Chapter 5

Risks and preparedness

5.1 This chapter discusses the increasing environmental biosecurity risks posed to Australia by increases in trade and travel, including incursion pathways that were identified as being particularly high risk or in need of better regulation during the inquiry.

5.2 This chapter also discusses areas of biosecurity preparedness which witnesses and submitters identified as requiring greater resources or better organisation, including:

- resourcing of biosecurity operations;
- environmental biosecurity research capacity;
- taxonomic and identification capacity;
- poor implementation of existing plans; and
- a lack of research on impacts of climate change.

General biosecurity environment

5.3 The following statistics provided by the departments of agriculture and the environment illustrate the extent of movements, including cargo, mail and people, across the Australian border in 2013–14:

> In 2013–14, the department:
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> - cleared 17.7 million international passengers, from whom 261,000 items were seized due to biosecurity concerns
> - handled 186.6 million international mail items, of which 24,100 were seized due to biosecurity concerns
> - assessed and granted entry to 17,460 vessels arriving from overseas
> - processed 23,500 import permit applications, of which 18,700 permits were granted after assessment
> - assessed 440,000 commercial and 621,000 air freight consignments (under $1000 value) for import into Australia
> - inspected 45,600 sea containers from high risk ports
> - monitored 6,060 live animals and 21,700 hatching eggs at government post entry quarantine facilities.[1]

5.4 The departments further explained that the task of managing Australia's biosecurity is expected to become more complex in the future due to climate change and changes in the global distribution of pests. Furthermore, there are expected to be

1 Department of Agriculture and Department of the Environment, *Submission 59*, pp 6–7.

significant increases in passenger, cargo and parcel movements across Australia's borders and also within Australia:

> The Department of Infrastructure and Regional Development predicts a 107 per cent increase in total passenger movements through Australian airports by 2030, with significant annual growth projected from countries posing a greater biosecurity risk; and a 129 per cent increase in Australia's trade by 2025, with containerised trade almost doubling to 13.6 million units by 2025. At the same time, there is expected to be significant growth in the domestic movement of people and goods (Commonwealth of Australia, 2014). While letter volumes through domestic and international mail centres are declining, there is strong projected growth in parcels, driven primarily by online shopping (Department of Communications, 2013).
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> These trends, combined with changing global demands, increasing imports from a growing number of countries and new pathways, population expansion and climate change mean that there will be increasing complexity in Australia's biosecurity risk management.[2]

5.5 The departments also submitted that the scale of the biosecurity task, combined with the limited resources available to address it, means that expenditure must be prioritised to the most high-risk areas. Within these areas, expenditure should further be predominantly directed towards preventing entry of species of biosecurity concern as this is the most cost-effective point at which to deal with threats.[3]

5.6 The departments' submission cites economic returns on investment in prevention of 1:100. In comparison, economic returns on investment in eradication, containment, and asset-based protection achieve returns of only 1:25, 1:5–10 and 1:1.5 respectively. As noted in chapter 3, there is no agreed methodology for measuring environmental benefits in economic terms; however, in general, investment in preventing incursions of environmental pests and diseases is believed to be more cost effective than responding once they have arrived.[4]

5.7 In general, submitters and witnesses agreed that it is prudent to attempt to improve preventative measures and that, given the finite resources available for biosecurity operations, a risk-based approach to identifying pests and diseases, and their potential incursion pathways, is necessary. However, a number of matters were raised as areas where this approach does not appear to have been effectively implemented. Matters relating specifically to marine, freshwater and island biosecurity are discussed in chapter 6.

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2 Department of Agriculture and Department of the Environment, *Submission 59*, p. 7; see also Dr Robert Klumpp, *Committee Hansard*, 10 November 2014, p. 45 regarding increasing biosecurity threats facing Tasmania.

3 Department of Agriculture and Department of the Environment, *Submission 59*, p. 8.

4 Department of Agriculture and Department of the Environment, *Submission 59*, pp 7-8.

Pathways and risk assessment

5.8 The departments of agriculture and the environment acknowledged that biosecurity risk is inherent in the production, trade, and movement of goods, the movement of people, and the natural migration of animal and bird species and climatic and other natural environmental events that bring exotic pests and diseases to Australia.[5] Risk assessments are used to identify levels of risk posed by particular pathways or organisms and how they can be managed. These risk assessments can be reviewed and updated at any time when new information is available.[6]

5.9 The Department of Agriculture is responsible under the Quarantine Act for assessing the biosecurity risk associated with imports and the Department of the Environment is responsible under the EPBC Act for assessing environmental risks associated with the import of live specimens. Importing live specimens such as 'animals and plants, seeds and biological control agents' requires the agreement of both departments.[7]

5.10 Currently, only animals and plants listed on the List of Specimens taken to be Suitable for Live Import (live import list) are permitted to be imported. This live import list includes any plant that can be imported under the Quarantine Act, provided it is not listed as a CITES specimen under the EPBC Act. Animal Species proposed for inclusion on this list are the subject of a risk assessment, focused on their potential environmental impact, by the Department of the Environment.[8]

5.11 All new plants proposed to be introduced to Australia are assessed for their potential to become weeds. This is done through the Australian weed risk assessment system and plants that are found to have a high risk are prohibited. Plants found to have a low risk are permitted into Australia with appropriate conditions. This system is administered by the Department of Agriculture; however, the Department of Environment has determined that this system also adequately assesses the potential environmental risk of plants under the EPBC Act.[9]

5.12 Between 1997 and July 2014, 5,500 plant species have been assessed, of which 69 per cent have been accepted for importation and 31 per cent rejected on the grounds of their potential invasiveness.[10]

5.13 The import risk analysis (IRA) process is currently the subject of a review, consultation for which occurred between July and September 2014. This review is

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5 Department of Agriculture and Department of the Environment, *Submission 59*, p. 22.

6 Department of Agriculture and Department of the Environment, *Submission 59*, p. 22.

7 Department of Agriculture and Department of the Environment, *Submission 59*, p. 23.

8 Department of Agriculture and Department of the Environment, *Submission 59*, p. 23.

9 Department of Agriculture and Department of the Environment, *Submission 59*, p. 23; see also Australian Government, 'Preventing the entry of new potential weeds into Australia', http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/where/prevent.html (accessed 21 January 2015).

10 Department of Agriculture and Department of the Environment, *Submission 59*, p. 23.

examining: transparency and consultation during the IRA process; the use of external scientific and economic expertise; and consideration of regional differences in animal or plant health status during the IRA process.[11]

5.14 The Department of Agriculture, in accordance with its move to a risk-based biosecurity intervention strategy, has developed a risk return resource allocation model to guide decision making:

> The model works by calculating risks and costs of investment for specified biosecurity control scenarios. Control scenarios can be constructed to represent risk-based intervention strategies such as profiling, targeting, rewards and penalties. It describes a comprehensive, non-overlapping set of organisms of biosecurity concern. In this context, the term organism can refer to an individual species of pest or disease (such as Asian gypsy moth) or a group of species (such as weeds), with approximately 60 organisms currently described in the model.
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> The model describes approximately 60 entry pathways by which the organisms of biosecurity concern can enter Australia and over 130 pathway specific biosecurity controls. Examples of controls include border inspection, pre-export certification, stakeholder engagement, and surveillance. Switchable settings in the model determine which controls are operating.
>
> Risk is calculated as the combination of consequence and the likelihood of entry, establishment and spread of organisms of biosecurity concern across all pathways. Separate calculations of risk are generated for the environment; primary industries (agriculture, fisheries and forestry); domesticated and companion animals; infrastructure and produced goods; human health; and social impacts.[12]

5.15 The submission notes that consequences in this model are expressed in monetary terms for primary industry, while other categories, including environment, use non-monetary scales.[13]

Identification of pathways

5.16 The CSIRO submitted that 'Pathways are well known but have not been quantified in terms of risk as a pathway or by type of organism even though the tools for this are available today.' In addition, the CSIRO stated that 'Most pathways are not consistently monitored for environmental biosecurity detection, largely because many

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11 Department of Agriculture, Examination of the Import Risk Analysis (IRA) process, (accessed 9 January 2015) http://www.agriculture.gov.au/ba/ira/iraexamination

12 Department of Agriculture and Department of the Environment, *Submission 59*, pp 23–24; Further information on the risk return resource allocation model was provided to the committee on notice: Department of Agriculture, *Answer to written question on notice No. 7* (received 18 November 2014).

13 Department of Agriculture and Department of the Environment, *Submission 59*, p. 24.

of the potential environmental invasive species are poorly understood and the costs of monitoring are currently high.'[14]

5.17 The CSIRO also noted that, as a signatory to the Biodiversity Convention, Australia has agreed to Aichi Biodiversity Target 9, which reads:

> By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.[15]

5.18 However, the CSIRO reported that prioritisation of species that are a threat to the Australian environment has 'only been applied by some sectors and some threat types. Moreover, no assessments have been made since 2009.'[16]

5.19 The CSIRO undertook a prioritisation of marine pests in 2005 and advised that:

- a prioritisation of potential environmental weeds exists under the National Environmental Alert List, developed by the Australian Weeds Committee; and
- a prioritisation of invertebrates and pathogens with respect to potential environmental impact was developed by the Environmental Biosecurity Committee in 2009.[17]

5.20 The Environmental Biosecurity Committee no longer exists and the list is no longer publicly available; however, the CSIRO supplied an interim version of the list, stating that it was no longer current and requires updating.[18]

5.21 The Invasive Species Council was also critical of the relative neglect of work on prioritising environmental biosecurity threats compared to what has been achieved in other sectors:

> There has been some identification and priority ranking of environmental risks in some aspects of biosecurity – for example for exotic vertebrates (by the Invasive Animals CRC) and marine invaders at a national level. In contrast, the priority biosecurity threats for plant and animal industries have been comprehensively identified through the work of Animal Health Australia and Plant Health Australia, which are industry-government bodies majority-funded by governments.[19]

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14 CSIRO, *Submission 48*, p. 6.

15 Convention on Biological Diversity, 'Aichi Biodiversity Targets', (accessed 9 January 2015) http://www.cbd.int/sp/targets/ ; CSIRO, *Submission 48*, p. 8.

16 CSIRO, *Submission 48*, p. 8.

17 CSIRO, *Submission 48*, p. 8.

18 CSIRO, *Submission 48*, p. 8, p. 16; also see Department of the Environment, 'National Environmental Alert List', (accessed 9 January 2015) http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/alert.html

19 Invasive Species Council, *Submission 74*, p. 30.

5.22 In this context, the Invasive Species Council emphasised the danger posed by overseas plantations of Australian plants, such as eucalypts and wattles, where plant disease can now become well adapted to Australian species before arriving here.[20]

5.23 Wild Matters, an environmental consultancy, submitted that considerable work has been done by biosecurity agencies and research institutes at both state and federal level to identify high risk organisms, but that often greater attention was paid to agricultural threats.

5.24 With regard to pathways, Wild Matters stated that the Beale review, IGAB, NEBRA and the National Invasive Plant Surveillance Framework all emphasise the importance of identifying, prioritising and conducting surveillance of high-risk pathways; however, there 'has been no implementation of these recommendations or establishment of the foundation knowledge or activities required to enable their implementation'.[21]

5.25 Furthermore, Wild Matters argued that:

> Nationally coordinated initiatives such [as] the National Weed Spread Prevention Initiative (NWSPI) and the Weeds of National Significance (WoNS) program have demonstrated the willingness of managers to adopt a pathway-based approach to identifying risk. However the discontinuation of these nationally coordinated programs has resulted in lost capacity to implement agreed/supported strategies and plans.[22]

5.26 The Farm Tree & Landcare Association submitted that the pace at which priority weed lists, such as the list developed under the WONS program, are updated is not matching the pace at which new weeds are emerging and becoming established. As funding and enforcement actions are often linked to such priority lists, it can be difficult to obtain support to control emerging weeds. This situation makes it difficult to address weeds at the most cost-effective time—that is, when they first emerge.[23]

Identification of high-risk species

5.27 The committee questioned the Department of Agriculture as to whether it maintained a current list of species that are high-priority threats to the environment. Ms Mellor responded:

> There is the weeds list and then, from my perspective, in plant and animal health there are certain things that we worry about that could get here and affect the environment, way of life or production. To that end, things like didymo are high in our mind—or rock snot, and I do not like that in the

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20 Invasive Species Council, *Submission 74*, p. 30.

21 Wild Matters Pty Ltd, *Submission 35*, p. 5.

22 Wild Matters Pty Ltd, *Submission 35*, p. 5.

23 Farm Tree & Landcare Association Inc, *Submission 44*, pp 2–3. Frustration with the speed at which priority weed lists are updated was also expressed in evidence given to the committee during its recent inquiry into the National Landcare Program, see Mr Max Schlachter, Mount Alexander Region Landcare Facilitator, Connecting Country, *Committee Hansard*, 13 October 2014, p. 13.

> *Hansard* but that is what it is. There are things that are high in our mind—Mexican feather grass, for example. There is probably, say, a 'top six on the Richter scale' that biosecurity scientists worry about and some of them are particularly invasive to the environment.[24]

5.28 The Department of Agriculture provided the following list on notice:

> Six invasive species that are of high concern to the department and are considered as threats to the environment include; *Didymosphenia geminate* (didymo), *Phytophthora cinnamomi*, (root rot) *Mytilopsis sallei* (black striped mussel), *Pseudogymnoascus destructans* (causes white nose syndrome in bats), tramp ants and the *Duttaphrynus melanostictus* (Asian black spined toad).[25]

Specific pathways of concern

5.29 Several pathways and industries were highlighted during the inquiry as raising particular concerns, including: mail, particularly as it relates to internet sales; cargo; the horticulture industry; and the live animal trade. These matters are discussed in turn below.

5.30 The role of the ornamental fish trade in biosecurity breaches was also raised during the inquiry; however, this topic is discussed in the following chapter.

Mail

5.31 As noted above, although letter volumes are dropping for both domestic and international mail, parcel volumes are projected to grow strongly, largely due to online shopping.[26] The committee discussed with the Department of Agriculture the level of biosecurity risk posed by the mail pathway and how it manages that risk.

5.32 Ms Mellor, Deputy Secretary, commented that the mail pathway is 'not the highest risk pathway'. International mail enters Australia from four main gateways that are run by Australia Post. Australia Post, the department and the Australian Customs and Border Protection Service undertake a screening process of mail. About 185-plus million international mail items come into Australia each year with about 120 million articles being letters. The department indicated that letters generally do not pose a high risk but nevertheless, sampling of letters is undertaken.

5.33 Of the 70 million parcels or packages arriving each year, over 50 per cent are screened. Screening also covers parcels coming into Australia through courier services. Ms Mellor noted that seizures are made and the information is recorded and used to assist with the nature of what is coming into the country. While many parcels are of no concern, for example, arrangements are in place to screen out books, Ms Mellor stated 'if they are manufactured in a certain way and come from companies like Amazon as the managing company, we sample, but we generally can tell'.

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24 Ms Rona Mellor, Deputy Secretary, Department of Agriculture, *Committee Hansard*, 31 October 2014, p. 35.

25 Department of Agriculture, *Answer to question on notice No. 6* (received 18 November 2014).

26 Department of Agriculture and Department of the Environment, *Submission 59*, p. 7.

However, Ms Mellor went on to note that 'the nature of what is coming through can be quite risky: seeds, grains, meat products, animal products et cetera'.[27]

5.34 In conclusion, Ms Mellor stated:

> In context, 70 million sounds like not a lot compared to 185-plus million, but it is a lot and it is a very difficult environment in which to work. What we know about the mail pathway is that more than 99 per cent of mail that comes through that pathway is compliant with quarantine regulation. So we are looking for less than one per cent in that total pathway, mostly in parcels.[28]

5.35 Figures provided in the departments' submission on the number of identifications of exotic pests and disease by mode of arrival also appear to indicate that mail poses less of a risk when compared with air and sea pathways. For example, in 2013 mail accounted for only 750 identifications of exotic pests and diseases out of a total of 18,393. Mail accounted for a similar proportion of total identifications in the years 2009 to 2010.[29]

5.36 Although mail appears to present comparatively low levels of biosecurity risk, the committee received evidence from the Invasive Species Council concerning the ease with which prohibited plants and seeds can be ordered online and enter the country through the mail system.

5.37 To illustrate this problem, the Invasive Species Council documented the process it followed to buy, via eBay, and successfully import into Australia Mexican feather grass, sleepy grass and Kochia scoparia seeds. These packages of seeds were obtained from the United States, Hong Kong and China respectively.[30]

5.38 In its submission, eBay stated that it has a plants and seeds policy, developed with the Department of Agriculture, and that buyers are directed to this policy when searching for plants and seeds:

> eBay takes an educative approach to biosecurity within the marketplace. eBay has a plants and seeds policy which was developed in conjunction with the Department of Agriculture, and incorporating warnings which are presented to eBay users looking for products within related categories and in response to search keywords related to plants and seeds.[31]

5.39 The Invasive Species Council stated in evidence that no warning regarding the illegality of importing these plants was displayed when it purchased them. Furthermore, the Invasive Species Council stated that it had submitted a complaint

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27 Ms Rona Mellor, Deputy Secretary, Department of Agriculture, *Committee Hansard*, 31 October 2014, p. 26.

28 Ms Rona Mellor, Deputy Secretary, Department of Agriculture, *Committee Hansard*, 31 October 2014, p. 26

29 Department of Agriculture and Department of the Environment, *Submission 59*, p. 40.

30 Invasive Species Council, *Submission 74*, Attachment 1, p 65.

31 eBay, *Submission 18*, p. 2.

regarding the advertising and sale of prohibited plants and seeds to eBay and received no response, nor were the plants and seeds in question removed from the website:

> There is no warning to say this is illegal. eBay in their evidence said that the controls are there. Before I bought it, I complained to eBay saying, 'This is illegal.' I lodged a formal thing and there has been no action. The ACT government have been telling me they have been trying to stop the Mexican feather grass from being sold on eBay since June. They have raised it with the national weed committee. This is the ACT government weeds officer. It is still on sale today and it is the same supplier. They have already sold the Kochia, and they tell you how many they have sold. They have sold a few thousand here.[32]

5.40 The Invasive Species Council also noted that one of the seed packages had passed through the mail system unhindered despite the customs declarations stating that it contained Kochia scoparia seeds.[33]

5.41 NGIA also acknowledged in evidence that online shopping presents a biosecurity risk:

> I see comment in one of the submissions that these plants are available commercially in Australia. Yes, they are, on eBay, or they can be imported from overseas. That is not an issue that we can control; that is an issue of people buying in seeds or plants that come through in the mail system, to say that they particularly might like to see, say, serrated tussock or Mexican tussock grass, saying, 'Well, it's freely available in the US. It's available as seed.' They can bring it in and put it here.[34]

5.42 The committee sought further information from eBay regarding the presentation of its plants and seeds policy and how effectively it is displayed to customers before they purchase species that are prohibited for importation to Australia. The committee did not receive a response from eBay to these questions.

5.43 In response to a question on notice regarding how it deals with breaches of Australia's quarantine requirements through online trade, the Department of Agriculture stated that it is attempting to address this problem through the following measures:

> The department has also been working with internet seed suppliers to deal with online purchasing from overseas which may be in breach of Australia's quarantine requirements. For instance, eBay Australia has since updated its plants and seeds selling policy, which enables the department to report breaches of the policy to eBay and for that entity to then take action against the international seller. The site also incorporates warnings which are presented to eBay users intending to purchase certain plants and seeds. Investigations are also underway on the volumes and types of seeds being

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32 Mr Andrew Cox, Chief Executive Officer, *Committee Hansard*, 11 November 2014, p. 31.

33 Mr Andrew Cox, Chief Executive Officer, *Committee Hansard*, 11 November 2014, p. 30.

34 Mr Robert Prince, Chief Executive Officer, Nursery and Garden Industry Australia, *Committee Hansard*, 11 November 2014, p. 12.

purchased by Australian eBay users to identify key entities for education and enforcement activities.

The department has written to other international seed suppliers (eg. Amazon and Chinese based on-line shopping sites such as Aliexpress and CNDirect). To date, over 120 suppliers have been provided with information on Australia's plant and seed import requirements.

The department is also:

- working with the Australian Customs and Border Protection Service and Australia Post to improve mail screening techniques.
- promoting the benefits of biosecurity through programs such as Border Security, fact sheets and web content, in-language radio interviews, and advertising through social media—this increases public awareness and for the requirements to be communicated back to family and friends overseas.
- conducting education campaigns that target specific seasonal and cultural events.[35]

5.44 The department also indicated that as part of an educational exercise, in 2013 it targeted 5165 Australians who had received non-permitted plant or seed imports through the international mail. These people were sent a brochure informing them of Australia's biosecurity import requirements with links back to relevant pages of the department's website. A result of this exercise, 345 of the recipients sought additional information from the website and a further 41 people made contact with the department directly by phone or email.[36]

Cargo

5.45 The risk of cargo as a pathway was noted in evidence. Mr Richard Stoklosa, for example, noted that the Asian House Gecko is a very invasive species which likes to live on wharves and therefore can enter vessels and move around the world.[37]

5.46 The Department of Agriculture stated that cargo on vessels presents a greater biosecurity risk to Australia than mail, but that the greater level of pre-arrival information gathered on cargo and vessels assists in dealing with this. The department stated that the over two million containers that come in a year are 'largely compliant' and are 'a little bit easier to manage than mail because we get evidence of what is coming pre-arrival, so we can make decisions about the tools we need to manage that'.[38]

5.47 However, vessels themselves pose a more difficult problem:

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35 Department of Agriculture, *Answer to question on notice No. 4* (received 18 November 2014).

36 Department of Agriculture, *Answer to question on notice No. 4* (received 18 November 2014).

37 Mr Stoklosa, *Committee Hansard*, 10 November 2014, p. 21.

38 Ms Rona Mellor, Deputy Secretary, Department of Agriculture, *Committee Hansard*, 31 October 2014, pp 26–27.

> Depending on their speed, location and when they are loaded, the loading process itself can attract pests. Over in New Zealand, which has burnt pine longicorn beetles, which are quite terrible, loading at night for travel to Australia is a bad thing because the beetles at certain times of the year are attracted to the lights. In my own experience I have had to ask a vessel master to turn around and go back because there have been a lot of beetles they have not been able to manage. The vessel masters themselves are very experienced in Australia's quarantine laws. Bees, depending on the time of the year, the speed of the vessel and whether it is stopping at multiple ports et cetera, can be an issue. Marine pests can be an issue. We do a lot of work with the shipping sector on biofouling processes. We know when they have been repainted, when they have been dry-docked and when they have been cleaned; we gather information about that. The vessels are tricky because they are tracked themselves.[39]

5.48 The departments of agriculture and the environment also highlighted the 'Country Action List' in their submission as an example of how they respond to cargo as an incursion pathway:

> The Country Action List is an example of how the Department of Agriculture targets a range of high risk pests and other contaminants (such as soil) on imported sea containers and noncontainerised (breakbulk) cargo at the border. This initiative is part of a joint programme with New Zealand to manage cargo arriving from ports at risk of introducing pests such as the giant African snail, Asian black-spined toad, exotic bees and ants. All containers and break bulk from countries on the action list require full six sided inspection of external surfaces and the internal surfaces of empty containers, when discharged at Australian ports.[40]

5.49 The effectiveness of Australia's approach to managing the biosecurity risks posed by cargo was questioned by several submitters. In particular, the recent history of tramp ant incursions, which travel in cargo, was cited as evidence that this pathway requires further attention.

5.50 For example, the Invasive Species Council submission highlighted the repeated incursions made by red imported fire ants at cargo ports and also discussed incursions and interceptions of yellow crazy ants:

> The large number of YCA [yellow crazy ant] interceptions and incursions show that quarantine processes have major gaps for ants. The average of 8 interceptions a year (in the past 5 years) and average of 2 outbreaks detected a year (since 2001) are likely to represent only a proportion of YCAs arriving in Australia. The 2006 threat abatement plan notes that the 'system of detecting tramp ants at the border relies on external inspection of all cargo', which will 'detect a proportion of ant contamination, and relies on the presence of actively foraging ants on the container exterior'. With no dedicated surveillance programs for timber imports, there are likely to be

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39 Ms Rona Mellor, Deputy Secretary, Department of Agriculture, *Committee Hansard*, 31 October 2014, p. 27.

40 Department of Agriculture and Department of the Environment, *Submission 59*, p. 28.

> several undetected incursions each year, and there would have been many incursions that failed to establish.[41]

5.51 As discussed in the previous chapter, both the Invasive Species Council and Dr Lach stated that important elements of the 2006 tramp ant threat abatement plan have not been effectively implemented, including work on strengthening offshore surveillance.[42]

Horticulture industry

5.52 The role of the horticulture industry in environmental biosecurity was raised in relation to both the importation of potentially invasive species and their subsequent spread within Australia. The New South Wales Natural Resources Commission (NRC) stated in its submission:

> The NRC's review of NSW weed management found that several of these pathways are currently poorly monitored and controlled – for example, the nursery industry, aquarium industry, fodder distribution, transport corridors, and livestock movement.[43]

5.53 The NRC also stated:

> The commercial plant trade is a particular concern for introduction of environmental weeds.
>
> - National protocols for certifying nurseries and tracking plant sales should be adopted to ensure that incursions can be easily traced and quickly eradicated.[44]

5.54 The NRC further stated in evidence:

> If you look at the track record, the majority of escapes of plants have come through the nursery system. However you look at it, that industry has contributed to more escapes of weeds and potential weeds than any other.[45]

5.55 The committee raised the NRC's assessment with the NGIA, which responded by making a distinction between large commercial nurseries, which it believes are well regulated, and smaller operations, which it believes do pose a biosecurity threat:

> But it is very easy to call a whole range of things 'nurseries'. It is whether that is their principal business or if someone has just grown some plants and is having a day trade at the markets. Yes, that is uncontrolled. That is very uncontrolled, even to the point of selling poisonous plants. There is no registration required; anyone who has green fingers can grow some plants and take them to their local boot sale and start selling them. That is a

41 Invasive Species Council, *Submission 74*, p. 9.

42 Invasive Species Council, *Submission 74*, Attachment 1, pp. 8–9; Dr Lori Lach, *Committee Hansard*, 11 November 2014, p. 60.

43 Natural Resources Commission, *Submission 70*, p. 3.

44 Natural Resources Commission, *Submission 70*, p. 7.

45 Dr John Keniry, Commissioner, Natural Resources Commission, *Committee Hansard*, 11 November 2014, p. 55.

> concern to us. But we have tried to get registration and we get pushed back from different levels. It is seen as more red tape.[46]

5.56 The Invasive Species Council highlighted the problem of incorrect labelling in the nursery industry as a means by which weeds can enter Australia. It submitted that, although Mexican feathergrass is a prohibited import, it has repeatedly been sold by Australian nurseries under incorrect labels:

> **Pathways:** Imported as a nursery plant under incorrect or outdated names. In 2009 a nursery imported Mexican feathergrass seeds by incorrectly labelling them as *Stipa lessingiana*, which is a permitted import. Mexican feathergrass is not. A similar violation had occurred in 1996 when a Victorian nursery imported the seeds by labelling with an earlier valid scientific name, *Stipa tenuissima*. Mexican feathergrass has also been sold by a Sydney nursery as a native grass 'elegant spear *Austrostipa elegantissima*', perhaps as a result of another improper importation. In 2007-2008, it was sold widely in Queensland after being labelled as *Stipa capillata* and *Stipa capriccio* by an interstate supplier.[47]

5.57 The NRC stated that the improvement and standardisation of labelling and identification of weeds across the nursery industry had the support of the nursery industry in New South Wales:

> …the research shows that two-thirds—nearly 70 per cent—of weed incursions are garden escapees. There are not any national standards for the identification of weeds. In our conversations with the New South Wales nursery association, they were very supportive of there being industry-led standardisation. We had very productive conversations with them and they were supportive of an industry-wide approach to have a permitted list, if it were industry led and government were providing the initial resources to help them to implement standard labelling of their products for sale. This is an area which would be achievable if the Commonwealth sat down with the industry and had further discussions about what obvious steps they could take, because we found a very receptive area at the industry level.[48]

5.58 The NRC stated that it had considered ways to improve the regulation of plant species that are sold through the nursery industry and had concluded that the introduction of permitted lists, rather than the current prohibited lists, would be a significant improvement:

> On the issue of regulation, we gave a long thought to what should happen—whether we should maintain prohibited list or permitted lists—and we came down quite strongly in favour of permitted lists. The principal reason for going for permitted lists is that, for something to get onto the list, someone has to think about the characteristics of the plant and about its potential to

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46 Mr Robert Prince, Chief Executive Officer, Nursery and Garden Industry Australia, *Committee Hansard,* 11 November 2014, p. 16.

47 Invasive Species Council, *Submission 74*, Attachment 1, p. 30.

48 Mr Bryce Wilde, Executive Director, Natural Resources Commission, *Committee Hansard,* 11 November 2014, p. 55.

> acclimatise to Australia and naturalise itself. With a prohibited list, generally a problem has to emerge and then you say, 'We have to stop that'—or else it has to be recognised as a problem overseas. We made that recommendation. It was not accepted by the New South Wales government, but it is still our firm view that in the nursery trade we should have permitted lists.[49]

5.59 The only state that currently operates a permitted list instead of a prohibited list is Western Australia. The NRC stated that this was partly because the incursion pathways are more easily controlled due to the geographical isolation of Western Australia. However, it argued that a harmonised approach could be developed across the eastern seaboard states.[50]

5.60 Mr Prince, Chief Executive Officer of the NGIA, stated that he did not believe any recent incursions could be attributed to deliberate introduction by members of the horticulture industry. He argued that recent incursions were mostly the result of accidental introductions by members of the general population or of smuggling of material across the border.[51]

5.61 Mr Prince also informed the committee that the horticulture industry has invested in the development of a risk management tool to assess the potential invasiveness of species that members of the industry may be considering importing. The NGIA has also developed the federally-funded Grow Me Instead campaign, which involves the publication guides for each state and territory identifying invasive urban plants and suggesting superior alternatives. The NGIA has also conducted surveys of retail centres to ensure that known invasive species are not being sold to the public.[52]

5.62 As noted in the discussion of the mail pathway above, the NGIA believes that, despite the initiatives mentioned above, invasive plant species remain commercially available in Australia via online retailers. However, the horticulture industry in Australia is not in a position to address this problem.[53]

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49 Dr John Keniry, Commissioner, Natural Resources Commission, *Committee Hansard*, 11 November 2014, p. 54.

50 Mr Bryce Wilde, Executive Director, Natural Resources Commission, *Committee Hansard*, 11 November 2014, p. 54. The introduction of permitted lists was also favoured by the Council of Australasian Weed Societies, see *Submission 50*, p. 4.

51 Mr Robert Prince, Chief Executive Officer, Nursery and Garden Industry Australia, *Committee Hansard*, 11 November 2014, p. 10.

52 Mr Robert Prince, Chief Executive Officer, Nursery and Garden Industry Australia, *Committee Hansard*, 11 November 2014, pp 11–12; see also http://www.growmeinstead.com.au/ (accessed 14 April 2015).

53 Mr Robert Prince, Chief Executive Officer, Nursery and Garden Industry Australia, *Committee Hansard*, 11 November 2014, p. 12.

Live animal trade

5.63 In 2014, the Vertebrate Pests Committee, which was recently combined with the Australian Weeds Committee to form the Invasive Pests Committee, developed updated guidelines for the import, movement and keeping of non-indigenous vertebrates in Australia.[54] The Zoo and Aquarium Association (ZAA) participated in developing these guidelines and stated in evidence that this process highlighted several issues regarding the importation of live animals.

5.64 The ZAA commented that the regulation of live importation differed significantly depending on the nature of the organisations involved. It reported that the zoo industry is 'heavily regulated' and works within a 'significant legislative framework', whereas the private aviculture and ornamental wildlife industries are less strictly regulated.[55]

5.65 The ZAA described further research it undertook following this review process regarding the biosecurity threat posed by the zoo industry. This research demonstrated that zoos pose only a limited risk and that exotic birds are the most likely category of animals to escape and not be recaptured.[56]

5.66 With regard to the threat posed by exotic birds, the ZAA noted that zoos are currently unable to import any exotic birds, but an exotic bird can be imported if it is a pet. Dr Carolyn Hogg, ZAA, commented that the 'current exotic birds in our collections all come from seizures that have occurred at the border of Australia'. Dr Hogg went on to state there is there is limited understanding of the current status of the movement of illegally imported individuals and that the private aviculture and ornamental wildlife industries are largely unregulated in Australia. However, work is being undertaken at the University of Adelaide to assess the establishment risk of exotic vertebrate species from backyard and illegal keeping. This has a potential business impact for the zoo industry in the long term, particularly if there is an incursion of a new disease.[57]

5.67 Dr Hogg concluded:

> It is our opinion that Australia is at risk by not funding work that is designed to identify potential pathways of new exotic species into our country and we are at considerable and unknown risk from private and illegal keeping. The Australian government and the beneficiaries of all

54 Department of Agriculture and Department of the Environment, *Submission 59*, p. 15; Department of Agriculture, *Guidelines for the Import, Movement and Keeping of Non-indigenous Vertebrates in Australia*, January 2014, http://www.feral.org.au/wp-content/uploads/2014/07/VPCGuidelinesJan14.pdf (accessed 6 January 2015).

55 Dr Carolyn Hogg, Manager, Science and Policy, Zoo and Aquarium Association, *Committee Hansard*, 11 November 2014, p. 46.

56 Dr Carolyn Hogg, Manager, Science and Policy, Zoo and Aquarium Association, *Committee Hansard*, 11 November 2014, p. 46.

57 Dr Carolyn Hogg, Manager, Science and Policy, Zoo and Aquarium Association, *Committee Hansard*, 11 November 2014, pp 46–47.

> those who are keeping exotic wildlife should be funding research opportunities into pathways of unregulated trade.[58]

5.68 The ZAA further stated that the current lack of knowledge on the size and nature of the illegal importations of live animals into Australia could be partially addressed by the development of a national database of seized wildlife to which all agencies contribute. Dr Hogg stated:

> I was very surprised to learn during that time that actually the zoo industry were able to supply the largest and most comprehensive database in the country with regard to seized wildlife from one location.
>
> As a result, the primary concern of our industry is the lack of continuity across all state and government agencies, including the federal government, with regard to the documentation of incursions. We strongly believe that there should be a fully funded national database which all agencies are required to contribute to. We need this in order to determine future potential pathways of incursions into our country.[59]

5.69 The Invasive Species Council provided the example of the pigeon paromyxovirus. It submitted that, although the precise incursion pathway is unknown, the pigeon paromyxovirus may have entered Australia through pigeon smuggling. This disease was first detected in Australia in August 2011 and has the potential to spread to native bird populations.[60]

5.70 Dr Andrew Peters of Charles Sturt University also raised the pigeon paromyxovirus incursion as an example of failings in Australia's biosecurity system. He submitted that in this case there was a failure to:

- prevent the incursion of the virus through the illegal movement of birds into Australia;
- recognise the threat posed by the virus to domestic pigeons and more specifically to native pigeons and doves;
- commit resources to eradication when this is still achievable;
- undertake research work to identify potential risks; and
- develop a strategy to identify and manage risks posed by the virus to Australia's environment.[61]

5.71 The Australian Museum submitted that it had been involved with more than 100 cases of illegal wildlife importation from a broad range of species in the past five

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58 Dr Carolyn Hogg, Manager, Science and Policy, Zoo and Aquarium Association, *Committee Hansard*, 11 November 2014, p. 47.

59 Dr Carolyn Hogg, Manager, Science and Policy, Zoo and Aquarium Association, *Committee Hansard*, 11 November 2014, p. 46.

60 Invasive Species Council, *Submission 74*, Attachment 1, pp 36–37.

61 Dr Andrew Peters, *Submission 65*, pp 2-3.

years. On this basis, it considered that trafficking of wildlife presents a risk of introducing new pests and diseases to Australia:

> The Australian Centre for Wildlife Genomics at the Australian Museum has handled more than 100 cases involving illegal wildlife over the past 5 years…These cases span a broad diversity of species (including birds, reptiles, mammals, molluscs, and fish). With respect to quarantine, there is high risk that these illegal imports could carry diseases or additional pests/parasites (in the case of live animals). On this basis, illegal trafficking should be acknowledged as a potentially significant pathway for entry of exotic pests and diseases into Australia.[62]

Departmental resourcing and risk-based inspection system

5.72 The CPSU provided the committee with the results of a survey of its members working in the Department of Agriculture. The CPSU identified the following key concerns about the recent administration of biosecurity operations: the risk-based intervention system; budget cuts and staffing levels:

> Two thirds (65.6%) of CPSU members surveyed said that Australia's biosecurity arrangements have become worse or significantly worse over the past decade due to declining standards and increasing risks. Members were asked what changes had caused biosecurity arrangements to decline. The most common responses were budget cuts (90%), the policy of risk-based intervention (79.9%) and staffing numbers (77.7%). Members were concerned that decisions about risk-based intervention have been influenced by budget cuts, creating greater risks to Australia's biosecurity.[63]

5.73 The CPSU explained that its members believed that decisions to inspect cargo or mail, or screen passengers, are often being made on the basis of whether resources are available to undertake that work, rather than on the basis of biosecurity risks:

> Some examples are that mail from a certain country gets screened in a certain port because the risk says it should be screened but in another port does not get screened, because the resources are not available. That is mail. People who fit a risk profile, normally arriving from a flight from certain countries, are being released without intervention or screening depending upon the number of staff that are at work that day.[64]

5.74 The CPSU further stated that the theory underpinning the risk-based intervention policy is supported by members, but that they feel it has not been effectively implemented:

> When the risk based system was introduced, there was strong support amongst the workforce for it. It was based on using the intelligence gathered to identify the risks rather than just doing everything—so it is more efficient although there is still a risk—but it was to be complemented

62 Australian Museum, *Submission 36*, p. 2.

63 CPSU, *Submission 72*, p. 2.

64 Mr Rupert Evans, Deputy Secretary, CPSU, *Committee Hansard*, 31 October 2014, p. 2.

> with an increased focus on audits and surveillance. It is the view of our members that the risk based approach has been introduced that neatly lines up with having less money to do it anyway, but that the audit and surveillance that was supposed to go with it has not lived up to what was promised. Whether that is because of a lack of resources or there has been a change in approach, our members do not know. It was supposed to be that risk based intervention would mean less inspections—efficiency based on intelligence—and more audits and surveillance to ensure that the actual risk that had been assessed was the case. The frustration has been in doing fewer inspections in a particular profile or area but not an increase in audit or surveillance.[65]

5.75 With regard to staffing numbers, the CPSU reported that the most recent federal budget projected a reduction in full-time equivalent staffing levels of 232 and that two rounds of voluntary redundancies had recently been completed.[66]

5.76 Further concerns about agency staffing levels affecting the performance of Australia's biosecurity system were expressed by the Australasian Wildlife Management Society, which submitted that:

> AWMS' main concern about the management of new harmful incursions is that agencies tend to stop at the stage of developing a strategy or even enacting legislation, and then announce their preparation publicly. However, it usually stops there. Strategies, policies and acts will not in themselves prevent new incursions. They provide the framework. To be effective management requires adequate trained staff with the necessary support and well-developed and evaluated processes to implement them.[67]

5.77 The Department of Agriculture provided details of how biosecurity operations are funded partly by appropriations and partly by cost recovery from industry. Scientific work, biosecurity policy and legislation advice to government, mail and airport clearance, work on intergovernmental agreements and emergency responses are all funded by government appropriation. However, remaining operations, which make up between 60 and 70 per cent of departmental operations are funded by importers and exporters. Staffing levels in these two areas are therefore affected differently by reductions in government funding.[68]

5.78 The Department of Agriculture also provided information on how recent changes to its cost recovery arrangements have allowed it to improve its operations. In 2014 the department raised its fees, which had not been increased for some time. Legislation was also passed in March 2014 which allowed the department to use funds generated through cost recovery to improve its work processes and technology. Under

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65 Mr Rupert Evans, Deputy Secretary, CPSU, *Committee Hansard*, 31 October 2014, p. 5.

66 Mr Rupert Evans, Deputy Secretary, CPSU, *Committee Hansard*, 31 October 2014, p. 2.

67 Australasian Wildlife Management Society, *Submission 11*, p. 2.

68 Ms Rona Mellor, Deputy Secretary, Department of Agriculture, *Committee Hansard*, 31 October 2014, p. 28.

previous arrangements, fees generated by a particular activity could only be used to fund that activity.[69]

5.79 The Department of Agriculture also provided more detail on recent voluntary redundancy rounds. It stated that in fact there had been one voluntary redundancy round that had extended over two financial years:

> The VR number we had for 2013–14 for the whole department was 365—that is full-time equivalents. For 2014–15, up until 31 August, there were another 82. For 2013–14, 255 of the FTEs were from the regions and 110 were from Canberra. For up until 31 August for 2014–15, 30 were regionally based FTEs and 52 were Canberra based FTEs.[70]

5.80 The Department of Agriculture nominated animal and plant risk assessment work and funding and staffing provided under the EPPRD, the EADRA and the NEBRA as specifically related to environmental biosecurity, all of which is supported by appropriation rather than cost recovery.[71]

5.81 The Department of Agriculture informed the committee that it was not possible to state how much of the funding provided by the Commonwealth Government under these agreements could be ascribed specifically to environmental biosecurity as opposed to agricultural biosecurity:

> While developed on a sectoral basis, the animal and plant agreements do not distinguish between the agricultural or environmental impact of a particular pest or disease. The animal and plant cost-sharing agreements provide for affected industry signatories that benefit from an eradication response to share the costs and decision making responsibility for that response.
>
> These arrangements apply where a production industry sector benefits from a response, not because the impacts of a specific pest or disease are exclusively agricultural.[72]

5.82 The department was, however, able to provide the following summary of action on invasive species with an environmental impact taken since 2001:

> Since 2001, twenty two eradication responses have been conducted at a cost of $310 million. Of these nine were in response to an invasive species with either a known or potential likelihood to harm the environment. These include the four tropical weeds, red imported fire ants (South East

69 Ms Rona Mellor, Deputy Secretary, Department of Agriculture, *Committee Hansard*, 31 October 2014, p. 28.

70 Mr Greg Williamson, First Assistant Secretary, Department of Agriculture, *Committee Hansard*, 31 October 2014, p. 30.

71 Ms Rona Mellor, Deputy Secretary, Department of Agriculture, *Committee Hansard*, 31 October 2014, p. 28.

72 Department of Agriculture, *Answer to question on notice No. 7* (received 18 November 2014).

> Queensland and Yarwun, Queensland), browsing ants, electric ants, Siam weed, Asian honeybees, citrus canker and Myrtle rust responses.[73]

5.83 The suggestion made by the CPSU that the risk-based intervention system is being compromised by a lack of staff was contested by Ms Mellor of the Department of Agriculture. She asserted that the department has national processes and rules governing how staff manage risks at the border and that additional staff are deployed where workload pressures are identified.[74]

5.84 The committee suggested to the Department of Agriculture that reduced staffing levels would inevitably lead to situations where pressure is placed on front-line staff to cut corners rather than delay the movement of passengers or cargo for long periods; however, the department stated that it expects staff to follow procedures and that options are available for speeding up processing without compromising on risk management:

> Our view would be, though, that if the staffing ratio to the movement of passengers is out of kilter, for example, that you do not cut corners: you actually do your job. That can become difficult, I know, for staff. I have been in airports at times when that has happened. There are huge queues, but we still have to do our job.
>
> We have a number of ways to manage risk in the airports—not everybody goes through an officer. A large proportion of passengers are compliant. Return travellers are one thing—they all know the rules—but a large proportion of people declare that they have nothing, and our sampling shows that. We are confident with the honesty in the declarations. For those we have to see, we use a number of channels. We use X-ray, as you know. We also use bench search and detector dogs. We use them according to the risk. The risk is determined by where they have come from and the sorts of things they have declared. Our staff can pick a bag that is full of pomegranates even though nothing is declared. They are highly experienced. It is not our contention that they should cut corners and they are not instructed to do so.[75]

Northern Australia Quarantine Strategy

5.85 In the context of resourcing, the committee notes that the departments of agriculture and environment advised that the Northern Australia Quarantine Strategy (NAQS) has been in place since 1989. The strategy is focused on early detection of exotic pests, diseases and weeds along Australia's northern coastline, from Cairns to

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73 Department of Agriculture, *Answer to question on notice No. 7* (received 18 November 2014). This answer also contains a list of all responses since 2001, both those under the three deeds and those undertaken off deed, broken down by deed.

74 Ms Rona Mellor, Deputy Secretary, Department of Agriculture, *Committee Hansard*, 31 October 2014, p. 29.

75 Ms Rona Mellor, Deputy Secretary, Department of Agriculture, *Committee Hansard*, 31 October 2014, p. 29.

Broome and including the Torres Strait. The department advised that target lists are used to prioritise surveillance efforts, and those target species are reviewed annually.

5.86 Several submitters and witnesses were very concerned about reductions in Commonwealth biosecurity staffing, particularly in Northern Australia. The committee notes that the final report of the recent Joint Select Committee on Northern Australia recommended that the number of biosecurity officers be significantly increased in Northern Australia to increase the chances of early detection of pest and disease incursions, and reduce the time taken to identify specific pests and diseases and put in place remedial action.[76]

5.87 The Invasive Species Council submitted that environmental NGOs consider NAQS to be an 'an exemplary model for detection of new incursions and community education'; however, it suggested that the funding for NAQS 'has declined' and is increasingly focused on agricultural priorities. The council stated:

> …we understand that what was a very lean operation has suffered recent budget cuts involving the loss of 20% of its staff over the past two years, ending a permanent presence in many remote communities such as in the Torres Strait islands, where quarantine officers have been stationed for the last 20 years. We question whether the program has sufficient funding to achieve its purposes, particularly since the recent budget cuts.

5.88 The CPSU submission included a comment from one of its members regarding the effect of staff losses in northern Australia:

> Recent staff cuts through VR process and actively recruiting staff to take redundancies across Northern Australia, especially in the Torres Strait Islands has left a great gaping hole in our northern Biosecurity defences. It is only a matter of time before there will be another incursion into Australia through this route.[77]

5.89 The departments of agriculture and the environment submission highlighted NAQS as an example of its surveillance activities. It did not, however, comment on resourcing for the program.[78]

Key threatening processes and threat abatement plans

5.90 The departments of agriculture and the environment submitted that the EPBC Act 'provides a framework for the management of invasive species by providing for the listing of key threatening processes and the development of threat abatement and recovery plans'.[79] However, some submitters and witnesses were highly critical of these processes, particularly the lack of implementation of threat abatement and recovery plans.

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76 Joint Select Committee on Northern Australia, *Pivot North: Inquiry into the Development of Northern Australia: Final Report*, September 2014, p. 180.

77 CPSU, *Submission 72*, p. 4.

78 Department of Agriculture and Department of the Environment, *Submission 59*, p. 30.

79 Department of Agriculture and Department of the Environment, *Submission 59*, p. 20.

5.91 For example, Dr Burbidge told the committee that:

> Most of the threat abatement plans applying to invasive species and islands are documents sitting on a shelf that are not particularly well used. For example, there is a threat abatement plan for tramp ants. It covers a large number of species of ants which have wandered around the world, many of which have become established in Australia. They have arrived in equipment, food and plants that have been brought into Australia. That threat abatement plan has lot of good proposals in it but, by and large, nothing has happened.[80]

5.92 As discussed in chapter 4, Dr Lach also stated in evidence that the tramp ant abatement plan contained good proposals but had not been effectively implemented.[81]

5.93 The Invasive Species Council expressed concern at the recent listing of 'novel biota' as a key threatening process under the EPBC Act. They submitted that this 'effectively shuts down the capacity to use the national threat abatement process to assist with addressing invasive species problems not already listed'.[82] In the opinion of the Invasive Species Council, the listing of novel biota in general as a key threatening process means that specific invasive species that would otherwise qualify as key threatening processes are no longer being listed because they are considered to be already covered by the general listing.

5.94 In response to questioning on this issue, Mr Oxley from the Department of the Environment told the committee that although the department has responsibility for the 'development, review and to some extent, the implementation of threat abatement plans':

> …we have limited capability and resources allocated to the Department of the Environment for implementation of threat abatement plans…there is no substantive program of investment in the implementation of threat abatement plans at the Commonwealth level…we have limited resources and we direct it to dealing with the threats of highest importance. The primary area of importance of us at the moment is the development of the curiosity bait to deal with feral cats.[83]

5.95 Mr Oxley noted that the department does work with other parties to try to facilitate the implementation of threat abatement plans, and also that one of the roles of the Threatened Species Commissioner is to work with a range of stakeholders to try to 'leverage more implementation action' in relation to the plans.[84]

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80 Dr Andrew Burbidge, *Committee Hansard*, 8 October 2014, p. 10.

81 Dr Lori Lach, *Committee Hansard*, 11 November 2014, p. 60.

82 Invasive Species Council, *Submission 74*, Attachment 1, p. 51.

83 Mr Stephen Oxley, First Assistant Secretary, Wildlife Heritage and Marine Division, Department of the Environment, *Committee Hansard*, 31 October 2014, p. 24.

84 Mr Stephen Oxley, First Assistant Secretary, Wildlife Heritage and Marine Division, Department of the Environment, *Committee Hansard*, 31 October 2014, p. 24.

Scientific expertise and research capacity

5.96 Many submitters and witnesses emphasised the need to provide greater levels of support to scientists and experts working in fields relevant to environmental biosecurity. Evidence presented to the committee suggests the availability and effective utilisation of scientific expertise is central to maintaining Australia's environmental biosecurity preparedness. The main concerns regarding scientific expertise and research capacity raised during the inquiry are discussed below.

Funding

5.97 The committee heard evidence from the Plant Biosecurity CRC and the Invasive Animals CRC that the provision of funding through competitive grants processes means that it is very difficult to maintain continuity of research projects and to plan long-term projects. Both CRCs stated that they had not been consulted about plans announced by the Minister for Industry to roll CRCs into proposed new industry growth centres.[85]

5.98 Mr Andreas Glanznig of the Invasive Animals CRC emphasised that the lack of permanent funding for research in this area does not accord with the strategic importance of biosecurity:

> One of the key points that I would make in terms of institutional arrangements is that, as a CRC, we are ad hoc, and we are time-bound. We are also, I suppose, very fortunate that both we and the Plant Biosecurity CRC put in very strong bids, but it was a very competitive round. We may not have got up, and what would that have meant for incursions and innovation capability? There is a real strategic risk, if you are looking at it from a national point of view. And that does beg the question about what permanent arrangements can be put in place to ensure ongoing innovation, and also nationally-coordinated surveillance and eradication efforts.[86]

5.99 This position was supported by Dr William Roberts of the Plant Biosecurity CRC:

> …the Plant Biosecurity CRC folds, in a formal sense, in the middle of 2018. So we are about 2½ years into a six-year program. When it folds—obviously we are looking at what the future beyond mid-2018 is, but there is absolutely no certainty. The climate does not look very favourable for research at the moment in Australia, just generally. It has declined for many years, over many different administrations, I might say. And there is no really long-term commitment that we can see anywhere in this area. It is very ad hoc.[87]

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85 Mr Andreas Glanznig, Chief Executive Officer, Invasive Animals CRC, and Dr William Roberts, Principal Scientist, Plant Biosecurity CRC, *Committee Hansard*, 31 October 2014, pp 9–10.

86 Mr Andreas Glanznig, Chief Executive Officer, Invasive Animals CRC, *Committee Hansard*, 31 October 2014, p. 9.

87 Dr William Roberts, Principal Scientist, Plant Biosecurity CRC, *Committee Hansard*, 31 October 2014, p. 10.

5.100 Several submitters stated that the discontinuation of the Weeds CRC had substantially reduced the research focus on environmental weeds. The Council of Australasian Weed Societies stated:

> That is one of the areas of huge concern for CAWS. The level of research, funding and activity in environmental weeds has been declining over the years to the point where it is not non-existent but just so small that it is insignificant, particularly with the loss of Weeds CRC.[88]

5.101 The Invasive Species Council also stated that the 'research situation for environmental priorities has worsened since the demise of the Weeds CRC'.[89]

5.102 The Australian Museum, which possesses biosecurity capabilities in diagnostics and detection, similarly argued that research capacity at the state level was declining due to a lack of funding, which in turn reduces opportunities for training students to maintain current levels of expertise in the future:

> The capacity is probably declining at the moment. We have seen major losses of staff expertise…The Australian Museum has lost 50 per cent of its researchers over the last nine years. We really need to think about improving the funding. I realise this is a state responsibility at the moment, but Australia's biodiversity is not the sole responsibility of the state. It has to be a federal matter. So, yes, it is a major problem. If we were at least to be paid to do some of this there is the potential therefore to support students and to develop and mentor the next generation of systematists as some of us get a little older and think about retiring.[90]

5.103 Professor David Guest, University of Sydney, submitted that underfunding of scientific research capacity in the biosecurity area is particularly concerning given the nature of Australia's free trade obligations under the SPS Agreement. Professor Guest stated that, in effect, a lack of published scientific research on a potential pest leads not to its exclusion, but to allowing its entry:

> "Science-based" means that only published scientific evidence can be used in the pest risk analysis. Only organisms studied and known to damage Australian plants and environments can be considered. As published studies on the impact of exotic pests and diseases on the vast inventory of Australian native plants and environments can only be undertaken after an incursion has already occurred, the current pest risk analysis methodology must conclude, for lack of published evidence, that there is no potential impact. Ironically, this assessment is based on the absence of science. In almost every field of science, medicine and engineering however, the absence of scientific data invokes a "precautionary principle" that requires extrapolations from current, albeit imperfect, knowledge to infer that a risk might exist and should be avoided.

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88 Ms Anna-Marie Penna, Vice-President, Council of Australasian Weed Societies, *Committee Hansard*, 8 October 2014, p. 19.

89 Invasive Species Council, *Submission 74*, p. 76.

90 Dr Patricia Hutchings, Australian Museum, *Committee Hansard*, 11 November 2014, p. 40.

> While the SPS does include a "precautionary principle" that allows temporary restrictions on trade to facilitate scientific studies where such uncertainty exists, the chronic underinvestment in funding and capacity in science and quarantine means the capacity to conduct rigorous studies in the very short time allowed does not exist.[91]

5.104 This view contrasts with that put by the Ms Mellor of the Department of Agriculture on the relationship between free trade imperatives and biosecurity. She stated:

> We do not feel any pressure to take our foot off the very conservative approach we have to biosecurity by virtue of the negotiation of a free trade agreement. What it certainly does is open the door for dialogue between two countries about priorities; then we get on with the job of assessing the risk.[92]

5.105 This position was also put in the submission of the departments of agriculture and the environment, which emphasised:

> …free trade agreements do not override Australia's rights and obligations under the SPS Agreement to protect human, animal and plant life or health. Australia's bilateral and regional free trade agreements therefore reflect these rights and obligations to ensure that biosecurity risks can continue to be effectively managed, and often include formal consultations on sanitary and phytosanitary issues.[93]

5.106 The CSIRO stated in evidence that it considers Australia's research capacity in environmental biosecurity is quite strong; however, it noted there are barriers to involving this capacity in the implementation of environmental biosecurity:

> We think the science underpinning biosecurity—particularly environmental biosecurity—is pretty good, pretty sound and strongly developed in Australia. We believe Australia is one of the leading countries in terms of science capacity, but there is fairly little capacity for that science to be involved in the implementation of environmental biosecurity.[94]

5.107 In general, the CSIRO expressed the view that Australia does not lack scientific knowledge on how to respond to invasive species, rather it is a question of how willing governments are to devote resources to implementing effective biosecurity measures based on this knowledge.[95]

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91 Professor David Guest, University of Sydney, *Submission 43*, p. 2.

92 Ms Rona Mellor, Deputy Secretary, Department of Agriculture, *Committee Hansard*, 31 October 2014, p. 27.

93 Department of Agriculture and Department of the Environment, *Submission 59*, p. 9.

94 Dr Andy Sheppard, Research Director, CSIRO Biosecurity Flagship, *Committee Hansard*, 11 November 2014, p. 17.

95 Dr Andy Sheppard, Research Director, CSIRO Biosecurity Flagship, *Committee Hansard*, 11 November 2014, p. 17.

5.108 The CSIRO noted that Australia had once led the world in developing highly targeted, biologically based agents to suppress established pest populations but that capacity in this field now stood at a quarter of what it was 20 years ago.[96]

5.109 The committee notes the concerning discussion of the decline in biosecurity expertise in Australia in recent times contained in the CSIRO's *Australia's Biosecurity Future* report. The report states:

> Another major concern for Australia is the loss of biosecurity-specific human resources. These declines are occurring broadly across the biosecurity landscape, reducing our overall pest and disease response capability. For example, there have been major declines in taxonomists (an important part of diagnostics), with estimates that 50 per cent of Australia's diagnostics capability will be lost by 2028.
>
> In addition, many experienced staff in fields such as epidemiology and entomology are approaching retirement, with a lack of younger people available to take their place and meet immediate needs. A 2012 survey, commissioned by the Australasian Plant Pathology Society and the Australian Entomological Society, identified that the number of plant pathologists and entomologists in the over 55 age bracket had increased since 2006, alongside a decline in numbers in the under 35 age brackets. The study highlighted that to maintain the status quo, 50 per cent of current capacity in these areas will require replacement within 15 years.[97]

5.110 This CSIRO report also echoes concerns mentioned above that overall funding levels for biosecurity are too low, despite a significant boost in expenditure following the Beale review in 2008, and that the manner in which funding is delivered to research bodies is further hindering their work:

> …it is clear that funding cycles are often short-term, creating a mismatch between research efforts and biosecurity challenges, which are often experienced over a longer timeframe.[98]

5.111 The committee discussed recent funding cuts to the CSIRO and how this had affected its ability to contribute to biosecurity activities. Dr Sheppard stated that a recent restructure had led to the establishment of nine research flagships, one of which is the biosecurity flagship, and that this reflected the fact that biosecurity is viewed as an extremely important research area. However, he also acknowledged that its ability to address environmental biosecurity is restricted by the funding sources the CSIRO relies on:

> …as a collaborative and cooperative research body which tends to do the majority of its research through co-investment with clients of all backgrounds, our capacity to do research is very limited by what the market

96 CSIRO, *Submission 48*, p. 3.

97 CSIRO, *Australia's Biosecurity Future: preparing for future biological challenges*, 2014, p. 44.

98 CSIRO, *Australia's Biosecurity Future: preparing for future biological challenges*, 2014, p. 45.

> is interested in supporting. Certain aspects of environmental biosecurity have effectively been in decline over recent years as a result of that.[99]

5.112 The Department of Agriculture submitted that it 'maintains a strong scientific capability, with many officers having tertiary science qualifications, to underpin evidence-based policy development, decision-making and service delivery across all areas of the department'. It also noted that ABARES provides 'biophysical, economic and social research, modelling and analysis across the animal, plant and marine spectrum'.[100]

5.113 The Department of Agriculture also noted that it seeks external scientific advice where required and cited the Centre of Excellence for Biosecurity Risk Assessment (CEBRA), established at the University of Melbourne via an agreement with the Department of Agriculture and the New Zealand Ministry for Primary Industries, as an important source of external expertise. It is currently intended that CEBRA will operate until 30 June 2017.[101]

Utilisation of existing expertise

5.114 The committee heard evidence that, in addition to the funding uncertainty for research in this area, existing expertise has not been fully utilised. The Australian Museum submitted that the taxonomic expertise that currently exists in Australia's natural history museums, while employed in an ad hoc manner in the biosecurity system, could be better utilised:

> …we wanted to emphasise the importance of accurate identification of invasive species. That is especially where the expertise of the museum and other state museums and state herbaria lie. Where we do a significant amount of what is called taxonomic research—which is related to identifying species, describing species, discovering biodiversity—and when we are dealing with invasive species, there really is nothing more important than actually knowing what you are dealing with. The identifications must be correct. We wanted to emphasise the role that these state institutions need to be playing in the biosecurity framework of Australia. At the moment we feel that although the roles of museums are recognised, there is nothing formal in place to ensure that the expertise is brought into play at the right time.[102]

5.115 The importance of involving taxonomic expertise more heavily in the biosecurity system was emphasised by several examples in the submission and

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99 Dr Andy Sheppard, Research Director, CSIRO Biosecurity Flagship, *Committee Hansard*, 11 November 2014, p. 17.

100 Department of Agriculture and Department of the Environment, *Submission 59*, p. 25.

101 University of Melbourne, 'Centre of Excellence for Biosecurity Risk Analysis', (accessed 9 January 2015) http://cebra.unimelb.edu.au/about; Department of Agriculture and Department of the Environment, *Submission 59*, p. 25.

102 Dr Shane Ahyong, Senior Research Scientist, Manager Marine Invertebrates, Australian Museum, *Committee Hansard*, 11 November 2014, p. 38. Also see Australian Museum, *Submission 36*, p. 6.

evidence provided by the Australian Museum. For example, the museum submitted that the sweet potato flea beetle was overlooked in Australia for 15 years due to misidentification.[103]

5.116 The museum also expressed concerns about the quality of priority species lists and stated that the priority marine species list identified for the *Species biofouling risk assessment* report contains, in their view, species that are known not to be invasive anywhere in the world and, conversely, does not contain some known high-risk species.[104]

5.117 Dr Shane Ayhong of the Australian Museum cited the example of the Marine Invasives Taxonomic Service, a centralised system in New Zealand, under which relevant experts had been identified and placed on a retainer so that they could be called on to make identifications quickly:

> It was a centralised identification service for all marine biosecurity samples that were collected around the country. That was coordinated through my office. What would happen is every sample that was collected for any biosecurity project would come to me at the Marine Invasive Taxonomic Service. It would then be inventoried and receive a tracking number. There would be chains of evidence et cetera. I would then distribute those samples to the appropriate expert, who would be on retainer to turn around that sample in a particular time frame. There were different classes of urgency. Those identifications were centralised. I could send samples to an expert and get the identification back very quickly. That would then be entered into the database, the data would become available, the appropriate authorities would be notified and the process would continue. That worked very well.
>
> Admittedly, it is a much smaller scale in New Zealand. But the scale of samples that we processed was 40,000 in about two years. That is a very high rate of turnover. That was because it was a coordinated, centralised service. All of the experts were not on site with me, but I knew who they were and I had them on retainer. They were contracted to turn the samples around when I got them. If there was a ship coming into port from the subantarctic islands and there was a potential biosecurity issue, we would send someone up there to take a sample and identify it quickly. We had a way of doing that.[105]

5.118 This system cost $4 million over four years to operate in New Zealand. The Australian Museum submitted that a similar system could be implemented in Australia under the *Intergovernmental Agreement on Biosecurity* and would speed up identification processes, make better use of existing expertise and avoid duplication of

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103 Australian Museum, *Submission 36*, p. 6.

104 Australian Museum, *Submission 36*, pp 3–4; Also see discussion of the island apple snail by Dr Donald Colgan, Principal Research Scientist, Group Head Malacology, Australian Museum *Committee Hansard*, 11 November 2014, p. 40.

105 Dr Shane Ahyong, Senior Research Scientist, Manager Marine Invertebrates, Australian Museum, *Committee Hansard*, 11 November 2014, p. 39.

work between states.[106] As noted by the Australian Museum, such a system would fall under the following priority reform area already included in schedule 4 of the *Intergovernmental Agreement on Biosecurity*:

> Establish and adopt a framework for funding and managing nationally collaborative surveillance and diagnostic activities, including the development and consolidation of infrastructure and capacity.[107]

5.119 A further example of where expertise might be better utilised was provided by Dr Kirsten Parris and Professor Michael McCarthy of the University of Melbourne. They reported that they had been called on by the Victorian Department of Primary Industries to provide expert advice several times for responses to possible incursions of the Asian black-spined toad. In their view, response times are being slowed because expert advice is sought on an ad hoc basis, rather than being consolidated into an environmental pest response plan equivalent to those in place for the agriculture and marine sectors:

> On both these occasions, it appeared that the agency had no access to guidelines regarding the best way to respond to an incursion of the Asian black-spined toad. This has important implications for the timeliness and adequacy of any response to an incursion. It also relies on the availability of experts to provide timely and appropriate assistance on a case-by-case basis. Importantly, such case-by-case assessment takes time that would be better spent on actually managing the incursion.[108]

5.120 The CSIRO noted that it had led the development of a National Environment and Community Biosecurity Research Development and Extension Strategy (NECBRDES) as part of the National Biosecurity Research Development and Extension Framework under Schedule 8 of the *Intergovernmental Agreement on Biosecurity*. This strategy remains at the consultation phase and has not yet been submitted to the National Biosecurity Committee.[109]

5.121 The CSIRO stated that this draft strategy:

> …fully recognises the opportunity for improved national coordination and responsibility, the need for increased investment in environmental biosecurity, industry relevance to support this development and a need to address this. The draft strategy also includes all the relevant RD&E priority areas relevant for this Senate Inquiry including: risk analysis and decision making; detection, diagnosis and surveillance; management methods and strategies; and stakeholder engagement.[110]

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106 Australian Museum, *Submission 36*, p. 6.

107 *Intergovernmental Agreement on Biosecurity*, 2012, p. 23

108 Dr Kirsten Parris and Professor Michael McCarthy, *Submission 75*, p. 3.

109 CSIRO, *Submission 48*, pp 3-4.

110 CSIRO, *Submission 48*, p. 4.

Climate change and biosecurity risk research

5.122 Climate change is likely to increase the impacts of invasive species on biodiversity.[111] Climate change is also likely to increase the potential for weed and pest invasions, and change the risk profiles of introduced species.[112]

5.123 In light of this relationship between climate change and invasive species, many submitters emphasised the need to devote greater scientific resources to examining how climate change will alter the nature of environmental biosecurity threats to Australia. For example, the CSIRO submitted:

> The potential for future impacts of existing and future incursions is, in many cases, going to be significantly impacted by global change drivers, i.e. climate change, land use change (including clearing) and changed disturbance regimes (e.g. fire). For example, a major biodiversity management response for adaptation to climate change is to improve landscape connectivity, but this also presents a significant opportunity for increased invasive species invasion and climate change itself will lead to some species migration along climate gradients. Novel ecosystems are already a reality in the Australian environment, and these will only become more common with climate change. New species assemblages, due to changed distributions of both alien and native species, will require revisiting management options. Global change drivers may result in considerable change to our current biosecurity risk profiles, where currently low risk and low threat issues become greater risks in the future.[113]

5.124 The committee notes the suggestion in the CSIRO's recent *Australia's Biosecurity Futures* report that advances in genetics may soon be able to improve the process of identification, despite the decline in taxonomic expertise Australia is experiencing:

> …genetics may help to enhance taxonomy in the face of declining specialists. DNA barcoding, for example, involves reading a short DNA sequence from a genetic sample, recording this sequence in a public database, and then comparing it against all other samples to understand how closely related two organisms are. It provides a more objective analysis than just recording the results of a single study that classifies a particular specimen, and the data remains useful over time such as when species are reclassified or previous taxonomies are questioned. DNA barcoding may prove to be extremely valuable as it reduces the cost of species identification while at the same time improving the quality and distribution of taxonomic information.[114]

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111 *Australia state of the environment report 2011*, p. 639; Beale, Roger et al, *One Biosecurity: a working partnership*, September 2008, p. xiii.

112 Wet Tropics Management Authority, *Submission 23*, p. 3.

113 CSIRO, *Submission 48*, p. 6.

114 CSIRO, *Australia's Biosecurity Future: preparing for future biological challenges*, 2014, p. 48.

5.125 The Plant Biosecurity CRC reported that it had conducted some research into the effects of climate change on plant biosecurity, but that its focus had primarily been on agricultural pests, which nevertheless may have applications in environmental biosecurity.[115]

5.126 The Invasive Animals CRC emphasised the need to address risks posed by more frequent extreme weather events, such as cyclones:

> Through CSIRO we have a significant climate change adaptation project. There is obviously a lot of additional complexity. As a policy response, I think generally it would again be around trying to reduce propagule pressure and the risk of establishment through phasing out the high-risk species. Particularly to respond to the increased risk of extreme weather events, it is focusing on high-risk point-source invasions. We know that, from increased cyclonic activity, they can impact on some of the private zoos and the like. It is trying to make sure that they are secure to those extreme events. Similarly down south, it is looking at trying to minimise those types of point-source risks. They would be game parks and the like.[116]

5.127 The WTMA also stated that climate change would increase the vulnerability of the Wet Tropics World Heritage Area and that risk assessments must be updated to account for changing climatic conditions:

> It is important to note that climate change is considered as an important driver of increased vulnerability to pest invasion and changing risk profiles of introduced species. Climate change will significantly increase the potential for weed and pest invasions in the Wet Tropics and decrease the resilience of Wet Tropics ecosystems. These changes will render many current and past assessments inadequate. There is an urgent need to update risk assessments to better account for how future climate will affect the invasive potential of introduced species. These should include modelling of suitable habitat for invasive weeds and consideration of disruption to ecosystem function, changes to weather and rainfall patterns, and the potential for more intense cyclones and more severe droughts.[117]

5.128 Ms Anne-Marie Penna, Vice President of the Council of Australian Weeds Societies, stated that climate change makes modelling the impact of invasive species much more difficult:

> …one of the problems with that modelling is that you are looking at how things change based on changes to climate—but there are a whole lot of interactions in the native systems that we do not understand, because there just is not enough knowledge. Once you get changing plant communities,

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115 Dr Sophie Peterson, Research Coordinator, Plant Biosecurity CRC, *Committee Hansard*, 31 October 2014, p. 13.

116 Mr Andreas Glanznig, Chief Executive Officer, Invasive Animals CRC, *Committee Hansard*, 31 October 2014, p. 13.

117 Wet Tropics Management Authority, *Submission 23*, p 3; also see comments by the Wet Tropics Management Authority on the effect of cyclones at *Committee Hansard*, 31 October 2014, p. 19.

> you have an opening niche that something can potentially take a foothold in. You always end up with the unexpected, such as things like arum lily—a wetland species that has taken a foothold in coastal areas. You are always going to get surprises, unfortunately. Again that gets back to the fact that we do not really do a lot of research, or enough research, into native ecosystems as a whole—and certainly not into environmental weeds.[118]

5.129 The departments of agriculture and the environment noted in their submission that ABARES has developed several modelling applications which can be combined to 'model the potential distribution of exotic pests, based on climatic and ecological/landscape factors'. The submission does not state whether these applications can be used to model how climate change might influence the potential impact of invasive species.[119]

Conclusion

5.130 Given the limited resources available to the Commonwealth, state and territory agencies tasked with protecting Australia's biosecurity, submitters and witnesses agreed that it is important to employ a risk-based approach to prioritising incursion pathways and invasive species. However, evidence presented to the committee suggests there are pathways and industries that currently pose a significant threat to Australia's environmental biosecurity and that these areas require more intensive surveillance and tighter regulation. Examples of such pathways and industries include: mail, cargo, the horticulture industry and the live animal trade.

5.131 The committee also received evidence that suggests the effective operation of Australia's risk-based biosecurity system is threatened by a lack of resources, both within the Department of Agriculture and the Department of the Environment, and within scientific bodies active in the biosecurity area, such as the CSIRO, the Plant Biosecurity CRC, the Invasive Animal CRC and Australia's natural history museums.

118 Ms Anne-Marie Penna, Vice-President of the Council of Australasian Weeds Societies (CAWS), *Committee Hansard*, 8 October 2014, p. 24.

119 Departments of Agriculture and the Environment, *Submission 59*, p. 26.