
Review of the National Environmental Biosecurity Response Agreement

Submission of the Invasive Species Council

27 March 2017

Endorsed by:



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About the Invasive Species Council

The Invasive Species Council was formed in 2002 to advocate for stronger laws, policies and programs to keep Australian biodiversity safe from weeds, feral animals, exotic pathogens and other invaders. We are a not-for-profit charitable organisation with over 2000 supporters. Our work is almost entirely funded by donations from supporters and philanthropic organisations.

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Environment Centre Northern Territory
Gene Ethics
Humane Society International
Island Conservation
Kuranda Envirocare
National Parks Association of NSW
National Parks Association Queensland
National Parks Australia Council
Nature Conservation Society of SA
Northern Gulf Regional Management Group
Queensland Conservation Council
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Victorian National Parks Association
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1. Introduction and summary of recommendations

The 2012 establishment of NEBRA was an important step forward in environmental biosecurity, and it has been used to positive effect in responding to four outbreaks of invasive ants. However, as a latecomer, NEBRA was largely modelled on the two existing industry deeds – the Emergency Animal Disease Response Agreement (EADRA), adopted in 2002, and the Emergency Plant Pest Response Deed (EPPRD), adopted in 2005 – rather than based on a fresh consideration of how to achieve optimal responses to environmental outbreaks in the public interest. No consultation of environmental stakeholders was undertaken during the development of NEBRA.

This submission responds to a request for views to inform the five-year review of NEBRA conducted by KPMG for state, territory and federal governments. It draws on information in the NEBRA Five Year Review Discussion Paper¹, our experiences and other sources.

Our submission identifies several shortcomings of NEBRA and the other agreements as applied to environmental pests and diseases. NEBRA lacks the environmental equivalents of the aspects of EADRA and EPPRD that provide much of their strength for pests of concern for primary industries – emergency response plans for high priority outbreaks, and participation by the government-industry bodies Animal Health Australia and Plant Health Australia. Although this review is focused only on NEBRA, many of our recommendations should also apply to EADRA and EPPRD when they are applied to environmental outbreaks. It is important that there be a consistent approach to environmental invaders, whether they are considered under NEBRA or one of the other agreements.

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1.1 Our approach in this submission

Initially, in section 2, we outline several differences between environmental and industry biosecurity, as well as Australia's obligations under the Biodiversity Convention, that warrant an environment-specific approach to pests and diseases with environmental impacts. NEBRA and the other agreements should be revised to facilitate responses to the particularly difficult challenges of environmental invasions and to optimise decision-making in the public interest.

We then consider in five case studies of environmental invaders (sections 3 to 7) how well NEBRA and the other agreements have been implemented.² It is essential to the review to examine these and other cases to identify how NEBRA works in practice. Although the review is focused only on NEBRA, the environmental outcomes under other agreements – with decisions made mostly by the same parties using the same processes – can reveal much of relevance to NEBRA processes. This is important in part because only a few outbreaks have thus far triggered NEBRA consideration.

In the five years of operation, four eradications have proceeded under NEBRA national cost-sharing arrangements:

- Red imported fire ant – Yarwun, Qld (completed)
- Red imported fire ant – Port Botany, NSW

¹ See <http://www.agriculture.gov.au/biosecurity/emergency/nebra>

² Four of these case studies were compiled for ISC's submission to the 2014-2015 senate inquiry into biosecurity (Invasive Species Council 2014). They have been only minimally updated.

- Red imported fire ant – Brisbane Airport, Qld
- Browsing ant – Darwin, NT

An additional eradication that was considered under NEBRA and would have qualified for national cost-sharing has proceeded without cost-sharing, funded by the Commonwealth:

- Macao paper wasp – Cocos (Keeling) Islands

Due to the lack of information released under NEBRA, we are uncertain how many outbreaks have been referred under NEBRA and rejected for eradication. We are aware of the following five:

- Smooth newt – Melbourne (see case study, section 3)
- Drywood termite – Cocos (Keeling) Islands³
- A praying mantis – Victoria⁴
- An ant – Northern Territory⁵
- Several mite species – locations unknown⁶

The lack of any reference to rejected cases in the NEBRA discussion paper is surprising, for as our case study on the smooth newt (section 3) demonstrates, they could reveal much about the way NEBRA is implemented.

In sections 8 to 22 we analyse various aspects of NEBRA (and the EADRA and EPPRD agreements) that need reforming, and make recommendations, which are listed below.

1.2 Recommendations

The highest priorities are to reform the process for decision-making under NEBRA to optimise the public interest. These include automatic triggering of NEBRA for priority organisms, majority instead of consensus decision-making, an emergency response fund, and meaningful involvement of environmental stakeholders and environment departments. Outbreaks of national environmental significance should always be considered under NEBRA (rather than EADRA or EPPRD) and no industry body should have a right under any agreement to veto an eradication. The proposed Environment Health Australia or equivalent is needed to undertake the preparatory work for effective responses to outbreaks, and an environmental body or committee with ecological expertise is needed to inform decision-making under NEBRA. Mechanisms to foster transparency and accountability, such as a requirement to publish all decisions and information relied on, are vital for decision-making in the public interest. The NEBRA criteria (as well as those under EADRA and EPPRD) should be revised to reflect Australia's environmental obligations and the characteristics of environmental invasions, including application of the precautionary principle, removal of the requirement for eradications to be cost beneficial and extension of NEBRA to outbreaks where existing outbreaks are contained and have a low risk of spread.

³ In a recent improvement in communications this decision was revealed in a communiqué by the Department of Agriculture and Water Resources at <http://www.agriculture.gov.au/about/media-centre/communiqués/drywood-termite>.

⁴ Communicated at a NEBRA consultation workshop, Sydney, 24 Jan 2017. No detail provided.

⁵ Communicated 17 Mar 2017 in response to request for information to the Department of Agriculture and Water Resources. No detail provided.

⁶ Communicated 17 Mar 2017 in response to request for information to the Department of Agriculture and Water Resources. No detail provided.

List of recommendations

The need for a new decision-making model

1. Develop a new model of decision-making in the public interest, which includes (1) a commitment to proceed with eradication within defined thresholds of feasibility and significance, and (2) majority decision-making in other cases.
2. Develop a priority list of species or groups of species for which NEBRA is automatically triggered and there is a pre-commitment to proceed with eradication (subject to certain conditions such as cost). Develop contingency plans for these species.

The need for precaution

3. Require application of the precautionary principle in decision-making by the National Biosecurity Management Group and the National Biosecurity Management Consultative Committee, as well as the other agreements (EADRA, EPPRD), in responding to outbreaks with potential impacts on the natural environment.

The need for Environment Health Australia

4. Establish Environment Health Australia or an equivalent to foster productive collaboration between governments and the environmental sector for undertaking the work necessary to support effective biosecurity responses to new outbreaks, including the preparation of contingency plans for high priority potential invaders and acting as NEBRA custodian.

The need for comprehensive national significance criteria

5. Be explicit in requiring application of the precautionary principle in national significance assessments under NEBRA and other agreements (for environmental outbreaks).
6. Include in Schedule 3 the following additional categories of nationally important criteria.

Nationally important species:

- Species that could become threatened as a result of the pest or disease
- Species listed under state or territory laws where the species is present only in those states or territories, by the IUCN, or otherwise considered to be threatened

Nationally important places:

- Protected areas such as national parks and marine parks

Ecologically valuable places:

- Ecological communities listed as threatened under state or territory laws or otherwise known to be threatened
- Ecological communities that could become threatened as a result of the disease or pest
- Offshore islands with conservation values
- Wetlands listed in *The Directory of Important Wetlands in Australia*

The need to proceed even if feasibility is uncertain

7. Taking into account the precautionary principle and the potential to develop and improve techniques as an eradication proceeds, provide in clause 6.7 the potential for an eradication to proceed for a trial period during which techniques are tested and/or developed.

The need for expert advice

8. Make it mandatory under NEBRA for the National Biosecurity Management Group to seek and have regard to advice from independent scientific and technical experts in making a

determination about whether to proceed with or continue eradication. Require that assessments of national significance and technical feasibility specify which experts were consulted and what their advice was.

9. Task an environmental body with appropriate ecological expertise – such as the Threatened Species Scientific Committee or a standing scientific panel – to conduct or oversee assessments of national significance for species of environmental concern.

10. Require the establishment of an independent scientific panel for each eradication attempt to review progress and provide ongoing advice to the National Biosecurity Management Group.

The need for transparency and accountability

11. Publish all decisions by the National Biosecurity Management Group, the NBM Consultative Committee, the National Biosecurity Committee and AGMIN on responses to outbreaks, irrespective of whether an eradication is approved, the reasons for decisions and information relied on for decisions, including assessments of national significance and technical feasibility. Information that cannot be released publicly can be redacted from documents.

The need for a defensible approach to benefit:cost analysis

12. For pests or diseases with national environmental significance, remove the requirement for eradication to be cost beneficial, in recognition that there is no satisfactory method for quantitatively assessing and comparing most environmental costs and benefits. Instead, require that costs and benefits be identified, and proceed from an assumption that an environmental BCA will be positive. Amend Attachment 4A (including as outlined above) to better reflect environmental values.

The need for environmental sector involvement

13. In decisions under NEBRA and other agreements regarding outbreaks with potential impacts on the natural environment, an ENGO representative should be invited to be an observer to the National Biosecurity Management Group and consultative committee processes, able to participate in all ways except for voting on whether to proceed with or continue an eradication.

The need for environment department participation

14. The proposed position of Chief Environmental Biosecurity Officer should be established, and this person should chair the National Biosecurity Management Group under NEBRA and be a member of the group under other agreements when the outbreak under consideration is likely to have environmental impacts.

15. Environmental department representatives of the federal government and lead state/territory governments should participate in both the National Biosecurity Management Group and consultative committee for outbreaks of potential national environmental significance. All state and territory governments should ensure that environmental departments are fully involved in decision-making, including reviewing all assessments and being consulted on all decisions and/or representing their government in NBMG and consultative committee processes. The involvement by environment departments should be spelt out in formal agreements between the biosecurity and environmental agencies.

16. All assessments produced by the consultative committee should be reviewed by the environment department of each government participating in the National Biosecurity Management Group.

The need for short-term emergency response funding

17. Establish an emergency response fund for funding immediate and short-term emergency responses for potentially nationally significant outbreaks (as assessed by an expert panel).

The need to prioritise the public benefit

18. Any outbreaks with potentially significant environmental impacts should be managed under NEBRA, with the involvement both of relevant industry groups and environmental NGOs, and the potential to come to cost-sharing arrangements with industry bodies.

19. No industry body should have the right under any agreement to veto an eradication of a species with potential to harm the natural environment or to limit the funding for such an eradication.

The need to apply NEBRA to new outbreaks of certain existing pests or diseases

20. Amend the NEBRA definition of 'outbreak' to allow for national cost-sharing to be applied for new outbreaks of established pests or diseases where existing outbreaks are contained and represent a low risk of spread.

The need to review and justify decisions to abandon eradications

21. Before a decision is made by the National Biosecurity Management Group to stop funding an eradication, there should be consultation with stakeholders and revised assessments based on the NEBRA criteria. All documents relevant to the decision should be publicly available. The National Biosecurity Management Group should be required to publish reasons for its decisions and an independent review should be conducted in the spirit of learning from failures.

The need for transition to management options

22. Include a transition to management framework in NEBRA to facilitate containment and other actions to limit the threat of a nationally significant invasive species if eradicating it is not feasible.

23. Provide a mechanism for reconsideration of eradication if there is new information (such as a change in the feasibility of eradication or the severity of impacts and significance) which indicates that the incursion is likely to satisfy NEBRA criteria.

2. Relevant features of environmental biosecurity

We briefly outline here some of the factors relevant to environmental outbreaks of new pests or diseases that the reviewers should take into account in recommending changes to NEBRA – differences between environmental and industry-focused biosecurity, Australia’s international obligations under the Biodiversity Convention and principles of decision-making in the public interest.

2.1 Differences between environmental and industry-focused biosecurity

The following features make clear why it is essential to develop specific approaches under NEBRA that are appropriate to protecting the natural environment from new invaders.

The values to be protected – biodiversity and environmental health: Conservation requires a biosecurity commitment to protecting hundreds of thousands of species, from microbes to macropods, and their interactions that constitute ecosystems and ecosystem processes in terrestrial, freshwater and marine systems. In contrast, industry biosecurity is mostly focused on protecting individual species that are of economic value and number no more than a few dozen (except for the nursery and aquarium industries, which use a wider although replaceable range of species). Conservation often requires a landscape-scale, tenure-blind focus. The values at stake for industry are quantifiable in economic terms and are sometimes replaceable (by new breeds, products or enterprises). The values at stake in conservation are not replaceable – each species and ecosystem is important – and cannot be adequately quantified in economic terms. This means they are often undervalued when biosecurity priorities are decided.

Invasive species threats – scale and complexity: Because of the high diversity of species and ecological communities in the natural environment, there are far more invasive species that are of threat to environmental values than to industry. Environmental threats are also typically far more complex than those that threaten industry, involving direct and indirect impacts arising from changes in biological and physical interactions.

State of knowledge: Due to commercial incentives and being few in number, much more is known about cultivated species and the invasive threats to them than about biodiversity and invasive threats. The lack of knowledge about our native biota means that most invasive species impacts are not documented or monitored. The impacts of even high profile species are often poorly known.

Predictability and timeframes: While impacts on cultivated species can be predicted with reasonable accuracy, there are high levels of uncertainty about impacts in the natural environment due to complex interactions, long timeframes (decadal to millennial) and lack of knowledge. Many impacts are facilitated by or synergistic with other threats, such as fragmentation and climate change. Invasive impacts in the natural environment may not be observed for decades due to lag effects, lack of monitoring or their insidious nature. A cow killed by a new pathogen is much more easily detected than a dead bird in a forest. The combination of great uncertainties, long timeframes, limited management options and far reaching impacts requires an especially precautionary and defensive approach in environmental biosecurity.

Management approaches and options: There are many more management options in relatively simple, delimited agricultural systems than there are in complex natural environments. For example, in response to the recently introduced myrtle rust, plant industries

can use fungicides, breed resistant varieties or use tolerant species, none of which are options in the natural environment. In many natural situations, weeds cannot be controlled with broadacre mechanical or chemical control. Australia's post border biosecurity (managed by the states and territories) is more reactive rather than defensive, focussed mostly on controlling or proscribing a small subset of listed invasive species that are causing proven harm. A much more precautionary approach is warranted because options for control once a species is established are very limited.

Stakeholders and resources: There are commercial incentives for industry management of invasive species but environmental biosecurity relies on consistent government and community investment for the public good. Commercial incentives and greater government spending also mean that industry biosecurity is much better resourced than environmental biosecurity. A multitude of stakeholders, often with conflicting agendas, makes environmental biosecurity a much more socially and politically challenging policy area than industry biosecurity.

Because of the uncertainties and complexities of environmental invasions and the potential for decline and loss of irreplaceable natural values, it is particularly important to apply the precautionary principle to decisions under NEBRA. These also make it important to involve appropriate experts in decision-making, and to accept that techniques for eradication will often have to be developed and adapted as an eradication progresses.

2.2 Obligations under the Convention on Biological Diversity

NEBRA should refer to and reflect Australia's obligations under the Biodiversity Convention. Article 8(h) is particularly relevant, obliging parties to 'as far as possible and as appropriate':

Prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species.

NEBRA should be revised to be consistent with the following guiding principles for Article 8(h).

Guiding Principle 1, the 'precautionary approach':

Given the unpredictability of the impacts on biological diversity of alien species, efforts to identify and prevent unintentional introductions as well as decisions concerning intentional introductions should be based on the precautionary approach. Lack of scientific certainty about the environmental, social and economic risk posed by a potentially invasive alien species or by a potential pathway should not be used as a reason for not taking preventative action against the introduction of potentially invasive alien species. Likewise, lack of certainty about the long-term implication of an invasion should not be used as a reason for postponing eradication, containment or control measures.⁷

The precautionary approach is contained in the preamble of the Biodiversity Convention and in principle 15 of the 1992 Rio Declaration on Environment and Development, defined as:

... where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat.

Guiding principle 2, the 'three-stage hierarchical approach':

⁷ See <http://www.cbd.int/decision/cop/?id=7197>.

Prevention is generally far more cost effective and environmentally desirable than measures taken following introduction of an alien invasive species. Priority should be given to prevention of entry of alien invasive species (both between and within States). If entry has already taken place, actions should be undertaken to prevent the establishment and spread of alien species. The preferred response would be eradication at the earliest possible stage (principle 13). In the event that eradication is not feasible or is not cost-effective, containment (principle 14) and long-term control measures (principle 15) should be considered. Any examination of benefits and costs (both environmental and economic) should be done on a long-term basis.

Guiding principle 3, the ecosystem approach:

All measures to deal with alien invasive species should be based on the ecosystem approach, in line with the relevant provisions of the Convention and the decisions of the Conference of the Parties.

Guiding principle 5, research and monitoring:

In order to develop an adequate knowledge base to address the problem, States should undertake appropriate research on and monitoring of alien invasive species. This should document the history of invasions (origin, pathways and time-period), characteristics of the alien invasive species, ecology of the invasion, and the associated ecological and economic impacts and how they change over time. Monitoring is the key to early detection of new alien species. It requires targeted and general surveys, which can benefit from the involvement of local communities.

Guiding principle 13, eradication:

Where it is feasible and cost-effective, eradication should be given priority over other measures to deal with established alien invasive species. The best opportunity for eradicating alien invasive species is in the early stages of invasion, when populations are small and localized; hence, early detection systems focused on high-risk entry points can be critically useful. Community support, built through comprehensive consultation, should be an integral part of eradication projects.

Guiding principle 14, containment:

When eradication is not appropriate, limitation of spread (containment) is an appropriate strategy only where the range of the invasive species is limited and containment within defined boundaries is possible. Regular monitoring outside the control boundaries is essential, with quick action to eradicate any new outbreaks.

In summary, the guidelines under the Biodiversity Convention require that a precautionary approach is applied in decision-making under NEBRA, that eradication is given a high priority and proceeds at the earliest possible stage, that benefits and costs (both environmental and economic) are calculated on a long-term basis, that an ecosystem approach is taken, that there is research and monitoring, that community support is developed and that containment becomes the focus if eradication is not appropriate.

2.3 Public interest considerations

Decisions under NEBRA must be made in the public interest (clause 1.1). To ensure a high level of public confidence in the decision-making process, NEBRA parties should demonstrate a strong commitment to:

- Transparency and public accountability
- Taking account of the best scientific advice
- Meaningful involvement of relevant stakeholders
- Provision of sufficient funding to achieve strong environmental biosecurity and meet commitments such as those under the Biodiversity Convention.

The following recommendation from the draft report of the IGAB review is relevant to public interest decision-making:

IGAB2 should include an explicit commitment by jurisdictions to support financially, decisions agreed to under NEBRA, but look to put in place systems that ensure decisions are evidence-based, [precautionary] and transparent, in keeping with best risk management principles, and that give confidence to governments and the community that funds are being committed wisely and appropriately.⁸ *(ISC's proposed addition to the IGAB draft recommendation is inserted in square brackets)*

Also relevant is the recommendation by the IGAB review panel that the IGAB should make clearer commitments to environmental biosecurity and include:

- the principle of ecologically sustainable development
- acknowledgement of Australia's international responsibilities under the Convention on Biological Diversity
- a program of work to determine, plan and prepare for national priority pests and diseases impacting the environment and native species
- a focus on environment and community as well as industry partnerships

⁸ Craik et al. (2016)

3. The case of the smooth newt

Of European and western Asian origin, the smooth newt (*Lissotriton vulgaris*) was first detected in Melbourne in June 2011. The decision under NEBRA in 2013 to reject eradication of the smooth newt reveals several fundamental weaknesses in NEBRA and undermined the confidence of environmental stakeholders in decision-making under NEBRA.

3.1 Environmental impacts

The smooth newt is the only salamander species known to be established in the wild in Australia. The species is able to live in a wide range of habitats, and climate matching suggests that large parts of New South Wales, Victoria, eastern Tasmania, southern South Australia, and south-western Western Australia are highly suitable for it. As the only member of an entire amphibian order established in Australia, and the first invasive population of this species in the southern hemisphere, it is hard to predict the likely impacts of the smooth newt. Tingley et al. (2014) note that 'On average, exotic species with only distant relatives in their invaded ranges tend to have greater impacts' because native species lack co-evolved defences against them.

Potential impacts of the smooth newt could arise from predation, competition, toxicity and disease spread. It is a generalist carnivore, eating invertebrates, crustaceans, and frog and fish eggs and larvae. Therefore it 'may compete with and prey upon a wide range of terrestrial and freshwater species in Australia'.⁹

There is a risk that smooth newts could poison the animals that prey on them (as cane toads do). Some salamanders produce a neurotoxin (tetrodotoxin) on their skin. Tests have previously shown that the European smooth newt has low levels or no tetrodotoxin, but because Australian predators 'have no evolutionary history of exposure to tetrodotoxin ... the effect of even low doses of this toxin on Australian frog-eating predators remains unclear.'¹⁰ If the toxin is potent, it could affect a wide range of potential predators (invertebrates, wading birds, snakes, lizards, turtles and mammals which prey on species occupying similar environments).

A close relative of the smooth newt carries chytrid fungus, which has caused extinctions and declines in Australian frogs, so there is a risk that smooth newts will also spread the disease.

3.2 The response under NEBRA

The smooth newt was discovered in an outer suburb of Melbourne in June 2011. A trapping survey in June-November 2011 found it at four locations. Surveys in 2012 found it at additional locations, suggesting it had spread. It was found at six sites in 2013, including four of the 2012 sites.¹¹ The full extent of its current establishment is unknown. Interim containment measures were put in place at one site between 2011 and 2013. In 2016, surveys by ISC and Ecology Australia found breeding smooth newts at only one of the previous survey sites and at a new nearby site on the opposite side of a major creek.

Sometime in 2012 the outbreak was referred by the Victorian government to a National Biosecurity Management Consultative Committee. In January 2013 the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) completed a 'national significance

⁹ Tingley et al. (2014)

¹⁰ Tingley et al. (2014)

¹¹ Tingley et al. (2014)

assessment', as required under NEBRA.¹² The relevant expertise of the assessors and the extent to which they consulted with experts is unknown. However, the references in the assessment suggest the assessment was based only or mainly on the very limited published literature. The ABARES assessment 'did not identify any likely severe and/or extensive impact'. However, it acknowledged that 'the potential extent of impact of the smooth newt on Australian biodiversity remains somewhat unclear' and suggested that further information on the behaviour of the smooth newt would assist with a NEBRA assessment. In ISC's view the assessment did not reflect the potential significance of the outbreak and the extent of uncertainty. The conclusions contrast with the analysis of researchers Tingley et al. (2014), who emphasise the unknowns arising from the lack of evolutionary history of salamanders in Australia. The assessment also dismissed the potential for the newt to be toxic to predators. In contrast, Tingley et al. (2014) warn that its effects could differ on Australian species due to their lack of evolutionary exposure to the toxin.

In April 2013 the Victorian Department of Primary Industries completed a NEBRA Preliminary Technical Feasibility Analysis, which concluded that the technical feasibility of eradication was 'low to moderate', despite initially scoring the feasibility 'moderate' with a different weighting of the criteria and being unable to determine the score for some criteria.¹³ There was a suspicion among some departmental staff that the final risk rating was deliberately downgraded to ensure that NEBRA was not triggered. We do not know how valid the conclusion is, partly because the revised scoring for the conclusion was not explained, although clearly the almost two years of inaction since detection, allowing the newt to spread, had probably increased the difficulty of eradication.

On an unknown date in 2013, the National Biosecurity Management Group (NBMG) decided to not support an eradication of the smooth newt. This decision was made at least 22 months after the newt was detected, reducing the prospects of eradication and increasing the costs. Due to the lack of transparency of decision-making by the NBMG and the consultative committee, ISC does not know why the proposal for eradication was rejected. As far as we are aware, the decision-making process did not involve ecological or amphibian experts. ISC is aware that opinions (within government) differ as to whether eradication should have been attempted.

The parties to NEBRA do not appear to have taken the potential environmental impacts of the smooth newt very seriously. Decision-making was exceedingly slow, with the decision by the NBMG to not attempt eradication taken 22 to 30 months after detection. Despite the great uncertainty about likely impacts due to the lack of prior experience in Australia with invasive salamanders, the precautionary principle was ignored. There was limited, if any, input from independent experts on the potential ecological impacts.

By deciding not to eradicate the smooth newt, Australian governments have in effect decided to proceed with the ecological experiment of allowing a new order of amphibians to establish and spread in Australia.

After the NEBRA decision, the Victorian government decided not to conduct its own eradication. We were unable to obtain any record of this decision from an FOI request. The Victorian government roughly calculated that the cost of eradication would be \$294,000 over four years, this being noted as the total cost of Victoria's high risk invasive animals program for one year.¹⁴

¹² Parsons & ten Have (2013)

¹³ Victorian Department of Primary Industries (2013)

¹⁴ Victorian Department of Primary Industries (2013), Appendix A

After 2013 all smooth newt monitoring and containment efforts by the Victorian government ceased.

3.3 What the case reveals

Low priority was afforded to the smooth newt outbreak, as evidenced by the approximate two years between detection and a decision by the NBMG. This length of time is likely to have diminished the prospects of eradication and increased the costs. The establishment of any new species in the natural environment should be of concern. That the smooth newt represents a new taxonomic order of animals in Australia, is a generalist carnivore and is potentially toxic to its predators should have generated a great deal of concern and motivated a rapid response.

Experts on the likely impacts of the smooth newt were apparently not involved or consulted in the preparation of the national significance assessment or risk assessment for the NBMG (there were no relevant references to indicate this in the material we obtained under FOI) and a subsequent scientific paper about the invasion contradicted conclusions in the advice provided to the NBMG.¹⁵ The complexity of ecological interactions and the many uncertainties should have necessitated the close involvement of experts and peer review. Decisions under NEBRA would generate more confidence if assessments were conducted by and subject to peer review by independent experts.

This case particularly highlights the lack of precaution applied in decisions under NEBRA. Because the smooth newt has not established invasive populations in the southern hemisphere and there are no salamanders in Australia, there are inevitably high levels of uncertainty about the likely impact. This uncertainty should have resulted in a higher risk rating and strongly favoured a decision to attempt eradication. By the time it has spread far enough for its impacts to become apparent, it will be far too late to eradicate the smooth newt.

Another aspect of decision-making that should trigger the precautionary principle is the required assessment of technical feasibility. It assumes that techniques for eradication are already known and have previously been tested in relevant circumstances. This is unrealistic for many new invaders, including the smooth newt, and does not allow for the fact that techniques almost certainly improve as new techniques are developed as an eradication proceeds. There is a major tension between responding quickly to limit spread of a new invader and assessing the long-term technical feasibility of eradicating it. One way of partly addressing this is to provide access to short-term emergency funding to allow for early action while a more considered response is developed. Australia should also develop contingency plans for high priority potential invaders that identify eradication options and the research needed to develop effective techniques.

There was a complete lack of transparency about the decision by the NBMG to reject the proposal for national cost-sharing to eradicate the smooth newt. Once we became aware of the smooth newt through a passing comment at a meeting in Canberra in mid-2013, we began requesting information. Initial requests were refused because the government didn't want the incursion location publicised. The ABARES national significance assessment was provided after a request to ABARES, but required permission from the Victorian government. An FOI to the Victorian government (at no cost) was required to obtain the eradication feasibility assessment and confirm if there were any further documents.

We are gravely concerned that the lack of transparency in decision-making under NEBRA and the other agreements undermines the quality of decision-making and encourages governments

¹⁵ Tingley et al. (2014)

to prioritise short-term budget considerations over the longer-term economic benefits of eradications and the public interest in environmental protection. A requirement to publish reasons for decisions and information on which the decisions are based should increase the motivation for decision-makers to better serve the public interest and improve accountability.

4. The case of the red imported fire ant

Of all invasive species that should be kept out of Australia, the red imported fire ant (*Solenopsis invicta*) (RIFA) is widely regarded as one of the worst. It is also one of the most costly, and any flaws in biosecurity resulting in new incursions put at risk the \$329 million already spent (to June 2016) trying to eradicate them, which is a very small proportion of the costs that would result if eradication fails. The commitment of governments to eradication has been mainly due to the extremely high social and economic costs of these ants. However, because of the decision-making processes under NEBRA, a single NEBRA party reluctant to pay its share of costs could cause the eradication to be abandoned. Failure looms unless sufficient commitment and funding are forthcoming this year when the Agriculture Ministers Forum makes a decision about a proposed 10-year funding program.

While the south east Queensland red fire ant incursion subject to eradication since 2001 predates NEBRA, because the eradication is proceeding as a so-called 'NEBRA-like' arrangement, the observations about red imported fire ant eradication are relevant to NEBRA.¹⁶ New fire ant incursions have been managed under NEBRA since NEBRA commenced in 2012.

4.1 Environmental impacts

These aggressive ants are likely to dominate large areas and deplete populations of small ground animals and plants. They have more severe ecological impacts than other ants because they can reach extremely high densities of up to 2600 mounds a hectare.¹⁷ In Australia there are concerns for many threatened species, including turtles, crocodiles, lizards, frogs and ground-dwelling birds such as malleefowl, black-breasted button-quail and plains wanderer.¹⁸ Certain plants may be at risk from the ants' habit of eating or damaging seeds, grazing on seedlings and disrupting pollination and seed dispersal.

The social and economic impacts of these ants are extreme. Their stings are very painful and in the United States they have caused more than 85 human deaths. They would severely compromise outdoor activities. Modelling indicates that in Southeast Queensland alone, if left uncontrolled, fire ants would impose costs in the order of \$45 billion over 30 years.¹⁹

4.2 The response under NEBRA and ad hoc arrangements

In 2001, RIFA were found in two locations in Brisbane – around the main cargo port at Fisherman Islands, and in the suburbs of Wacol and Richlands. They were found later to be genetically distinct, indicating two incursions. The Queensland government immediately 'mounted an emergency response to delineate the invasion and if possible eradicate the fire ant, despite scepticism that eradication could be achieved, given no other country has been able to eradicate them.'²⁰

Soon after this, the National Red Imported Fire Ant Eradication Program was established with cost sharing by the federal, state and territory governments. Since then five more outbreaks

¹⁶ Since 2010, all ad-hoc eradications were required to be consistent with any relevant deed arrangements. This decision is referred to in Item 3.11 of the resolutions of the 2013 Standing Council of Primary Industries held on 3 May 2013.

¹⁷ Department of the Environment (nd)

¹⁸ Maloney & Vanderwoude (2002), Department of the Environment (nd)

¹⁹ Antony et al. (2009)

²⁰ Keith and Spring (2013)

have been detected – at Gladstone (2006), Gladstone (2013), Port Botany (2014), Brisbane Airport (2015) and Port of Brisbane (2016). The 2001 outbreaks were handled under ad-hoc arrangements, and the 2013, 2014 and 2015 outbreaks under NEBRA. We don't know how the 2016 outbreak has been handled in relation to NEBRA.

4.3 What the case reveals

An analysis of the eradication program showed it came very close to success in 2003, but because of a failure to fully 'delimit the invasion', part of the infested area remained outside the searched and treated areas.²¹ Keith and Spring say this result highlights 'the crucial importance of mathematical modelling of biological invasions'. Because of this missed opportunity the infested area approximately doubled between 2004 and 2010.²² Keith and Spring recommended that the eradication strategy be designed to be more pre-emptive by modelling the likely expansion front of the ants and treating areas beyond where nests are detected to keep pace with their predicted movements. It highlights the importance of applying the very best science to eradications and involving external experts.

The eradication to date shows the importance of learning as an eradication proceeds and that techniques inevitably evolve. The decisions under NEBRA to proceed with eradications at Gladstone, Port Botany and Brisbane Airport were greatly facilitated by the knowledge gained by the long-term eradication effort in south-east Queensland. They show that rejecting eradication proposals because there is initial uncertainty about the feasibility of eradication can be premature.

The case shows the importance of long-term commitment and sufficient funding to optimise the chances of success. Eradications typically don't succeed if they are half-hearted or underfunded. Funding was reduced when there were 'spectacular' reductions in fire ant numbers early in the program, leading to a reduction in the area treated and the spread of residual infestations.²³ This put at risk the success of the program.

The massive, expensive eradication effort represents an admirable commitment of Australian governments to eradicate red imported fire ants, which is justified on the basis of the extremely high impacts and costs if they are not eradicated. However, the commitment by some governments has been tenuous at times and the resulting reduction of funds, short-term funding and repeated reviews have undermined the potential for success. Not all governments have as yet committed to the proposed 10-year funding program, which was recommended by the independent review panel in May 2016. That any single government could veto this program highlights the highly problematic nature of decision-making processes under NEBRA and the other agreements. It is also concerning that it will take over a year to make the decision due to the infrequency of agricultural minister meetings, losing valuable time.

The importance of this NEBRA review is highlighted by the severe implications for current and future generations of abandoning the RIFA eradication. The process for decision-making should be optimised to ensure that decisions are made in the public interest.

²¹ Keith and Spring (2013a)

²² Keith and Spring (2013b)

²³ Brooks et al. (2015)

5. The case of myrtle rust

First detected in New South Wales in April 2010, myrtle rust (*Puccinnia psidii*) (also known as eucalyptus or guava rust) is now established in Queensland (east of the Great Dividing Range as far north as the Wet Tropics), NSW and Victoria, and has been detected in Tasmania and the Northern Territory. The response to myrtle rust was conducted under the Emergency Plant Pest Response Deed (prior to the existence of NEBRA), but much can be learned from the response about current flaws in emergency responses that are highly relevant to NEBRA.

Its establishment in Australia in 2010 represents a very serious failure of biosecurity – of prevention, detection and response. The emergency response was seriously flawed, with a premature decision made not to eradicate, which was revised four months later to suppression with a goal of long-term eradication. By not proceeding rapidly with an eradication program (as was specified in the response plan) Australia may have missed a small window of opportunity (of about six months) to eradicate the rust before the weather became conducive to spread of the rust's spores.

5.1 Environmental impacts²⁴

Australia is in the very early stages of invasion by myrtle rust, a fungus from South and Central America which causes disease of Myrtaceae species, Australia's dominant plant family. The impacts so far indicate it will have serious ecological consequences and could cause several plant extinctions. There is no known method of controlling the disease in the wild except perhaps for application of fungicides in very small areas as a last resort for high priority assets.

The pathogen is established in a wide variety of natural ecosystems – rainforests, heathlands, woodlands and wetlands – as well as in urban areas. So far, more than 350 native species (more than 10% of Australia's myrtaceae species) have proven to be susceptible (in the laboratory or in the wild). This number will increase as the disease spreads. About 20% of the more than 300 species susceptible in the wild so far are 'highly' or 'extremely' susceptible. In Queensland, 48 species have been rated as highly or extremely susceptible. At least six endangered Myrtaceae species are susceptible. Other species hitherto not regarded as of conservation concern, such as scrub turpentine (*Rhodamnia rubescens*) and native guava (*Rhodomyrtus psidioides*), are showing such high rates of mortality that they are at risk of regional or total extinction.²⁵

Disease impacts on keystone species have broader ecological ramifications. Of 15 susceptible *Melaleuca* species in Queensland about half are 'highly or extremely susceptible'. Several – such as *Melaleuca quinquenervia*, *M. leucadendra* and *M. viridiflora* – are important sources of nectar for birds and flying-foxes, and the forests they form serve as habitat for many animals. About 19 eucalypt species so far have proven susceptible in the wild but little is known about potential impacts. Dozens more have shown susceptibility in laboratory tests.

5.2 The response under EPPRD

For more than a decade before it arrived, myrtle rust was regarded by plant pathologists as a serious risk for Australia.²⁶ Concern was heightened when Eucalyptus rust reached Hawaii in

²⁴ NSW Scientific Committee (2011), Carnegie & Lidbetter (2012), NSW Department of Primary Industries (2012), Pegg et al. (2013), Makinson (2014), Pegg et al. (2014), Queensland Government (2014), Carnegie et al. (2016)

²⁵ Carnegie et al. (2016)

²⁶ Coutinho et al. (1998)

2005.²⁷ In 2006 the Primary Industries Ministerial Council stated that it was ‘one of the most serious threats to Australian production forests and natural ecosystems’.²⁸

The Office of the Chief Plant Protection Officer released a national response plan in 2007 and Plant Health Australia published a contingency plan for the nursery and garden industry in 2009.²⁹ The PHA plan identified *Puccinia psidii* as a ‘high-extreme’ risk for the nursery industry. Oddly and unjustifiably, the plan gave a lower risk rating for the environment – ‘high’ (rather than ‘extreme’) – a rating contradicted by subsequent impacts. The response plans recommended pathway risk analysis, early detection systems and awareness raising with businesses using Myrtaceae.

It is thought that the rust was in Australia for several months prior to detection, suggesting surveillance was inadequate.³⁰ In 2006 the Primary Industries Ministerial Council said the best defence to Eucalyptus rust was ‘early detection through the use of hazard site surveillance using sentinel crops in Australia, the South West Pacific and South East Asia.’³¹ The Office of the Chief Plant Protection Officer was said to be investigating costs and options for early detection. As far as we are aware, 5 years after it was reported in Hawaii, no early detection systems or specific surveillance programs had been established.

The rust was confirmed on 23 April 2010 in a NSW central coast nursery on willow myrtle plants (*Agonis species*).³² The grower said the disease has been present since mid-March 2010. It was also found at low levels on turpentine trees in a windbreak and bottlebrush plants up to 500 metres away but not in bushland.³³ On 30 April 2010, although the rust had been found only on two properties and not in bushland, the NBMG deemed that it was not feasible to eradicate the rust. This was based on advice from the Consultative Committee on Emergency Plant Pests (CCEPP) that there was a ‘high likelihood that its spores may have spread to other areas’.³⁴ This position was maintained for the next four months. In July, the CCEPP advised that it had ‘become clear that the host range of [myrtle rust] in Australia is more limited than anticipated’ (contrary to the eventual outcome).

After considerable criticism³⁵ and more surveys showing there had been only limited spread (only four infected properties had been identified by mid-August), the earlier decision not to eradicate was revised. On 2 July 2010, the NBMG agreed to the Interim Response Plan for myrtle rust, which was to attempt to suppress the rust with a long-term goal of eradication. It activated the Emergency Plant Pest Response Deed which triggered 100% cost-sharing by the federal and state/territory governments (no industry funding).

²⁷ Uchida et al. (2006)

²⁸ Primary Industries Ministerial Council (2006)

²⁹ Office of the Chief Plant Protection Officer (2007), Plant Health Australia (2009)

³⁰ Trace studies indicated that it had been present since October 2009 (National Management Group 2010b).

³¹ Primary Industries Ministerial Council (2006)

³² Carnegie and Cooper (2011) outline the sequence of events and the on-ground surveillance and eradication program in NSW.

³³ Consultative Committee on Emergency Plant Pests (2010)

³⁴ National Management Group (2010a)

³⁵ On 6 May Plant Health Australia requested that the CCEPP reconsider the decision that it was not technically feasible to eradicate the rust, and also requested that NSW be supported in suppressing the rust and delimitating the infected area (Carnegie & Cooper 2011). For example, the Institute of Foresters of Australia wrote in June 2010 to the agricultural minister expressing ‘extreme’ concern that the incursion not been ‘met with an adequate and speedy response to eradicate this most serious plant pathogen’. John McDonald, the industry development manager of the Nursery and Garden Industry Association said: ‘The jurisdictions are quick to define the pest as established so that they can walk away from it without having to commit any funds . . . at the first stage of that incursion, all jurisdictions washed their hands and ran away.’

The rust was first detected in bushland in late October 2010, 6 months after its first detection in Australia. By 7 December there were 127 infected premises, 1034 premises had been inspected and 1330 surveillance visits had been completed. In December the rust was found in Queensland. The emergency response was stood down on 22 December after technical advice that eradication was no longer feasible because the rust was spreading naturally in bushland.³⁶

5.3 What the case reveals

The 30 April 2010 decision that myrtle rust was ineradicable was far too premature, given it had been detected only in two nurseries and not in bushland. It was also inconsistent with the process outlined in the contingency plan.³⁷

Given the recognised extreme risks of the disease, and the lack of information about the extent of establishment and likely impacts, the precautionary principle should have been applied.³⁸ Short-term budgetary considerations appear to prevail over environmental and longer-term economic considerations in many emergency response decisions. One state (or industry in some cases) reluctant to contribute funds can delay or veto an eradication.

The decision-making lacked transparency and did not appear to consistently involve experts in ecology or plant pathology. It did not involve environment NGO stakeholders. A scientific advisory panel was appointed only in July but it is not clear whether there were members with ecological and conservation expertise.³⁹

Environmental risks were not given sufficient weighting in the decision-making process. We very much doubt that the same decision would have been made for something like foot and mouth disease or equine influenza (industry equivalents in terms of the rust's significance).

Carnegie and Cooper (2011) report that until November-December (when weather conditions conducive for spread and infection occurred) the rust was spreading only due to movement of infected plants and people. This leaves open the possibility that had more resources (flowing from national cost-sharing arrangements) been dedicated to surveys and eradication in the initial stages after detection, the rust's spread into bushland could have been prevented. Carnegie and Cooper (2011) say that the conditions in the few months after detection (until late spring) 'provided an ideal situation to attempt to eradicate the rust'. ISC is of the opinion that the very high risks of myrtle rust warranted an early full-scale eradication attempt, which would have been consistent with the contingency plan. It is unclear why the NBMG did not follow the contingency plan.

Compared to the potential impacts of this disease – both economic and environment – extremely modest sums were invested in the emergency response. On 9 April 2011, it was

³⁶ See Carnegie and Cooper (2011) for an outline of the response.

³⁷ The contingency plan for Eucalyptus rust by Plant Health Australia (2009) stated: 'If the initial detection is contained within an area small enough and/or isolated enough that eradication is considered feasible, eradication procedures should also be implemented immediately, without waiting for the results of delimiting surveys, as any delay will allow further spore production and dissemination, reducing the likelihood of successful eradication.'

³⁸ The decision by the NBMG was the opposite of what is required by the precautionary principle. It justified the decision to not proceed with eradication by saying that 'based on information currently available, the CCEPP can not assure the NMG that eradication is technically feasible' (National Biosecurity Management Group 2010c). FOI material, National Management Group Out of Session Paper No. 1, 13 May 2010.

³⁹ According to NMG notes, the members were 'drawn from the three technical committees that prepared the projects for the response plan and have expertise in forest health, diagnostics, plant pathology, myrtle/guava rust taxonomy and science, economics and risk analysis.'

reported (in *The Australian*) that the NSW government had spent \$5 million detecting, controlling and attempting to eradicate the rust (to December 2010), Queensland had spent \$970,000, and the federal government \$1.4 million.⁴⁰

The federal government invested a modest sum of about \$1.5 million for management of myrtle rust as part of the Transition to Management Plan but little of this was dedicated to environmental issues. None of the recommended environmental monitoring projects were funded. The level of funding and the proposed activities are far from sufficient for such a nationally significant disease. (Compare this to the \$12 million granted for Hendra virus research.) There should be a national research and management plan to identify priority research questions and management options relevant to the environment.

Myrtle rust is one of the most threatening invaders of the natural environment, yet there was minimal engagement of the environment sector or environmental agencies in preparing for and responding to the incursion. As far as we are aware, there was no consultation with environment NGOs in the development of contingency plans and the emergency response. In contrast, the nursery and garden industry sector (but not the forestry industry) was involved in both – as a party to deed arrangements between industry and governments for emergency responses and due to the existence of Plant Health Australia.

Australia should be preparing for the potential arrival of other serious pathogens of native plants, including new strains of myrtle rust. Plantations of Australian native species overseas greatly increase the risks of host jumps by pathogens in these export locations and then invasion of the pathogen into Australia (as has occurred with myrtle rust). Another serious disease of Eucalyptus has recently been discovered in South America and there are various pathogens of Australian eucalypts and wattles in Africa and Asia that are of concern.⁴¹ Overseas experts have warned about the risks posed by two pathogens harming Australian wattles in South Africa (*Ceratocystis acaciavora* and *C. albifundus*)⁴² but there is no contingency planning that we are aware of for these disease threats – in part because there is no environmental body the equivalent of Plant Health Australia and Animal Health Australia.

The response to myrtle rust highlights the need to ensure that improvements to NEBRA apply also to the industry response agreements EADRA and EPPRD so that environmental considerations, preparedness and actions are the same regardless of which response agreement is triggered.⁴³

⁴⁰ Deighton and Higgins (2011)

⁴¹ Summarised in Booth (2011)

⁴² Wingfield et al. (2011)

⁴³ CSIRO's (2014) submission to the 2014-2015 environmental biosecurity inquiry by the Senate Environment and Communications References Committee makes a similar point when it says '...the effectiveness of NEBRA as an evidenced-based and effective process has not been reviewed. Case histories, such a myrtle rust (Box 1), suggest NEBRA performance is not optimal and could be considerably improved.'

6. The case of the Asian honeybee

The Asian honeybee (*Apis cerana*) was first detected in the Cairns region in 2007 and as of October 2012 was established across 500,000 hectares in far north Queensland.⁴⁴ The outbreak was subject to a failed eradication attempt (under EPPRD), regarded by many as prematurely abandoned because some states did not want to provide financial support. The potential biodiversity impacts of the bee were ignored in the emergency response assessment.

6.1 Environmental impacts

The potential impacts of Asian honeybees are poorly known due to limited research. Recent studies in north Queensland have found that they have a broad floral appetite.⁴⁵ Social bees in the genus *Apis* often exclude other insects from nectar and pollen by swamping flowers, and this has been observed of Asian honeybees in parts of Asia and north Queensland. This indicates that they could change plant-ecosystem dynamics where they become dominant. They are likely to reduce populations of native pollinators, reduce seed set, and alter the genetic structure of plant populations. 'As they spread in Australia, joining European honey bees as dominant floral visitors, the risk is that native links will collapse under the pressure of these super-consumers of floral resources that perform poorly as pollinators and exclude native pollinators through resource depletion.'⁴⁶

6.2 The response under EPPRD

In May 2007, a nest of Asian honeybees was detected in the mast of a fishing boat in dry dock in Cairns and seven live colonies were found.⁴⁷ The Queensland government attempted to eradicate the bees throughout 2007 and it was thought successful until more nests were detected in July 2008. In March 2009 Queensland submitted a response plan proposing national cost-sharing to eradicate the bees. In July 2009 the National Biosecurity Committee determined that the incursion should be managed under the Emergency Plant Pest Response Deed. The NBMG agreed to allocate \$3 million to eradication, with costs split between the federal government (40%), state and territory government (40%) and industry (20%). Funding ceased on 30 March 2011 due to a majority decision by the NBMG that it was no longer feasible to eradicate the species. This was despite an independent review (commissioned by the Queensland government) saying that more information was needed to determine whether eradication was feasible.

A senate inquiry (by the Rural Affairs and Transport Reference Committee in 2011), triggered by concerns about the impacts on commercial beekeepers and farmers that depend on managed honey bees for pollination, concluded that the response to the Asian honey bee was flawed in several respects.

In response, in April 2011 the consultative committee reviewed a technical advice review, but failed to reach consensus on whether eradication was feasible, and in May 2011 the NBMG concluded (by majority) that eradication should not proceed. The federal government allocated \$2 million to 'support a national pilot program aimed at creating an ongoing solution to the

⁴⁴ Koetz (2012)

⁴⁵ Gross (2015)

⁴⁶ Gross (2015)

⁴⁷ The Senate Rural Affairs and Transport References Committee (2011), Commerford and Koetz (2013).

management of Asian honeybees'.⁴⁸ In July 2011, the Asian honey bee Transition to Management Program was commenced.

6.3 What the case reveals

ISC agrees with the conclusions of the Rural Affairs and Transport References Committee about the flaws in the emergency response. The committee concluded that due to scientific uncertainty and the potential spread and environmental, economic and social impacts of the Asian honeybee in Australia, 'there were no reasonable grounds on which to favour the conclusion that the pest was ineradicable'.⁴⁹

The senate committee said it was 'not convinced that the processes in place for the initial response to emergency plant and animal disease incursions are sufficiently capable of being appropriately adapted to deal with specific cases or incursions. In the case of the Asian honeybee, the committee was concerned that, notwithstanding the efforts of Queensland, there were insufficient resources applied to the eradication effort, given the potential consequences of the establishment of this pest in Australia.'⁵⁰

The committee said there was 'an urgent need for Australia to examine its emergency plant and animal pest response strategies to ensure that any such efforts are appropriately tailored and funded to address the practical demands of eradication, taking into account the broader implications and potential consequences to Australia of the establishment of a given pest or disease.' They were concerned that 'initial efforts are not sufficiently well planned, resourced and carried out with sufficient national and technical oversight.'⁵¹

The committee was critical that the risk assessment for the Asian honey bee incursion 'did not include an assessment of the impact on Australia's biodiversity'. The committee recommended that the environment department and relevant scientific organisations be consulted as soon as an incursion is reported to provide advice on the biodiversity consequences of the establishment and spread of the pest and that a written response is made to the relevant agencies as soon as possible setting out the biodiversity consequences.⁵² (ISC considers the only way to ensure the environment is adequately considered is to meaningfully involve environmental NGOs and environment departments in decision-making.)

The Senate Rural Affairs and Transport References Committee recommended that the Consultative Committee on Emergency Plant Pests reconsider whether the Asian honey bee was eradicable and that it 'should specifically apply the precautionary principle to areas of scientific uncertainty in its reconsideration'.⁵³

⁴⁸ Department of Agriculture, Fisheries and Forestry (2011)

⁴⁹ The Senate Rural Affairs and Transport References Committee (2011)

⁵⁰ The Senate Rural Affairs and Transport References Committee (2011)

⁵¹ The Senate Rural Affairs and Transport References Committee (2011)

⁵² The Senate Rural Affairs and Transport References Committee (2011)

⁵³ The Senate Rural Affairs and Transport References Committee (2011)

7. The case of Koster's curse

Koster's curse (*Clidemia hirta*) is a highly invasive shrub from South America that smothers the understorey of tropical rainforests and pastures. It was the target of eradication under a NEBRA-like program for 13 years. In 2015, when another outbreak was found, it was abandoned as a target, a decision that leaves large parts of Australia vulnerable to invasion by this lantana-like weed.

7.1 Environmental impacts

Koster's curse is lantana-like in its impacts, forming dense thickets that smother native vegetation. Its berries are spread by birds. According to a summary of impacts in the 2015 transition to management plan (2015), it has the potential to drive rare sub-canopy forest species to extinction as they are displaced by the weed, as has occurred on several Indian Ocean Islands and in Malaysia.⁵⁴ In Hawaii most plants below the Koster's curse canopy have disappeared.

In Australia, the weed could invade a wide range of forest types, including threatened regional ecosystems in north Queensland. It would seriously degrade land in the high rainfall coastal areas of Queensland, northern NSW and the Northern Territory. It is also a risk for primary industries, including horticulture and beef and dairy grazing.

The traits of Koster's curse make it difficult to contain and control – traits such as bird dispersal of fruits, a short generation time, year-round fruit production, long-lived seed, high fecundity. It is difficult to detect.

7.2 The response under NEBRA-like arrangements

Koster's curse was first detected in Julatten, north Queensland, in August 2001. In 2002 it became part of the national cost-share funded Four Tropical Weeds Eradication Program. This program is conducted as a 'NEBRA-like' arrangement.

Good progress was made over 13 years, with significant reduction of plant densities and soil seed bank.⁵⁵ In 2014-15, only 67 fruiting plants were detected. It was only in 2013 that the eradication program received substantial funding, with a budget of \$400,000 a year (> 80% from the Queensland and federal governments). An independent review of the Four Tropical Weeds program in 2014 apparently found that there was a 25:1 return on investment.⁵⁶

In July 2015 a second, large infestation of Koster's curse was detected 130km south of Julatten in dense rainforest in the Wooroonoran National Park (near Innisfail). It is not known how Koster's curse established so far from the original outbreak. The size and density of the outbreak suggests it established 5 to 10 years ago. In August 2015, the Consultative Committee for Exotic Plant Incursions decided that Koster's curse was no longer technically feasible to eradicate.

⁵⁴ Biosecurity Queensland (2015)

⁵⁵ Biosecurity Queensland (2015)

⁵⁶ Noted in Mitchell River Watershed Management Group (2015).

7.3 What the case reveals

The decision to withdraw funding – after a one-year transition to management phase – has been heavily criticised by those involved in the eradication effort.⁵⁷ The decision was made without any consultation with them and without release of the information relied on by the consultative committee to determine that eradication is not feasible. Was there any calculation of the likely cost of eradicating the second infestation, and a comparison with the potential costs of containment and control? The speed of the decision implies there was not a thorough revised assessment of feasibility and costs, and that it was based on the insufficiency of funds (\$400,000 a year) already allocated. A fresh assessment reviewing the potential benefits against the higher eradication costs may have concluded allocating additional funds would be in the public interest. The confidentiality associated with the decision (as with all decisions under the response agreements) does not provide for confidence that the public interest was primary in the decision.

Unless alternative funding is found, Koster's curse will almost inevitably spread through the region's river systems to infest large parts of the 72,000km² Mitchell River catchment area and ultimately large areas of Northern Territory, Queensland and NSW. Given that the seed is bird dispersed, containment over a large area is unrealistic. Controlling it to protect important assets will be extremely expensive, likely to exceed by orders of magnitude the one-off eradication costs.

⁵⁷ Mitchell River Watershed Management Group (2015)

8. The need for a new decision-making model

Relevant NEBRA clauses

Clause 6.7(e)

To avoid any doubt, the NBMG must decide, on the basis of advice from the NBMCC, that a national biosecurity incident response will not commence if:

- (v) the NBMG has not reached a consensus that a national biosecurity incident response should commence.

Clause 6.7 (f)

The NBMG must decide, on the basis of advice from the NBMCC, that a national biosecurity incident response will not continue if:

- (iii) it has not reached consensus that a national biosecurity incident response should continue.
-

A major flaw in NEBRA (and the other response agreements) is the need to achieve consensus of all members of the NBMG for an eradication, and the need for unanimous support for cost-sharing arrangements. This allows any one government (and any one industry member in the case of EADRA or EPPRD) to veto an eradication attempt. A similar flaw is the requirement for decisions of the consultative committee to be made by consensus.

These unusually onerous requirements are opposed to the public interest. They tend to skew decisions towards no or limited action and short-term, limited funding (ie. lowest common denominator decisions). This is reinforced by the lack of transparency and accountability in the work of the NBMG and the NBM consultative committee (see section 14). In the absence of external scrutiny, NEBRA parties can make decisions with little concern about public criticism.

Problems arising from the decision-making model have been evident with the eradication program for red imported fire ants (section 4), and may have been a factor in the refusal to support eradication of the smooth newt (section 3). The potential of one party to stymie, hamper or delay an eradication was exemplified by Western Australia's refusal to allocate more than one year's funding in 2013 for the red imported fire ant program (despite an offer of \$3 million of additional funds from Queensland).⁵⁸ A lack of long-term funding may have extended the timeframe for the eradication effort. Western Australia's reluctance to provide funds put at risk the entire program; however this may have changed with Western Australia's renewed commitment to the program in 2016-17 after three years of no funding.

By contrast, a risk-management, precautionary approach to a new outbreak should favour strong action on eradication over no action and the allocation of optimal funds to achieve eradication. Lessons learnt from past eradications are that eradication responses are improved by long-term planning and the retention of skilled staff, which requires the allocation of sufficient, long-term funds. If the proposed 10-year funding program for red imported fire ants is agreed to by the Agricultural Ministers Forum, this will be a major boost to Australia's prospects of eradication.

Others have recognised the problems associated with consensus decision-making. The 2015 report of the senate inquiry into environmental biosecurity recommended that the capacity of a

⁵⁸ Standing Council on Primary Industries ministerial council resolutions 3 May 2013.

single party to veto action under NEBRA be removed (recommendation 2).⁵⁹ A 2011 review of Australia's preparedness for responding to foot and mouth disease (FMD) found that consensus decision-making has 'tended to obscure authority, responsibility and accountability for progress in national FMD planning and preparations, and increased the potential for delays, confusion and compromise'.⁶⁰ It cited a review of Exercise Minotaur (a simulation to test Australia's preparedness for FMD), which expressed concern about the possibility that a single party to the deed could have the power of veto and potentially delay response activity.

To optimise decision-making in the public interest, a new model is needed that includes a pre-commitment to proceed with eradication on certain pre-identified priority species or within certain thresholds of feasibility and significance. Majority decision-making, *not* consensus, should apply for other cases.

Considerable work is needed to identify the priority species for which NEBRA would automatically be triggered and to develop contingency plans to identify surveillance and eradication techniques. There have been more than 90 contingency plans developed for agricultural biosecurity (through Plant Health Australia and Animal Health Australia) as well as many technical guidelines to assist eradication. The equivalent work has not been done for environmental priorities.⁶¹ High priorities to start with include Asian black-spined toads, didymo (or rock snot), certain invasive ant species, and diseases that could affect a wide range of native plant species. But there are probably well over a hundred species that warrant contingency planning. Identifying these priority species and developing contingency plans should be the work of an environmental body such as the proposed Environment Health Australia (see section 10).

Recommendation 1

Develop a new model of decision-making in the public interest, which includes (1) a commitment to proceed with eradication within defined thresholds of feasibility and significance, and (2) majority decision-making in other cases.

Recommendation 2

Develop a priority list of species or groups of species for which NEBRA is automatically triggered and there is a pre-commitment to proceed with eradication (subject to certain conditions such as cost). Develop contingency plans for these species.

⁵⁹ The Senate Environment and Communications References Committee (2015)

⁶⁰ Matthews (2011)

⁶¹ See Invasive Species Council (2014a) and Craik et al. (2016). By late 2014 Plant Health Australia and Animal Health Australia had developed at least 90 contingency plans. The only relevant plans for high priority environmental invaders were two tramp ant plans and the contingency plan for eucalyptus (myrtle) rust.

9. The need for precaution

Relevant NEBRA clauses

Clause 6.4(a)

The NBMG must determine whether the pest or disease that is the subject of the outbreak is of national significance and likely to be eradicable.

Clause 6.7(b)

The NBMG may decide, on the basis of advice from the NBMCC, that a national biosecurity incident response will commence if:

- (i) the technical feasibility analysis of the outbreak indicates that eradication is possible and likely; and
- (ii) the benefit:cost analysis indicates that it is cost beneficial; and
- (iii) the risk assessment indicates that the outbreak would have national impacts and an unacceptable likelihood of the pest or disease establishing itself or spreading; and
- (iv) one or more of the national significance criteria are met.

A major flaw of NEBRA is that it ignores the precautionary principle, despite this being integral to sound biosecurity decision-making and required under the Biodiversity Convention and the EPBC Act. The level of certainty required for decisions is inappropriately high given the potential for severe and irreversible harm to the environment coupled with a general lack of information about the impacts of environmental invaders and techniques for eradication. The difficulty of meeting the threshold for eradication due to uncertainties was exemplified by the NBMG's decision to reject the smooth newt as a target for eradication (section 3) and the decision under the EPPRD to prematurely abandon eradication of myrtle rust (section 5). The latter decision was justified on the basis that 'on information currently available, the CCEPP can not assure the NMG that eradication is technically feasible'.⁶² At this stage, the rust had been detected only in two nurseries and not in bushland. This requirement for a high level of certainty, as demonstrated for a disease recognised as an extreme risk and with a contingency plan, guarantees that most environmental outbreaks will not qualify for a response under NEBRA or the other agreements. As noted in section 4, we very much doubt the same decision would have been made for an outbreak of foot and mouth disease or equine influenza, industry equivalents in terms of the rust's significance.

The draft report by the IGAB review panel comments that 'governments are rightly concerned about the potential to inappropriately allocate taxpayer funds to eradication programs that have little or no chance of success'.⁶³ This is, of course, an important consideration. However, applying the precautionary principle does not require proceeding where there is 'little to no chance of success'. Depending on the severity of potential impacts, uncertainty warrants a higher risk rating and lowers the threshold for action.

The Queensland government has adopted a version of the precautionary principle in the state's Biosecurity Act 2014, section 5(c): '...lack of full scientific certainty should not be used as a

⁶² National Management Group (2010c)

⁶³ Craik et al. (2016)

reason to postpone taking action to prevent a biosecurity event or to postpone a response to a biosecurity risk'. The explanatory notes to the bill justify it in part by saying that 'the costs of not taking action to a potential threat, such as a highly infectious zoonotic disease transmitted between animals and humans, can be more significant than the cost of taking early and definitive action which subsequently proves to be unnecessary'.⁶⁴ As a process for responding to nationally significant outbreaks, NEBRA should adopt the highest standards and principles rather than lag behind any of its parties.

As outlined in section 2.1, NEBRA's lack of the precautionary principle is contrary to Australia's international obligations under the Biodiversity Convention, as stated in the preamble and the first guiding principle for Article 8(h) of the Biodiversity Convention (section 2.2). The precautionary principle is standard in environmental law and policy (although often poorly enacted): one version of the principle was endorsed in the 1992 Intergovernmental Agreement on the Environment and is in the EPBC Act.

The precautionary principle is fundamental to effective biosecurity for the natural environment for the reasons outlined in section 2.1. Uncertainty is particularly prevalent and high with respect to impacts in the natural environment because of the complexity of biological interactions, the diversity of ecosystems, the inherent unpredictability of environmental changes over time, including under climate change, and the limited research on Australian ecology.

From a risk management perspective, where the potential impacts of a new outbreak are potentially serious but uncertain, or where the feasibility of eradication is uncertain, there could be very sound reasons from a public interest perspective to proceed with an eradication. This is particularly so for environmental outbreaks because of the difficulties and costs of managing invasive species once they are entrenched. In addition, the high benefit-to-cost ratio common for eradications of new outbreaks should lower the certainty threshold for proceeding with an eradication.

Another reason for proceeding with eradications even when the technical feasibility is uncertain is that much can be learnt during the process that increases the feasibility of eradication. This has been evident, for example, with the eradication programs for the red imported fire ants and non-NEBRA programs for yellow crazy ants. Even if eradication is not achieved, what is learnt during an attempt can often be applied to controlling the species to mitigate impacts or to similar future invaders.

Two senate inquiries have recommended that the precautionary principle be applied to decision-making about eradications. In 2011 the Senate Rural Affairs and Transport References Committee recommended that the Consultative Committee on Emergency Plant Pests reconsider whether the Asian honey bee was eradicable and that it 'should specifically apply the precautionary principle to areas of scientific uncertainty in its reconsideration'.⁶⁵

In 2015 the Senate Standing Committees on Environment and Communications recommended that the Commonwealth Government work with state and territory governments to include in NEBRA an explicit precautionary principle which states that a lack of full scientific or technical certainty regarding the feasibility of eradication must be weighed against potential biosecurity risks when determining whether to mount a response.⁶⁶

⁶⁴ Queensland Government (2013)

⁶⁵ The Senate Rural Affairs and Transport References Committee (2011)

⁶⁶ The Senate Environment and Communications References Committee (2015)

The draft report of IGAB review rejected the proposal of several submitters to include the precautionary principle in the IGAB on the basis that the Beale review rejected such a move.⁶⁷ However, that was because the Beale panel considered the precautionary principle was incompatible with the WTO SPS Agreement, which applies to trade decision and not to decisions about eradications. There are no legal reasons to reject inclusion of the precautionary principle in NEBRA, and strong legal and practical reasons to include it.

Several decisions relevant to the environment, under NEBRA or the Emergency Plant Pest Response Deed have not been precautionary. When there is uncertainty about the impacts of an organism or the feasibility of eradication, it seems the inclination of the NBMG (or its consultative committee) has been to not proceed with eradication. This was particularly evident in responses to myrtle rust (section 5), the smooth newt (section 3) and the Asian honey bee (section 6).

Recommendation 3

Require application of the precautionary principle in decision-making by the National Biosecurity Management Group and the National Biosecurity Management Consultative Committee, as well as the other agreements (EADRA, EPPRD), in responding to outbreaks with potential impacts on the natural environment.

⁶⁷ Craik et al. (2016); Beale et al. (2008)

10. The need for Environment Health Australia

NEBRA lacks the environmental equivalent of one of the greatest strengths of the industry agreements EADRA and EPPRD – the government-industry bodies Animal Health Australia and Plant Health Australia. Among their many roles, these organisations are the custodians of EADRA and EPPRD, facilitate industry involvement in biosecurity responses and undertake vital preparatory work such as contingency planning for high priority pests. There is no equivalent for environmental biosecurity.

There has been recognition, including by the 2008 Beale review of biosecurity, the 2015 senate inquiry into environmental biosecurity and the 2016 IGAB review that environmental biosecurity needs a similar focus, but none has been prepared to recommend the establishment of Environment Health Australia as proposed by the Invasive Species Council.⁶⁸ Instead, they have recommended that the government-industry bodies expand their roles to encompass the environment.

This is unrealistic and has not occurred despite the passage of nine years since being recommended by the Beale review. It would require revolutionary changes in their institutional arrangements and operations. It is highly unlikely that the consensus needed from industry members of Plant Health Australia and Animal Health Australia will ever be achieved to modify their company constitutions to enable the necessary environmental focus. Effective engagement and involvement of the environmental sector by the existing bodies is also highly unlikely. Industry bodies are likely to regard the environmental sector as a competitor for increasingly scarce public resources in the biosecurity arena and prefer the status quo. Expanding the responsibility of these mainly agricultural bodies would ensure that environmental biosecurity continues to be treated as an add-on and secondary to agricultural biosecurity and continues to lag far behind in essential prevention and preparation work. It fails to recognise the many ways in which effective environmental biosecurity differs from that for industry, as explained in section 2.1.

Plant Health Australia itself recognised the need for a separate body in their submission to the Beale review:⁶⁹

For environmental pests there are many more stakeholders across government, industry and the community than is the case with commercial specific pests. Major challenges lie ahead in forming links and partnerships between these groups and along the continuum. Trust, goodwill and impartial decision making will be important and consideration needs to be given to establishing an independent body similar to Plant Health Australia to create the framework and coordination for partnerships to operate.

The main reasons given for the reluctance to create the proposed Environment Health Australia are concern that creating a new structure will lead to fragmentation and cost more. Ultimately the costs to Australia for failing to optimise environmental biosecurity will be manifoldly greater than the costs of establishing the proposed body. And as we have explained, the extent of work and the ecological focus needed warrant a strong environmental-specific focus. Our perception is that industry bodies and most federal and state agricultural departments are reluctant to undermine the status quo with its predominant focus on agricultural priorities.

⁶⁸ Beale et al. (2008), The Senate Environment and Communications References Committee (2015), Craik et al. (2016), Invasive Species Council (2012), Invasive Species Council (2014a)

⁶⁹ Plant Health Australia (2008)

To address the disparity between environmental and agricultural biosecurity, the independent reviewer of the Environment Protection and Biodiversity Conservation Act, Allan Hawke, considered it necessary to legislatively require that the environment be given equal consideration alongside human health and economy and social considerations⁷⁰. However, it is hard to mandate equivalent priority without reforming institutional arrangements. Only a dedicated body such as the proposed Environment Health Australia can deliver the required focus on environmental biosecurity preparedness and responsiveness.

Such a body is needed to undertake the work necessary to better prepare Australia to respond to outbreaks of environmental pests and diseases, including the identification of priority risks and development of contingency plans that set out surveillance and emergency response methods. Environment Health Australia would also be the appropriate body to act as custodian of NEBRA in the same way that PHA and AHA are the custodians of their respective deeds. These functions would greatly facilitate the potential to achieve eradications under NEBRA.

Recommendation 4

Establish Environment Health Australia or an equivalent to foster productive collaboration between governments and the environmental sector for undertaking the work necessary to support effective biosecurity responses to new outbreaks, including the preparation of contingency plans for high priority potential invaders and acting as NEBRA custodian.

⁷⁰ Hawke (2010)

11. The need for comprehensive national significance criteria

Relevant sections of schedule 3

Section 1.2

Impacts on nationally important species

(a) A 'nationally important species' is a native species that has a particular significance to the Australian community across the nation because it is:

- (i) relevant to the national identity; or
- (ii) nationally listed; or
- (iii) the subject of an international obligation.

For example, kangaroo species, koala, whale species and painted snipe.

(b) This sub-criterion is met if the pest or disease is likely to have a significant impact on the conservation status of a nationally important species.

Section 1.4

Impacts on nationally important places

(a) A 'nationally important place' is any place that has a particular significance to the Australian community or because it is relevant to the national identity. For example, nationally important places may include National Heritage Places included in the National Heritage List under the Environment Protection and Biodiversity Conservation Act 1999 and Australian properties included on the World Heritage list.

(b) This sub-criterion is met if the pest or disease would be likely to have a significant impact on the values that make a place nationally important.

Section 1.5

Impacts on ecologically valuable places

(a) An 'ecologically valuable place' is an area that:

- (i) makes a significant contribution to Australia's natural environment; or
- (ii) meets national heritage listing criteria, as set out in the Environment Protection and Biodiversity Conservation Act 1999 and regulations; or
- (iii) are nationally-listed, ecological communities and RAMSAR wetlands covered under the Environment Protection and Biodiversity Conservation Act 1999.

(b) This sub-criterion is met if the pest or disease would be likely to have a significant impact on the national heritage values of an ecologically valuable place.

Australia is a megadiverse country and the vast majority of species and ecological communities here are unique. With invasive species having caused the majority of animal extinctions and declines and the declines of a substantial proportion of threatened plant species and ecological communities [cite Tim's report], the country should be doing everything possible to prevent or

eradicate new invaders. There are several ways that the national significance assessment should be strengthened to improve Australia's capacity to protect this natural heritage.

As discussed in section 2, Australia's international obligations and the public interest require application of the precautionary principle in decisions under NEBRA, including about whether a 'pest or disease that is the subject of the outbreak is of national significance'. The lack of information about the likely impacts of most species and the difficulties of predicting impacts over ecologically meaningful timeframes make it extra important to apply the precautionary principle. The reference in schedule 3 to 'significant impacts' reflects the language in the EPBC Act, but is considerably weaker than the EPBC Act for not including the precautionary principle. There should be explicit reference to the precautionary principle in schedule 3, and the language should change to reflect this. For example, it would be appropriate to change 'likely' in 1.2(c)(i) and 1.3(c)(i) to 'possible'.

Information should be provided in schedule 3 about how the precautionary principle should be applied in national significance assessments. This should include the need to apply extra precaution in the case of exotic species with only distant relatives in their potential range, for, as noted in section 3, these tend to have greater impacts due to native species lacking co-evolved defences.⁷¹ Extra precaution should also apply to exotic species likely to have a rapid ability to evolve, such as pathogens.

We support the broad categories of significance criteria outlined in Schedule 3. However, they need strengthening to more comprehensively capture outbreaks of national significance, including in the following ways.

A major weakness of the definition of (a) nationally important species is that the national list of species (those listed under the EPBC Act) is far from comprehensive. There are many species genuinely threatened that have never been assessed under the Act, including many listed at a state and territory level. To capture the intention of this category, nationally important species should include species listed under state or territory laws where the species is present only in the states or territories where it is listed, species listed as threatened by the IUCN, or species otherwise considered by experts to be threatened (eg. in an action plan or journal paper). It should also include species that could become nationally threatened as a result of the pest or disease under consideration. The lack of this category is a major gap. Myrtle rust, for example, is severely threatening several native plant species, including native guava (*Rhodomyrtus psidioides*), a once common pioneer rainforest plant in Queensland and New South Wales. Its populations have declined by more than 50% in less than five years.⁷²

The criteria for 'nationally important places' are far too limited and should be expanded to include all protected areas, including nature reserves, national parks, indigenous protected areas, and marine parks.

As with species, the listing of threatened ecological communities under the EPBC Act is far from comprehensive and the ecologically valuable places category needs to be expanded to include ecological communities listed as threatened under state or territory laws or otherwise known to be threatened. It should also include ecological communities that could become threatened as a result of the disease or pest. Offshore islands often have high conservation values or harbour genetically distinct populations but some may not lie within protected areas and these should be included. Some islands such as Lord Howe Island have had considerable investments in

⁷¹ Tingley et al. (2014)

⁷² Carnegie et al. (2016)

island-wide eradications, and this investment should elevate the importance of eradicating new incursions. All wetlands in *The Directory of Important Wetlands in Australia* should also be included.⁷³

Recommendation 5

Be explicit in requiring application of the precautionary principle in national significance assessments under NEBRA and other agreements (for environmental outbreaks).

Recommendation 6

Include in Schedule 3 the following additional categories of nationally important criteria.

Nationally important species:

- Species that could become threatened as a result of the pest or disease
- Species listed under state or territory laws where the species is present only in those states or territories, by the IUCN, or otherwise considered to be threatened

Nationally important places:

- Protected areas such as national parks and marine parks

Ecologically valuable places:

- Ecological communities listed as threatened under state or territory laws or otherwise known to be threatened
- Ecological communities that could become threatened as a result of the disease or pest
- Offshore islands with conservation values
- Wetlands listed in *The Directory of Important Wetlands in Australia*

⁷³ Environment Australia (2001)

12. The need to proceed even if feasibility is uncertain

Relevant NEBRA clauses

Clause 6.4(a)

The NBMG must determine whether the pest or disease that is the subject of the outbreak is of national significance and likely to be eradicable.

Clause 6.7(b)

The NBMG may decide, on the basis of advice from the NBMCC, that a national biosecurity incident response will commence if:

- (i) the technical feasibility analysis of the outbreak indicates that eradication is possible and likely
-

It is unrealistic to expect sufficient knowledge of whether an eradication is technically feasible at the early stages of an invasion unless there has been prior experience elsewhere with eradicating or controlling that species or similar species. Even then, techniques might work differently in the Australian environment. Therefore, the NEBRA requirement that a pest or disease must be assessed as 'likely to be eradicable' is an unreasonable barrier to eradication of environmental invaders. A lack of prior experience is particularly prevalent in the case of environmental invaders such as smooth newts (section 3) which haven't previously established invasive populations. Most experience with eradication techniques has been for agricultural pests and diseases.

Rejecting eradication proposals because there is initial uncertainty about the feasibility of eradication is premature given how much can be learned by doing. A lack of prior knowledge of effective eradication techniques does not mean that an eradication lacks feasibility. Almost invariably, techniques are improved or new techniques are developed as an eradication proceeds, but the likelihood of success often cannot be assessed before trying. The potential for improving techniques has been amply demonstrated in cases such as red imported fire ants and yellow crazy ants.

Even if an eradication turns out to be not feasible, the methods developed during an attempt are likely to be useful for controlling the pest or disease in future and to apply to similar future invaders.

The precautionary principle should be applied in assessing the feasibility of eradication. This means that NEBRA should provide the potential to proceed with eradication in the absence of confidence about its feasibility, at least for a trial period. We recommend that an additional part be added to clause 6.7 to provide for this potential.

Recommendation 7

Taking into account the precautionary principle and the potential to develop and improve techniques as an eradication proceeds, provide in clause 6.7 the potential for an eradication to proceed for a trial period during which techniques are tested and/or developed.

13. The need for expert advice

Relevant NEBRA clauses

Clause 6.6

The NBMCC, with the assistance of the other parties, will review the notifying party's assessment of whether the pest or disease outbreak is of national significance and whether it can be eradicated, and prepare advice for the NBMG.

Clause 6.7 (b), (d)

(b) The NBMG may decide, on the basis of advice from the NBMCC, that a national biosecurity incident response will commence if:

- (i) the technical feasibility analysis of the outbreak indicates that eradication is possible and likely; and
- (ii) the benefit:cost analysis indicates that it is cost beneficial; and
- (iii) the risk assessment indicates that the outbreak would have national impacts and an unacceptable likelihood of the pest or disease establishing itself or spreading; and
- (iv) one or more of the national significance criteria are met.

(d) In making a determination in accordance with clause 6.7(c), the NBMG may:

- (i) seek and have regard to advice from technical experts
-

High quality scientific information, particularly about the potential impacts of a new invader and the technical feasibility of eradication, is important for sound decision-making under the NBMG. But the lack of published scientific information about most potential environmental invaders (section 2.1) and the lack of contingency plans (section 8) mean that high quality information is typically lacking. In the case of the smooth newt (section 3), there was almost no relevant published information about their potential impacts, for there are no other salamanders established in Australia and no invasive populations of smooth newts elsewhere. In such cases, it is vital to consult experts and to apply the precautionary principle (see section 9). It appears that neither of these was done in the smooth newt case. The senate inquiry into the Asian honeybee response (section 6) found the initial response lacked sufficient technical oversight and there was no assessment of the potential biodiversity impacts.⁷⁴ The committee concluded that due to scientific uncertainty and the potential environmental, economic and social impacts of the bee, 'there were no reasonable grounds on which to favour the conclusion that the pest was ineradicable'.

Clause 6.7(d) of NEBRA specifies weakly that the NBMG may 'seek and have regard to advice from technical experts'. This should be strengthened to make it mandatory to seek and have regard to advice from scientific and technical experts. Such advice is vital for the assessments of national significance and technical feasibility. It should be made very clear in these documents which experts have been consulted and what their advice was.

⁷⁴ The Senate Rural Affairs and Transport References Committee (2011)

The Australian Bureau of Agricultural and Resource Economics and Sciences, which focuses on agricultural issues and has limited ecological expertise, conducted the national significance assessment for the smooth newt. As outlined in section 2.1, the complexities of interactions and impacts in the natural environment are typically far greater than in agricultural systems, and ecological expertise is needed to evaluate their potential significance and the feasibility of eradication.

An appropriate environmental body – such as the Threatened Species Scientific Committee or a standing scientific panel with ecological expertise – should instead be tasked with writing national significance assessments. Decisions under NEBRA would generate more confidence if assessments were conducted by and subject to peer review by independent experts.

Ecological and other scientific expertise is also essential to improve the prospects of success of eradication. An independent scientific panel should be established for all eradications to provide ongoing advice to the NBMG and review progress. The red imported fire ant case study (section 4) highlights the importance of involving the best available experts in developing and reviewing eradication programs and ensuring that eradication programs are optimally funded. If this had been done, eradication of the southeast Queensland outbreak may have been achieved more than a decade ago.

Recommendation 8

Make it mandatory under NEBRA for the National Biosecurity Management Group to seek and have regard to advice from independent scientific and technical experts in making a determination about whether to proceed with or continue eradication. Require that assessments of national significance and technical feasibility specify which experts were consulted and what their advice was.

Recommendation 9

Task an environmental body with appropriate ecological expertise – such as the Threatened Species Scientific Committee or a standing scientific panel with ecological expertise – to conduct or oversee assessments of national significance for species of environmental concern.

Recommendation 10

Require the establishment of an independent scientific panel for each eradication attempt to review progress and provide ongoing advice to the National Biosecurity Management Group.

14. The need for transparency and accountability

The activities of the National Biosecurity Committee, NBMG and consultative committee are unnecessarily closed and confidential. We are gravely concerned that this undermines the quality of decision-making and encourages governments to prioritise short-term budgetary considerations over the longer-term economic and environmental benefits of eradications. It perpetuates the lower priority given to environmental biosecurity than to agricultural biosecurity, for the involvement of affected industry groups (as a party to EADRA or EPPRD and through Plant Health Australia and Animal Health Australia) would bring more accountability to decisions about agricultural invaders.

The Department of Agriculture has justified the ‘careful management’ of information on the basis that it is needed to (i) avoid inappropriate action by the public, (ii) protect trade and market access, (iii) protect ‘confidential’ information and (iv) limit potential compensation claims.⁷⁵ We are not convinced these are sound reasons for the current extent of secrecy, for there are ways to address the problems identified by the department. Some information currently treated as confidential would be suitable for limited or full release. The reasons for confidentiality should be balanced with public interest concerns and the need to explain decision-making so as to be accountable to stakeholders and the general community and to build confidence in decisions that impact on the environment, human health and social amenity. For some outbreaks, public communiqués are issued, but they reveal limited information about the reasons for decisions and other important details.

The community should not have to pay money and go through onerous FOI processes to gain information about processes under NEBRA that are meant to be serving the public interest. Likewise, there should be transparency about responses to outbreaks of environmental significance under EADRA and EPPRD.⁷⁶

The independent review of the RIFA eradication (May 2016) was made public six months after the report was finalised only after the Australian Senate supported a motion to release the document.

⁷⁵ Department of Agriculture (2014)

⁷⁶ An attempt by the Invasive Species Council to use Freedom of Information laws in 2013 to access minutes of the NBMG from July 2011 to June 2013 resulted only in the provision of nine pages of meeting agendas nine months later at a cost of \$97.50. Attempts to obtain agendas over a longer period, minutes of the meetings, or to narrow down our request were refused because it was deemed to ‘substantially and unreasonably divert resources of the agency’. Information about the myrtle rust outbreak considered by the NBMG, consultative committee, Plant Health Australia and the National Biosecurity Committee were requested under FOI in 2013. These were provided after four months at a cost of \$801.01 (initially quoted \$1330.09). In 2017 we made an FOI request for papers and minutes of the National Biosecurity Committee over a three-year period to try to understand deliberations and decision-making around aspects of recent biosecurity decisions. This was refused as it ‘would involve a substantial and unreasonable diversion of resources of the agency from its other operations due to [the request’s] broad scope’. A narrowed request covering a one-year period with some exclusions would cost over \$1000 with no guarantee that the request would ultimately be granted. We have yet to decide whether we can afford to pursue access to this information, whose publication should be a matter of course in a modern transparent system. At the same time we made an FOI request for minutes and papers of AGMIN meetings from 2014 to September 2016. This request was also refused as a ‘substantial and unreasonable diversion of resources’. When the request was narrowed to only those matters relating to environmental biosecurity or invasive species with an environmental impact, a cost estimate of \$496 was received, with no guarantee that the information would be provided. The full papers of the predecessor to AGMIN, SCOPI (Standing Committee of Primary Industry), were automatically published on the internet.

Although industry representatives are party to relevant decisions under EADRA and EPPRD, industry bodies have also criticised the lack of transparency, as highlighted in the senate inquiry into the citrus canker outbreak in Queensland.⁷⁷ For example, Growcom said: ‘The processes and decisions of the NMG were confidential therefore adding to the confusion. It is strongly suggested that future NMG processes and decisions be visually accountable and that the decisions are conveyed to the relevant stakeholders and the general public in a prompt manner.’ And the Queensland Citrus Growers said: ‘Confidentiality of CCEPP and NMG meetings has made it difficult for QCG and other industry representatives to communicate decisions and outcomes back to the industry bodies, and to the growers they represent.’

The reviewers of IGAB have recommended that systems are put in place to ‘ensure decisions are evidence-based and transparent, in keeping with best risk management principles, and that give confidence to governments and the community that funds are being committed wisely and appropriately’ (draft recommendation 7).⁷⁸

Recommendation 11

Publish all decisions by the National Biosecurity Management Group, the NBM Consultative Committee, the National Biosecurity Committee and AGMIN on responses to outbreaks, irrespective of whether an eradication is approved, the reasons for decisions and information relied on for decisions, including assessments of national significance and technical feasibility. Information that cannot be released publicly can be redacted from documents.

⁷⁷ The Senate Rural and Regional Affairs and Transport Legislation Committee (2006)

⁷⁸ Craik et al. (2016)

15. The need for a defensible approach to benefit:cost analysis

Relevant clauses

Clause 6.7(a)

The NBMG may decide, on the basis of advice from the NBMCC, that a national biosecurity incident response will commence if:

- (ii) the benefit:cost analysis indicates that it is cost beneficial (see Schedule 4)

Clause 6.7(e)

To avoid any doubt, the NBMG must decide, on the basis of advice from the NBMCC, that a national biosecurity incident response will not commence if:

- (ii) the benefit:cost analysis indicates that it is not cost beneficial to do so (see Schedule 4)
-

In the absence of any satisfactory method of calculating environment-specific costs and benefits of an eradication of an environmental pest or disease, it is puzzling that clause 6.7 requires an eradication to be cost beneficial. One positive aspect of NEBRA is that it recognises that determining environmental costs in a dollar sense 'can be problematic' and allows qualitative assessments for environmental or social costs and benefits (schedule 4, section 5.4). However, there is no guidance in the schedule about how these qualitative costs and benefits should be assessed and then compared so as to meet the requirement to specify whether an eradication is cost beneficial. Because of the lack of transparency of NEBRA deliberations, no BCAs are publicly available for us to learn how they have been done. Clause 6.7(a)(iii) implies that qualitative and non-economic values must be ignored to meet the requirement for a positive BCA – for example, that the potential extinction of a species must be ignored in decisions about whether to proceed with an eradication unless it provides some economic benefit for humans.

Unfortunately, years of research effort have not yielded a defensible method for environmental benefit:cost analysis (BCA) appropriate for situations such as NEBRA. Even the economic values at stake known as 'ecosystem services' (eg. pollination services for forestry, climate regulation, new drugs) are typically difficult or impossible to quantify, although they can be considerable. While a BCA provides important information for decisions under NEBRA and should be required, the requirement that an eradication be cost beneficial for outbreaks should be removed in the case of environmental outbreaks. That is, environmental costs and benefits should be described in such an analysis, in ways that reflect their values, without any attempt to derive a quantitative ratio of benefits to costs for invaders with environmental impacts.

Because species and places are irreplaceable, their non-economic values are immense in ways that cannot be reduced to numbers. It is reasonable to start from the assumption that the non-economic benefits of eradicating any pest or disease outbreak deemed to be nationally significant will outweigh the costs, particularly if the costs and benefits are considered over an ecologically relevant timeframe. It is probably also true that the economic costs considered over an ecologically relevant timeframe of ongoing control of an invasive species that is not eradicated will almost inevitably be far higher than the costs of eradication.

NEBRA has great flexibility built into it to allow judgement by the NBMG about whether it is worthwhile proceeding with an eradication (even if all assessments required under clause 6.7

are positive for eradication). Our recommendations about increasing transparency and accountability, among others, are more likely to foster responsible decision-making than imposing an inappropriate quantitative method for environmental BCAs.

The time required to prepare a detailed BCA, particularly in the case of environmental invaders for which there is little readily available information, also causes delays that reduce the chances of success of eradication.

In addition to removing the requirement for a positive BCA, we recommend that Attachment 4A (A National Framework for Biosecurity Benefit:Cost Analysis) be amended to better reflect environmental values, including in the following ways⁷⁹:

Section 1(e): The difficulty with determining costs and benefits in the biosecurity context is that environmental values such as ecosystem functions and the services derived from them are characterised by extensive uncertainty, irreversibility and non-linear changes that may generate unpredictable and potentially large negative effects. Only when It will often not be possible to determine whether the aggregate benefits of a proposal exceed the aggregate costs. ~~is a proposal considered to be economically feasible and desirable from a community-wide perspective, ignoring distributional impacts.~~ Where there are numerous choices alternatives, the option combining the greatest likelihood of effective action at least cost and with the apparent greatest net benefit to the community is considered to be optimal and preferred.

Section 2.1(f): In cases for which a BCA is appropriate, choose the appropriate BCA criterion – that is, decide on the decision criterion or combination of criteria, such as (expected) net present value or benefit:cost ratio, and explain this choice, including the technique to be used to illustrate potential environmental harm, eg, number and range of threatened species potentially affected, area of land under threat.

Section 2.3(d): Determine if it is appropriate to quantify non-market impacts. If so, identify valuation technique(s) (such as environmental asset valuation), noting that in many situations the better or only approach is to quantify environmental impacts in non-monetary ways or to document them qualitatively.

Section 2.6: There is also a need to guard against underestimation of benefits when not all important benefits are accounted for. ~~For example, In the past, the evidence is that potential environmental costs have been underestimated, eg,~~ the travel cost method addresses only some of the values associated with an environmental asset.

Section 3(c): The significance of 'non-market' (environmental and public health) assets impacted, ~~which will require application of environmental valuation techniques,~~ will place greater challenges on the analysis. ... Similarly, the assessment framework will need to take into account whether impacts are restricted to an industry, a sector or are likely to be broader, with potentially whole of economy flow-on implications. Note that impacts that disturb ecological integrity or ecosystem functioning have whole of society and economy effects, even if not immediately apparent or quantifiable.

Recommendation 12

For pests or diseases with national environmental significance, remove the requirement for eradication to be cost beneficial, in recognition that there is no satisfactory method for quantitatively assessing and comparing most environmental costs and benefits. Instead, require that costs and benefits be identified, and proceed from an assumption that an environmental BCA will be positive. Amend Attachment 4A (including as outlined above) to better reflect environmental values.

⁷⁹ underlines indicate insertions, ~~cross-outs~~ indicate deletions

16. The need for environmental sector involvement

One way to promote greater transparency and accountability in NEBRA processes, particularly in the absence of a body such as Environment Health Australia, would be to grant the community environmental sector observer status on the NBMG. Plant Health Australia and Animal Health Australia are closely involved in decision-making on responses under EADRA and EPPRD (as a member of the relevant consultative committees and as observers to the National Management Group), and affected industry parties participate in the national management group and consultative committee. In contrast, there is no involvement of any community groups in any of the processes under NEBRA or other agreements. For environmental outbreaks assessed under EADRA or EPPRD this could lead to the situation of an affected industry group having a power of veto over a response to a serious environmental invader.

ISC was informed in 2011 that the agricultural department was considering whether ENGO representatives would be invited to participate as observers under NEBRA. One comment from within the agricultural department, however, was that ENGOs might then expect too much from the process.

Recommendation 13

In decisions under NEBRA and other agreements regarding outbreaks with potential impacts on the natural environment, an ENGO representative should be invited to be an observer to the National Biosecurity Management Group and consultative committee processes, able to participate in all ways except for voting on whether to proceed with or continue an eradication.

17. The need for environment department participation

Most decisions about eradications are made by agricultural agencies with often limited involvement of environment departments. It is up to individual departments whether environment departments are even consulted about decisions to be made under NEBRA. This is despite the environment departments having the greatest ecological expertise and bearing responsibility for protecting environmental assets should an eradication not proceed or fail. One of the problems with biosecurity being primarily the responsibility of agricultural agencies is that environmental biosecurity is thus not a sufficiently high priority for either the environmental or agricultural agencies. This is obvious from the many ways in which environmental biosecurity lags that for primary industries, and has been recognised in several recent reviews, including the 2015 senate inquiry into environmental biosecurity and the 2016 review of IGAB.⁸⁰ Most agricultural agencies lack any manifest commitment to important environmental targets such as those set out in Australia's national biodiversity strategy.

We consider it vital to meaningfully involve environment departments in the NBMG and the consultative committee. The IGAB review panel has recommended in their draft report the establishment of a senior expert position of Chief Environmental Biosecurity Officer within the environment department.⁸¹ It would be highly appropriate for this officer to chair the NBMG.⁸² We consider it essential for environmental department representatives of the federal government and lead state/territory governments to participate in both the NBMG and consultative committee for outbreaks of potential national environmental significance. All state and territory governments should ensure that environmental departments are fully involved in decision-making, including reviewing all assessments and being consulted on all decisions and/or representing their government in in NBMG and consultative committee processes. The involvement by environment departments should be spelt out in formal agreements between agencies as recommended by draft IGAB review report.

Greater environmental representation at the ministerial level also needs to be considered. State, territory and federal level ministerial representation for biosecurity decision-making currently occurs through the minister responsible for agriculture. This results in decision-making with a strong agricultural focus and perspective. Greater priority would be given to the environment though a greater role for environment ministers and environment departments in biosecurity policy and decision-making. A better model would be for every jurisdiction to have a minister for biosecurity, highlighting the dual environmental and agricultural focus. For purely environmental threats, state, territory and national environment ministers could lead decision-making. Funding mechanisms and departmental capacity would need to be addressed for this to occur. An arrangement of this type is now in place for the eradication of the largest yellow crazy ant infestation in Queensland in the Cairns area where the program is overseen by the Wet Tropics Ministerial Forum which consists of the Federal and Queensland environment ministers.

⁸⁰ The Senate Environment and Communications References Committee (2015); Craik et al. (2016)

⁸¹ Craik et al. (2016)

⁸² Note that this position of Chief Environmental Officer (which should be hosted in the environment department) needs powers under the Biosecurity Act 2016, which can currently only be delegated to Department of Agriculture SES officers.

Recommendation 14

The proposed position of Chief Environmental Biosecurity Officer should be established, and this person should chair the National Biosecurity Management Group under NEBRA and be a member of the group under other agreements when the outbreak under consideration is likely to have environmental impacts.

Recommendation 15

Environmental department representatives of the federal government and lead state/territory governments should participate in both the National Biosecurity Management Group and consultative committee for outbreaks of potential national environmental significance. All state and territory governments should ensure that environmental departments are fully involved in decision-making, including reviewing all assessments and being consulted on all decisions and/or representing their government in NBMG and consultative committee processes. The involvement by environment departments should be spelt out in formal agreements between the biosecurity and environmental agencies.

Recommendation 16

All assessments produced by the consultative committee should be reviewed by the environment department of each government participating in the National Biosecurity Management Group.

18. The need for short-term emergency response funding

An effective response to new outbreaks usually requires rapid action, but meeting the requirements under NEBRA (or one of the other agreements) and reaching consensus on a cost-shared response is often time consuming. This is particularly so for environmental invaders about which little is known and for which there is no contingency plan. It took about two years from when smooth newts were detected for NEBRA parties to reach a decision (to not eradicate), although some of the delay was due to the Victorian government being slow to refer the outbreak (see section 3).

To ensure no time is lost, a state may start eradication prior to a decision under NEBRA, taking the risk that it will bear these costs. Costs can be reimbursed if NEBRA is formally triggered. This is routine practice under EPPRD and EADRA, but did not occur in the case of the smooth newt.

To facilitate rapid action, we strongly recommend that a national fund be established to fund initial responses up to a certain cost for a certain time period. This would then allow time for compiling information, consulting experts, completing assessments and developing a longer-term response. The fund should be financed either by the federal government or with contributions from all federal, state and territory governments.

The government in an affected state or territory is unlikely to commit significant funds to proceed with an eradication without knowing whether national cost-sharing will be agreed. Delaying action until an agreement can be reached under NEBRA could sacrifice the potential for eradication or considerably increase the costs. When myrtle rust was detected, there was a small window of opportunity of about six months before the weather became conducive to spread of the rust's spores (see section 5).

The CRC for Plant Biosecurity stressed the importance of rapid response in its submission to the 2014-15 senate inquiry into environmental biosecurity:

While detection and identification must be swift, so must action, and resourcing for immediate response is vital. Rapid response cannot be hindered by negotiation of responsibility and funding, or lack of capacity. To this end, both the Australian and State governments could jointly consider an allocation of funds specifically set aside for immediate use in the initial stages of an incursion – thereby avoiding the inevitable delays in the allocation of funds and resources while jurisdictional matters are resolved.⁸³

The NSW Office of Environment and Heritage made a similar proposal in its submission to the senate inquiry:

Access to well-governed contingency funds is needed to allow early and adequate response to biosecurity threats where the benefit is primarily for the good of the public (such as the environment) rather than a specific industry sector. The new NEBRA arrangements are neither adequately tested nor well understood.⁸⁴

⁸³ Plant Biosecurity Cooperative Research Centre (2014)

⁸⁴ Office of Environment and Heritage (2014)

Likewise, NSW's Natural Resources Commission said there was need for 'a central rapid response fund so that incursions can be immediately eradicated'.⁸⁵

Decisions about early funding should be made on the basis of advice from an expert panel (such as the Threatened Species Scientific Committee or a standing scientific panel for environmental outbreaks). Species that are on a priority list of species or groups of species for which NEBRA is automatically triggered (see recommendation 2) could automatically qualify for funds. Signing up to a national response agreement should commit the federal government or all parties to providing funds for early emergency responses according to an agreed formula. Funds would be reimbursed to the emergency response fund if NEBRA was formally triggered, paid from the NEBRA outbreak response funds.

Recommendation 17

Establish an emergency response fund for funding immediate and short-term emergency responses for potentially nationally significant outbreaks (as assessed by an expert panel).

⁸⁵ Natural Resources Commission (2014)

19. The need to prioritise the public benefit

Relevant NEBRA clauses

Clause 1.2(c)

This agreement will not displace or replace the operation of any of the related biosecurity arrangements, including those for cost-sharing under pre-existing arrangements.

Clause 6.2(a), (b)

The parties agree that this agreement will not displace or replace any pre-existing cost-sharing arrangements.

If an emergency response to a pest or disease can be handled under pre-existing cost-sharing arrangements the parties will agree to do so.

NEBRA is only triggered if an outbreak cannot be dealt with under one of the two industry agreements, the EADRA or EPPRD. This has one practical virtue – these agreements allow for cost-sharing arrangements with industry members – but they also mean that many environmental outbreaks will be dealt with under agreements with an industry focus and under plans developed primarily for industry purposes. The hierarchy means that decision-making for outbreaks with impacts on both industry and the environment is more likely to be dominated by industry perspectives. The precautionary principle, an essential characteristic of environmental decision-making, is not applied. It means that an industry party to the agreement can veto a response to a serious environmental outbreak. This is highly inappropriate and contrary to the public interest.

Recommendation 18

Any outbreaks with potentially significant environmental impacts should be managed under NEBRA, with the involvement both of relevant industry groups and environmental NGOs, and the potential to come to cost-sharing arrangements with industry bodies.

Recommendation 19

No industry body should have the right under any agreement to veto an eradication of a species with potential to harm the natural environment or to limit the funding for such an eradication.

20. The need to apply NEBRA to new outbreaks of certain existing pests or diseases

Relevant NEBRA definition

Outbreak

outbreak, in relation to pests and diseases means a recently detected outbreak of:

(b) a distinguishable variant of a pest or disease that is established, but not a new incidence of an established pest or disease

One vital reform of NEBRA is to include consideration of new outbreaks of pests and diseases already in Australia where existing outbreaks can be contained. Where containment is effective, it can be easier in some cases to prevent a pest or disease spreading from there than it can be to prevent new incursions from overseas. This appears to be the case with yellow crazy ants, for example (the queens mostly cannot fly and the colonies spread by budding). An infestation in a locality such as a remote climatically isolated area or offshore island may be easily contained. For a country of such vastness and ecosystem diversity, the focus of NEBRA is too narrow, engendering neglect for many incursions that are of national environmental significance.⁸⁶

Yellow crazy ants more than qualify as nationally significant for their significant impacts on biodiversity, particularly on Christmas Island and in the Wet Tropics World Heritage Area.⁸⁷ The Queensland government considered the outbreaks in Queensland to be eradicable but only ever committed very limited funding to the effort before withdrawing from the effort in 2012 as part of cost-cutting. The federal and Queensland governments are currently funding the eradication of yellow crazy ants from the Wet Tropics World Heritage Area. The ants are subject to substantial control efforts on Christmas Island, including the release of a biological control agent, and are contained in the Northern Territory. Regular interceptions in Queensland and New South Wales imply that the major pathway is from overseas rather than from within Australia. We haven't heard of any outbreaks attributed to spread from within Australia.

It would be of great public benefit to Australia to eradicate yellow crazy ants from Queensland under national cost-sharing arrangements (subject to feasibility assessment), and we strongly recommend that there be the flexibility under NEBRA to do so. This option would be triggered only very occasionally, for it is often the case that once a pest or disease is in Australia it will inevitably spread.

Recommendation 20

Amend the NEBRA definition of 'outbreak' to allow for national cost-sharing to be applied for new outbreaks of established pests or diseases, where existing outbreaks are contained and represent a low risk of spread.

⁸⁶ NSW's Natural Resources Commission (2014) has also criticised the narrowness of NEBRA: 'Further, the NEBRA has significant limitations due to the narrow definitions of when it can be used. For example, the recent incursions of tropical soda apple and orange hawkweed have potential to cause significant environmental damage to extended ranges within Australia. However, response under NEBRA was not provided for either.'

⁸⁷ Lach & Hoskin (2015); also see references in ISC's case study on yellow crazy ants (Invasive Species Council 2014b).

21. The need to review and justify decisions to abandon eradications

There have been at least three cases in which a decision by the NBMG to withdraw from an eradication has been heavily criticised by stakeholders and others as premature or poorly justified – the Asian honeybee (under EPPRD, see section 6), myrtle rust (under EPPRD, see section 5) and Koster’s curse (under NEBRA-like non-deed arrangements, see section 7).

At the very least these cases demonstrate the need for much greater transparency and accountability. The unnecessarily confidential nature of deliberations and lack of consultation undermine confidence in the process, leading to suspicions that short-term budgetary considerations outweigh the long-term public interest. It needs only one party to decide they no longer wish to invest in an eradication for the funding to cease.

When new information comes to light – such as an additional outbreak of Koster’s curse – the decision about whether or not to continue with an eradication should be based on a revised assessment of the case for or against eradication. Our perception is that when the costs of an eradication increase due to new outbreaks or spread, governments are more inclined to pull the plug rather than revisit the assessment, whether or not the potential benefits continue to warrant eradication.

Continuous learning is important, so every eradication attempt should undergo a final review.

Recommendation 21

Before a decision is made by the National Biosecurity Management Group to stop funding an eradication, there should be consultation with stakeholders and revised assessments based on the NEBRA criteria. All documents relevant to the decision should be publicly available. The National Biosecurity Management Group should be required to publish reasons for its decisions and an independent review should be conducted in the spirit of learning from failures.

22. The need for transition to management options

NEBRA is focused only on eradication, and contains no mechanism for other responses – such as containment – if eradication fails or is not feasible. A ‘transition to management’ phase has recently been included in the EPPRD and is apparently being considered for the EADRA. We recommend a similar option be included in NEBRA, as was recommended by the 2015 senate inquiry into environmental biosecurity.⁸⁸ This will be beneficial for facilitating beneficial collaborative action to slow spread, achieve containment, build community capacity for management, fast-track research to fill information gaps and protect important environmental assets if eradication is not feasible. There should also be a mechanism to reconsider decisions to not proceed with an eradication when new information – for example, about techniques or impacts – becomes available that may justify proceeding with an eradication.

Recommendation 22

Include a transition to management framework in NEBRA to facilitate containment and other actions to limit the threat of a nationally significant invasive species if eradicating it is not feasible.

Recommendation 23

Provide a mechanism for reconsideration of eradication if there is new information (such as a change in the feasibility of eradication or the severity of impacts and significance) which indicates that the incursion is likely to satisfy NEBRA criteria.

⁸⁸ The Senate Environment and Communications References Committee (2015)

23. References

- Antony G, Scanlan J, Francis A, et al. (2009) *Revised Benefits and Costs of Eradicating the Red Imported Fire Ant*. Queensland Department of Primary Industries and Fisheries, Brisbane.
- Beale R, Fairbrother J, Inglis A, Trebeck D. (2008) *One Biosecurity – A Working Partnership*. Independent review of Australia's Quarantine and Biosecurity Arrangements. Report to the Australian Government.
- Biosecurity Queensland (2010) *Response Plan for Apis cerana in North Queensland*. Queensland Government Department of Agriculture, Fisheries and Forestry.
- Biosecurity Queensland (2013) *Asian Honey Bees in Queensland*. (<http://www.daff.qld.gov.au/animal-industries/bees/diseases-and-pests/asian-honey-bees>).
- Biosecurity Queensland (2015) *Plan for Transition to Management of Koster's curse (Clidemia hirta)*. Draft, 14 October 2015. Department of Agriculture and Fisheries, Queensland Government.
- Booth C. (2011) Overseas incubators. *Feral Herald* 27. Invasive Species Council.
- Brooks R, Glanville R, Kompas T. (2015) *Queensland Biosecurity Capability Review*. Queensland Government.
- Carnegie A, Cooper K. (2011) Emergency response to the incursion of an exotic myrtaceous rust in Australia. *Australasian Plant Pathology* 40(4): 346-359.
- Carnegie A, Lidbetter J, Walker J, et al. (2010) *Uredo rangellii*, a taxon in the guava rust complex, newly recorded on Myrtaceae in Australia. *Australasian Plant Pathology* 39: 463-466.
- Carnegie A, Lidbetter J. (2012) Rapidly expanding host range for *Puccinia psidii* sensu lato in Australia. *Australasian Plant Pathology* 41(1): 13-29.
- Carnegie AJ, Kathuria A, Pegg GS, et al. (2016) Impact of the invasive rust *Puccinia psidii* (myrtle rust) on native Myrtaceae in natural ecosystems in Australia. *Biological Invasions* 18:127-44.
- Commerford M, Koetz A. (2013) *Ecology and behaviour of Asian honey bees (Apis cerana) in Cairns, Australia*. Asian honey bee Transition to Management Program. Department of Agriculture, Fisheries and Forestry, Queensland Government.
- Consultative Committee on Emergency Plant Pests (2010) For NMG Meeting No 3. , 2 July 2010. (Obtained under FOI).
- Coutinho T, Wingfield M, Alfenas A, Crous P. (1998) Eucalyptus Rust: A Disease with the Potential for Serious International Implications. *Plant Disease* 82:819-825.
- Craik W, Palmer D, Sheldrake R. (2016) *Intergovernmental Agreement on Biosecurity Review Draft Report* (<http://www.agriculture.gov.au/biosecurity/partnerships/nbc/intergovernmental-agreement-on-biosecurity/igabreview/igab-draft-report>).
- CSIRO (2014) Submission to the inquiry into the adequacy of arrangements to prevent the entry

and establishment of invasive species likely to harm Australia's natural environment conducted by the Senate Environment and Communications References Committee.

Deighton L, Higgins E. (2011) Myrtle rust 'biggest threat to ecosystem'. *The Australian* 9 April 2011. (<http://www.theaustralian.com.au/news/health-science/myrtle-rust-biggest-threat-to-ecosystem/story-e6frg8y6-1226036247221>)

Department of Agriculture (2014) Overview of Emergency Management Process. Undated briefing to Invasive Species Council 14 Feb 2014.

Department of Agriculture, Fisheries and Forestry (2011) Communique: National group supports work of Asian Honeybee Coordination Group. 19 July 2011.

Department of the Environment (nd). The reduction in the biodiversity of Australian native fauna and flora due to the red imported fire ant, *Solenopsis invicta* (fire ant). Advice to the Minister for the Environment and Heritage from the Threatened Species Scientific Committee on Amendments to the list of Key Threatening Processes under the Environment Protection and Biodiversity Conservation Act 1999. (<http://www.environment.gov.au/node/14581>)

Environment Australia (2001) *A Directory of Important Wetlands in Australia, Third Edition*. Environment Australia, Canberra.

Gross C. (2015) The buzz about Asian honey bees. *Wildlife Australia* 52(3): 42-44.

Hawke A. (2010) *The Australian Biodiversity Act*. Report of the Independent review of the Environmental Protection and Biodiversity Conservation Act 2009. Department of Environment, Water, Heritage and Arts. Australian Government.

Invasive Species Council (2012) *Keeping Nature Safe – A Proposal for Environment Health Australia*. (<https://invasives.org.au/publications/keeping-nature-safe/>)

Invasive Species Council (2014a) *Stopping New Invasive Species*. Submission to the inquiry into the adequacy of arrangements to prevent the entry and establishment of invasive species likely to harm Australia's natural environment conducted by the Senate Environment and Communications References Committee. (http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/biosecurity/Submissions)

Invasive Species Council (2014b) *Stopping New Invasive Species. Case studies*. Submission to the inquiry into the adequacy of arrangements to prevent the entry and establishment of invasive species likely to harm Australia's natural environment conducted by the Senate Environment and Communications References Committee. (http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/biosecurity/Submissions)

Keith J, Spring D. (2013a) Eradicating the red imported fire ant by numbers. *The Conversation* 24 July 2013. (<http://theconversation.com/eradicating-the-red-imported-fire-ant-by-numbers-16118>).

Keith J, Spring D. (2013b) Agent-based Bayesian approach to monitoring the progress of invasive species eradication programs. *Proceedings of the National Academy of Sciences*

doi/10.1073/pnas.1216146110.

Koetz A. (2012) *Spread of Apis cerana in Australia, 2007 – 2012*. Asian honey bee Transition to Management Program. Queensland government Department of Agriculture, Fisheries and Forestry.

Lach L, Hoskin C. (2015) Too much to lose: Yellow crazy ants in the Wet Tropics. *Wildlife Australia* 52(3): 37-41.

Makinson R. (2014) *Exotic Rusts on Myrtaceae*. Key threatening process nomination under the EPBC Act.

Matthews K. (2011) *A review of Australia's preparedness for the threat of foot-and-mouth disease*. Australian Government Department of Agriculture, Fisheries and Forestry, Canberra.

Mitchell River Watershed Management Group (2015) *Koster's curse poised to devastate regional environment*. Media release 11 September, 2015.

Moloney S, Vanderwoude C. (2002) Red imported fire ants: a threat to eastern Australia's wildlife? *Ecological Management and Restoration* 3(3): 167–75

National Management Group (2010a) *Interim Response Plan Myrtle Rust Incursion*. 2 July 2010. (Obtained under FOI).

National Management Group (2010b) *Myrtle rust in NSW - status review*. (Obtained under FOI).

National Management Group (2010c) National Management Group Out of Session Paper No. 1, 13 May 2010 (Obtained under FOI).

Natural Resources Commission (2014) Submission to the inquiry into the adequacy of arrangements to prevent the entry and establishment of invasive species likely to harm Australia's natural environment conducted by the Senate Environment and Communications References Committee. (http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/biosecurity/Submissions).

NSW Department of Primary Industries (2012) Field hosts of Myrtle rust recorded in NSW. Current at 25 May 2012. (<http://www.dpi.nsw.gov.au/biosecurity/plant/myrtle-rust/hosts>)

NSW Scientific Committee (2011) Key Threatening Process – Final Determination: 'Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae.

Office of Environment and Heritage (2014) Submission to the inquiry into the adequacy of arrangements to prevent the entry and establishment of invasive species likely to harm Australia's natural environment conducted by the Senate Environment and Communications References Committee. (http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/biosecurity/Submissions).

Office of the Chief Plant Protection Officer (2007) *Puccinia psidii*. Forestry, rural and urban biosecurity plan. Pest specific contingency plan. Australian Government Department of

Agriculture, Fisheries and Forestry, Canberra.

Parsons S, ten Have J. (2013) *NEBRA National Significance Assessment for the Smooth newt (Lissotriton vulgaris)*. Assessment by the Australian Bureau of Agricultural and Resource Economics and Sciences. January 2013.

Pegg G, Giblin F, McTaggart A, et al. (2013) *Puccinia psidii* in Queensland, Australia: disease symptoms, distribution and impact. *Plant Pathology* Doi: 10.1111/ppa.12173

Pegg G, Perry S, Carnegie A, Giblin F. (2014) *Managing myrtle rust- a menace to our Myrtaceae*. Presentation. Plant Biosecurity CRC.

Plant Biosecurity Cooperative Research Centre (2014) Submission to the inquiry into the adequacy of arrangements to prevent the entry and establishment of invasive species likely to harm Australia's natural environment conducted by the Senate Environment and Communications References Committee. (http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/biosecurity/Submissions).

Plant Health Australia (2008) Submission to quarantine & biosecurity review.

Plant Health Australia (2008) Submission to Quarantine & Biosecurity Review.

Plant Health Australia (2009) *Threat Specific Contingency Plan – Guava (eucalyptus) rust Puccinia psidii*. Industry biosecurity plan for the nursery and garden industry. Plant Health Australia, Deakin ACT.

Primary Industries Ministerial Council (2006) Records and Resolutions of the Primary Industries Ministerial Council, 20 April 2006

Queensland Government (2013) *Biosecurity Bill 2013 Explanatory Notes*. (<https://www.legislation.qld.gov.au/Bills/54PDF/2013/BiosecurityB13E.pdf>)

Queensland Government (2014) Known plants affected by myrtle rust. (<http://www.business.qld.gov.au/industry/agriculture/land-management/health-pests-weeds-diseases/weeds-and-diseases/identify-myrtle-rust/plants-affected-myrtle-rust>)

The Senate Environment and Communications References Committee (2015) *Environmental Biosecurity*. Commonwealth of Australia.

The Senate Rural Affairs and Transport References Committee (2011) *Science Underpinning the Inability to Eradicate the Asian Honey Bee*. Commonwealth of Australia.

The Senate Rural and Regional Affairs and Transport Legislation Committee (2006) *The Administration by the Department of Agriculture, Fisheries and Forestry of the Citrus Canker Outbreak*. Commonwealth of Australia.

Tingley R, Weeks A, Smart A, et al. (2014) European newts establish in Australia, marking the arrival of a new amphibian order. *Biological Invasions* DOI: 10.1007/s10530-014-0716-z.

Uchida J, Zhong S, Killgore E. (2006) First report of a rust disease on Ohia caused by *Puccinia psidii* in Hawaii. *Plant Disease* 90: 524

Victorian Department of Primary Industries (2013) *NEBRA Preliminary Technical Feasibility Analysis: Smooth Newt (Lissotriton vulgaris)*.

Wingfield M, Roux J, Wingfield B. (2011) Insect pests and pathogens of Australian acacias grown as non-natives – an experiment in biogeography with far-reaching consequences. *Diversity and Distributions* 17: 968–977