertidal area. You would not be able to walk over that area in bare feet; the sharp shells would lacerate your feet.

The general issues associated with marine pests are that they dominate space and force out native species. They can become voracious predators that consume native species. They can cause toxic algal blooms, which can cause problems for human consumption of shellfish, especially when those algal blooms have been concentrated in the tissues of shellfish, particularly oysters and mussels. They can therefore affect human health and the health of marine organisms. They also have the potential, where they are covering over benthic communities—or sea floor communities—of influencing nutrient cycling. I highlight Port Phillip Bay as an example. Port Phillip Bay is extremely important for cycling the nutrients that come into it through Melbourne. The sea floor is very important to that nutrient cycling process. Introduced marine pests may serve to curtail that process and cause problems for that particular environmental service.

Introductions are what we term ecological roulette. The impacts of many introduced species are likely to be slight, but sometimes we know that the results will be devastating. A couple of international examples worth highlighting here include the waterways of eastern USA and Canada where the European zebra mussel now out-competes local species. It is massed over large areas and it is also very effective at clogging up water pipes and inlet valves. The antifouling measures to control it now cost in the order of $1 billion per year, so the fouling of boats and inlet and outlet pipes by this particular species is a multibillion-dollar problem. The other species that often comes up as an example is the comb jellyfish that was introduced into the Black Sea. It now constitutes up to 95 per cent of the biological mass of the Black Sea. It led to the collapse of the Black Sea's fishery worth $250 million a year, causing massive social dislocation and the complete collapse of that fishery.

In Australia we are yet to see levels of that magnitude, although there are some worrying trends starting to occur with the Northern Pacific sea star, which I will discuss in a moment. There is a time line for introductions. Water was first used as ballast to stabilise ships in the mid to late 1800s. In 1908 the problem was first recognised that it was a possible vector to spread introduced marine pests. In 1973 the threat to Tasmanian waters was identified. By the late eighties we had identified 62 exotic species in Australian waters. In 1992 the Northern Pacific sea star was identified in Tasmania, although it had already been there for six years—it had been misidentified. By 1995 that species had reached Port Phillip Bay. From a handful of individuals in Port Phillip Bay—from memory, the first discovery was of around six of them—the population is now in the order of 165 million individuals. In 1999 there was a black stripe mussel outbreak in a marina in Darwin. The threat posed by that particular species caused an unprecedented action, which was basically a sterilisation program for the marina. That species was subsequently eradicated, but the threat remains that it could be reintroduced. By the late nineties more than 215 exotic species were listed. What this highlights is that, increasingly, we are seeing more and more species on our doorstep. There has been the caulerpa seaweed

outbreak in South Australia, and now the Northern Pacific sea star has extended beyond Port Phillip Bay with an outbreak near Inverloch, 100 kilometres east.

In relation to the Northern Pacific sea star, this particular photo shows the initial infestation of Hobart. It shows just how easy the hand collection of them was, how easy it was to pick them up—and still is. Female Northern Pacific sea stars can produce 19 million eggs. As I said, it boomed from a handful in 1996 to 165 million in 2000. There are now 1,200 tonnes of sea star in the bay compared to 2,700 tonnes of fish. So you can see again that the biomass of this thing is huge. The species has been implicated in the abrupt 40 per cent decline in fish numbers over the past three years. This is in an as yet unpublished state government report that is due to be released shortly, highlighting this particular impact on the fish populations in Port Phillip Bay. You can see the potential implications for social, economic and environmental elements of the bay are, indeed, extreme. Left unchecked, it will spread to Western Australia, South Australia and New South Wales. It is worth while saying that the prevailing currents mean that this species will not get to South Australia and Western Australia unassisted. It will get here through conscious actions; it will get here through ballast water. We now have a choice of whether we want to act to prevent the introduction of this particular species or leave it unchecked and potentially let it get here.

As for the trends, the CSIRO estimate that there are between four and six new introductions to Australian coastal waters each year. The risks are compounding and increasing with each introduction. In recent work the CSIRO identified 700 species—I believe this figure has been increased to 1,500—that have a demonstrated invasion history or capability. Of those, 32 species are of concern to Australia, so we are not, by any stretch of the imagination, at the end of the potential invasion cycle. We are at risk from a whole range of marine pests that could still be on our doorstep and indeed are.

In terms of policy initiatives, in 1989, possibly following the outbreak of the zebra mussel in the United States, the International Maritime Organisation convened the Ballast Working Group. In 1995, Australia initiated a national ballast water management strategy. In 1999, a task force was set up to look at marine pest issues and recommended the establishment of a national system. In 2001, Australia initiated ballast water management arrangements for international vessels, so before vessels coming from international ports could come into Australian waters with high-risk ballast they had to demonstrate that they had undertaken actions to reduce that risk. However, where there is intercoastal trading and shipping, there is still an issue about controls at that level because at the moment there is no comprehensive domestic ballast water management strategy. Water from, for example, Tasmania or Victoria could be discharged in the Spencer Gulf or the Gulf of St Vincent here in South Australia. So at the moment there are no national domestic ballast water controls, which I believe is a great problem.

In 2002, in conjunction with the Commonwealth and AQIS and with the support of the shipping industry, Victoria advanced a domestic ballast water management strategy which was successfully trialled in Westernport. That trial highlighted that 83 per cent of the vessels coming to Victoria had in fact come from another port locality within Australian waters. It also highlighted that only two per cent of the vessels had not complied with the trial by the time they came to the port. What it is demonstrating is that the trial was successful and that a domestic ballast water management strategy can work and have the support of the shipping industry.

In the absence of a domestic ballast water management framework, Victoria moved to implement domestic ballast water management arrangements for the state in April this year. That followed an outbreak of the Northern Pacific sea star on Victoria's open coast—as I said, near Inverloch—and was as a result of the seafood industry, the aquaculture industry, the conservation sector, the recreational fishing peak body, the scientific community and the dive industry working in conjunction to place further pressure on the state government to implement a domestic ballast water management framework. I believe you will see similar alliances being struck between community organisations as this issue draws on.

In summary, the serious risk posed by introducing marine pests was first identified in the seventies. We do know a lot more about the problem and the risk of introductions—and I highlight the good work undertaken by the CSIRO when they had the Centre for Research into Introduced Marine Pests. I would like to state on the record that there has been a diminished capacity in terms of the CSIRO, unfortunately, as a result of resources moving away from this issue in recent years. I believe there were six researchers and now there are three senior researchers. As we know, the moves for a CRC were unfortunately not supported by the shipping industry, so a CRC for ballast water and other vector research was not established.

We have made gains scientifically, politically and socially in battling marine pests, and Australia has been at the forefront of international initiatives. However, the marine pests are still winning and I believe we are not moving quickly enough—particularly, as I said, on the issue of domestic ballast water arrangements. While there are moves to develop a national system for the prevention of the introduction of marine pests into Australia, it has stalled. I would urge members of this committee to take a very strong interest in the national plan. I think at the moment preventing the entry of exotic pests—that is, barrier control—is the only effective long-term strategy. Reacting after the fact is very problematic; it is costly and in many instances it is just not feasible. When we are dealing in Port Phillip Bay with 126 million sea stars, hand collection is obviously not going to be the way to cope with something like that; we are going to be looking, long term, at perhaps genetic control as the only option there. So I would say that if possible the inquiry needs to place pressure—someone actually mentioned a blowtorch when I said I was coming here today—on the state and territory governments to work in unison to implement the national system of preventative actions on introduced marine pests. I will open that up for questions.

CHAIR—Thank you. I was just looking through one of the *Waves*, which we were given in our papers, and it was talking about the problems with CSIRO's funding; it was not appropriate to ask CSIRO about that, I suppose. Your magazine said that the marine pest centre, which was established a few years ago, had been stripped of resources as part of this CRC attempt. Could you expand on that at all?

Mr Allen—I do not know if it was in relation to the attempt for the CRC, but it definitely has been stripped. I can comment in terms of its resources. As I said, it did have a dedicated staff of six senior scientists. Three of those have since left and the role of the centre has been subsumed back into the general operation of CSIRO. Some would argue that that has diminished its capacity to be able to deal with the many research requirements still needed on introduced marine pests.

CHAIR—I will just bounce around a bit—sorry, but I have got a bouncy head! Was there a point at which the Northern Pacific sea star would have been controllable in Port Phillip Bay or the Derwent, and why didn't it happen then?

Mr Allen—I can speak in relation to Port Phillip Bay. In terms of the Derwent, the problem was that, as I mentioned in the presentation, it was first identified in 1986 but it was misidentified. It was about 1992 or 1993, when its population was exploding, that it was identified and by then it was way too late. In terms of Port Phillip Bay, the conservation sector in unison with the seafood industry aquaculture sector were calling for state government action for controls on ballast water coming from Tasmania in the mid-1990s. So, yes, I think that there could have been actions put in place at that stage. In terms of preventative actions, the problem with Port Phillip Bay was that they were first identified on mussel ropes in the southern part of the bay but then very quickly after that they were also located in the northern part of the bay, so it was not clear whether we were dealing with one introduction or a couple. It is very difficult, obviously, with an area like Port Phillip Bay when you have got ships moving through and coming through the Heads.

CHAIR—What is happening with the effort at Inverloch at the moment?

Mr Allen—The effort has been incredible, in fact. The state government acted very promptly as soon as the local community identified that they had the Northern Pacific sea star in their midst. The state government called on volunteers to start to collect the sea stars. There has been a concerted effort by divers and they have now been diving since late January. I think that on any weekend they have had up to 45 to 50 divers in the water. That is showing that they have had some success. They have reduced the population. They found a hotspot just inside the inlet; they have reduced the numbers down now. On any diving weekend I think they are collecting about eight to 15 sea stars. From an initial infestation I think they were pulling out around 40 to 50 every weekend. So it is showing that they have had an impact.

However, it highlights the fact that there are certain parameters within which you can have one of these clean-up events. It depends ultimately on how far the population has spread and whether in fact the population has had a spawning period. In this instance it had not; it was understood that the sea star had not spawned, so it was worthwhile putting in the effort to try to contain it. And it had a very strong level of community support. So it is too early to say whether they have been successful, but at least the community's vigilance and commitment have been commendable.

CHAIR—But, as we were told by the previous witness, the currents suggest that the Northern Pacific sea star will eventually slide along the Victorian coast.

Mr Allen—Yes, that is a fair comment. However, as I said, to the west—the prevailing currents go from west to east—it will be a conscious decision, because they are not going to get to South Australian or Western Australian waters other than via ballast water, because of the prevailing currents. They will not get there in terms of the prevailing currents; they will only get there via shipment. So we can put in place—and we need to put in place—these preventative measures.

CHAIR—I noticed on your web site that funding cuts resulted in one of your offices being closed. Was federal government or state government funding involved there?

Mr Allen—The network is funded through the NHT, the Natural Heritage Trust, and we did have funds diminished—not last financial year but the financial year before that.

CHAIR—That funding has not been restored?

Mr Allen—No, and we have had to make some conscious decisions in terms of how we maintain our operations.

CHAIR—Does that suggest that NHT gives insufficient priority to marine pests, do you think?

Mr Allen—No, I do not think that would be a fair assumption. The network covers a range of particular issues and there are obviously competing demands placed on the NHT, so I would not link that with the network's diminished funds in relation to this issue.

Senator WONG—I probably should have asked the previous witness this, but what is the status of the CSIRO research centre into invasive marine species?

Mr Allen—I would have to take that question on notice, although as I said, at the moment, as far as I am aware, the centre does not exist as such. The role has been subsumed back into the general functions of CSIRO.

Senator WONG—Into CSIRO Marine Research, is that right?

Mr Allen—Yes.

Senator WONG—You talk about the domestic ballast water management plans and the need for state governments to do that. Do you not think there is a role here for the Commonwealth?

Mr Allen—Yes. It does not make sense for one state to go it alone, but I think it highlights the frustration and the level of urgency that one state is obviously feeling over this issue. States could actually undertake the management arrangements, as long as consistent reporting and consistent protocols were established at the national level. So it could still be undertaken by state EPAs, as long as there was some overall national guidance. But what we are seeing at the moment is one state going it alone—and it has been criticised by some of the other states for doing this.

Senator WONG—What is the basis of the criticism?

Mr Allen—That it is going out ahead of the national system. I would argue, as I think Victoria is arguing, that it will inform the development of the national system. But there has been criticism from the shipping industry and also some other state agencies that instead of Victoria going it alone they should be waiting for the national system. It is a bit of a double-edged sword.

Senator WONG—Where is the national system?

Mr Allen—Exactly.

Senator WONG—Sorry, it was not a trick question! Is one being developed?

Mr Allen—Yes, there is one being developed, and it has been in the pipeline now since 1999. That will look at, hopefully, domestic arrangements. It will also look at other preventative measures across a number of vectors, remembering that ballast water is not the only vector here. We have hull fouling and aquaculture; there are moveable oil rigs in exploration phase; and there is also emergency response—and the national plan will be dealing with all of those.

So I guess the issue is that there have been a lot of good intentions for a long time in relation to this issue. You only have to look back to when this issue was first flagged—it was the 1970s. As my presentation highlights, we need less talk and more action. As somebody commented, this whole issue will capsize with talk. There needs to be more dedicated action on this issue. The implementation of the best domestic ballast water controls is an absolute priority, and we have the opportunity, with the intergovernmental agreement coming up this October, to seriously move this issue forward.

Senator WONG—Is the national system you are talking about the same national system that Dr Bax gave evidence about?

Mr Allen—I did not hear that.

Senator WONG—You were not here for that?

Mr Allen—No. But I would assume that it is the same system.

Senator WONG—The National System for the Prevention and Management of Introduced Marine Pests, which was formed by the Ministerial Council in late 2002.

Mr Allen—That would be it, yes. At page 4 of the newsletter that was provided to you, it says:

> This plan will (a) identify mechanisms to prevent new incursions; (b) develop emergency management (preparedness and response) arrangements for new incursions; and (c) implement ongoing management and control actions for those introduced marine pests that are established in Australian waters.

The newsletter says that the Department of Agriculture, Fisheries and Forestry will play a leading role in components (a) and (b), while the Department of the Environment and Heritage is the lead agency for component (c). It says that the plan will be implemented in the next two years. I highlight that the publication I am referring to is now 12 months old.

Senator WONG—Do you have any information about where the plan is?

Mr Allen—To be honest, at this stage, no. It is not completely clear. I have been told that some elements of it have stalled and other elements are progressing. But I am happy to get back to the committee.

Senator WONG—What role could the Commonwealth take, apart from implementing the national system? One of the issues we are trying to consider is whether the current regulatory framework provided by Commonwealth legislation is sufficient to deal with these issues. It has been put to us by a range of conservation groups that there are mechanisms under the EPBC Act which could be utilised but are not. Do you have any views on those issues?

Mr Allen—Not in relation to where this would fit under the EPBC Act. I would have to take the question on notice.

Senator WONG—Can you tell us a bit more about the study—which I think you said was unpublished—implicating the sea star in the drop in fish numbers?

Mr Allen—I believe that 11 marine scientists were involved in the development of the report. The key author was with the Marine and Freshwater Resources Institute, which has now been renamed. It is a state government research agency. The report remains unpublished. As I said, I believe that it has gone out for peer review again. The *Age* newspaper reported on a draft of the report on 20 December last year, and that is where I am drawing this information from. The report highlights that there have been changes, particularly to the marine communities in the centre of the bay, as a result of the sea star infestation. It is believed that the sea star pushed certain species into near-shore coastal waters and they were then subjected to increased fishing pressure.

Senator TCHEN—Thank you for coming to give evidence and for providing this very interesting newsletter—it is more like a magazine—from your organisation. Reading it was very illuminating. Pages 4 and 5 deal with responses to a number of questions that the Marine and Coastal Community Network posed to the Commonwealth and state governments. One column lists five initiatives from the Commonwealth, and the other three columns have the combined answers from the seven state and territory governments. There are no further questions to the Commonwealth, so I take it the network was satisfied with the Commonwealth's answers. There were follow-up questions to the states, and I note that the answer for more than half of them was 'no specific actions'. Earlier you said to us that when you came here your colleagues thought you might be applying the blowtorch to the state and territory governments. In your view, what more should the state and territory governments be doing to coordinate and support what the Commonwealth government has done?

Mr Allen—Again, I would say that they need to implement domestic ballast water arrangements. They need to look at the national trial that has been adopted in Victoria and accepted by the shipping industry and the state government. They should be looking to roll that out across all states as the first issue in terms of ballast water.

They should also be using, if possible, powers under their legislation to minimise hull cleaning in open coastal waters. Any hull cleaning where there may be the possibility of translocating marine pests should be contained within dry docks and the material should be appropriately disposed of. I think they also need to put in place measures in relation to the translocation of aquaculture species in particular, to ensure they are not spreading marine pests. One which is worth highlighting is the Pacific oyster. Victoria took a stand in 1996 to prevent the farming of the Pacific oyster in open coastal waters. It is now farmed in Tasmania, New South Wales and South Australia, but where there is the potential for introduced pests coming from aquaculture

activities appropriate measures should be put in place. It has to be more than just codes of conduct. I think requirements need to be put in place under each state's legislation.

I am just trying to think of other vectors. The other one that is coming up increasingly is the aquarium trade. It is an area that is not given a great level of recognition as a vector, yet the seaweed *Caulerpa taxifolia*, which has now invaded the Mediterranean, is attractive to aquarium interests because it grows under reduced light conditions and gives a nice green aquarium and you can actually purchase that particular product through the Internet. Up until recently, it was being sold in some Victorian aquariums, so I think state agencies need to put in place measures to also educate and prevent the introduction of some of these species through the aquarium trade.

Senator TCHEN—We have the same sort of problem with nurseries and plants.

Mr Allen—Exactly.

Senator TCHEN—I noticed on your list that the Victorian government seemed to be more proactive than the other state governments; perhaps it is a coincidence that you are also from Victoria. Maybe now that you are national coordinator you can get the other states more in line as well. But even in Victoria, where they had a domestic water ballast management trial in 2002, it took them until 2004—after a particular outbreak—before they took further action. Is that type of inertia endemic in the state and territory agencies?

Mr Allen—I would say introduced marine pest initiatives always ramp up when there is another crisis. We are reacting to crises continually. If you look at even the development of the initiatives preceding Victoria, most of them are linked to either the outbreak of the Northern Pacific sea star or the outbreak of the black striped mussel. Again, it just seems that we tend to allow the issue to fall off the agenda. There is a flurry of activity when there is a new introduction or the spread of an existing introduction, as opposed to maintaining a sense of urgency. I reiterate that there have been a lot of good intentions but following through with action is the real problem. So if I can again urge the committee to look very carefully at how we maintain that momentum to get these initiatives in place, it would be greatly appreciated.

Senator TCHEN—It almost sounds like human behaviour—you need a crisis to galvanise people. I am not suggesting we should allow a crisis to occur to keep people on their toes. But looking at marine pest prevention, you said prevention is the only effective long-term strategy; however, is it actually practical to have a 100 per cent prevention success rate?

Mr Allen—No system is going to be perfect, but we have to be able to demonstrate that there are some actions that we undertake. When the first wheel was actually invented I guess it was not teflon or carbon modified. We start with something and then we improve upon it. To be honest, aiming for the perfect system I think can almost lead to inertia. It is just seen as too difficult or too hard. We keep putting off initiatives into the future. That is why I guess I have been urging the committee so strongly to enact measures to do with domestic ballast water. I think that is something where we do have a trial that has been demonstrated to be able to work and where the shipping industry is giving it support. If we get this in place then the fact that we are not moving on some of these other areas—hull fouling or other vectors—perhaps as quickly as we should will become obvious and that will raise questions about why we are not. So I

would say: do not wait. I do not think we should be waiting for the perfect system. Our actions now will inform the development of the system.

Senator TCHEN—Given that it probably will not be a perfect system, would it be a more successful strategy to maintain a barrier? Without seeking to achieve 100 per cent, we could be trying to build up and enhance our knowledge base, keeping the resource available so that we can react very quickly when a particular threat is identified. I know that we have successfully dealt with the black striped muscle, as one issue—and also the fire ant issue is now under control. Both of them use a lot of resources over a very short term. Both of them were brought under control fairly quickly. Would that be the more effective way of doing things?

Mr Allen—Are you talking about this at a state level, or are you talking about this—

Senator TCHEN—No, as a national approach. We heard earlier that the Commonwealth has responded very quickly where there is threat, even though the threat is only state based. Certainly the black striped muscle was a very good example of it. We heard earlier from the Animal and Plant Control Commission in South Australia, who are dealing with the broomrape problem. Would that kind of rapid reaction approach be just as effective or more effective? Does it work? We could be spending all our energy on setting up this prevention barrier and, in the meantime, something else which we were not creating a barrier against might get in.

Mr Allen—I think you are right. As I said, no system is perfect, but I think we need to put in place the preventative measures and then we need to ensure that we are undertaking appropriate auditing of whether those measures are effective. If that is what falls under what you are talking about in terms of R&D, then, yes, I would support that. But I do not think it is a question of either we do this or we do that.

Senator TCHEN—Mr Allen, are you a marine scientist?

Mr Allen—I am an environmental scientist by training, with marine background as well.

Senator TCHEN—I have a question that I did not particularly want to put to Dr Bax earlier. It is not a trick question. It is about Port Phillip Bay. Suppose I said to you that, because of Port Phillip Bay's geographic and environmental set-up, it is a fairly good isolated area where we could conduct marine pest control experiments, what would you think? Forget about maintaining Port Phillip Bay's natural environment—whatever that is—we will just use it as an experimental testbed on how to deal with new marine pests. What would you think of that?

Mr Allen—The problem with Port Phillip Bay is that it has a number of other variables affecting it. Some would say that the reason the sea star managed to gain such a quick foothold was that the bay is a largely modified environment, as a result of scallop dredging from the 1960s to the 1990s and elevated levels of nutrients going into the bay. There were also other introduced marine pests. One known as corbula may have aided the introduction of sea stars, because it provided a viable food source that was available very readily. I am not sure I completely get your question, I must admit.

Senator TCHEN—I am thinking more of the community reaction. Forget about Port Phillip Bay's natural environment; this is a perfect marine laboratory. I am saying we could let the

marine pests come in and see whether we could control them. The lessons learned in Port Phillip Bay could be applied elsewhere, to the benefit of everyone else.

Mr Allen—I am still not completely sure of your question. Are you saying that we could undertake control measures within Port Phillip Bay?

Senator TCHEN—Yes. For example, when we see North Pacific sea stars coming into Port Phillip Bay, we can say, 'Let's see whether we can work out ways of eradicating them, using Port Phillip Bay as an experimental testbed.'

Mr Allen—Other than closing off the heads and making Port Phillip Bay go dry—which of course is not going to be economically viable—I cannot see—

Senator TCHEN—No, if that is the only way to deal with it.

Mr Allen—It would not go dry properly, because you would still have all the inputs coming out of your catchments anyway. You can never divorce any activities from the other values. The natural values of Port Phillip Bay are such that an enormous number of industries depend upon them, so you cannot divorce the natural values from the preventative or management responses that you put in place.

Senator TCHEN—No, I was just letting my imagination go wild.

Mr Allen—They did that at Darwin Harbour—they put copper sulphate into the marina, but it is not viable.

Senator WONG—I probably would not recommend that for Port Phillip Bay.

ACTING CHAIR (Senator Tchen)—No, I would not recommend that either. Are you tabling the PowerPoint presentation, Mr Allen?

Mr Allen—Yes.

ACTING CHAIR—Thank you, we accept that.

Mr Allen—Could I also table an article that was in the recent edition of the *Waves* newsletter on what options exist for ballast water treatment?

ACTING CHAIR—Yes. Thank you for coming today, Mr Allen.

[2.38 p.m.]

CROSSMAN, Mr Neville David, President, Weed Management Society of South Australia Inc.

RICHARDS, Mr Noel William, Treasurer, Weed Management Society of South Australia Inc.

CHAIR—I welcome the witnesses representing the Weed Management Society of South Australia. Thanks for your time today; it is much appreciated by the committee. I note that Dr Bass, who was the President of the Weed Management Society at the time the submission was lodged, is unable to join us today. The committee has a copy of an article titled 'Even weeds have their place', in which Dr David Bass raises some very interesting issues on the environmental management of weeds. We have already published your submission. Do you wish to make any corrections to the written submission at this stage?

Mr Crossman—No.

CHAIR—I invite you to make an opening statement before we move to questions.

Mr Crossman—Thank you for giving us the opportunity to make a presentation and also for coming to South Australia and listening to us. I will go through our PowerPoint presentation, which will take five to 10 minutes. I have tabled a copy of the slides, so you can work through them as we go along.

A PowerPoint presentation was then given—

Mr Crossman—The Weed Management Society was formed in October 1999. Our aims are to minimise the economic, environmental and social impacts of weeds in South Australia. We do that predominantly through education and information sharing. We have a quarterly newsletter and we hold bimonthly public meetings where we invite guest speakers to talk about weed issues in South Australia.

We have a membership base of about 150 or so. We are funded predominantly through membership fees and we are a not-for-profit organisation, so we work on the smell of an oily rag, so to speak. Our membership is made up of both state and local government members, university academic researchers and students, industry and community representatives, and people with an interest in agricultural and environmental weeds. As I said, we have got researchers. There are also managers within government and quite a few volunteers—members of friends groups and so forth. A few private landowners and students also make up a fair portion of our membership.

Today we want to address what we consider are three key issues: firstly, conflicts of interest, which I will elaborate on in the next couple of slides; secondly, the issues of resourcing, mainly having sufficient resources to manage invasive plants to reduce their spread and impact; and,

thirdly, issues with surveillance and the response to new weed incursions, such as making sure effective strategies and actions are put in place.

With regard to the first issue of conflicts of interest, we consider that that is a real problem that needs to be addressed from the point of view of invasive economic plants. All these plants have short-term economic benefits. There are three sectors listed on the PowerPoint slide: the garden industry, pastoralists and graziers, and horticulturalists. With regard to the garden industry, we have already heard in detail today about some of the problems with asparagus, bridal creeper, bridal veil and so forth. Pastoralists and graziers are on our radar, mainly because there are two problems there. There is the impact of grasses deliberately planted for pasture, fodder and salinity control. There are cases now of them becoming invasive. There is also the problem of non-palatable perennial grass weeds that are existent across many farms and that are causing problems as well. Then there are the horticulturalists. An interesting case is olives, which we are very concerned about here in South Australia. It is one that I have got a lot of strong personal interest in as well. Those benefits are often minimal compared to the actual costs from an environmental and economic point of view. These are long-term, as opposed to short-term, benefits that arise from some of those plants.

We suggest that there are a couple of solutions available. We think it is essential that legislation both recognises and provides mechanisms to deal with such conflicts of interest. There are three alternatives available. One is to not grow any of those plants, and ban their importation and sale. That would probably have to come from a national level. The second possibility is allowing those plants to be grown but with quite strict regulatory and management controls on those particular species. Of course, that requires sufficient resources to police. The third option is to let them grow them with no restrictions whatsoever if they are not invasive. We prefer a consistent national approach. We are obviously quite supportive of and think it is a good move for the EPBC Act to start thinking of a national list of prohibited garden invasives.

The next issue that we want to raise is the problem of inadequate government resources and response relative to the scale of the weed problem. In relation to particularly environmental weeds, the costs are more from a social point of view and the only way to get funding for minimising social cost is through governments. Private companies are generally not going to invest in the protection of nature and the removal of weeds. We also believe that weeds are a long-term issue, so there needs to be adequate, long-term funding to match that. There was an interesting presentation this morning from a couple of members of the Animal and Plant Control Commission. We have also done a little bit of research and it is true that the current funding is about $3.5 million per annum. It has been at that level since 1991, which means that there has been no consideration towards the increases due to CPI. Obviously $3.5 million today is worth a lot less than $3.5 million was worth 13 years ago.

In South Australia we have a minimal number of staff that are dedicated weed researchers. I think the figures are approximately two full-time equivalent staff members for the whole of South Australia. This graph shows the annual funding allocated to the Animal and Plant Control Commission from 1991 to 2001. You will see the $3.5 million line in the middle, which is where the funding is closely parallel to.

CHAIR—Are they nominal or real figures?

Mr Richards—They are nominal; they are not adjusted.

Mr Crossman—There is no adjustment for inflation, so it has remained flat over the past 13 years or so. This graph shows a couple of solutions for what we believe is inadequate resourcing. We need governments to recognise that we need consistent investment in weed management across Australia commensurate with the cost of the problem. There needs to be strategic, effective, long-term investment across the spectrum of the stages of an invasion. You would have heard that there are several levels of invasion, starting from the introduction of a species, so you need a good strategy that prevents the introduction. If invasive species are in the environment, strategies need to be put in place for their eradication and containment. For a plant that is already quite a serious environmental or agricultural weed, you need good, sound, integrated weed management strategies put in place.

The next problem that we are concerned about is that of prevention and surveillance. There is no proactive approach to preventing new weed problems in South Australia; it is very reactive. If a plant is identified as a weed, then mechanisms are in place to have that listed on the proclaimed list of invasive plants. That is reactive in nature; it is not actually identifying potential plants and having them listed—and there we go again.

Obviously prevention is the most cost-effective means of dealing with the weed problem to prevent it from spreading or being introduced. A lot of the weeds that might be future problems are already here in some form but they are not necessarily clearly identified in many cases. South Australia has not put in place a formal system to detect and respond to new weeds. The key issue is adequate funding, or dollars, to respond to new incursions, especially of environmental weeds.

We would like to see adequate Commonwealth funds going to AQIS and Biosecurity Australia for effective border protection. We want to see rapid weed risk assessments put in place. It is widely believed—and it is true—that the weed risk assessment process is a sound and accurate measure, but we want to see these processes put in place quickly and efficiently. There is also the possibility to have a southern Australian quarantine strategy. That would involve the formal development and maintenance of surveillance systems with trained botanists and making sure that funds were available to respond to incursions so that, when a new weed is identified and found in the landscape or in an environment, the resources are available to go out there, target that weed and, hopefully, eradicate it to prevent it from spreading any further.

In conclusion, invasive species represent a persistent threat to Australia. Policy and action therefore need also to be persistent and ongoing. Rather than the current annual or two-year funding cycles, we need longer term cycles of funding. There need to be opportunities to develop nationally consistent policies in investment to deal with the invasive species risk. We strongly welcome the amendment to the EPBC Act because it is raising the profile of invasive species in Australia. Our submission refers to a couple of specific issues regarding the amendment.

CHAIR—Thank you for that. The submission was very interesting as well. Coming back to the issue of the South Australian government's funding of weed management, it is a story that we have heard around the country and in various submissions—that the whole issue of weeds and invasive species is not getting sufficient priority from government. Why do you think that is the case?

Mr Crossman—It is probably because the recognition of invasive species is not high on the public radar yet. That has recently changed. When I began my studies back in the mid-nineties there was very little education about invasive species. Now the university program that I went through has several topics which teach the issue of invasive species. There is more and more media attention about it now. So that is changing and the environmental impact is becoming more widely recognised, but it is still much lower down on the ladder compared to salinity or land clearance problems.

CHAIR—I am not sure whether it was your submission or someone else's that compared the annual cost of salinity and the government's response vis-a-vis the annual cost of invasive species. The cost-benefit ratios in this area that I have seen done in various submissions blow me away in terms of the enormous return that you get from a small investment. How do you think we can get that message through to the community and to governments?

Mr Crossman—That is a very good question.

CHAIR—A very good question, I thought!

Mr Richards—We can probably learn from lessons from the salinity CRC's work in raising the profile, and we can see other shifts in social norms, if you like—even with smoking, where most people would regard that as a negative activity. That kind of social policy perhaps could yield benefit. But weeds also are a ubiquitous problem that has been there since the year dot. Because they are part of the background, it is difficult to raise them from the background noise to the serious social issue that they really are.

CHAIR—Your submission deals partly with the proposed bill. It is one of the very few submissions we have had that actually deals with the proposed bill that triggered this inquiry. What do you think are the strengths and weaknesses of the proposed bill?

Mr Richards—One of the strengths—and I do not pretend to be an expert in matters legislative—is the proposal for a national list, which has a lot of merit. There is a lot of confusion. We heard many times today, and I am sure you have heard before, about the proliferation of lists. So something that had some substantive scientific merit and that could be broadly endorsed by a lot of stakeholders would be a very positive move.

Senator WONG—Is your organisation aware of whether or not the current provisions of the legislation would still permit that to occur?

Mr Richards—I could not comment on that. It is possible.

Mr Crossman—There are a couple of wording issues that we did have some concern about, particularly creating classes of different levels of invasive species, one of which is the 'beyond eradication' category or class. That is a very negative term.

Senator WONG—It is the too-hard basket.

Mr Crossman—It is the too-hard basket. WONS weeds are weeds that are in that basket, really, because they are weeds that are widespread and causing considerable impact.

CHAIR—Well and truly out of the basket, actually.

Mr Crossman—We have concerns about that sort of wording because it does not put much faith in the ability to manage or contain those weeds to some degree.

CHAIR—My final question is about the nursery industry. You would have heard the evidence from the earlier witnesses from the nursery industry indicating that they believe their voluntary procedures are resulting in fairly responsible actions, at least by the large wholesale nurseries. What are your observations about the extent to which the nursery industry is still encouraging garden escapees or problems in South Australia?

Mr Crossman—The industry's reluctance to take on a stronger regulatory framework concerns me a bit. They are very reliant on self-regulation. Obviously we are concerned that that will not really do much at all. I have noticed that gardening shows like *Burke's Backyard* and *Gardening Australia* mention it when a weed is invasive or should not be planted in your backyard. But it is very slow. Sixty per cent of nurseries in Australia are not covered by the industry body. You can still walk into supermarkets and Bunnings and so forth and see plants that are invasive. So I think that if self-regulation is working at all it is working very slowly.

Mr Richards—It is only because there are so many players. A number of our members are nursery industry people who are trying to do what we would regard as the right thing, but, of course, innumerable players are not.

CHAIR—Are there any lessons for Australia or for South Australia on olive trees at the moment?

Mr Crossman—I cut my research teeth on olives. It is a big problem. It is now recognised that it is a problem. The state government does recognise that but there still seem to be very slow efforts to do anything about it. Obviously from the environmental point of view olives are really bad, but there is also the big fire risk, which gets a mention but does not feature as highly as I think it should, given the Canberra bushfires and so forth. If a fire went through some of the foothills here, where there are a lot of people—a lot of urban areas—I would hate to imagine what might happen.

Senator WONG—Why specifically olives for bushfire issues?

Mr Crossman—I am not sure if the science is there 100 per cent to back up what I believe, but I do strongly believe that they burn at a much higher temperature and there is much higher biomass—wood matter and leaf material—than would normally be the case in eucalypt type communities. There is a higher oil content in the vegetative matter of the olive as well. So it is strongly believed that a fire would burn at a higher temperature and move at a faster rate simply because of the huge increase in biomass.

Mr Richards—The other issue is that an olive infestation tends to have a consistent canopy height in comparison to a eucalyptus community where there are a variety of canopies. So the potential to build up a fire head is very different.

Senator WONG—Has there been much published research on that issue?

Mr Crossman—On the fire issue for olives?

Senator WONG—Yes.

Mr Crossman—No, it has been very limited. There has been some published research on the impact of olives. To float my own boat again, that is what I did back in the late-nineties for my research. That was the first study into the actual environmental impacts, from a species diversity point of view, of feral olives. Since some figures are now available it has been brought to the attention of the public. We have been quite forthright in pushing the olive problem as well and making sure it is something that is more widely recognised locally.

Senator WONG—From the evidence of the commission earlier today, there appears to be some action, but probably not as much as you suggest there should be.

Mr Crossman—That is right. If I can be so bold: it was suggested this morning that a weed risk assessment was required for any planning approval in respect of an olive activity, but that is not necessarily so. That is a local government decision.

Senator WONG—I read that in the submission and I wondered about that because, as I understand it, local governments have the discretion to put these guidelines in place, as they do across a whole range of regulatory functions.

Mr Crossman—Exactly.

Mr Richards—Yes. Also, where it can be contended that it is an existing land use—it may only be horticulture and not necessarily olives—no approval is required.

Senator WONG—What could the state government do instead? As you know, with planning generally, the state governments have a role in terms of setting strategic directions and so forth. The regulatory approvals are still very much at local government level.

Mr Crossman—Late last year there was an intergovernmental state government inquiry into the olive problem. I am not sure of the findings because they have not been made public yet, but obviously they were looking at the olive problem and possibly looking at the planning regulations as well. What they could possibly do is just make olive growing noncomplying in certain areas. You cannot plant olive trees in certain parts of South Australia. That is probably a bit on the extreme side. It is an option that is available if they are concerned about protecting natural resources.

Senator WONG—Was it your submission that mentioned bridal veil?

Mr Crossman—Yes.

Senator WONG—Tell me about that.

Mr Crossman—That is a species which is now present in certain parts of South Australia. It is nowhere near as widespread, obviously, as bridal creeper. It is believed that, if bridal creeper is contained and removed, bridal veil is thought to be able to move into the vacancy that is there,

into that slot. You would be doing a lot of work trialling bridal creeper. If you do not do any further work, bridal veil will simply take over and the situation you have will be as bad if not worse than what it was when bridal creeper was there.

Senator WONG—Is it sold commonly in nurseries here? Did the commission say it was banned?

Mr Richards—Yes, they did. It is banned from sale, although you see it popping up in the Paddy's Market type of environment.

Mr Crossman—That problem that the nursery industry raised with trying to regulate community markets is a very big problem.

CHAIR—We need weed police.

Mr Crossman—Yes; if someone is prepared to fund it, they would probably get a lot of benefit for the environment and for the community.

Senator TCHEN—Mr Crossman, you are exactly the right person I wish to ask this question of. What exactly is the olive problem? Why are feral olives a problem? I am from Victoria. We are trying to plant olives.

Mr Crossman—If I were prepared, I would have some great pictures. The olive tree itself is a very thick tree. It seems to have the ability to slot into what is a vacant niche within our eucalypt woodlands. Our eucalypt woodlands have tall eucalypts, small herbs and some shrubs; but there is a gap there for a larger size shrub, small tree, and that is really what the olive is.

Senator TCHEN—That is good for greenhouse gas reduction, isn't it?

Mr Crossman—Yes, more biomass I guess is good. When I studied olives back in the late 1990s, I found that in areas where there were a large number of olives and in similar vegetation communities where there were not many olives, there was over a 50 per cent reduction in species diversity. So there were half as many species in the heavily invaded areas. And the actual eucalypt canopy cover was about 80 per cent lower. You are really getting a situation where I guess, over time, olives are out-competing your native plants and we are getting a serious reduction in diversity.

Senator TCHEN—Did your research show why there was this species reduction? One would have thought, as a layman, that olive trees were much more capable of providing a food source than some of the eucalypts.

Mr Crossman—I think it was mentioned this morning that olives are dispersed predominantly by starlings and foxes, which themselves are exotic or invasive species. So there is a nice little dynamic action happening there. But there are benefits from olives. When I was at Flinders University, a colleague of mine did a study looking at some of the species that use olive trees for habitat. Olive trees provide habitat protection for some small marsupials—birds as well—against cats and foxes. I have done olive control work and I found quite a few birds nests in olive trees, so there are positives. Obviously, if you are going to remove olive trees you have

to make sure that you replace them with native species that also provide habitat. There are benefits, but because the tree is quite a thick, strong and bushy plant, very little light gets through and there is no opportunity for native species to come up through that, grow and regenerate.

Senator TCHEN—When I heard evidence this morning from the South Australian Animal and Plant Control Commission, I had not realised that feral olives were a problem. It came as a bit of a surprise to me because I thought man needed olives to sustain a very important empire of civilisation. Obviously, they are a very good thing. The real problem we have is we cannot grow enough of them, as they are feral. I suppose feral olive trees would have an economic impact because there would be uncontrolled growth and there would be no quality control. It might have an economic impact on the olive industry. Apart from that, there are social and environmental issues involved in eradicating olives. How do you put a social cost on this environmental issue? You are suggesting that we allow the native vegetation to regenerate and the question then is what benefit that will represent.

Mr Crossman—I think economists have been grappling for years on how to best measure the value of biodiversity or native ecosystems. I could give you a short lecture on some of the ways of doing that. You are looking at valuing water catchment, looking at valuing the different species for their potential cures for cancer—that is one that is often cited—and you are looking at tourism value for native environments. People go to world heritage areas and they like to see what a natural pristine environment is. There are all sorts of ways of valuing the environment. But I personally do not think a sound and strong system is actually in place yet for economists to put an accurate dollar value on what is almost intangible—that is, the sort of feeling you get from a nice environment or from knowing that there is a diverse range of species out there. It is hard—

Senator TCHEN—It is almost self-defeating asking a professional economist to value the environment or what the social costs are because all they do is try to put the replacement costs, if you like, in economic terms. What we really need is a non-economist to put a cost on the environment. You are a non-economist; can you put a cost on it?

Mr Crossman—For me, it is a personal thing; I have a strong love for—

Senator TCHEN—I assume that you are a non-economist. I could be misjudging you.

Mr Crossman—I did a couple of economics topics in my degree. It is a very difficult issue.

Mr Richards—There are tangible ecosystem services that you can value. For example, if you lose your understorey, as is the case with an olive invasion, and the potential for increased turbidity in your waterways as a consequence of less soil protection, there is a tangible impact of that change.

Senator TCHEN—It is one of those perennial questions, isn't it, unless you can put a cost on it, then the sky is the limit of what it is worth to protect it. Obviously, that is not sustainable. I have one other question: Dr Bass—and I notice Dr Bass raised the issue of whether weeds should be unconditionally eradicated—was the president of your association, but he is no longer president. Does that represent a coup or a change in direction?

Mr Crossman—No. We have it in our constitution that the president can only be a president for two years and his two years are up. It was a constitutional matter that he, thankfully, did not challenge.

Senator TCHEN—So we do not have to go and find where he is buried?

Mr Crossman—No.

Senator TCHEN—Are you familiar with this article that was referred to by the chair, 'Even weeds have their place', from Flinders University? I cannot see a date on it; it is undated.

Mr Crossman—Dr Bass is still technically my supervisor. He was my supervisor for my PhD research so I have had a very close relationship with Dr Bass for quite a long time.

Senator TCHEN—Can you perhaps expand on what he meant?

Mr Crossman—From memory, that article relates to the need to conduct a rigorous analysis of what weeds are where and what functions they are performing in the environment. Like I said, olives provide habitat and a food source.

Senator TCHEN—Yes, you were saying that.

Mr Crossman—It is all very well to go in and totally eradicate olives but unless you have in place some sort of program that replaces them with appropriate food sources then you are almost going to do as much harm as good. From memory I believe Dr Bass was referring to the need to look at what the weeds are doing and what food and habitat they might be providing and to have in place appropriate strategies for their control and replacement with alternative food sources.

Senator TCHEN—You provided a chart in your presentation on funding for weed control in South Australia. You have been asked questions about funding from the federal government. Did you do a comparable study on federal funding for weed control?

Mr Crossman—No, we did not.

Senator TCHEN—So we do not know whether that has been on a steady or growing level?

Mr Crossman—As far as I am aware, the WONS have only been funded for—

Mr Richards—Since about 2000, 1999 or thereabouts.

Mr Crossman—WONS have been funded for three to four years at about $20 million in total—a million dollars per weed. That is fairly static.

Mr Richards—That has been concentrated in higher population states, as you might expect. But the weed problems are no less severe here. Of course, WONS are limited to those species. Natural Heritage Trust funding, for example, must be addressing WONS or the Commonwealth government's environmental alert list species. So it is quite limited in its focus. Whilst there are

a number of WONS species that are an issue here, there are many others that are not WONS that are major issues.

CHAIR—Thank you very much for that. I was going to ask some questions about that article as well. It is the first time I have ever seen camphor laurel mentioned as even remotely useful, which I find quite extraordinary coming from Queensland where it is a weed. Thank you very much for your evidence today.

Proceedings suspended from 3.13 p.m. to 3.30 p.m.

McALISTER, Mr Edward James, (Private capacity)

CHAIR—Welcome to the hearing. Mr McAlister is chief executive of the Royal Zoological Society of Adelaide Inc. and a board member of the pest animal control CRC. Thanks for your time this afternoon. It is very much appreciated by the committee. I understand you are appearing essentially in a private capacity today rather than in an official capacity, because the secretariat learnt of your reputation in this area, rang you up and asked you to consider appearing. That is basically correct, as I understand it.

Mr McAlister—I am quite shocked.

CHAIR—We have already published your submission. Do you want to make any corrections to the written statement at this stage?

Mr McAlister—I have no corrections, but I want to amplify it as I go along.

CHAIR—I encourage you now to do that, and then we will move to questions.

Mr McAlister—Thank you very much. As you have said, Chair, I am here as the chief executive of the Royal Zoological Society of Adelaide Inc. I am also the president of the World Association of Zoos and Aquariums, so I obviously come with an ecological look at this whole thing. I also am a botanist by training; therefore, I have a foot in both camps—weeds and feral animals. I recognise that the committee is particularly looking at about half a dozen plants and half a dozen animals. I have not got any particular expertise in each of those areas, so I thought I would make some more generic comments which might be of some value. I also recognise that I am the 50th submission, and you have probably heard it all already anyway, so I will make some generic comments.

I have mentioned in passing local outbreaks of pests of native origin, for example koalas on Kangaroo Island. At the moment in Adelaide that is a very important matter. I have also brought an article, which I will table, from *Flinders Journal*, which is the journal of the Flinders University of South Australia. It is on the effect that seagull numbers can have on the spread of disease. Seagulls have also been implicated up at Lake Torrens where, for the first time in many years, a big colony of banded stilts were nesting. When the seagulls arrived, there was 100 per cent mortality in all of the chicks and the eggs. In passing, I want to make the comment that what will be a good source for the foxes probably in some cases has to be thought about for other native animals as well, if it exploded. With my background, I am very much aware of the fact that the willow has been a major problem for us along the Murray. Lantana is not a problem here as it is in Queensland and New South Wales, but blackberry certainly can be. We have olives, of course, which are one of our worst weeds.

I will move on to make some generic comments. I also felt it was worth while making the comment, as the former president of the Australasian regional association of zoos and now the world president, that we often talk about the importation of diseases and problems, but the zoo world is well regulated in relation to the importation of animals. I think the number that are coming in are very small and the chance of us doing any damage is really quite small. For me,

the biggest single harmful factor for our wildlife is still the rabbit. I hope we do not lose sight of the fact that the rabbit is still the No. 1 pest and that work needs to continue to make rabbit control even more effective in all parts of the country.

As the fox is one of the things you are particularly worried about, I have made comments in an article, which I will submit, which is going to be in the *Adelaide Zoo Times* and is about the damage that foxes can do. There is also a very interesting article from the Perth Zoo in their newsletter about the Western Shield campaign to eradicate foxes, which I will touch upon in a moment. It is an interesting article from them about that matter. Looking at what has happened in Western Australia with the use of 1080, when the animals get a chance after the foxes have been removed the smaller marsupials actually bounce back, provided there are some there in the first place.

My own experience with foxes and feral animals is that we released a dozen—including two males and two females—yellow-footed rock wallabies in the Flinders Ranges. We decided we would not release any animals until after there had been no sign of foxes for a year. I was very impatient, I must confess. I was very keen to get on with it, but I was convinced that we had to wait for a year. In that time, we are now in I think the fourth generation of young born in the wild. From the last check, there were about 49 animals coming out of those 12. We have lost some through old age and other problems, but we have not lost one from foxes. We also do feral control four times a year. We shoot cats, rabbits and goats, which of course compete with or are predators of the young animals. We have had very good success. It is one of only nine per cent of reintroduction projects for macropods on the mainland which would be regarded as being successful, and it is being used as a model for other such projects.

The interesting thing about that project is that, when we went up there first, the local people were a bit scathing about the idea of putting the wallabies back in the wild—more than scathing; they were a bit rude about the idea. However, once we got going, one of our young female vets went to the school and spoke to the children and the children became very enthusiastic. At Christmas time that year, they had the Wallaby Hop. The children all dressed up in wallaby outfits with tails and they did the Wallaby Hop. They went home to their parents and the parents were sucked in to getting involved. The pastoralists who did not want to do any baiting ended up being almost forced by moral pressure from the children. It started off with a 10-kilometre wide radius around the outside of the sanctuary. The result was that lambing percentages increased, so all of a sudden it has now been increased to a 30-kilometre wide radius. Once you can get the children on board, you can work through the children to get to the parents.

CHAIR—Don't let Brendan Nelson hear that!

Mr McAlister—The other thing that happened is that when they got enthusiastic they formed a biodiversity group up there in the Flinders Ranges. They got money from the NHT to eradicate weeds and to keep on eradicating foxes and rabbits, particularly, as well as dogs and cats.

We have bred bilbies here—particularly up at our other property at Monarto, which is 70 kilometres out of town. They have been released on Thistle Island, where there were no foxes or feral cats. They have been sufficiently successful to the point that the people who own that island are complaining because the bilbies are now digging holes in the runway. So it has been quite a success for us. I chair the Wildlife Ethics Committee for South Australia and recently we had a

request from Roxby Downs. They released bilbies up there in a fox-proof enclosure, and it has been so successful and the bilbies have bred so well that they have now sought permission to release outside the enclosure. So we have followed up that and we have given approval based upon some other conditions.

The cat, which is probably one of the worst pests, is not responsible for the extinction of any animal as far as I know. We were trying to re-establish an animal called the stone curlew or the bush thick-knee, depending which name you want to use, over on the west coast of South Australia. The first half a dozen that we introduced had no chance. There was one cat we had not got, and just that one cat was enough to stop it happening. We eventually got the cat—and cats are probably the most difficult thing of all to trap—and we tried again. The last time I checked we still had animals over there. There is no breeding yet but we still have animals there.

I also touched upon the fact that, if one does not remove weeds and lets the weeds become more and more—and overgrazing encourages that—people gradually come to think that the landscape was always like that. A lot of people who go up to the Flinders Ranges think that has always been like a moonscape, but if you look back at old photographs, it certainly was not always like that. So there is an ecological cost in that.

A moment ago, I heard you ask whether anyone could put a price on the environment. Some work has been done, particularly by the Wildlife Conservation Society of New York, in putting value on the environment. That is usually in countries like Africa and South America. I am not aware of any particular work that has been done here specifically. Some work has been done on putting a value on trees. Some years ago, I did a valuation of trees just for horticultural value, but that has since been reworked into something which adds to the value of trees which have nesting hollows et cetera. So I am aware of that work having been done.

There is an interesting thing about the use of the word ‘weed’ as a plant out of place. I have sometimes suggested that if an area has been very badly degraded it is quite obvious that the local species are not going to be successful again so you put something else in to ameliorate the effect of the salt or whatever and then gradually, as the salt levels are reduced, you can start to put back the other species in that region provided you do not make a bigger problem by bringing in a weed.

I was a bit surprised when I was in Perth last year to discover that in Perth the kookaburra and the rosella are regarded as pests—I had always thought they were native to it—and, of course, koalas do not belong there either. So, after 37 years of living here, I was surprised to find that the kookaburra, which we think is wonderful here, is a pest over there, and the rosella is another pest. The comment I made in this submission is that there is no silver bullet—to use that expression—for all or any of these pest species, but we have to keep working towards it. I have touched on education. It is interesting that, in my own work, when I am looking at things and giving a talk, I find that more and more—even before I talk about research or captive breeding programs—the word ‘education’ comes up. That is the first thing I refer to, because I believe it is very hard to replace something; it is far better to stop it disappearing in the first instance.

I was the foundation chairman of the Anti-Rabbit Research Foundation of Australia, and we brought in the idea of the Easter bilby. That was very successful here in South Australia and even in Victoria. To some extent, even though we are the most urbanised state in the country, with 1.1

million people living in Adelaide out of our total population of about 1.4 million or 1.5 million, there still seems to be a connection with the bush here which does not exist in Sydney, so we did find the Easter bilby quite successful. Once again, that was education being used as a tool to get children involved for the future.

I touched on the articles in the *Zoo Times*, both the Perth one and the Adelaide one. In my role in the CRC I have said consistently that the zoos stand ready to help anytime that we want to put in articles and put up displays. In fact, we are putting up a display very shortly in Adelaide Zoo about the impact of foxes on the environment. Certainly, from that point of view—and I know I am speaking on behalf of all the zoos—we are more than happy to give advice, to help and to put up material in the zoo which will help educate the public. I know that on Saturday mornings people do not wake up and think, 'Let's go to the zoo and see Ed McAlister's conservation and education programs,' but 450,000 people will come through the two properties this year. We spend a lot of money each year on the education message and hopefully they will come and enjoy themselves and then go out with a better understanding of what we are trying to do. It is a perfect opportunity to creep up on them, take them by surprise and educate them without them knowing it is being done.

On research, I am still a very big fan of the CRCs. I have one more year to go on the board and I think that that will probably be my last year on the board. To go to those meetings and to see the way in which those people work together has been very good for me, and I have enjoyed the experience. I have found it very good and very useful indeed. Having said that, I think that goals need to be set, and I understand that the pest animal control CRC are looking to a new bid this year, hopefully for 2006. I think we are quite expectant of key performance indicators. There needs to be some indicators, some milestones for the CRCs to meet.

Two weeks ago in Adelaide there was a meeting of the council of the CRCs, and there were about 150 people there. To me once a year is fine as a bit of a talkfest, but there should be smaller working groups. In my submission I suggested that the pest animal CRC work more closely with the weed management CRC, perhaps the tropical ecology CRC and maybe the one that is working with fire. Those are areas which seem to work together to me. If there were some way in which they could communicate more effectively, then it would be something that would be well worth our while.

I know there are some things in the pipeline for the commercialisation of getting rid of pest animals, certainly in the CRC with which I am involved. Once that groundbreaking research has been done, it should be handed over to a group of people who are into research and development rather than letting the CRC continue working on it. They should move on to do blue sky research, which is a horrible term but it is the one that everybody is now using.

The miscellaneous points I want to make include that adequate funding in a timely fashion must be made available and that animals and plants do not recognise state and territory boundaries so the Commonwealth must take the lead. If foot-and-mouth disease got into the country, then the Commonwealth would take over the program. I believe that with pests such as foxes or cats or some of the weeds, the Commonwealth should take over the running of these programs. There are many parts of the country that cross state boundaries—the Mallee crosses at least three: New South Wales, Victoria and South Australia—and where efforts across regions would also work.

I also want to make a comment about the fact that, as a chair of the ethics committee for the state, I am very aware of not putting animals through a painful death. However, if we were to stop using 1080 to get rid of foxes, which is what is being discussed, then it would be a retrograde step as far as the good work that has been done in Western Australia and the work we are doing all over the Flinders Ranges. If we did not use 1080, then I am afraid the foxes would bounce back and we would not have had recent successes with Operation Bounceback or our smaller program. We also need to work with New Zealanders quite closely. Of course for us possums are not a pest, but for them they are a major problem—they have got 60 million possums or some incredible figure like that. Obviously that cross-Tasman cooperation is essential.

The final comment I would like to make before I answer any questions you might have is: there are non-traditional partners that can be used. I know that Birds Australia members are frequently in the field. If they see an incursion of an animal or plant, then it is worth their while to report it to somewhere. We have used shooting clubs to help us get rid of goats in particular in the Flinders Ranges. I do not have any particular problems with using these amateur groups. The Trees For Life group, Birds Australia, the Society of Growing Australian Plants, shooting clubs and four-wheel drive clubs could bring information back to us—to the professionals. The community then becomes involved with what is going on; they have a better understanding and a better appreciation of the impact of these interlopers.

CHAIR—I was interested in the point you made about the various community clubs. Like all politicians, I am regularly advised by members of shooting clubs that they are the solution to all feral animals in Australia. I often wonder about the whole notion of shooting clubs and so forth, and whether it is almost a pin in a haystack approach to eliminating feral animals in one small area. What are your thoughts on that? How does it relate to the continuing success of Operation Bounceback?

Mr McAlister—In our case the Flinders Ranges is a restricted area, of course. In fact, there is a suggestion that the wallabies we are talking about once upon a time used to go onto the flats. They are no longer on the flats; they are now just on the rocky slopes up in the hills. Therefore, it is comparatively easy to rip warrens and to shoot goats and to kill foxes in a restricted area. And the foxes will keep an incursion at bay. I do not think, as a nationwide panacea, it is going to work, but there is certainly no harm in doing it. We could not have done what we have done with our sanctuary without using the shooting clubs and others to help us, but I do not think it is the answer. There is a whole suite of answers. It might be fine in a localised situation, but I do not think it is the answer. However, the knowledge that they would bring back when they see an incursion would be useful.

CHAIR—Defending the little sanctuary that you have built up for the wallabies would presumably require constant vigilance by the community in that area?

Mr McAlister—It does. We often talk about community involvement, and I have to say that, when I talk about community involvement, I tend to think about saving gorillas in Africa or saving the tiger in Indonesia. It was quite interesting when I went to Leigh Creek to suddenly find—and I have used this in talks that I have given—that, without the local people being involved, it was not going to happen. They have taken over. The children from the school up there monitor how the animals are doing. The locals keep an eye on the traps for us. We have a

lot of community support, and without that community support it would not have been at all possible.

CHAIR—Coming back to the Roxby Downs issue and the release of the bilbies outside the fenced area, what sort of assessment do you need to do before you decide that that is a reasonable approach to adopt?

Mr McAlister—The Roxby Downs company is paying for this work to be done; they would not have got ethics approval if they had not agreed to undertake a whole series of checks, balances and tests. There are two people up there permanently to keep an eye on it. There are 11 of us on the committee. We had to be very happy that the animals had some chance. We did not want to sacrifice the animals just to become fox food. We had to be very happy with they wanted to do. But I guess the point about that is that taking foxes and cats away has made it possible for the animals to bounce back.

CHAIR—Whilst there is no silver bullet, do you have any optimism that we can carve out further island sanctuaries or sanctuaries on the mainland in different areas?

Mr McAlister—Once upon a time animals surrounded people, but the problem for them now is that people have moved in and the animals are now surrounded by us. So we have the situation where we have these island sanctuaries and they are not continuous anymore. I think there are corridors of plants to make the animals move up and down. I think nothing breeds success like success. Only this morning I had a phone call from another landholder who wants us to release yellow-footed rock wallabies on his property. Because we have had some success, the locals have become enthusiastic. As I said, nothing breeds success like success. Had it been a disaster in the first instance, they would have all said, 'We told you so,' and that would have been it. But we were successful.

CHAIR—Yes, success has many parents and failure is an orphan.

Mr McAlister—Yes, that is right.

Senator WONG—What were some of the reasons for the initial resistance that you described among some pastoralists to baiting on their property?

Mr McAlister—There were two pockets of resistance. One was the mining community. Leigh Creek is a mining town, so obviously there was resistance. They told me I was 'a bloody idiot'; those were words they used. The other pocket of resistance came from pastoralists who were concerned that, if 1080 were on their property, their dogs might pick up a bait. The main problem came from a concern about dogs picking up baits. The locals were also concerned about their dogs picking up a bait. We felt that, if their dogs were that far out of the town, they deserved to pick up a bait anyway.

Senator WONG—I am sure you put it a bit more diplomatically to them, Mr McAlister.

Mr McAlister—Of course.

Senator WONG—You are the chair of the Pest Animal Control CRC. Is that right?

Mr McAlister—No, I am a member.

Senator WONG—You raised an issue about research funding and moving on from the CRC model. Could you explain what you mean by that?

Mr McAlister—I think what I was suggesting was that, when the research is done and you have actually got an answer, we should not have scientists who are experts in basic research trying to then commercialise it. I think there is another organisation caused Pestat set up which is designed to specifically take it from that research stage and move it forward, do more development and make it more applicable. So what I am suggesting is not to use the brains of a group of scientists who are expert researchers to then go into the development process; other people can think about that, people with more experience in development.

Senator WONG—The opposition to the 1080 poison that you alluded to—is that substantial?

Mr McAlister—Yes, it is growing. I think the animal liberation people are against it. I do not like it either; I must make that quite clear. Even within the CRC one of the members there was unhappy; we were doing the annual report and they were unhappy with the way we were writing the annual report. He was concerned about the word 'humane'. We were happy with the word 'humane'; obviously we want to get rid of animals in as humane a way as possible. But, yes, that opposition to 1080 is certainly growing. It is not a pretty death, I believe, but the animals they kill do not have a pretty death either.

CHAIR—I think we heard from the CEO of the pest animal CRC in Canberra, and he said there had been some work on alternatives to 1080 which they were hoping to bring on board.

Mr McAlister—Yes, we are actually doing a bit of work here, funnily enough. We helped them do a little bit of work as well, testing the harmful effects on native animals. There was quite a lot of that work, on birds particularly. If you are going to drop that stuff around there is some suggestion now that even some birds will pick it up. But there is definitely a growing concern about 1080.

Senator WONG—I almost wonder whether I should raise it, but I will: you alluded to the rather difficult problem on Kangaroo Island.

Mr McAlister—Yes. Are you going to ask me what the answer is, are you?

Senator WONG—I am not sure. I have been trying to work out whether it is actually within the terms of our inquiry. I suppose, technically, koalas are introduced. How do we manage the population explosion of koalas on Kangaroo Island?

Mr McAlister—Or of any marsupial, such as the red kangaroo. I make the point that we are going to shoot four million kangaroos this year in this country—I would not want to be the one to suggest that we shoot koalas on Kangaroo Island. I was involved in the first task force, and it was made quite clear to us that we were not going to shoot koalas. What I found interesting was that, being a botanist, when I asked the question, 'How many koalas get to their first birthday?' I was told, 'Most of them.' But when I asked, 'How many get to their second birthday?' the answer I got was a shrug of the shoulders; nobody knew. I also discovered that male koalas are

routinely sterilised, but nobody had ever sterilised a female koala until we did 12 here—there are two different methods—and that was only, say, five or six years ago.

So, having been successful with a dozen koalas in captivity which then did not breed, they then tried it on the island. But those things live about 14 years. We thought we had 7,000 koalas at the time. I think there are now more like 30,000 koalas. I think we have got about 4,000 sterilised in the meantime; that leaves 26,000 that are still eating. The answer to the problem probably will end up being that they die from starvation, or some other thing will happen. But I also feel that people 20 or 30 years ago should have been doing what we have been doing in captivity.

We are about to release some Tamar wallabies back into the wild on the west coast of South Australia, and we do not want to put out a whole group of animals where the ratio of males to females is 50-50. In fact, in captivity you find that 60 per cent of the numbers born are male and 40 per cent are female, so you get a preponderance of males. So what we have been doing just recently is checking the pouches when they are only about an inch big and euthanasing the males. The female then of course produces another and, if that is a female, that is what we want. We want a big group of animals to be released, but we want a preponderance of females over males.

In fact, when ethics approval was given to look at the koalas on Kangaroo Island, in my first report back as chairman of the ethics committee I told them they had broken the approval—as they caught the koalas to sterilise them, if they found young that were about eight to 10 centimetres long and pink without hair they euthanased them in what was euphemistically called 'pouch management'. I reminded them that that was not covered by the ethics approval and that they had to stop doing it. I think now that in the management program, when they catch the koalas, if there are any young in the pouch they obviously should be euthanased and the animal then sterilised, but it is going to take a long time before that problem is solved, unless they eliminate quite a lot of koalas. I think that in the next couple of years you will see a lot of pressure being put on the government to allow it. But I recognise that it is not going to be very popular with tourists if somebody starts shooting furry little bundles.

CHAIR—Are they competing with other animals for food on Kangaroo Island?

Mr McAlister—They are killing the trees. They have a particular habitat that they are particularly keen on—the nice gums down on the creeks—and they decimate it. Dr Black from the Nature Conservation Society might want to make some comments on that. Certainly the best habitat is being destroyed, and it is going to take 20 or 30 years to replace the trees there. In the meantime, the koalas are breeding, and they eat as they breed. Even sterile koalas eat!

Senator WONG—Yes. Finally, what about the tammar wallabies?

Mr McAlister—That is a subspecies which is now extinct on the mainland. Sir George Grey, who was governor of South Australia and went on to be governor of New Zealand, took a few hundred of them to an island off the coast of New Zealand, where their population has exploded. We have brought 100 of them back. The New Zealanders are now poisoning and shooting the other 4,900. We are bringing them back here. They are a pest on an island off the coast of New

Zealand but we do not have them here, so we are bringing them back to go on the west coast of South Australia.

Senator WONG—Have they already been released there?

Mr McAlister—Not really. They are just finishing quarantine now. We also use them as surrogates. The brush-tailed rock wallaby population in Victoria is down to very small numbers, and we have brought some into captivity. We take the young out of the pouch and put them onto the teat of either a yellow foot, tammar or rock wallaby as a surrogate mother. In about six weeks there is another one. They just kick in again and after about six weeks another one appears in the pouch of the brush-tailed rock wallaby. We take them out—because, of course, whenever an egg is fertilised it is held at 64 cells until the time is right. If you take the young away from the pouch, the foetus continues to develop. We are actually—

Senator WONG—putting the accelerator on!

Mr McAlister—Instead of having one born per year, we are getting five or six per female per year. You can see how that could be very successful if you could do it in the short term and then release a whole lot of animals back to the wild.

Senator TCHEN—Your evidence was fascinating. I will not ask any questions.

BLACK, Dr Andrew, Committee Member, Nature Conservation Society of South Australia

BOND, Ms Anthelia Josephine, Threatened Plant Action Group Coordinator, Nature Conservation Society of South Australia

TUCKER, Mr Peter, Committee Member, Nature Conservation Society of South Australia

TURNER, Mr Matthew, Scientific Officer, Nature Conservation Society of South Australia

CHAIR—I now welcome the witnesses from the Nature Conservation Society of South Australia. Thanks for your time today; it is very much appreciated by the committee. You have accepted the invitation to appear today without providing a submission, but whoever wants to make an opening statement can. I have a phone interview, so I will hand over to Senator Tchen.

Dr Black—Thank you very much. I have been assigned the task of offering our presentation. Firstly, thank you indeed for inviting us to be part of your program. We appreciate the opportunity. Although we have not made a submission, we do now have a written submission, which we would like to table, if we may.

ACTING CHAIR—Yes, thank you. The committee has no objection.

Dr Black—We certainly do not anticipate that you are going to read it while we are talking to you. We would like to be quite brief, presenting some principles, addressing the terms of reference and, particularly, seeing whether there are opportunities to extend those terms of reference just a little bit.

Threats to biodiversity clearly are the issues that our organisation is most interested in. There are threats to agriculture, which you are concerned about as well, but we can see that agriculturalists perceive weedy species as threats but can also see the advantages of introducing plants that grow well. That is a paradox: the plants that grow particularly well are those with the greatest potential to become invasive plants. So the agriculturalists are in a position of conflict of purpose and priority. We are probably not in that position at all. Our interest is in biodiversity, so there is not much conflict. We do not have a great enthusiasm for introducing new plants, new animals and new birds.

We would like to stress the precautionary principle. I know that principle is within the invasive species bill, but we would like to know a little bit more about how that precautionary principle will be applied. A national initiative is clearly most welcome. Hopefully, this will bring not only power but finances, as well as providing practical and symbolic input. You are well aware of the great problems that exist between states and the resultant great need for a coordinating and Commonwealth role.

Control and management of invasive species are in the terms of reference, and we would like to stress that these programs need to be targeted but also integrated, because a target that aims at a single species may not have the best environmental outcome, because of the interrelationship between species. For example, the blackberry is certainly a pest plant here in South Australia,

but it also provides an important habitat for small birds and bandicoots, so removing all blackberries would destroy their modified ecology.

There is, of course, an extremely complicated interaction between foxes and rabbits and native flora and fauna. The fox is on your list, and the rabbit is not, but we presume that the rabbit is still at the top. Certainly, if we crash the rabbit population, as has been done with the haemorrhagic virus, there will be an immediate improvement in the flora—certain plants—but the effect on the fauna is much more complicated. Because rabbits and foxes are now established in this country, particularly in southern Australia, they have a huge impact on, and are now part of, a perturbed ecosystem. When rabbit numbers crash, native predators need to look elsewhere, and our lizards, small mammals and birds may suffer as a consequence. It is a very complicated business. Another example, plague locust control or control of invertebrate pests, may have a serious impact on other insects and, therefore, on birds that eat insects. I am sure you are well aware of the major decline in populations of small insect eating birds throughout southern Australia.

We would also like to expand the concept of native species as potential invasive species. Two of us will give examples there. We would particularly like to make a distinction between native invasive species—a species that is taken out of its natural environment to another part and cultivated or planted there, then escaping into the environment, is what we would see as a potential native pest plant—and native species that are good colonisers, sometimes referred to as increaser species. Increaser species do not necessarily become invasive species or vice versa: that is, there are some invasive species that may not be increaser species in the list.

Senator TCHEN—That is 'increaser'.

Dr Black—Yes, that is a commonly used term. These terms tend to come and go a bit. I am referring to species that will re-establish themselves. They will colonise an area that has been degraded by overexploitation—for example, overgrazing. A less palatable species will become dominant in those areas—eremophilas, dodonea and some acacias will be in this group. Some land managers will see them as the enemy, but the true culprit is overexploitation of the natural vegetation on that land. These coloniser species—increaser species—then become important habitat and they may be the only habitat that is left in that place. We feel it is extremely important to distinguish that situation from a deliberately moved species that can become invasive and affect habitats outside of their normal range.

You have addressed the question of costs of alternative programs, and we would like to see that the precautionary principle is applied. Therefore, we would particularly like to see pests being prevented from coming in—before they come in. To expand on one of Tim Low's very famous phrases: 'Not all of tomorrow's weeds are necessarily already here. There will be others that may come in.' You will develop a list of prohibited species, and we would be interested to know just how the precautionary principle will be applied to that prohibited list—where the onus of proof is. Is it on the person who proposes to bring it in? How will that be dealt with under this legislation, given that the Criminal Code is referred to as a way in which this will be dealt with?

You have a list of pests and a list of weeds. Not all of those are relevant to South Australia, but the fox and the cat certainly are. Ed McAlister has already discussed some aspects of that, but we would be happy to discuss it further. We can see that 1080 baiting is still the way to control foxes

and we would reinforce what he has just mentioned—that is, the extreme advantage of fox control for medium-sized native mammals, such as rock wallabies and the like. Of course, 1080 is much more benign in the west—and that includes much of South Australia—and is more potentially troublesome in the south-east and east of the country.

As he stated, it is hard to be certain whether the cat has been responsible for any extinction, but clearly it has contributed to the decline of many species. It will eat almost anything. Quite possibly, it has been influential in the decline to near extinction of the night parrot. The north-south telegraph line went through in 1871 and within 10 years cats could be found 250 kilometres to the west of that line, so they established themselves very rapidly and came to be part of the system. The Aboriginal people would now regard them as part of their local fauna. We would like to see further work done on goats, camels and deer, and we wonder whether any further species of deer needs to be introduced to this country.

Regarding weeds, we would particularly like to stress the bridal creeper and bridal veil as important environmental weeds, as well as the olive. We can see that current programs in this country are insufficient, and we welcome the initiative to broaden the program from a wide national perspective through the EPBC Act. We can discuss things further or, if you would like, we can discuss the two examples of native species as potential invasive species.

ACTING CHAIR—Before we get to that, there are two issues I would like to seek some clarification on. A lot of the things you just told us have reinforced a lot of the evidence we have received so far, particularly much of the evidence we have heard today, especially that referring to the complexity of the issues and a need to look at the long-term relationships between species which are regarded as invasive at the moment—whether they have actually established some sort of relationship with others. It is not just a simple case of going in and eradicating them single-mindedly.

The first thing I would like you to amplify on is the term ‘precautionary principle’. You referred to it a number of times as something which is important in guiding policy developments. The precautionary principle is something which, over time, has been mentioned extensively and has become all things to all men. Taken to the extreme, it could imply that the best state is actually a state of stasis—when nothing happens. Perhaps you could amplify a bit on your interpretation of precautionary principle, particularly in terms of application.

The second issue is that you said your association is more concerned with the issue of biodiversity and not so much with the agricultural economic implications thereof. The simple question I want to ask you is: do you think the two issues—biodiversity and agricultural development—are independent or interrelated?

Dr Black—Clearly, they are interrelated, but we would see that agricultural pursuits would usually get the nod and biodiversity issues would be the ones that make the compromise. So that is why we are on the side of biodiversity.

ACTING CHAIR—That is as a result of the mighty dollar, isn’t it? That is the one thing you can count on.

Dr Black—That is right. Self-interest will continue to drive the protection of agriculture, but the only self-interest that drives biodiversity is rather subtle. Clearly, societies such as ours will drive that, but we have some potential allies—through ecotourism, for example. Tourists will come and see our wildlife, but if we destroy it and destroy the environment that the wildlife depends on we will not make dollars there. But, as I am sure many people have said, the exact dollars and cents of ecotourism and biodiversity need a lot more study. It is interesting that you say that the precautionary principle can mean all things to all persons. I will have to take that.

ACTING CHAIR—I said it that it seems to, because I keep getting different interpretations. People come along and say, 'The precautionary principle means that we should do this,' and then someone will come along with an entirely different interpretation.

Dr Black—Where is the onus of responsibility and the onus of proof? Clearly there are people—and indeed industries—who wish to import new seeds of new and better pasture plants and so on. They see those as providing something to feed the world, feed us and make money. The precautionary principle could be applied by saying, 'We are not going to allow you to bring in another variety of a plant that is already shown to be a pest in Australia,' or by saying, 'We are not going to allow you to bring in another variety of a plant that has become naturalised without being a pest,' or by saying, 'We are not going to allow you to bring in a plant that has become a pest in some other part of the world,' or by saying, 'This plant belongs to a genus or a family that is amongst the world's greatest pests: we require you to document for us all that is known about this plant.' So the onus of proof would be on the proponent, before they bring it in. That is my view of the precautionary principle. I am getting a few nods. Is that something that is conceivable?

ACTING CHAIR—I am neutral; I do not have a particular view on this. It is just that I keep getting different interpretations. One interpretation, which I personally find difficult to accept, is going beyond that and saying, 'This species might become dangerous and therefore unless you can prove that it is not going to become dangerous the precautionary principle dictates that we should not introduce it.'

Dr Black—Do you have a difficulty with that?

ACTING CHAIR—I think that might be going a little bit too far.

Dr Black—I think we have to be a bit dangerous in this and be prepared to go a bit too far.

Senator WONG—Or we should be cautious—that would be the other way of looking, wouldn't it? If in doubt, don't.

Dr Black—We should be a bit creative. We know that 30,000 or 40,000 plants have come in. We know that 3,000 of those have gone wild locally or more broadly and that 300 to 400 are already pests. If we are going to select plants that grow well because they are highly productive then we are going to have a higher percentage than the one per cent that have become pests. So, even if we cannot say that you have to prove that this does not have the potential to become a pest, at least we can ask: 'Just how essential is it to bring this plant in? Where are the risks and where are the benefits?' I am a medical doctor and that is what I talk about in my therapeutic

relationships: what are the risks and benefits of a different approach or an alternative approach? I think that that is applying the precautionary principle.

You might say, 'If you cannot prove that it is not going to become a pest, are you prepared to wear a fine that will occur if it becomes a pest?' But within how long would that apply? Five years or 10 years would not be long enough, because there are what you might have heard of as 'sleepers' that take longer to become pests. If something becomes a pest within 20 years, what percentage of the cost of controlling that pest will the proponent by prepared to pay? That is pretty hypothetical, I suppose.

ACTING CHAIR—I think that is a very logical line to go down. Unfortunately, I cannot think of a single instance where people are prepared to legislate for that—'If you want to bring it in, what sort of bond would you like to put up?' Usually it is either in or not in. Senator Wong, do you wish to ask some questions first or ask Dr Black and his colleagues to go through those two examples that they want to talk about?

Senator WONG—I have particular questions, but I am happy to do it in the order you want. I did wonder if your other colleagues would like to make any comment, Dr Black.

Dr Black—I know Matt would like to talk about koalas.

Mr Turner—I was particularly pleased to hear the senator's interest in the koala problem on Kangaroo Island. This is a very real problem and it needs to be looked at from a scientific point of view rather than an emotional point of view. In our submission, we have addressed the problem, acknowledging that the problem falls outside the terms of reference of this inquiry. We wanted to emphasise it because that would emphasise that the terms of reference do not cover all invasive species.

Mr McAlister spoke briefly about the koala problem on Kangaroo Island. What I would like to add is that the problem really needs to be addressed as soon as possible because, if it is not, we will see not only widespread loss of habitat but also widespread starvation of koalas. No-one wants to see that, even on the animal welfare side of this debate. We are really talking about a scientific solution that addresses population control. Whatever way of controlling the population is used is up to the government of the day, but it needs swift and decisive action as soon as possible.

The other thing to mention here is that there are other areas on South Australia, in particular the Mount Lofty Ranges, where koalas have been introduced. While they are not at the same level as what we might see on Kangaroo Island at the moment, it is speculated and quite possible that we will see these koalas increased to the levels we are seeing on Kangaroo Island. Had we bitten the bullet 40 or 50 years ago, before the population on Kangaroo Island grew to such a large number, we would not have the same sort of public outcry that we are seeing now. We would suggest that these sorts of things need to be nipped in the bud early on. That is all I wanted to say about the debate on koalas on Kangaroo Island, but I am happy to take any questions on that.

CHAIR—A quick question on that: at what stage does the natural biological control of lack of food come into play with a population explosion like that?

Mr Turner—That is a good question. I do not feel that I have the expertise to answer that, other than to say that it is a fairly simple equation where, as resources are depleted, individuals will die. Reproduction will probably go down at the same time. It is amazing how ecosystems can work out a balance. However, the projected balance that we might see on Kangaroo Island may not include many of the species that are there at the moment. They will be the ones that will disappear.

Dr Black—There are no foxes on Kangaroo Island.

Mr Tucker—I think it is probably worthwhile to mention that koalas were actually introduced to Kangaroo Island, so they were not natural there. Therefore, as to the ability of the vegetation and habitats to respond to this eating out of themselves, they are not going to necessarily respond as rapidly as they would or if they could in the eastern states where the koalas are natural.

Senator WONG—Do you have anything you want to add to your colleagues' evidence?

Ms Bond—Yes. I thought I could highlight the point about the precautionary principle and also about the issue of treating invasive species before they become too much of a costly problem to address. I look at the precautionary principle in the sense of guilty until proven innocent. Like you were saying, it is perhaps a pretty harsh approach but if you do not have that approach and you wait until something is proven guilty then you are faced with a much more costly problem to solve. I think that is a strong argument to have the precautionary principle in this case.

Senator TCHEN—What about the second case? You have two cases?

Dr Black—Peter is going to talk about bluebell.

Mr Tucker—There are two examples of native species which have become invasive outside of their range. They are included in here. Rather than going through what you can already read, I will just give you the two general areas of how those native plants—Australian plants, if you like, or national species—arrive into our ecosystems. It is usually quite often through horticulture. The bluebell creeper is the prime example of that one. The other one is quite often through revegetation projects, particularly revegetation projects of maybe the 1970s and 1980s. That is quite a good case of the acacia as well. Lots of species from Western Australia were brought over here for revegetation. Where I am employed we train a host of volunteers to go out and do bush regeneration work. It is always a lot more difficult to challenge your average Australian's perception of an Australian plant as a weed. It is generally not too difficult to get them to realise exotic plants out of Australia as weeds, but when you start talking about a Western Australian acacia or a New South Wales melaleuca the challenge becomes a lot more difficult. I think these are people who are already switched on. So the general public out there who may not necessarily be concerned with biodiversity straight up would have great difficulty understanding that.

CHAIR—Are they likely to become highly invasive?

Mr Tucker—Yes. There are two case studies in here—the *Sollya*, for example, in the south-east of South Australia. Up until three or four years ago it was originally thought that about 120

hectares were covered. It is now thought that it is hundreds of hectares. They do actually change the whole structure of the environment. The Cootamundra wattle is another good example. They actually change the structure. So instead of having an open woodland community with a whole range of animals, birds and plants which use those areas, the other species get in there. *Acacia baileyana*—the Cootamundra wattle—have quite a different growth form. They actually shade out the bottom and have been shown to exclude a lot of native plants. They do become invasive because a lot of them are spread by birds. If they have fruit they can be spread by foxes as well. They can be spread along roadsides—dirt roads—as graders go along. They can be spread in earth from earth moving equipment and that sort of thing. They do move around the landscape quite dramatically at times.

Senator WONG—I will be provocative for a minute. I can appreciate logically what you are saying but, from a government policy perspective, do you think there is an argument that in relation to the prevention and management of exotic invasives, both plant and animal—which we do so poorly—that before we worry about Australian natives, which may occur in their non-usual environment, we ought to be focusing more on exotic invasives?

Mr Tucker—I think it is very important to keep the two both as 'invasive' and not to distinguish between 'exotic' and 'native'. From another perspective, if you were in Spain and you were going to plant a plant from Russia, would you call it a 'native'? Here in Australia, we will grab something from Western Australia, plant it in Adelaide or Melbourne, and call it a native, and we are talking similar distances. The problem is that we have such a huge country that to use the term 'native' for our native plants is a bit erroneous.

Senator WONG—I appreciate the logic of it. I am thinking in terms of policy. I do not know whether you were here earlier for the evidence from the Nursery and Garden Industry Australia. They cover, I think, around 40 per cent of the industry and they are essentially self-regulating on this issue. It seems to me that we have so much work to do on regulating the sale of plants which are established as being weedy. As to the order of priorities, I have to be honest with you, it seems to me that there are more pressing issues upfront.

Mr Tucker—I would still stick to what I have said, obviously.

Senator WONG—You will stick to your guns on that; that is fair enough.

Mr Tucker—It comes down to what Ed McAlister was saying earlier—that is, education is a big factor. Also, weed risk assessments have been developed, so you can still run your native species through your weed risk assessments. If something is going to be entered into the horticultural industry which has a weed potential, it can still go through a weed risk assessment, irrespective of whether it is an Australian species or something from outside Australia. If it is a particularly productive acacia that could maybe be flagged as not being the sort of horticultural pursuit to take. You could maybe find another acacia which has less invasive potential because of the attributes of that species.

Dr Black—Senator Wong, you said you were being provocative, but we did not find you provocative at all. Clearly, we are provoking you by talking about this particular issue of native species that have the potential, if introduced, to become weeds or pests if transported. You made the point that the nursery industry is taking its time to regulate itself adequately, dealing with

plants from elsewhere. But, as it learns, if it is making progress there, it is not a huge step for it to understand that there are potentials in transporting plants from one side of the country to the other. Clearly, south-western Australia is a very different part of the world from north-eastern Queensland.

Senator WONG—I agree with you, and I think your position has more logic than mine, in a sense. Not that that is my position; I am just observing that. It seems to me from the evidence we have had so far that we have very poor regulation of the importation of a whole range of invasive species. We have very poor coordination nationally of the sale of both plants and animals. We have inconsistent regulation across the states and, even in states where the sale of the species may be banned, we have very poor or no regulation preventing interstate on-selling. So, when you are confronted with those kinds of issues in your regulatory framework, whilst I think as a matter of logic your point is well made—

Dr Black—We thought this bill was going to answer all those problems.

Senator WONG—I do not think it will.

CHAIR—Of course it will.

Ms Bond—I think it is worth trying to solve the whole problem at the time rather than trying to address just part of it.

CHAIR—Prevention is always the best cure.

Senator WONG—That is a good point. It goes back to what Mr Tucker was saying: it is easier to explain to the public the threat of the exotics than it is to explain that if you plant something from Victoria in South Australia there might be a problem.

Ms Bond—Absolutely.

Senator WONG—They do not get that.

Ms Bond—But you would probably be doing the same thing with native invasive species a few years down the track.

CHAIR—Although in Queensland everything from south of the border is regarded as exotic. We understand these things much better.

Senator WONG—Including the people!

CHAIR—That is right. I have a quick question about the issue of olives in South Australia and eradicating olive groves. There has been a lot of discussion here about olives. You will have to excuse me—I am from Brisbane, so I am not entirely familiar with the Adelaide Hills; I have driven through them a couple of times. As I understand it, the olive groves are fairly close to the city, by and large, but I do not quite understand why someone does not just cut them all down.

Mr Tucker—There are too many. We also have quite a conundrum in that, as Andrew suggested, where we have weeds, quite often native animals will use those weeds, so you have to be really careful. There is the nationally endangered bandicoot, and if we were to eliminate the blackberries another type of bandicoot would go extinct. It is complex. The olive groves extend for quite some distance. Most of those around the Adelaide Hills stem from failed ventures of the 1890s. What happens is that, if any of those that are currently being planted fail, you may not see that for 50 or 60 years.

Dr Black—You must appreciate that cutting them down does not kill them. They have to be poisoned as well.

CHAIR—They just grow back again?

Mr Tucker—We have a lovely technique called drilling and filling. It is very satisfying.

Ms Bond—It is actually quite a refined technique. People have to be trained in how to do it properly. A lot of olive control that has gone on in the past has not been effective.

Dr Black—It is painless euthanasia—humane.

Senator TCHEN—Do you know what you are doing to our national greenhouse gas emission target while you are doing that!

CHAIR—What would you recommend in terms of the Adelaide Hills? There has been a huge discussion about blackberries, olives, camphor laurels, and all the other things that are of some use, including privets. When we took evidence from the CEO of CRC for Weeds, she basically said, 'The native plants, given half a chance, can compete. The hard part is giving them half a chance.' What would be your recommendations in terms of management for that sort of area?

Mr Tucker—Before you do any sort of targeted work, particularly on infestations, it is absolutely critical to survey the area for not only native plants but also native animals. That would really drive how you will deal with a particular weed issue. Each weed issue will be separate. In the program that I work with we have volunteers, and their site consists of almost 100 per cent olives. You can get the volunteers working in a strategic manner that advantages the native vegetation—that is, you kill those that are at the bases of eucalypts which are obviously sick and dying, and if you find patches of native grasses or plants you open those up. You actually kill the weeds to enable the native plants to be advantaged. Sometimes it is not appropriate to go out and clear-fell an area; maybe it has to be staged over 10 years. One of the things I say to our volunteers in the workshops is that bush regeneration is one of those things where it is about the only time in this lifetime when you will be told to go slowly, because if you go too quickly you can cause more problems.

CHAIR—That is interesting. What sort of volunteer numbers do you have in Bushcare in South Australia?

Mr Tucker—I can only speak for the program that I am involved in, which is Bush for Life. We have about 630 volunteers and they do about 24,000 hours worth of work a year.

CHAIR—That is very impressive. I was staggered at the number of volunteers in Brisbane. Each little creek in the Brisbane suburban area has a catchment management group, and I was surprised at the huge number of volunteers working there every weekend cleaning out creeks.

Dr Black—I wonder whether Peter agrees that if you give the native species half a chance they will come back. I think that, particularly in the southern part of Australia and even more so when we get out into the drier areas, they need more than half a chance; in fact, they need several chances. As Peter has said, the way back for native species can be quite slow and, of course, it will be very incomplete and what emerges will not be what was replaced. The more fragmented the habitat is, the less the chance of sufficient seed source and genetic diversity to re-establish once you have removed the pest plants. It is easier for other pest plants to come in and establish themselves where you have removed the last lot of pest plants.

CHAIR—Peter, do you agree with that?

Mr Tucker—We tend to find that if there is a skeleton of native plants around—the basic grouping of native plants—they will come back quite well. In areas which are perpetually being grazed by rabbits, kangaroos or whatever is out there eating things, you lose that seed bank in the soil, and that is when they need extra assistance.

Senator TCHEN—You raise the interesting question of why you should give a particular species several chances when that species is obviously unable to compete. That species may well have been an invasive species, say, 100,000 years ago.

Dr Black—I think that if you extend that argument—

Senator WONG—You will never revegetate.

CHAIR—Let us just plant lantana!

Dr Black—Let us let everything in and compete with everything else.

Senator TCHEN—That is taking the argument to the other extreme.

Dr Black—Let me make a point about that. Let us say that we let everything in Australia compete with everything in Indonesia and vice versa. We will lose biodiversity. That is a fact. Some of theirs will outcompete some of ours and some of ours will outcompete some of theirs. The relationship between area of habitat and biodiversity is not linear; it goes up in a curve. If we double the area of habitat, we will only increase the total diversity by, say, 10 per cent. If we double it we have double the area, but previously we had two times that 10 per cent less. So we will lose species if we put everything together. If we value Australian biodiversity we must take seriously the question of outcompetition by species that have not been here for hundreds of thousands or millions of years.

Senator TCHEN—Again, given reasonable time, an environment's degree of diversity always increases to about the same level.

Mr Turner—On geological time scales?

Senator TCHEN—Yes, geological time.

Mr Turner—I think it is important to note here that humans get significant benefits from a biodiverse environment.

Senator TCHEN—That is discounting the fact that human beings are quite often the principal invasive species.

Dr Black—If we are not going to have the biodiversity we are not going to see that evolution. We are managing the environment and deliberately reducing biodiversity over much of the landscape. That is a deliberate act. We are going to a monoculture or close to it over most of our productive land. We are deliberately limiting biodiversity in that area.

Senator TCHEN—Dr Black, I am not disagreeing with you; I am just making an observation. From my background, I can tell you that there is nothing more monocultural than the landscape of East Asia.

Dr Black—What part of East Asia?

Senator TCHEN—On the plains. It is one of the most populous spots on earth, in terms of human habitation.

Dr Black—The most populous places on earth probably have the most biodiverse and productive lands and the most fertile soils. We do not have that luxury here. We have the worst soils in the world.

Mr Tucker—Apart from Antarctica, I suppose. Another reason for particularly giving an individual species a leg up as opposed to others—

Senator TCHEN—I am not talking about turning Australia into paddy field.

Mr Tucker—Some species are what they call keystone species, so their benefit to other species within an ecological community is far greater than them as just an individual plant or animal. A good example in South Australia would be those small mammals which eat fungus. We have lost virtually all of our fungivores, so the spread of fungus now is very poor and some of those funguses could be anything up to 200 years old. You would find that most plants have to have an association with a fungus. We do not know what is going to happen if these funguses die. What happens to the vegetation if they are not able to spread?

Senator TCHEN—I understand.

CHAIR—I have a couple of questions about the latter part of your submission—about identifying the next weeds. You have identified a couple in areas you are concerned about in the dryland salinity range—tagasaste and tall wheat-grass. Do you think enough research is being done by agricultural research type institutes before new wonder plants are introduced for commercial release?

Ms Bond—I guess the short answer to that is no. In my current position, I coordinate the Threatened Plant Action Group's plant recovery programs, so we have a number of projects across the state that we work on. Most of the work that we do is habitat restoration, of which most is managing the weeds that are there. We do find that we are managing both the native Australian species that are invasive and species that are actively being promoted for agricultural practices—and the example of tall wheat-grass was mentioned—for salinity and use in remedial situations. At a number of sites, we have found that tall wheat-grass has become invasive in terms of native vegetation. It is proving difficult to control and is costing us in resources. There are a number of examples like that as well. There are a number of pasture grasses. There is also perennial veldt grass and buffel grass, which has recently been identified as a problem in South Australia.

Dr Black—Can I mention a few more bird pests. I am a bird man myself and I will just mention some of the bird pests.

CHAIR—Starlings.

Dr Black—Starlings are very clear but there are others, such as the rock dove and the feral pigeon. There is also the mallard, which is the northern species that is very closely related to our black duck. You may be aware that in New Zealand there are no pure black ducks left. They call them grey ducks over there; they are a little more logical than we are, because the birds are grey rather than black. So the mallard has eliminated the pure New Zealand grey duck, and it is progressively invading genetically the black duck in Australia. The mallard probably could be controlled if everyone was in agreement to control it. That is a problem because the male is a very handsome bird and they are the sorts of birds that children can feed at ponds.

The Indian dove and the blackbird are also important invaders in this state. Ed McAlister mentioned the silver gull, which is a native. If you can project your current program to include native animals, the silver gull may be one of the first that will need attention. He referred to the fact that it has expanded its range and it is now interfering with the future of the banded stilt, and it is also impacting on other birds such as fairy terns.

CHAIR—That raises some fascinating issues. For example, if the silver gull has expanded its range, is that a natural process or a man-assisted process? And if it is a natural process and we still decide that it is a bad thing, do we intervene? It raises a whole range of ethnical issues.

Dr Black—It depends on how natural man, Homo sapiens, is. We are a part of nature, but we dominate it and influence it. Gulls are a problem in many parts of the world, not just here. There are different species—herring gulls and other gulls—in other parts of the world. The silver gull is our problem gull. It obviously has done very well because it adapts well to the human environment. That is, in fact, the story of our native birds. Some native birds have adapted well to the changes that we have made. For example, galahs, little corellas and crested pigeons have all expanded their range because we have converted more of our southern woodlands and mallee into open grasslands. Silver gulls have expanded because they like rubbish dumps, the Adelaide Oval and what we throw around on the beaches and so on. Gulls tend to be an aggressive, assertive species, so they have expanded. They are certainly now present in the inland lakes and river systems. In 1933, the banded stilt was breeding at Lake Callabonna, and gulls were not even mentioned. In the seventies, at a breeding event of banded stilts, only a few gulls were

present. The most recent banded stilt breeding attempts have been dominated by the presence of silver gulls.

Senator TCHEN—In that case, what about the mallard duck. Surely they fly in under their own steam? They are not introduced by humans.

Dr Black—Yes, they are. Mallards were introduced because they are ornamental. They were introduced for duck ponds and so on.

CHAIR—Thank you very much for your evidence this afternoon. It has been very helpful. My apologies for missing the beginning of it, but I will read the transcript when it comes through. It has been very interesting, and keep up the excellent work in terms of Bushcare and fighting the weeds. The whole issue of how much work is being done by community groups, in the absence of government action sometimes, is one of the big untold stories of this whole inquiry. Thank you very much for your efforts and evidence today.

Senator TCHEN—Mr Chair, following your comment, I am pleased to say that the current government has been very forthcoming in supporting community groups with environmental funding.

CHAIR—Yes, on a year-by-year basis, that is right.

Dr Black—Long may it continue!

CHAIR—Thank you all very much.

Committee adjourned at 4.58 p.m.