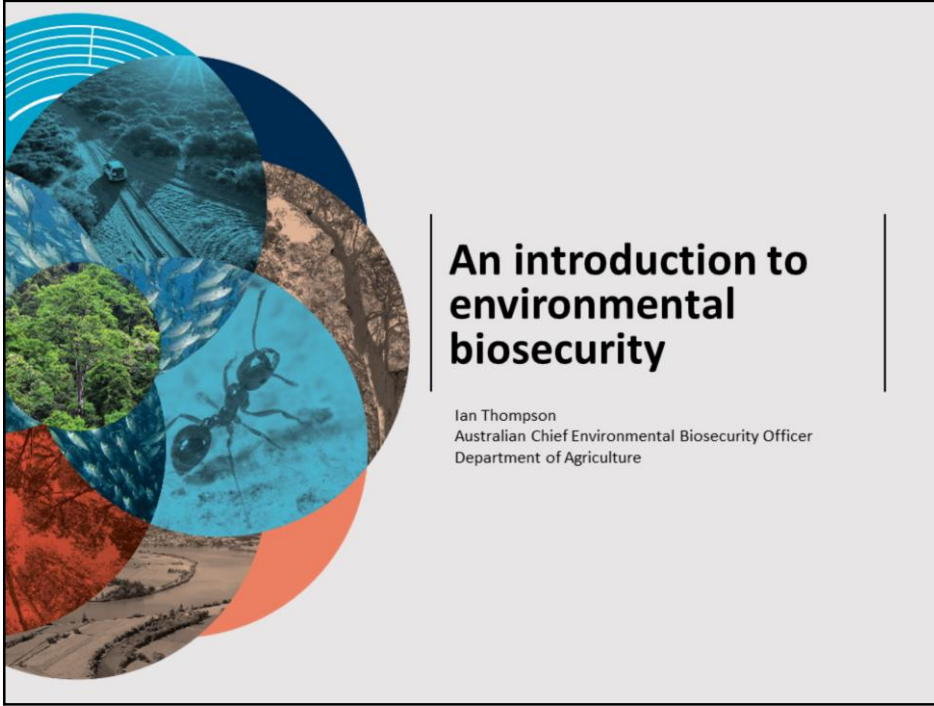




An introduction to environmental biosecurity

Ian Thompson
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What is
environmental
biosecurity?





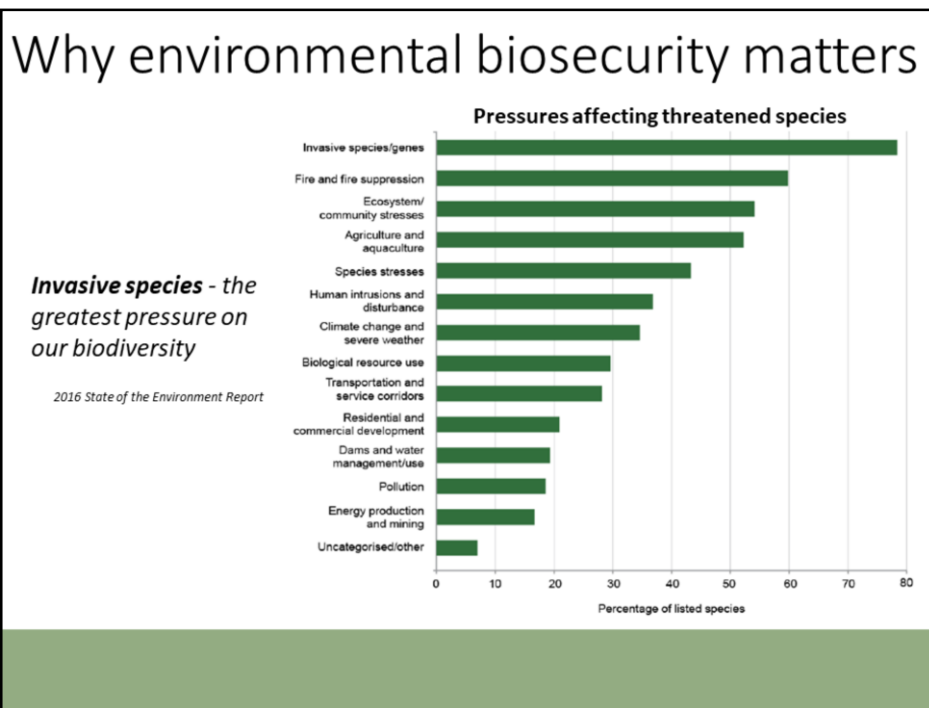
- Environmental biosecurity is protecting our unique environment and the services it provides.
- From suburban nature trails to iconic world heritage areas
- The cuddly koalas, croaking frogs, the sound of the birds around us.
- What if this was all at risk? For example, have you thought what a forest with myrtle rust could sound like? No nectar, no insects, no birds. Eerily silent!

“The management of risks to the natural environment and to social amenity, of pests and diseases entering, emerging, establishing or spreading in Australia” (IGAB review 2017).

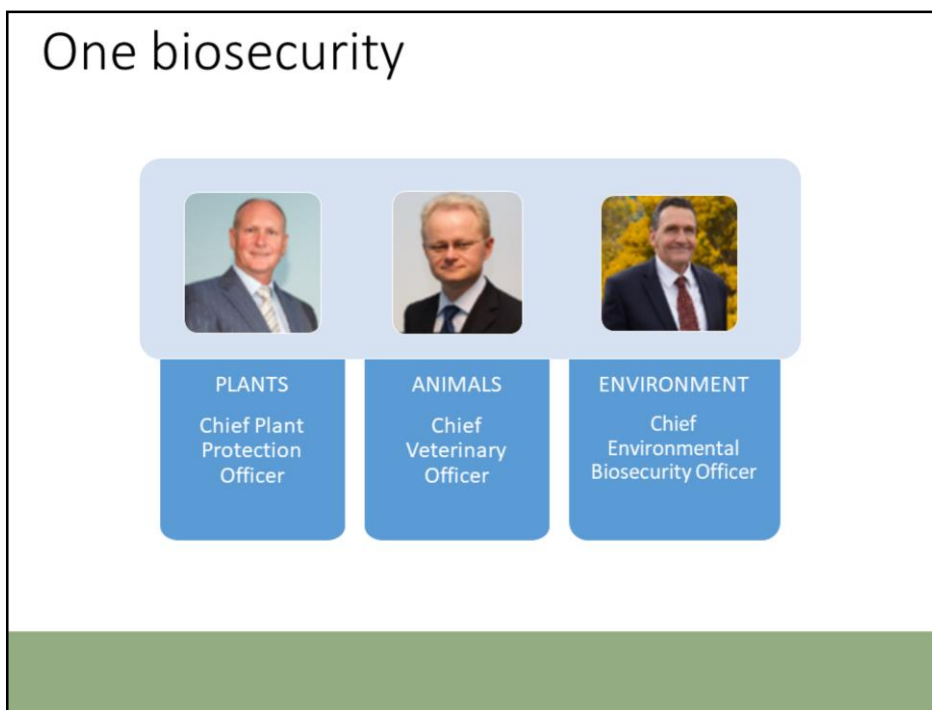
- It includes Australia’s natural terrestrial, inland water and marine ecosystems and their constituent parts, and its natural and physical resources.
- ‘Social amenity’ includes the social, economic and cultural aspects of the environment, such as tourism, human infrastructure, cultural assets and national image.



- Environmental biosecurity is about protecting Australia’s environment from pests and diseases that are likely to cause harm.
- Environmental biosecurity is important so that all Australian’s can continue to enjoy and benefit from our environment and unique biodiversity now and into the future.
- Our agricultural systems are linked to our natural systems – environmental biosecurity is just as relevant as ‘animal or plant’ biosecurity. Our environmental systems (our wildlife health) integrates plant and animal systems.
- Interactions between people, animals, wildlife and the environment are unavoidable and present a risk to both industry and the environment. E.g. farm visitors, stock routes, feral animals, bats. Environmental biosecurity goes beyond our food to our backyards, our bushwalks and our beaches. Its about our way of life.



- Australia possesses a unique and valuable biodiversity that needs to be protected. This biodiversity also supports the environmental systems we rely on for clean water, soil and ecosystem support.
- Australia's Biosecurity Conservation Strategy 2010-2020:
 - The main threats that degrade the environment includes invasive species (listed second) after climate change
 - The strategy also identifies that there are gaps in our national approaches to dealing with invasive species, particularly in the detection and coordinated response to species that mainly affect the environment.
- The 2016 State of the Environment report identified invasive species as *the* greatest pressure on our nationally threatened species, reducing overall species abundance and diversity. They represent one of the more potent, persistent and widespread threats to the environment, and are the most frequently cited threat to EPBC Act-listed species.
- Most of the jurisdictions work on environmental biosecurity now for example surveillance and response, as does the Commonwealth – NAQS is a key example. We need to do more to clearly embed it in our systems and explain to people, that we understand the issues and what we are doing about them.
- Invasive species threaten agriculture and forestry, native species, natural regeneration and ecosystem resilience and have a direct negative impact on nationally threatened species through predation, displacement and competition. They also have an enormous detrimental effects on the health, viability and functioning of communities, ecosystems and landscapes.
- They alter habitat and reduce biodiversity in both land and marine environments, resulting in both social and economic impacts.



Why a CEBO?

- Following the IBAB review, the Australian Government – with the support of all state and territory governments – has established the role of the Chief Environmental Biosecurity Officer (CEBO), within the Department of Agriculture and Water Resources
- Our Department was chosen as it has primary responsibility for managing Australia's biosecurity, including managing biosecurity risk to Australia's environment.
- Despite what you may have heard before, CEBO does not stand for 'fish bait' (Spanish) or 'fat' (Mexican slang)

Equal footing - one biosecurity for protecting the environment, industry, trade, people and our amenity and infrastructure

- Biosecurity activities have been traditionally centred around safeguarding Australia's agricultural production industries and managed in the spheres of 'Plant Biosecurity' and 'Animal Biosecurity'.
- With the appointment of the CEBO, we now have a dedicated notification point and champion for environmental biosecurity.
- Managing biosecurity risk to the environment is not done in isolation, it is a key part of the biosecurity system which is managed along with animal, plant and human health.

Gaps in environmental biosecurity			
Biosecurity in comparison	Plant	Animal	Environment
National leadership	ACPPO	ACVO	CEBO
National coordination	PHC	AHC	EIC
Jurisdictional leadership	CPHOs	CVOs	?
Response sharing agreement	EPPRD	EADRA	NEBRA
Response framework/guidelines	PLANTPLAN	AUSVETPLAN/AQUAVETPLAN	×
Strategic approach	Plant Biosecurity Strategy	AUSVETPLAN strategic plans	×
Contingency plans/risk mitigation plans	✓	✓	×
Report on sector status	✓	✓	×
Research strategy	✓	✓	✓
Priority pests/diseases identified	✓	✓	Interim list
Surveillance undertaken	✓	✓	×/?
Diagnostic capability	✓	✓	?
Research	✓	✓	?
Stakeholder engagement	✓	✓	Environmental biosecurity Advisory Group and Roundtables
Ability to respond to detections (information, capacity, training, pre-planning)	✓	✓	?

But how are we tracking, environmental biosecurity in comparison with animal and plant biosecurity

- Work started but a long way to go
- Effective biosecurity extends from overseas intelligence, through pathway analysis, research on pests, host and vectors and impact, risk analysis, and response
- It needs an institutional framework for this
- Some of this exists for the environment but there are many gaps. Biosecurity reflects its origins in ag. A lot to do to put the environment on not just the same structural footing but also a practical one
- Work in progress by National Biosecurity Committee's Environment and Invasives Committee and others includes – priority pest list, response awareness and training, preparedness work (i.e. develop identification protocols for priority

pests) for and access to diagnostics, revised RD&E strategy, InvasivePlan

CEBO's key objectives

To strengthen environmental biosecurity by:

- enhancing understanding and oversight of risks
- performing a national policy, engagement and leadership role
- better defining and prioritising risks
- improving preparedness, surveillance and response capacity
- supporting effective responses to detections and incursions.



The role of the Chief Environmental Biosecurity Officer is to:

- Enhance understanding and oversight of environmental biosecurity risks
- Perform a national policy, engagement and leadership role including major source of advice to the Commonwealth on environmental biosecurity matters
- Ensure Australia's environmental and community biosecurity risks are better defined and prioritised
- Improve the maturity of Australia's environmental biosecurity preparedness, surveillance and response capacity
- Support effective responses to detections and incursions of environmental pests and diseases.

Working together



What I've been doing

- Environment is very diverse with many stakeholders. I've met with many people and organisations since becoming CEBO and I can easily say that there's a lot going on and many people dedicated to the cause. This is just some.
- Examples include: the Centre for Invasive Species Solutions environment and community RD&E strategy, Wildlife Health Australia's wildlife biosecurity guidelines and surveillance network, Plant Health Australia's work on sentinel plants in botanic gardens, ABARES priority pest list, not to mention the work by countless NRM groups.
- People genuinely want to be involved and there is a lot of good-will that we need to harness to focus our efforts, this includes:
 - Indigenous engagement
 - Grass-roots environmental groups
 - Surveillance
 - Citizen science and
 - General community awareness
- There are also some challenges, for example the environment sector has always been fragmented and not particularly well resourced. Information is very dispersed and knowledge levels vary among stakeholders.
- Many players in the system, particularly those at the on-ground level, are not well

aware of biosecurity emergency response processes and national arrangements.

- We have gaps in information about threats, impacts and management. We are strengthening our networks to tap into universities, CSIRO and museums to fill some of these gaps.

Biosecurity 101



Biosecurity - a modern approach to an age-old issue

- Pests and diseases have been around forever
- Initial government intervention was regulation-based - Quarantine
- 'Biosecurity' embodies the modern approach to dealing with pests and diseases
 - International, national, state/territory and local rules and activities
- In Australia, key biosecurity principles include:
 - Appropriate level of protection
 - Maximum return on investment
 - Partnerships and shared responsibility



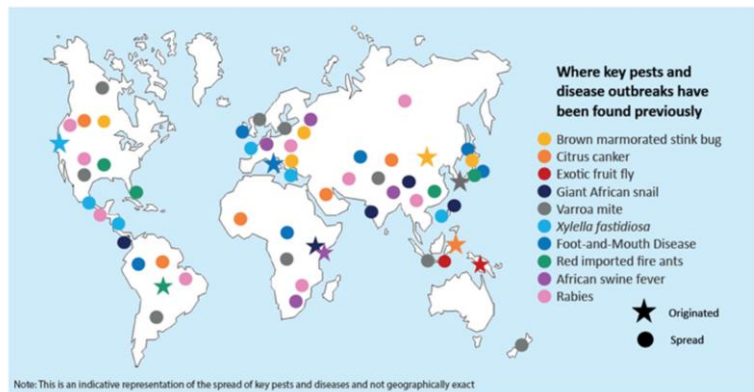
- Humanity has been battling pests and diseases since we started growing our own food.
- Initial government intervention was regulation-based, generally known as quarantine.
- The term biosecurity came into use during the late 1990s and it now embodies how we approach the issue of pests and diseases, which sits across levels, including in the international arena, nationally, at state and territory level, and the on-ground level.
- In Australia, key biosecurity principles include:
 - Appropriate level of protection
 - Maximum return on investment
 - Partnerships and shared responsibility
- I will discuss these later in my talk.

Managing biosecurity risks is becoming more challenging with increases in...



- Increasing volumes of international trade and tourism, climate change and the increasing complexity of global supply chains mean that we need to adapt to increasing and varying biosecurity risks.
- If we maintain proportional interventions, we are likely to face a 70% increase in our residual biosecurity risk by 2025.
- Our Risk-Return Resource Allocation (RRRA) model also shows that even if we triple investment in border interventions between 2015 and 2030, we will still not be able to keep risk to 2015 levels.
- Brown Marmorated Stink Bug and African Swine Fever are two of the more significant biosecurity threats we have to deal with currently.
- We have been strengthening our approach against both to ensure that risk is addressed offshore to a greater degree.

Globalised trade and tourism is driving the spread of pests and diseases



- Trade volumes are increasing but so is the spread of pests and diseases around the world.
- Australia/ New Zealand remain one of the last bastions fighting to maintain our pest and disease free status.
- Each year, the US accepts 40 new pests and diseases into management.
- Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Report:
 - Study released 6 May, 2019. Based on 15,000 research papers.
 - 1 million species of animals and plants are threatened with extinction.
 - Since 1970 there has been a 70% increase in numbers of invasive alien species across 21 countries.
- IPBES Asia Pacific regional assessment report (2018) noted that:
 - Invasive alien species have increased in number and abundance, and constitute one of the most serious drivers of biodiversity loss and ecosystem change across the Asia- Pacific region.
 - There is also increasing evidence that marine invasive alien species constitute an extremely serious, but less well understood threat to fisheries, coral reefs and the overall functioning of marine ecosystems and food webs in the Asia-Pacific region.

Other contextual challenges

- Climate change
- Increased urbanisation
- Habitat loss, e.g. due to land clearing
- Illegal plant and animal trade
- Rise of online retailers



- Climate change brings many uncertainties. Climate change simultaneously affects entire ecosystems, including hosts, competing organisms and natural enemies. Change in temperatures will make some regions more inhabitable to species that would otherwise not have been able to survive there.
- Increased urbanisation, bringing biosecurity risks closer to agriculturally and environmentally sensitive areas.
- Illegal trade - Yearly trade in exotic plants and vertebrate pets involves multi-billions of dollars and the market is growing. It forms one of the highest risks for the introduction on new pests and diseases that can easily enter and establish in our environment.
- Rise of online retailers (noting their ability to provide, and rapidly deliver, an extensive range of goods, including produce) and the corresponding rapid increase in small parcel movements

Key principle 1

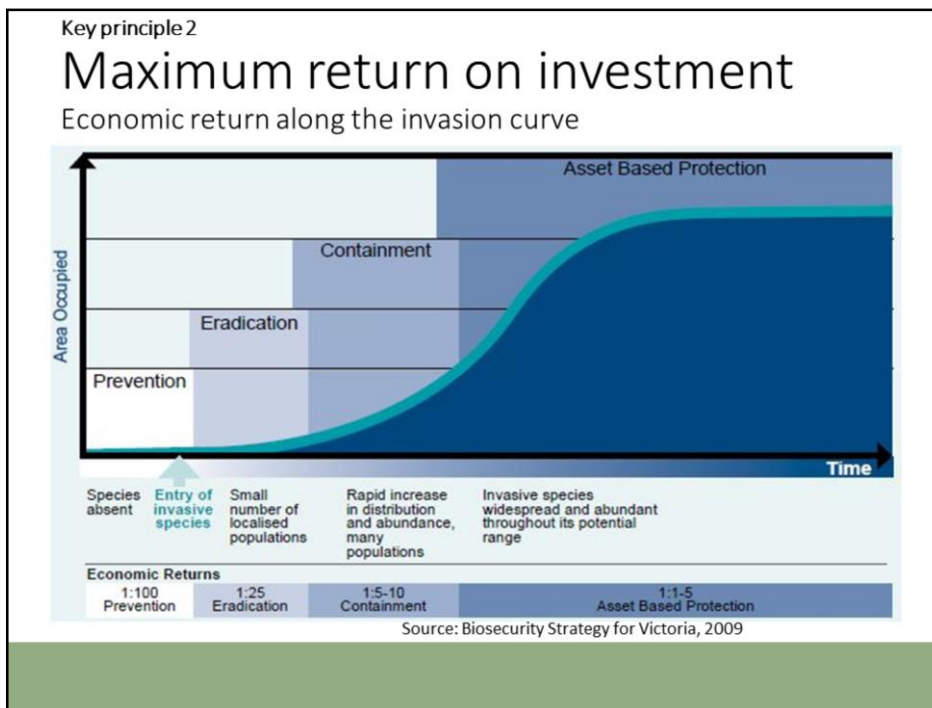
Appropriate level of protection (ALOP)

- Australia has a low risk preference but not zero
- WTO allows for ALOP
- Biosecurity risks assessed on scientific information

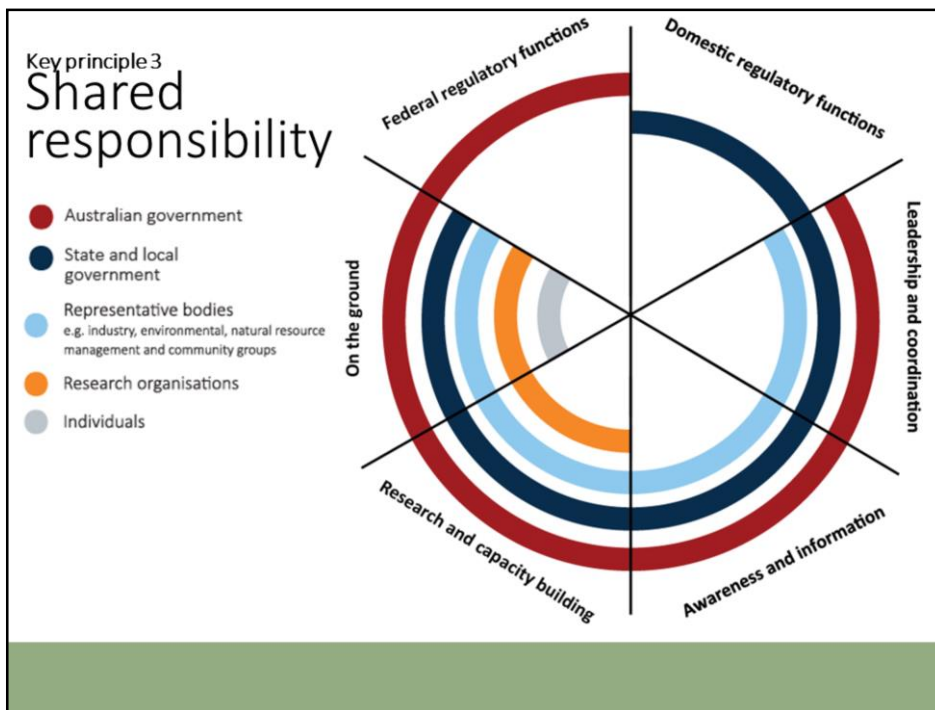


Not possible

- There is no such thing as “zero risk”. For as long as goods and people enter Australia there is some risk of exotic pests and diseases entering our country, including “hitching a ride” into Australia.
- Under the WTO agreement, each member country (and its jurisdictions) can determine what level of biosecurity risk they are willing to take and, based on that, what is the “Appropriate Level of Protection” (ALOP) they need to have to achieve that level of risk.
- Assessing the level of biosecurity risk is a process that involves a review of the current scientific knowledge about the particular pest, weed or disease – how it spreads, what climate suits its establishment, and what plant or animal species it affects are a few examples of the review process.



- The highest returns on any investment are achieved by focussing resources on prevention and eradication measures—the ‘left hand side of the curve’. In the case of containment, government investment tends to be justified on the basis that governments are best positioned to ‘contain’ the spread, but with contributions from stakeholders obtaining the benefits from avoided future impacts.
- Lower returns on investment are generally associated with asset based protection measures—‘the right hand side of the curve’. The benefits from managing a pest or disease in this situation are realised predominantly by the owner of the land it is controlled on and only to a small extent by surrounding land managers who might be affected by localised spread. There is generally a reduced net public benefit given the level of investment that might be required, particularly when comparing it to other parts of the generalised invasion curve.



- Following Nairn review (1996) – biosecurity is a shared responsibility; Beale review (2008) – biosecurity is a partnership

Federal regulatory functions

- Managing matters relating to the movement of people and goods at the national border. Regulating biosecurity controls to facilitate trade and market access, and fulfilling international convention obligations, including monitoring and reporting pest and disease status and protecting biodiversity.

On the ground

- Performing tasks for everyday management of biosecurity risks. Includes surveillance, complying with biosecurity obligations and managing pests, weeds and diseases. Contributing to the protection of the Australian environment and economy through practical biosecurity measures

Research and capacity building

- Maintaining capacity to prepare for, detect and respond to pests, weeds and diseases, and the management of those already established. Includes support for research and innovation to underpin Australia's science-based approach to biosecurity.

Awareness and information

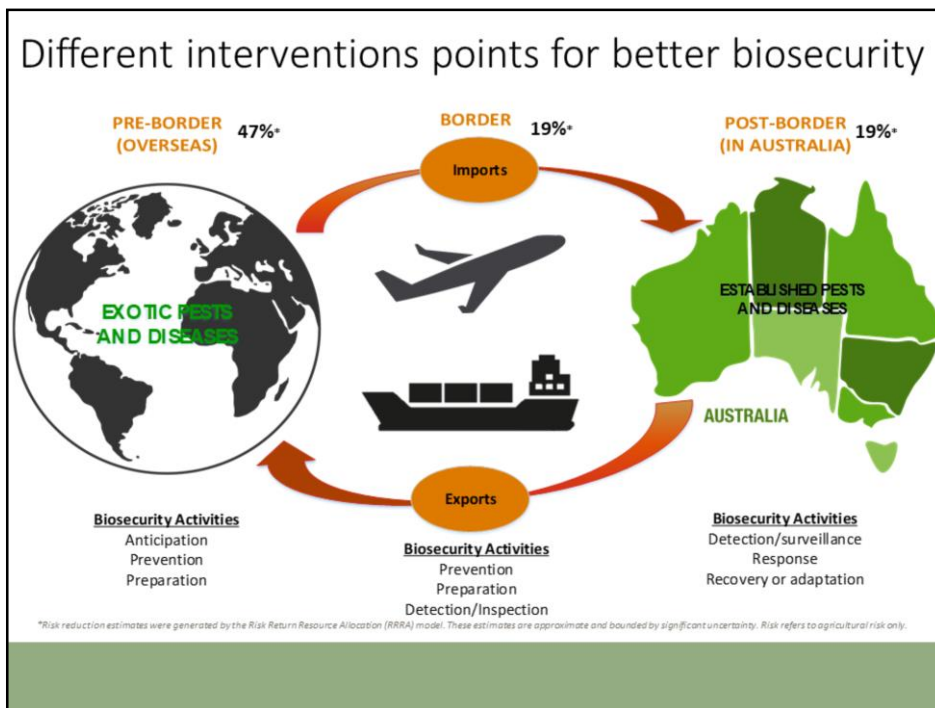
- Raising awareness and understanding of the biosecurity system and everyone's roles and responsibilities. Including publishing information about Australia's biosecurity system and responsibility for emergency response communications.

Leadership and coordination

- Providing leadership and coordination to proactively manage biosecurity risk reduction and analysis. Includes developing partnerships with biosecurity participants and fostering biosecurity awareness.

Domestic regulatory functions

- Managing biosecurity within Australia's border. Includes undertaking enforcement actions, regulatory interventions, emergency responses and negotiating and facilitating domestic trade.



- In order to protect Australia from pest and disease, biosecurity activities stretches across the biosecurity continuum, including pre-border, the border and post border (in Australia).

The international arena

- Strong trade-related context
- International Plant Protection Convention, the OIE, Convention on Biological Diversity
- Cooperate with WTO to prevent trade being a source of pest and disease spread
- Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement)



- Biosecurity is embedded in a strong trade-related context.
- Key international bodies include the International Plant Protection Convention, the OIE, Convention on Biological Diversity.
- Together they cooperate with WTO to prevent trade being a source of pest and disease spread.
- This is particularly reflected in the SPS Agreement.

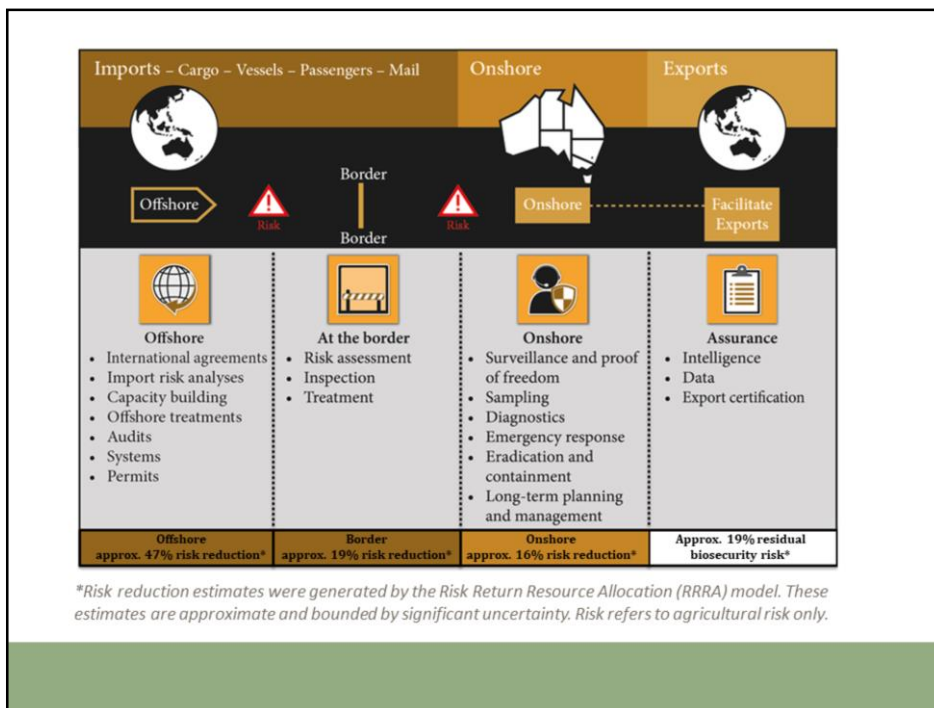
National arrangements

Australian Government

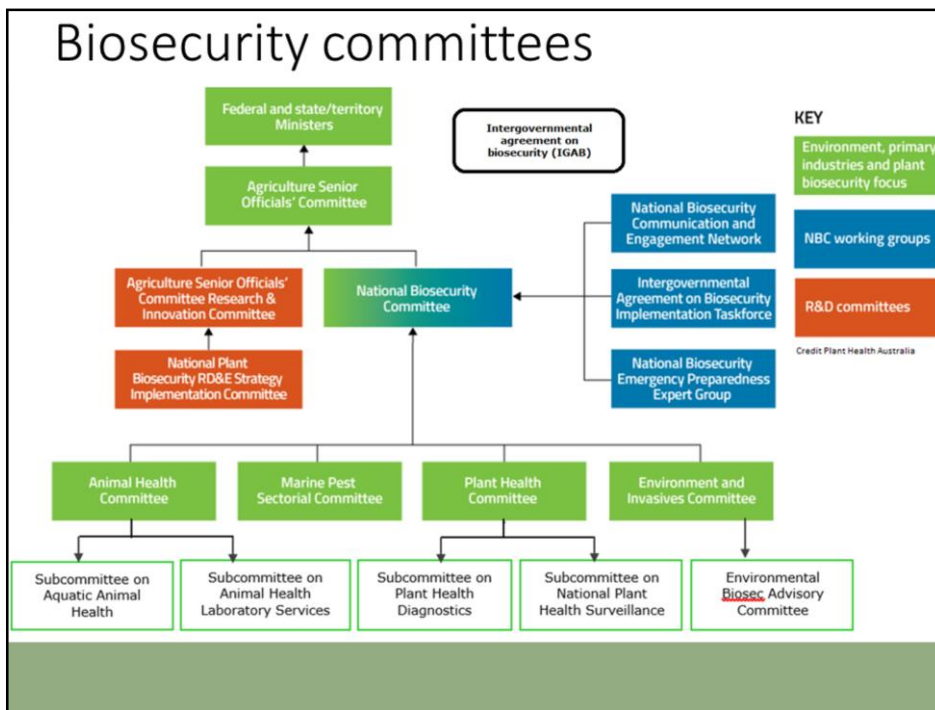
- Border protection
 - Inspections – mail, cargo, passengers
 - Surveillance and monitoring along the border
 - Regulate food and other imported products, including import risk assessments
 - Regulate export certification for goods
- Market access negotiations
- Emergency preparedness
- Outbreak response
- Biosecurity innovation
- Biosecurity partnerships
 - Indigenous ranger network
 - Community engagement activities
 - Secretariat for a range of high level committees



- DOA screens, inspects and clears the millions of people, mail parcels, baggage, ships, animals, plants and cargo containers entering Australia every year using x-ray machines, surveillance and detector dogs.
- Surveillance and monitoring of risk areas are also critical along with border control activities, which focus on assessing and managing potential biosecurity threats at Australia's airports, seaports, and international mail centres.



- During 2017-28, the Department of Agriculture supported the biosecurity risk assessment of:
 - 22 million arriving international passengers
 - 100,000 arriving aircraft
 - 19,000 arriving sea vessels
 - 4.4 million Full Import Declaration imports
 - 47 million self-assessed clearance imports
 - 84 million arriving non-letter mail articles
- We are grappling with about 80,000 different combinations of individual commodities and pest/disease pathways.



- The IGAB was signed on 13 January 2012 and signatories include all states and territories except Tasmania. The agreement sets out commitments for the Australian Government, and state and territory governments; outlines the agreed national goals and objectives; and clarifies roles, responsibilities and governance arrangements.
- The National Biosecurity Committee (NBC) is formally established under the Intergovernmental Agreement on Biosecurity (IGAB).
- The NBC provides advice to the Agriculture Senior Officials Committee on national biosecurity, and on progress in implementing the Intergovernmental Agreement on Biosecurity.
- The Agriculture Senior Officials' Committee (AGSOC) comprises all department heads and CEOs of Australian / State / Territory and New Zealand Government agencies responsible for primary industries policy issues. It is chaired by the Secretary of the Australian Government Department of Agriculture and Water Resources. AGSOC provides for cross-jurisdictional cooperative and coordinated approaches to matters of national interest.
- The National Biosecurity Communication and Engagement Network (NBCEN) produces nationally consistent public information in response to pest and disease outbreaks (biosecurity incidents) that impact on Australia's agricultural industries

and the environment. It also coordinates communication preparedness activities for biosecurity incidents.

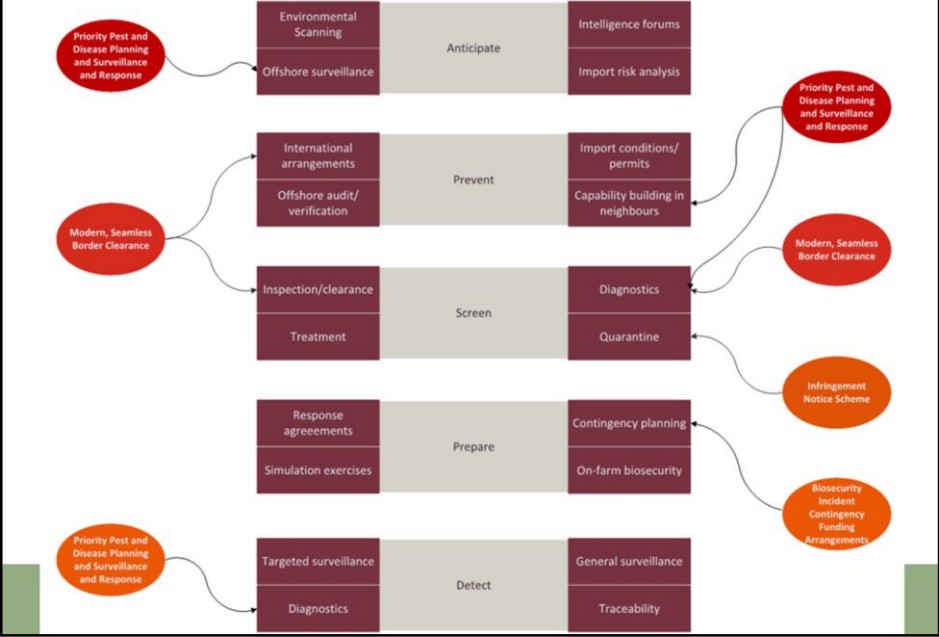
- The NBCEN consists of communication managers from the Australian, state and territory agriculture agencies, Plant Health Australia, Animal Health Australia, CSIRO's Australian Animal Health Laboratory, and the Australian Government Department of Health. The Australian Local Government Association, Wildlife Health Australia and the Centre for Invasive Species Solutions are observers.
- An IGAB Taskforce was established in 2014 to identify priority reform areas and to advise NBC on how to best progress IGAB implementation.
- The National Biosecurity Emergency Preparedness Expert Group was established by the National Biosecurity Committee (NBC) in 2015 to enhance Australia's biosecurity emergency preparedness, response and initial recovery arrangements. The expert group's membership is comprised of emergency response specialists from each jurisdiction, Animal Health Australia and Plant Health Australia.
- The sectoral committees:
 - Animal Health committee (AHC) - The main purpose of AHC is to develop science-based and nationally consistent policy on animal health issues, and to provide advice as necessary on animal health to NBC. In doing so, AHC provides leadership in developing and implementing policy, programs, operational strategies and standards for government in the areas of animal health, domestic quarantine, animal welfare and veterinary public health.
 - Marine Pest Sectoral committee (MPSC) - The MPSC develops and coordinates the implementation of harmonised, national arrangements to identify, minimise and address the pest risk to Australia's marine environment and associated industries, and plays an advocacy role within Government for highlighting the impact of marine pests on Australia's marine environment and associated industry
 - Plant Health Committee (PHC) - PHC is the peak government plant biosecurity policy and decision-making forum. Its role is to maintain or improve plant health in Australia in support of the economy, environment and community through strategic policy, technical and regulatory advice and national leadership on plant biosecurity matters. PHC has responsibility for delivering on national priority reform areas, including those identified for implementation of the Intergovernmental Agreement on Biosecurity (IGAB) and overseeing the implementation by governments of the National Plant Biosecurity Strategy (NPBS).
 - Environment and Invasives committee (EIC) - The EIC is responsible for providing national policy leadership on the identification, prevention and management of invasive plant, vertebrate and invertebrate species that adversely impact the environment, economy and community. The EIC provides a forum for identifying and resolving national priorities for freshwater and terrestrial invasive species as well as other species where there is an environmental or community biosecurity impact, that are not within the scope of another NBC sub-committee

State and territories

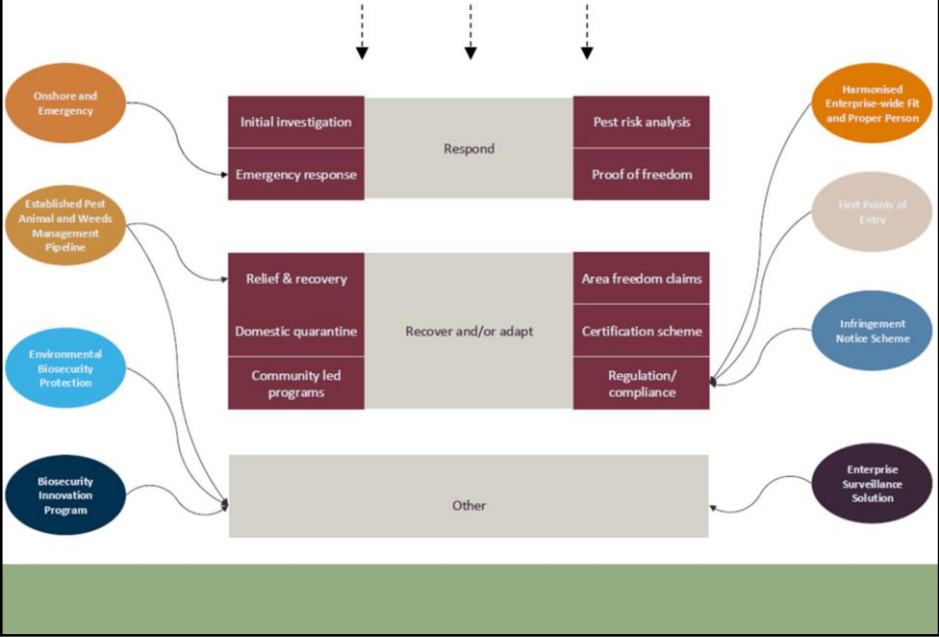
- Domestic regulation within their borders
- Negotiate and facilitate domestic trade
- Manage eradications and containment programs
- Develop partnerships with industry and community, including consultation and education
- Undertake biosecurity activities on public land and, under certain conditions, private land.
- Support landholders and community to manage established pest and diseases
- Regulate keeping of plant and animal species that pose significant risk



An overview of key biosecurity activities



An overview of key biosecurity activities (cont.)



Responding to outbreaks

- DoA and/or jurisdictions manage on-ground responses to outbreaks
 - DoA lead coordination for exotic pest and disease outbreaks
- National committees and groups
 - Consultative committees
 - National Management Group
 - Biosecurity Response Team
 - The National Biosecurity Communication and Engagement Network



Response deeds and agreements

- Emergency Animal Disease Response Agreement
- Emergency Plant Pest Response Deed
- National Environmental Biosecurity Response Agreement

Response plans

- AUSVETPLAN
- AQUAVETPLAN
- PLANTPLAN
- Emergency Marine Pest Plan

- Outbreaks are managed on the ground by the department of agriculture or primary industries, in the state or territory in which they occur.
- When a pest or disease is found that is exotic to Australia or occurs in more than one state or territory, the Australian Government Department of Agriculture and Water Resources takes the lead in coordinating the national response to the outbreak.

National committees and groups

Consultative committees

- Consultative committees are coordinating bodies that provide the technical link between the Australian, state and territory governments (responsible for agriculture/biosecurity), and industry for decision making during biosecurity incidents. Consultative committees are formed in response to specific incidents and involve people with relevant technical expertise.

National Management Group

- The National Management Group (NMG) makes decisions on whether or not to support national eradication programs through the cost-sharing arrangements

The National Biosecurity Response Team

- The National Biosecurity Response Team (NBRT) is a group of trained and experienced people who can be deployed to assist other states and territories during a major biosecurity incident. The team is made up of personnel from the Australian Government, and state and territory agencies responsible for agriculture/biosecurity. Team members have skills and the expertise required to respond to any type of biosecurity incident.

The National Biosecurity Communication and Engagement Network

- The National Biosecurity Communication and Engagement Network (NBCEN) produces nationally consistent public information in response to pest and disease outbreaks.
- The core network consists of communication managers from the Australian, state and territory governments (responsible for agriculture/biosecurity), Plant Health Australia, Animal Health Australia, CSIRO's Australian Animal Health Laboratory, and the Australian Government Department of Health.. Wildlife Health Australia, the Centre for Invasive Species Solutions, and the Australian Local Government Association are NBCEN observers.
- The network allows for rapid and consistent dissemination of information that people need to respond to a pest or disease outbreak. Audiences may include affected producers/growers and their local communities, trading partners, the general public, media, and stakeholders such as exporters

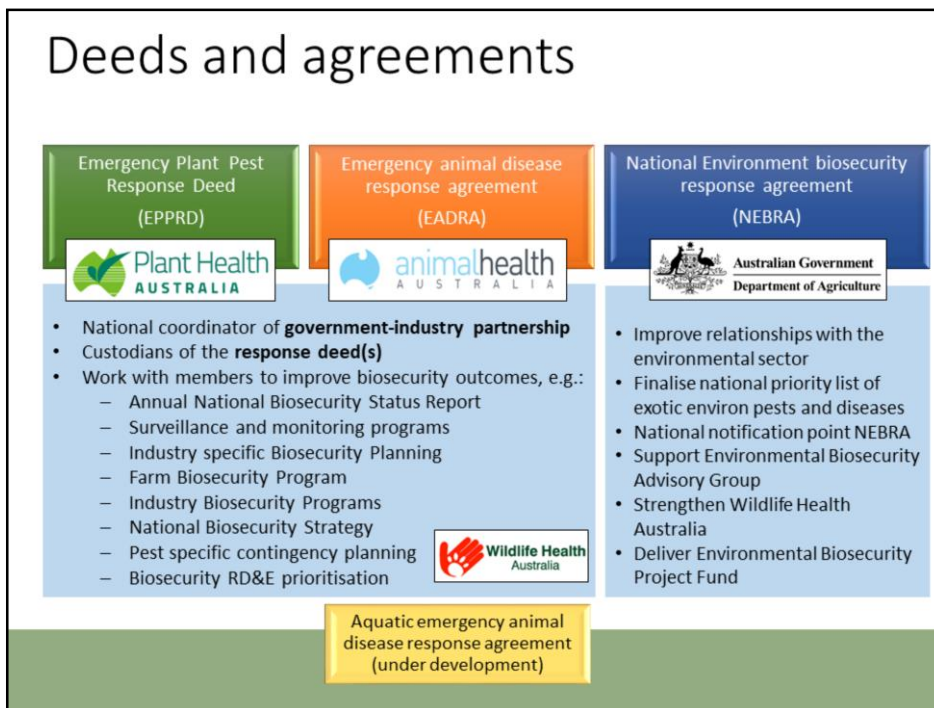
Response deeds and agreements

- To support timely and effective responses
- Outlines the planned management and funding of responses, including cost-sharing
- Stipulates roles and responsibilities of government and industry, including in decision-making
- Legally binding

Response plans

- agreed technical response plan and best practice guidelines for response procedures under the relevant deed.

Deeds and agreements



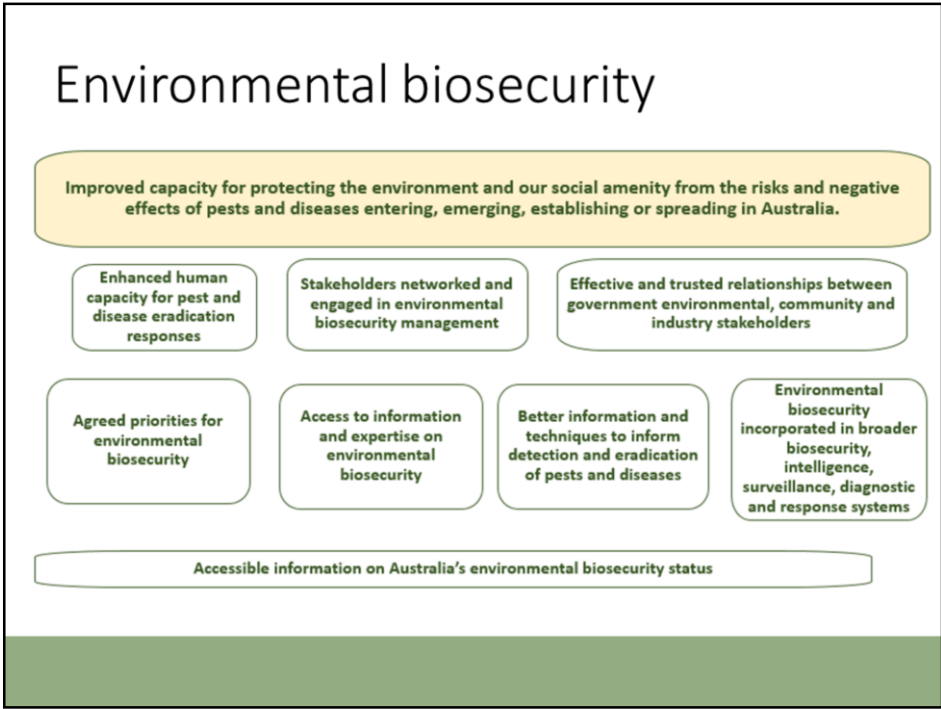
- The EPPRD is the plant industry's cost-sharing deed for emergency plant pest responses. The deed custodian is Plant Health Australia and the notification point is the office of the Chief Plant Protection Officer.
- The EADRA is the animal deed and involves similar arrangements as for plants. AHA is the custodian.
- The National Environmental Biosecurity Response Agreement (NEBRA), established 2012, provides a framework for national response incursion management to environmental pests and diseases. The NEBRA processes allow national decision making and cost sharing of responses to environmental pests and diseases.
- Wildlife Health Australia is a key player across the animal and environmental biosecurity sectors.
- Aquatic emergency animal disease response agreement is still being developed.

Monitoring pests and diseases

- The Australian Government and state and territories undertake regular surveillance activities, usually as part of their formal responsibilities – **'Active surveillance'**
- Various general surveillance initiatives already exists
- More 'eyes and ears' needed – **'General surveillance'**, including
 - organised activities, e.g. citizen science and 'blitzes'
 - unorganised events, e.g. reporting of fortuitous finds



- The economic return along the invasion curve shows how important early detection is, that is, the importance of surveillance activities
- Surveillance consists of active surveillance (generally run by government agencies with a very well defined sampling strategy). While such surveillance is very rigorous it is also very expensive to operate. General surveillance refer to surveillance activities that have one or more components that are more flexible or opportunistic and often rely on the support from non-government players.
- Roles for the community include the need for more 'eyes and ears' and abiding by biosecurity regulations
- For example, reports from the public has led to the initial discovery of the European wasp, Khapra beetle (*Trogoderma granarium*) in Western Australia, and red imported fire ant in Queensland.



What the CEBO has to deliver.



Want to know more?

More information at:
<http://www.agriculture.gov.au/biosecurity/environmental/cebo>

Or you can email us at:
ACEBO@agriculture.gov.au

If you would like more information about the project fund – please contact us at ACEBO@agriculture.gov.au.