Keeping Nature Safe

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Invasive Species Council, June 2012

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invasive species council

Environment Health Australia – keeping nature safe from invasive species

Australia urgently needs a more ecological, coordinated and collaborative approach to environmental biosecurity facilitated by a new national body, as made evident in the 2011 State of Environment report (boxed text).

As one of the top three threats to Australia's biodiversity, invasive species are overwhelming the capacity of current biosecurity systems and are set to worsen under climate change.

As recent environmental and biosecurity reviews have found, invasive species threats to the environment have been neglected in comparison to those threatening industry.[1] Current biosecurity systems were established to protect the relatively few cultivated species that are the basis of plant and animal industries, not the multitudes of species and complex interactions that constitute biodiversity.

Invaders will increasingly dominate and destroy native biota unless biosecurity structures and processes are adapted for the natural environment. It will not be sufficient to bolt on environmental responsibilities to existing structures. The complexity and scale of environmental challenges warrants a comprehensive biosecurity focus.

Here the Invasive Species Council proposes the establishment of Environment Health Australia as an essential element in reforming the nation's biosecurity systems to protect the environment. Through partnerships, planning, research, monitoring and outreach, EHA will facilitate more effective ways to safeguard terrestrial and aquatic environments from invasive pathogens, weeds and pests.

Environment Health Australia would complement existing industry-government biosecurity partnerships (Plant Health Australia and Animal Health Australia) established to protect species used in agriculture, and collaborate with these bodies.

The establishment of Environment Health Australia would lead to:

- Improved environmental biosecurity preparedness and capacity proactively deployed.
- More effective management of environmental invasions through ecological approaches.
- A more biosecurity aware, vigilant and active community.

Australia's 2011 State of the Environment report

Government responses to invasive species are uncoordinated at the national level, reactive, focused on larger animals, biased towards potential impact on primary industry at the expense of the total ecosystem, and critically under-resourced. This is not only poor environmental and heritage management, but poor economics, as prevention and rapid response to new arrivals and incursions can save vast expense over time.[2]

- Improved coordination and collaboration between jurisdictions, agencies and sectors to create a seamless, all-embracing biosecurity net.
- Monitoring of progress in environmental biosecurity.
- Improved biodiversity outcomes to assist Australia in meeting its national and international obligations.
- A stronger focus on invasive species management as an essential adaptation to climate change.
- Significant economic savings as priority environmental pests are subject to timely, efficient and effective control.

This proposal has been developed by the Invasive Species Council, an environmental NGO that campaigns for stronger laws, policies and programs to protect Australian biodiversity from invasive species (see www.invasives.org.au).

Environment Health Australia: A national body for environmental biosecurity with wide community, government, research and business membership to foster ecological, coordinated and collaborative approaches to prevent and reduce environmental harm from invasive species.

Contents

GLOSSARY

AHA: Animal Health Australia

CRC: Cooperative Research Centre

DAFF: Department of Agriculture, Fisheries and Forestry

EHA: Environment Health Australia (proposed)

ENGO: Environmental Non-Government Organisation

EPBC Act: Environment Protection and Biodiversity Conservation Act 1999

ISC: Invasive Species Council Inc

PHA: Plant Health Australia

NEBRA: National Environmental Biosecurity Response Agreement

NRM: Natural Resource Management

PIMC: Primary Industries Ministerial Council

PISC: Primary Industries Standing Committee

Biodiversity: The variability among living organisms from all sources, including, inter alia, terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems (UN Convention on Biological Diversity).

Biosecurity: Protecting the environment, economy, and human health and amenity from the negative impacts of invasive species.

Invasive species: Animals, plants and other organisms (exotic or native) that are introduced by human agency, directly or indirectly, to places outside their natural range where they reproduce and spread and threaten environmental, health, economic or social values.

1. Why Australia needs Environment Health Australia

'The impacts of invasive species are now considered to pose a threat to Australian biodiversity of the same order as habitat loss and climate change.'

– Federal Environment Department (2008)[3]

To counter invasive threats to the environment

Invasive species are deadly and damaging. They have already caused the extinction of more than 40 Australian mammals, birds and frogs, and are second only to land clearing in the numbers of Australian species and ecological communities they threaten (see Box 1)[4]. Invasive species cause extensive degradation and are the most difficult and expensive problem for managers of protected areas. Numbers are escalating as global trade and travel increase. In ecological timeframes, most are recent arrivals and have far to spread. Climate change will extend the range and impacts of many invaders and render species and ecosystems more vulnerable to harm (see Box 2)[5].

Current biosecurity arrangements were devised to protect the comparatively simple systems of primary industries, not the hundreds of thousands of species and their complex interactions that constitute biodiversity. Recent government-commissioned, independent reviews of Australia's national biosecurity laws (the 2008 Beale review) and environment laws (the 2009 Hawke review) emphasised the need for stronger environmental biosecurity. For example, Beale found that[6]:

> '… Australia has a relatively poor knowledge of the biosecurity threats to its natural environment. This is largely a function of the absence of commercial incentives to research and monitor environmental pests and diseases. As a result, the principal responsibility for biosecurity research as it relates to the natural environment lies with governments and the community. These activities have not received a high priority for funding. Unlike incursions that impact on primary production, where active engagement by business is motivated by self-protection, the effort required to respond to an incursion affecting the environment must be provided primarily by governments.'

Australia needs stronger environmental biosecurity to meet its international and national obligations for the environment, such as those under the Convention on Biological Diversity and the Australian Biodiversity Conservation Strategy (see Box 3).

To mobilise community resources

> 'Engagement with business and the general community on biosecurity must occur consistently and continually at several levels, from policy setting through co-regulatory alternatives to actions by individuals and companies, before, at and after the border.'
>
> *– Beale review of biosecurity and quarantine (2008)*
>
> 'Engaging all Australians is fundamental if we are to succeed in building ecosystem resilience in a changing climate.'
>
> *– Australia's Biodiversity Conservation Strategy 2010–2030*

Effective biosecurity requires the collaboration and cooperation of government, community, research and industry sectors (see Box 4). Community sectors provide extensive biosecurity services in land management, bush regeneration, feral animal control and threatened species conservation but their energy and expertise is yet to be comprehensively tapped in setting policy directions and shaping biosecurity programs. Governments have set up industry-government biosecurity partnerships through Animal Health Australia and Plant Health Australia (see Box 5). Similar arrangements with community sectors are required for environmental biosecurity to engender community involvement at all levels in biosecurity.

Any suggestions that the existing industry partnership structure can fill the gaps in environmental biosecurity are unrealistic and inappropriate (see Box 6).

In part because of institutional barriers and insufficient capacity, environment NGOs do not focus on biosecurity reform to the extent warranted by the severity of invasive species threats to the environment. The proposed EHA would facilitate a stronger NGO focus that would benefit all biosecurity sectors.

To ensure fairness and promote the public good

> 'Environmental biosecurity issues have not traditionally received the same attention as the potential impacts of pathogens, diseases, weeds or pests on primary production. … The new biosecurity legislation should require that the environment must be given equal consideration alongside human health and economic and social considerations…'
>
> *– Hawke review of the EPBC Act (2009)*

Although environmental biosecurity is more challenging than that for industry – with more threats, more species at risk, more stakeholders, and less knowledge – more public resources are dedicated to protecting private industries than the environment

BOX 1. LOSSES FROM ENVIRONMENTAL INVASIONS IN AUSTRALIA

Already gone: Invasive species are the main cause of animal extinctions in Australia and the reason why Australia has the highest recent rate of mammal extinctions world-wide. Invasive species have been responsible for about one-third of Australian extinctions since European colonisation, including:

- 24 mammals due to fox and cat predation with rabbits probably contributing (9 more mammals extirpated from the mainland survive only on predator-free islands).
- 2 mammals due to parasites carried by black rats.
- 13 island birds due to black rats, cats, pigs, introduced birds and honeybees.
- 3-5 frogs due to chytrid fungus.
- Several invertebrates, eg. 2 snails and 10 beetles from Lord Howe Island due to black rats.

On their way out: Invasive species are a major threat to the survival of hundreds more species, including close to 60% of critically endangered species and more than 80% of nationally threatened ecological communities. Close to 80% of freshwater fish at risk are threatened by invaders. Invasive species are second only to habitat loss as a current threat to biodiversity (with climate change a looming major threat), and the major threat for island biodiversity (increasingly important as repositories of biodiversity no longer extant on the mainland).

Newly or future threatened: The invasive threats from exotic species already in Australia are escalating.

> 'Australia is in the throes of ecological upheaval, and most of this change is coming … from old pests tightening their grip on the land. It is important to understand that most pests in Australia have yet to occupy their full range: they are still migrating outwards or increasing in density (infilling) or both.'
> *– Tim Low (1999) Feral Future*[11]

There are grave fears for dozens of animal species if foxes spread in Tasmania. Hundreds of plants are at risk as the plant pathogens *Phytophthora cinnamomi* and myrtle rust spread. With more exotic plant species in Australia than there are native plants, the burden of invasive weeds will continue to grow. Some animal invaders (northern Pacific seastars and deer, for example) are also at an early stage of invasion. New invaders will continue to arrive as collateral costs of global trade and travel. Recently arrived invaders – red imported fire ants, yellow crazy ants, Asian honeybees and myrtle rust – are harbingers of many more to come. Unless we take stronger measures now, the huge legacy debt of invasive species will increase beyond the capacity of future generations to pay for their management.

from invasive species. Until recently, invasive species were viewed mostly as an agricultural problem. Current biosecurity arrangements still reflect that history.

The community relies on governments to invest resources on their behalf to protect the environment for the public good. There needs to be more equity for the environment in public resources dedicated to biosecurity. Just as Federal and State/Territory Governments support a range of industry-government partnerships, such as through PHA and AHA, so they should support productive, public good partnerships with the environment sector through the proposed Environment Health Australia.

To secure economic and social benefits

> '… in light of the environmental impacts and production losses due to weeds and other invasive species, it is expected that any reforms should engender a high return on the investment.'
> *– Hawke review of the EPBC Act (2009)*

Improving environmental biosecurity will bring substantial economic and social advantages. A healthy environment is a prerequisite for a healthy economy, including for animal and plant industries. Many environmental invasions also harm the economy, human health and amenity. Prevention and rapid eradication are the most cost-effective approaches to invasive species but current biosecurity systems struggle to deliver on this. Stronger community involvement in surveillance, control and monitoring of invasive species is of great economic benefit. Governments committed to biosecurity will also benefit from having stronger community awareness and support for policies and programs. Industries will benefit from greater harmonisation between jurisdictions and the potential for cooperation with the community sector.

2. Proposed functions of Environment Health Australia

'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**.' [bolding ours]

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

Environment Health Australia would plan, coordinate, inform, shape and help deliver stronger biosecurity arrangements to protect Australia's environment, with functions including the following.

Create strong environmental biosecurity foundations

- Develop and promote more ecologically informed approaches to protect native species, ecological communities and ecological processes from invasive species.

Improve Australia's biosecurity preparedness

- Develop biosecurity plans for high-risk potential environmental invaders and for high-value areas at particular risk from new incursions, such as islands.
- Develop surveillance protocols for environmental incursions.
- Develop strategies to limit the exacerbation of invasive species impacts under climate change.
- Undertake regular foresighting and reporting to identify emerging and future threats.
- Provide advice on environmental biosecurity for relevant government policies, including on invasive species, climate change, mining and vegetation management.

Promote effective responses to environmental invasions

- Participate in National Environmental Biosecurity Response Agreement (NEBRA) processes.[7]
- Lead development of AUSENVPLANS to establish detailed emergency response arrangements[i].
- Commission, co-ordinate, facilitate and manage nationally agreed environmental health and biosecurity projects.
- Assist in developing and delivering training for biosecurity responses to environmental incursions.

Enhance community awareness, vigilance and action in biosecurity

- Build public awareness of environmental biosecurity.
- Support the community to become involved in biosecurity policy development and implementation.
- Develop best practice communication and community activation approaches in environmental biosecurity.
- Promote adoption of environmental biosecurity best-practice by all land managers.
- Harness the financial, intellectual and in-kind support of foundations, corporations and NGOs.

Improve environmental biosecurity capacity – knowledge, people and resources

- Identify and prioritise research needs for environmental biosecurity.
- Collect relevant economic data and develop economic rationales and costings for managing environmental incursions.
- Identify and prioritise invasive species management actions which can be implemented to deliver carbon offsets.
- Develop, with state and federal regulatory partners, an invasive species offsets policy that directs offset payments to mitigate priority invasive species threats.

Improve coordination and collaboration between jurisdictions, agencies and sectors

- Facilitate governments, community groups and researchers to work together to improve environmental health in Australia.
- Cooperate and collaborate with industry biosecurity bodies to jointly develop joint responses and conduct research where invaders have both environmental and industry impacts.

i) The NEBRA sets out emergency response arrangements, including cost-sharing arrangements, for biosecurity incidents which predominantly affect the environment and/or social amenity, and where the response is largely for public benefit. This includes marine pest incidents.

BOX 2. CLIMATE CHANGE AND INVASIVE SPECIES

> 'The ultimate outcomes are expected to be declines in biodiversity favouring weed and pest species (a few native, most introduced) at the expense of the rich variety that has occurred naturally across Australia.'
>
> *– The Garnaut Climate Change Review (2008)*[12]

Warmer climates, more extreme weather events, changed fire regimes, stress on native species and ecosystems, and climate-driven activities, such as the introduction of new pasture and garden plant varieties and agricultural development in new areas, are likely to benefit various invasive species to the detriment of the native biota. In many cases the impacts of invasive species benefiting from climate change are likely to exceed the direct impacts of climate change.[13]

One of the most effective ways of increasing the resilience of native species to climate change is to protect them from invasive species by acting now to prevent the introduction and spread of invasive species likely to flourish under climate change.

Carbon and invasive species

Invasive species contribute to climate change by increasing greenhouse gas emissions and reducing carbon sequestration. Examples in Australia operate on a landscape scale and include:

- Invasive plant pathogens – myrtle rust (*Puccinia psidii*) and *Phythophthora cinnamomi* in particular – reduce carbon sequestration by killing and damaging plants.
- Feral herbivores such as camels and water buffalo reduce carbon sequestration by killing and damaging plants and emit potent greenhouse gases (methane).[14]
- High biomass weeds such as gamba grass (*Andropogon gayanus*) and other invasive pasture grasses can transform ecosystems, fuelling fires that kill trees and release stored carbon into the atmosphere.[15]

Preventing and controlling invasive species will have numerous carbon benefits that should be considered for funding under carbon offset schemes.

Photo credit: Daintree National Park, Queensland – Creative Commons Licence, Diliff.

Monitor and report on Australia's progress in environmental biosecurity

- Develop indicators for monitoring progress on meeting environmental biosecurity targets.
- Produce regular reports to track national performance in reducing impacts and costs of invasive species on the Australian environment, and contribute data and analysis to the State of the Environment report and national environmental accounts.
- Undertake regular assessments of Australia's progress in meeting environmental biosecurity obligations, including the International Convention on Biodiversity and Australia's Biodiversity Conservation Strategy.

3. Structure & membership of Environment Health Australia

Environment Health Australia would be structured to foster partnerships between major participants and stakeholders in environmental biosecurity and promote collaboration with industry bodies where there are shared interests.

This proposal does not nominate a particular structure for EHA. One potential model is that of Plant Health Australia and Animal Health Australia, which are public non-profit companies, with industry and government members and an elected board (see Box 5).

It will be vital to ensure that the structure and protocols foster genuine partnerships. This requires that the community sector is supported as a major participant.

Potential members of EHA include:

- Federal Government: environment and biosecurity agencies.
- State/Territory Governments: environment and biosecurity agencies.
- Environmental NGOs with an environmental biosecurity focus.
- Indigenous land management organisations.
- NRM and conservation land management organisations.
- Research institutions focused on biosecurity and ecology, eg. CSIRO, Invasive Animals CRC, Plant Biosecurity CRC, Australian Centre of Excellence for Risk Analysis, The Ecology Centre.
- Professional bodies for people involved in environmental biosecurity (eg. weed societies, Ecological Society of Australia, Australasian Plant Pathology Society).
- Environmental and allied primary production industry bodies: eg. in ecotourism, ecological restoration, zoo and wildlife industries, botanic gardens, seed banks, bush foods, bush oils and essences, as well as apiarists, among others.

BOX 3. INTERNATIONAL AND NATIONAL OBLIGATIONS FOR ENVIRONMENTAL BIOSECURITY

Article 8(h) of the international Convention on Biological Diversity states that:

> *Each contracting Party shall, as far as possible and as appropriate, prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species.*

Target 9 of the Strategic Plan for Biodiversity 2011-2020 (under the Convention on Biological Diversity) is:

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

Target 7 of the Australian Biodiversity Conservation Strategy is:

> *By 2015, reduce by at least 10% the impacts of invasive species on threatened species and ecological communities in terrestrial, aquatic and marine environments.*

Photo credit: Outback South Australia – Creative Commons Licence, Zanka.

BOX 4. THE IMPERATIVE FOR COLLABORATION AND ENGAGEMENT

The Beale review of Australian biosecurity recognised the importance of community involvement in biosecurity.

> *Engagement with business and the general community on biosecurity must occur consistently and continually at several levels, from policy setting through co- regulatory alternatives to actions by individuals and companies, before, at and after the border.*
>
> *The message of One Biosecurity: a working partnership needs to be made available to a wide audience. Effective awareness campaigns and education that target all facets of the biosecurity continuum are essential, but particularly focusing on areas that have lacked representation in the past. These include aquatic and environmental biosecurity, travellers from non-traditional countries and Internet business transactions. This will require a more concerted involvement from the general community, the environment sector, organisations and businesses with a direct interest in the aquatic environment, airlines and travel agents, and Internet business providers.*

The need for collaboration is also stated in Australia's Biodiversity Conservation Strategy 2010–2030:

> *Engaging all Australians is fundamental if we are to succeed in building ecosystem resilience in a changing climate.'*
>
> *'Cooperation between different parts of the community is essential to increase effective engagement in biodiversity conservation. … [P]artnerships between sectors are necessary for successful outcomes.'*

Effective community participation is crucial to reforming environmental biosecurity and unlocking efficiencies not achievable by government alone. Major government reforms rarely occur without strong community advocacy and support. This is particularly the case for environmental reforms, where there are often commercial interests opposing reforms. Fostering involvement of the community sector and supporting capacity building to promote productive input is very much in the interests of any government committed to environmental biosecurity.

4. The need for a dedicated environmental focus

'The approach used to manage biosecurity risks to human health, food safety and the environment (including aquatic environments) needs to be consistent with the approach used to address risks that primarily affect the agriculture sector. However, comprehensive analysis will be required to guide precisely the measures to be applied along the continuum against specific risk pathways.'

– Beale review of biosecurity (2008)

This proposal is supportive of the 'one biosecurity' approach recommended by the Beale review that envisions a 'seamless' cross-sectoral, cross-jurisdictional approach to biosecurity. This requires, however, recognition of the distinctive requirements of environmental biosecurity. Many invasive species have both economic and environmental impacts, and sometimes social impacts as well, warranting a joint approach. But protecting the natural environment differs in many ways from protecting industry assets and requires a distinctive ecologically based approach to biosecurity. Environmental biosecurity cannot just be a bolt-on to existing industry approaches.

The values to be protected – biodiversity and environmental health: Conservation requires a biosecurity focus on the hundreds of thousands of species, from microbes to macropods, and their populations and interactions that constitute ecosystems and provide ecosystem services. In contrast, industry biosecurity is mostly focused on protecting particular species that are of economic value and number no more than a few dozen (except for the nursery industry which uses a wider range of species). The values at stake in conservation are mostly not replaceable whereas species or cultivars of value to industry can usually be replaced by new breeds or new enterprises.

Invasive species threats – scale and complexity: Because of the diversity of taxa, ecosystems and ecosystem processes to protect, there are far more invasive species that are of threat or potential threat to environmental values. The threats are more complex for they involve direct and indirect impacts arising from interactions between species. For example, the threat to industry of myrtle/eucalyptus rust consists of the impacts on individual cultivated plant species but in the environment the threat consists of direct impacts on plant species, indirect impacts on dependent wildlife, impacts on ecosystem processes (such as fire regimes and carbon sequestration), interactions with other threats and the effects of altered competition between species.

State of knowledge: Much more is known about cultivated species and the invasive threats to them than about biodiversity and invasive species threats. The lack of knowledge about our native biota, particularly invertebrates and microbes, means that most invasive species impacts are not documented or monitored.

> 'Little is known even about the taxonomy of fungi in Australia, with far less about 10 per cent of species scientifically documented... Many non-vascular plants and fungi arrive each year. It may be many years before their effects are felt in Australian ecosystems. As a consequence, lists of potentially damaging invaders rarely make reference to fungi.'
>
> *– Burgman et al. (2009)*[8]

Predictability and timeframes: While impacts on individual cultivated species can be predicted with reasonable accuracy, there are high levels of uncertainty in predicting impacts in the natural environment due to complex interactions, long timeframes (millennia) and lack of knowledge. Many impacts are synergistic with other existing and emerging threats. Climate change in particular increases the likelihood of previously benign species causing harm. Invasive impacts may not be observed for decades due to lag effects, lack of monitoring or their insidious nature. The combination of great uncertainties, long timeframes and limited management options warrants a highly precautionary approach in environmental biosecurity.

> 'Changes in attitude to invasive species usually lag behind their environmental effects, illustrated by one of the most damaging invasive species in Australia, Cinnamon or root rot fungus (*Phytophthora cinnamomi*). ... It was probably first established in Western Australia from a tropical source in the early 1900s. It did not spread substantially until the 1940s and coordinated measures to control it were not implemented until the 1970s. The Cinnamon fungus exemplifies the inefficiencies of a control approach that is reactive to a proven threat, rather than defensive of ecosystems.'
>
> *– Burgman et al. (2009)*

Management approaches and options: There are many more management options in relatively simple, delimited agricultural systems than there are in complex natural environments, including areas difficult to access such as islands. For example, in response to myrtle/eucalyptus rust, plant industries can use fungicides, breed resistant varieties or use different species, none of which are options for managing the natural environment. Weeds cannot be controlled with broadacre mechanical or chemical control methods in many natural situations. Most post-border biosecurity policy focuses on controlling or proscribing a small subset of invasive species that are causing proven harm, which is inconsistent with ecological uncertainties and complexities. There are commercial incentives

BOX 5. PLANT HEALTH AUSTRALIA (PHA) AND ANIMAL HEALTH AUSTRALIA (AHA)

PHA and AHA are not-for-profit companies established in 2000 and 1996 respectively to coordinate government-industry partnerships to protect plant and animal industries from incursions.

Plant Health Australia has 31 industry and 8 government members. Its strategic objective is to 'ensure a strong biosecurity partnership with government and industry minimises pest impacts on Australia, enhances market access and contributes to industry and community sustainability.'

Animal Health Australia has 16 industry and 8 government members. Its objectives are to 'strengthen Australia's national animal health system and maximise confidence in the safety and quality of Australia's livestock products in domestic and overseas markets'.

PHA and AHA activities are funded by member subscriptions – with about one-third contributed by industry members and two-thirds by government members – industry levies and special project grants.

PHA and AHA administer guidelines (PLANTPLAN and AUSVETPLAN) and deeds of agreement (Emergency Plant Pest Response Deed and The Emergency Animal Disease Response Agreement) outlining arrangements for responding to emergency incursions. The deeds specify that costs of eradicating emergency pests are to be shared by government and industry based on an assessment of the relative private and public benefits of eradication. PHA and AHA also develop contingency plans for particular high priority pest threats. AHA and PHA also have some environmental functions – for example, wildlife is included in AHA's disease surveillance program and contingency plans by PHA include environmental actions where economic pests also have environmental impacts.

AHA and PHA do not generally address policy and priority setting for established pests, a function that is essential for any environmental biosecurity body.

Photo credit: Native plant nursery in Ballarat, Victoria – John Sampson.

for industry management of invasive species but environmental biosecurity relies on government and community investment for the public good.

Stakeholders and resources: A multitude of stakeholders, often with conflicting agendas, make environmental biosecurity a much more socially and politically challenging policy area than industry biosecurity. Commercial incentives and government support also mean that industry biosecurity is much better resourced than environmental biosecurity. It is in the public interest for governments to invest in increasing the capacity of the community, including environmental NGOs, to fully participate in biosecurity.

Developing the concepts and approaches necessary for effective environmental biosecurity requires the establishment of an entity such as EHA.

5. How Environment Health Australia fits into the biosecurity landscape

Both the Beale review of biosecurity and the Hawke review of the EPBC Act have emphasised the need for stronger environmental biosecurity (see Box 8). Achieving this requires bringing together the right people informed by the best science and committed to collaboratively addressing environmental biosecurity priorities. EHA would fill gaps within the existing biosecurity framework and complement existing entities such as AHA and PHA (see Figure 1 and Figure 2). The benefits and opportunities that EHA would bring for various sectors are summarised.

Australian governments

Most biosecurity functions in governments are managed by primary industries agencies, with environmental agencies managing the harmful impacts of established invasive species on biodiversity, primarily in protected areas. There is a widely acknowledged need for greater coordination within and between governments. Both biosecurity and environmental agencies would benefit as:

- Participants in EHA, with cross-sectoral and cross-jurisdictional partnerships to tackle environmental biosecurity priorities.
- Recipients of many services, including a much more vigilant and active community at all levels of biosecurity.

Environment Health Australia would participate in or assist the operations of a diverse array of national biosecurity committees and groups, including the weeds, vertebrate pests and marine pests committees, and national management groups.

Industry

Agricultural industries are well-serviced through a range of bodies, such as their membership of Plant Health Australia and Animal Health Australia. EHA would complement the functions of bodies such as PHA and AHA, and industries would benefit as:

- Participants in EHA through the membership of environmental and allied primary production industry bodies.
- Partners in responding to incursions with environmental and industry impacts and collaborators in other projects of mutual benefit.
- Beneficiaries from stronger environmental biosecurity.

Research organisations

Australia's research community would benefit from the EHA proposal with more research commissioned to understand and address threats and more effective implementation of research outcomes in management actions. The establishment of EHA would serve as a catalyst for posing research questions of priority relevance to environmental biosecurity. Research organisations would benefit as:

- Participants in EHA, shaping biosecurity priorities.
- Collaborators in projects with indigenous, community and environmental groups.
- Service providers in EHA-commissioned research.

Community

Currently, community sectors are mostly involved in on-ground control of invasive species but have little role in shaping biosecurity policies and priorities (see Box 6). There has been only a limited role for these sectors in most biosecurity institutions, in contrast to the active role they play in other environmental policy areas. While industry bodies have a commercial incentive to participate in biosecurity, the community sector needs support to attain the knowledge and resource capacity necessary for productive participation in biosecurity. Community sectors would benefit as:

- Participants in EHA, with the potential for partnerships and influence in biosecurity processes.
- Beneficiaries of stronger environmental biosecurity, protection of the public interest and involvement of the wider community in biosecurity.

Environmental Health Australia would also participate in and collaborate with international agencies and groups, such as the United Nations Environment Program, Convention on Biodiversity, International Union for the Conservation of Nature, and the Invasive Species Specialist Group.

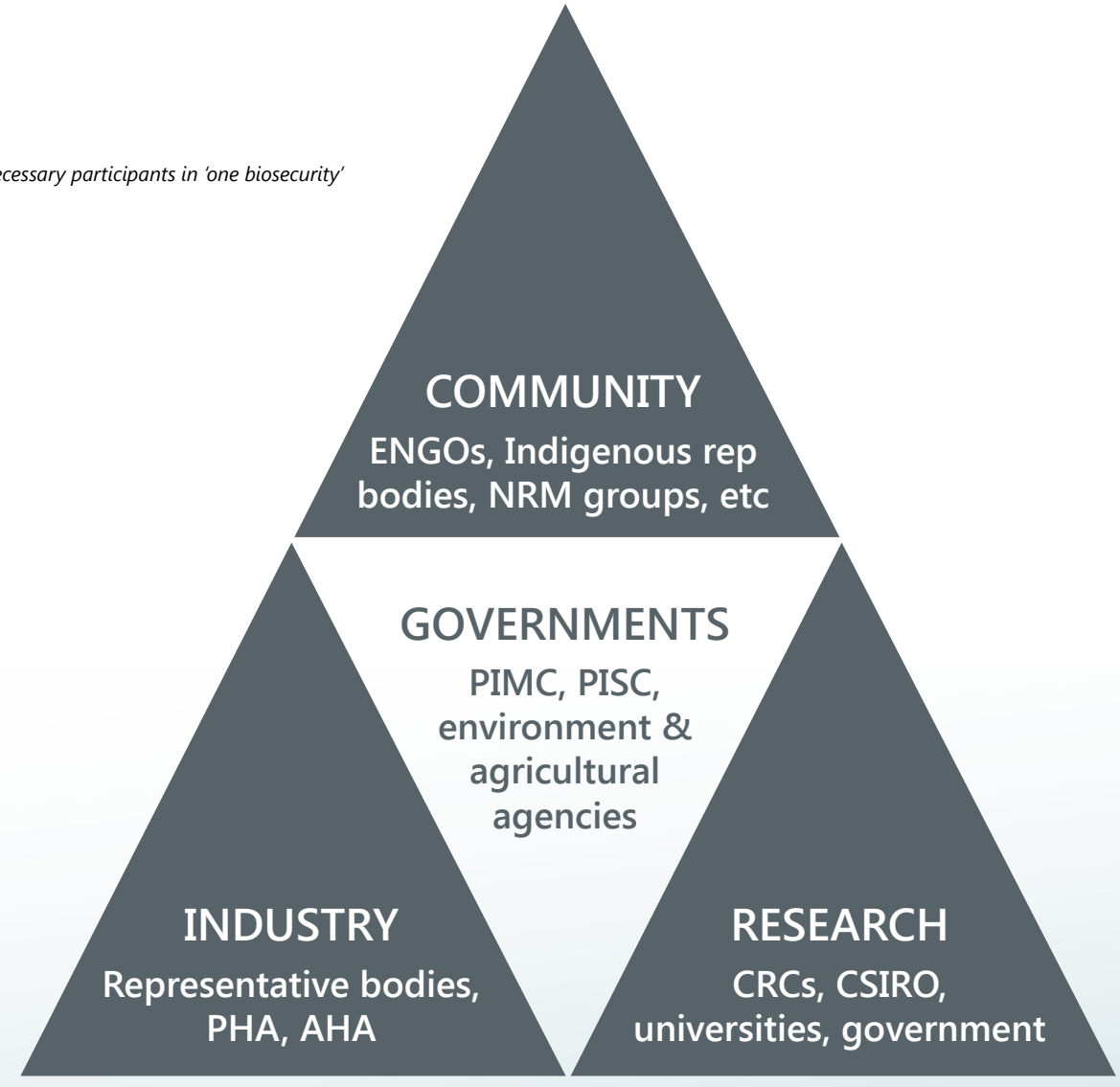
BOX 6. THE ENVIRONMENT NEEDS ITS OWN BIOSECURITY ORGANISATION

It has been proposed that the industry-focused Animal Health Australia and Plant Health Australia should encompass environmental pests and diseases.[16] However, this change would still not address weeds, pest animals, marine pests and invasive invertebrates (such as ants). Further, this would not accord environmental threats the priority and specific focus they require, and would exclude community sectors from an effective partnership role in environmental biosecurity. There may also be conflicts of interest when organisms valued by industry are an environmental threat. The environment sector would strongly oppose environmental biosecurity being subsumed within industry bodies.

PHA and AHA were set up to service their membership of industry organisations (a total of about 50 between them). The existing industry members are not likely to favour equivalence with an environmental membership or an environmental focus. In their submission to the Beale Review, PHA called for an equivalent body to service the needs of environmental biosecurity (see quote in section 2).

Photo credit: Grasslands of south-eastern Australia – Dr Sarah Bekessy.

Figure 1 The necessary participants in 'one biosecurity'



6. Financial issues & options

[T]he principal responsibility for biosecurity research as it relates to the natural environment lies with governments and the community. These activities have not received a high priority for funding.

– Beale review of biosecurity and quarantine (2008)

The establishment of Environment Health Australia is clearly in the public interest and its functions are vital to Australia meeting national and international environmental and biosecurity goals. However, budgetary constraints may be perceived as an impediment to this proposal. Against this, the Invasive Species Council cites the following compelling reasons for EHA to be prioritised for public funding:

- It would fulfill vital environmental and biosecurity functions recognised in several government reviews as major gaps.
- Improved biosecurity is essential to meet national conservation goals and mitigate high priority environmental threats.
- Environmental biosecurity lags industry biosecurity in preparedness, research, stakeholder engagement and many other respects yet receives less public funding.
- Government expenditure in biosecurity should give priority to public good outcomes.

The level of funding required annually for EHA would be only a small proportion of that provided over the past few years to assist industry biosecurity. The $390 million spent by governments on responding to the equine influenza outbreak[9] or the more than $500 million the Federal Government says it will commit to foot and mouth disease management (see next quote) could fund EHA for many years.

Appropriate resourcing for environmental biosecurity

> 'The Australian Government has committed to invest more than half a billion dollars to prepare for and manage the [foot and mouth disease] threat… Australia has in place detailed contingency plans and a comprehensive whole-of-government approach to managing animal health emergencies that are designed to ensure that resources from a wide range of agencies are available.'
>
> *– Department of Agriculture, Fisheries and Forestry[10]*

We have not provided costings for this proposal. Although costings should be derived from proposed functions, an obvious starting point for an estimate is the amount of funding for equivalent functions for industry biosecurity.

There can be little question that governments should fund environmental biosecurity to a greater extent than they fund industry biosecurity – given the greater challenges, the catch-up needed, the lack of commercial incentives for environmental biosecurity and the public good at stake.

Although environmental biosecurity lags well behind industry biosecurity, more public resources are dedicated to industry biosecurity than to environmental biosecurity. Industries have in place contingency plans and surveillance operations for several high priority threats to plant and animal industries, funded substantially by governments. The contingency plans for plant industries alone cover more than 100 pest species. The environment needs a similar level of preparedness.

Public funding for industry biosecurity includes that for Plant Health Australia and Animal Health Australia, contributions to industry biosecurity research bodies and projects, and management of particular incursions. No detailed information is available about the relative extent of public funding of environmental and industry biosecurity (and there are many overlaps). State and Federal Governments contribute about $4 million a year in operational funds to AHA and PHA, as well as project funding. Total AHA and PHA revenue for 2009-10 was about $20 million, and they employ more than 40 staff. The proposed scope of EHA functions is broader than for AHA and PHA. In advance of detailed costing, it is reasonable to expect that base EHA funding would be at least equivalent to that for AHA and PHA.

There are strong economic rationales for the proposed investment. EHA would facilitate more cost-effective approaches to environmental biosecurity that ensure best value for investment of public funds. There are synergistic benefits for the economy in collaborative environmental and industry biosecurity efforts. There are significant community human resources, for example with an increasing population of retirees that can contribute if given the appropriate support. Finally, the maintenance of environmental health is also of great economic benefit. Investments insuring the health of our greatest national asset, the environment, make sound business sense.

Potential sources of funding

Environment Health Australia would be reliant on public funding for much of its budget and it is appropriate that this be so given the public good outcomes. Potential sources of funding include the following.

- Federal and State/Territory Government contributions from general revenue, in the same way that PHA, AHA, and research and development corporations, are funded.
- The Biodiversity Fund, to be funded from the carbon tax to protect Australian biodiversity from climate change: the exacerbation of invasive species impacts is likely to be one of the major threats to biodiversity under climate change (see Box 7).
- Carbon offsets: Managing invasive species can prevent

BOX 7. GAPS IN ENVIRONMENTAL BIOSECURITY ENGAGEMENT

> 'Engagement with business and the general community on biosecurity must occur consistently and continually at several levels, from policy setting through coregulatory alternatives to actions by individuals and companies, before, at and after the border.'
>
> *– Beale review of biosecurity (2008)*

Many biosecurity processes with major conservation implications do not effectively engage environmental stakeholders.

Primary industry agencies have carriage over most biosecurity policy at national and state/territory levels. The mission and culture of these agencies is, not surprisingly, oriented more towards industry than biodiversity. For example, the Federal Department of Agriculture, Fisheries and Forestry's mission is 'Increasing the profitability, competitiveness and sustainability of Australian agricultural, fisheries, food and forestry industries and enhancing the natural resource base to achieve greater national wealth and stronger rural and regional communities.'

Similarly, federal and state/territory government biosecurity agreements have been mostly developed by the Primary Industries Ministerial Council (PIMC), whose mission is 'to develop and promote sustainable, innovative and profitable agriculture, fisheries/ aquaculture, and food and forestry industries'. Some inter-governmental biosecurity committees reported to the Natural Resources Management Ministerial Council, but this Council has been discontinued so that all inter-governmental policy is now under PIMC.

Although primary industries agencies acknowledge responsibility for environmental biosecurity, in practice they give priority to industry biosecurity goals and have much stronger engagement with industry stakeholders. For example, the membership of the Federal Government's Biosecurity Advisory Council is dominated by people from industry or involved in industry-focused research. Just one of eight members has a strong environmental background, while six have an agricultural focus. None are from the environment NGO sector. This situation is replicated on various state/territory based biosecurity committees. The 2009 Hawke review of the EPBC Act recognised this as a 'cultural' bias:

> *'A risk of integrating environmental, health and primary production considerations under a single biosecurity regime is that environmental outcomes could be compromised if the primary focus remains on trade and primary production – a problem of "culture"'.*

Through AHA and PHA, Rural Industry Research and Development bodies, and through other representative bodies, industry participants have a voice within many biosecurity processes in which there is no equivalent environmental representation. For example, they are involved in decisions about emergency responses to incursions, and have a voice in national committees under PIMC, such as the Animal Health Committee, Plant Health Committee, Australian Weeds Committee and Vertebrate Pests Committee, with AHA or PHA involved either as a member or observer. There are no mechanisms for equivalent engagement of the community environmental sector.

In recognition that environmental biosecurity requires a stronger focus, federal and state/territory governments have developed a National Environmental Biosecurity Response Agreement. This sets out 'emergency response arrangements, including cost-sharing arrangements, to respond to nationally significant biosecurity incidents that have substantial negative impacts on the environment and/or social amenity—where the response is for the public good.'[17] There was no consultation with the community environmental sector in the development of the Agreement, and there are no mechanisms for involvement in decision-making under it.

As well as institutional and cultural impediments to engagement of the environmental community sector, there are capacity and awareness limitations within the environmental NGO sector and failures to sufficiently prioritise biosecurity as a focus of reform. The proposed EHA would provide a means and resources to assist in collectively overcoming such impediments.

Photo credit: Box-Ironbark Forest – John Sampson.

and reduce greenhouse gas emissions (see Box 7).

- Development offsets: More effective management of invasive species is a worthy focus for offsets required as part of development approvals under federal and state regimes (as proposed in section 2, EHA could function to direct offsets to the most appropriate environmental biosecurity projects)
- Industry levies: Consistent with the 'polluter pays' principle, the industries responsible for and benefiting from introductions of environmentally harmful invaders should be required to contribute to mitigating the environmental damage caused.
- Philanthropic funding: Some EHA projects may attract donations.
- Memberships and in-kind support: Some members with commercial activities may be able to pay a subscription. Other members may contribute in-kind services.

BOX 8. GAPS IN ENVIRONMENTAL BIOSECURITY

Many authorities have acknowledged substantial gaps in environmental policy, including CSIRO, the Beale review and the Hawke review.

'... we lack national capacity to respond to pathogen and invertebrate threats to environmental biosecurity ... a holistic approach covering all biosecurity threat types and both industry and environmental sectors developed through regular reviews of risk prioritisation ...will be required. Research and development relevant to urban and environmental risks, as identified under AusBIOSEC, are unlikely to attract industry support.'

– CSIRO submission to the Beale review of biosecurity and quarantine (2008).

'...Australia has a relatively poor knowledge of the biosecurity threats to its natural environment. This is largely a function of the absence of commercial incentives to research and monitor environmental pests and diseases. As a result, the principal responsibility for biosecurity research as it relates to the natural environment lies with governments and the community. These activities have not received a high priority for funding. Unlike incursions that impact on primary production, where active engagement by business is motivated by self-protection, the effort required to respond to an incursion affecting the environment must be provided primarily by governments.

– Beale review of biosecurity and quarantine (2008).

'... the environmental risk of importing live plants (including reproductive material such as viable seeds) should be given equal weight to human health, social and primary production risks.'

'Currently, several thousand plant species persist as ornamentals or as naturalised populations in urban settings. They represent a vast reservoir of potential future problems. Movement of these species within Australia is effectively unconstrained and response to the issues they raise varies substantially between the States and Territories.'

– Hawke review of the EPBC Act (2009)

The Committee is reassured at the adequacy of the emergency arrangements for dealing with incursions that might adversely affect primary industries. It notes, however, that incursions of an environmental impact seem to have slipped through the cracks. Timely action against environmental pest incursions is equally important.

– Senate Environment Communications, Information Technology and the Arts References Committee (2004)[18]

Photo credit: Wilsons Promontory – David Neilson.

7. Conclusion

'The cost of weeds to agricultural industries is estimated at about $4 billion a year. The cost of weeds to the environment is difficult to calculate but could be greater than the estimated cost to agricultural industries.'

- Federal Department of Agriculture, Fisheries & Forestry

It has been said that the historical bias of Australia's biosecurity system is a result of agricultural costs being so easy to measure whilst environmental values do not readily yield to economic analysis.

The Invasive Species Council recommends the establishment of Environment Health Australia as an overdue and essential basis for protecting our irreplaceable and priceless natural assets. By facilitating partnerships, improving preparedness, and developing ecologically based approaches to environmental biosecurity, Environment Health Australia will help keep biodiversity safer from invasive species and limit the management burden we leave to future generations. It would properly be funded by governments as a public good. That investment would be multiplied many times over in the benefits to Australia of much greater community involvement in biosecurity and stronger protection of nature.

Timely establishment of Environment Health Australia is essential to help the nation achieve a better mark in our next State of Environment report card in 2016.

Australia's 2011 State of Environment 'Report Card'

Environment component	Impact of invasive species	Trend	Management effectiveness: outputs & outcomes
Biodiversity	Very high	Deteriorating	Ineffective
Heritage values	Very high	Deteriorating	NA
Inland water environments	High	Deteriorating	Partially effective
Land environment	High	Deteriorating	Partially effective
Antarctic terrestrial environment	High	Unclear	Effective

The Australia State of the Environment 2011 report clearly concludes that Australia is failing to manage invasive species. Unless this deteriorating trajectory is reversed, biodiversity will continue to decline and environmental degradation will worsen.

8. References & notes

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