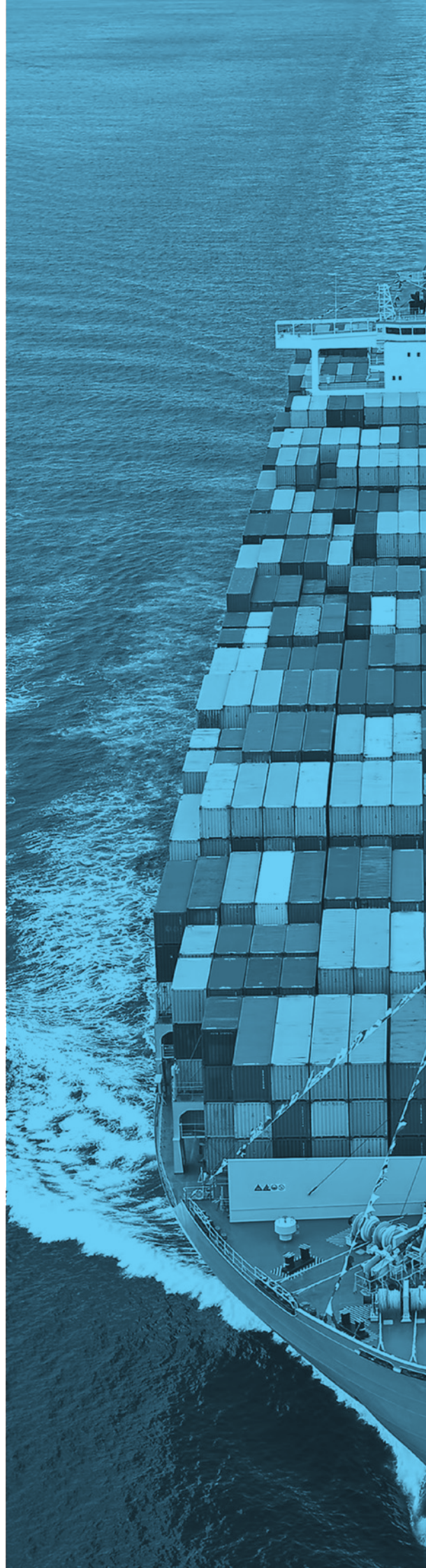


Intergovernmental Agreement on Biosecurity Review Draft Report

DECEMBER 2016

Wendy Craik, David Palmer and Richard Sheldrake
IGAB Independent Review Panel



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An invitation to comment

In late 2015, Australian agriculture ministers agreed to an independent review of the 2012 Intergovernmental Agreement on Biosecurity (IGAB) to consider the implementation and effectiveness of the IGAB and its schedules, and to assess the capacity of the national biosecurity system.

Following our appointment to the Review Panel in March 2016, we released a discussion paper in May 2016 as the basis for national consultation. The Intergovernmental Agreement on Biosecurity Review Draft Report (Draft Report) is the next step in our review of Australia's biosecurity system and the underpinning IGAB.

Between May and August 2016, we gathered information from a wide range of participants in the national biosecurity system, representing the broad range of views and perspectives from governments, peak industry and community bodies, researchers, businesses and individuals. We have held meetings covering 36 Australian, state and territory government agencies, 13 stakeholder discussion groups (at which more than 100 organisations and businesses were represented), and many other teleconferences and face-to-face meetings.

We received more than 65 written submissions (Appendix C: Public consultation); all non-confidential submissions are published on the Department of Agriculture and Water Resources [IGAB Review](#) website. More than half of the submissions came from industry representative bodies or organisations, including primary production, logistics, exports, transport and tourism; environmental non-government organisations were also well represented.

We are grateful to two independent reviewers whose opinion on the logic, practicality, strength of argument and factual correctness was sought. The Draft Report has benefited from their contributions.

We thank all those who have contributed and acknowledge the wealth of knowledge and expertise across the biosecurity system. We have drawn heavily from the views and information provided during consultation for our Draft Report.

We have considered the national biosecurity system's capacity to manage increased biosecurity risks and the role of a future IGAB in effecting a stronger national system.

This Draft Report is our invitation to all interested parties to constructively comment on our proposals and ideas. The draft recommendations outline the system-wide improvements needed in the short and medium term, including under a future IGAB—along with some longer-term aspirations. We recognise there are some issues yet to be resolved.

Submissions are due by **5pm AEDT Monday 27 February 2017**.

We welcome your responses as we seek to finalise the work of the Review. It is intended that a Final Report will be provided to all Australian agriculture ministers in May 2017.

Wendy Craik (Chair), David Palmer and Richard Sheldrake

Making a submission

The Review Panel welcomes submissions on the Draft Report from all interested parties. Submissions should address the Draft Report and consider the Panel's views, draft recommendations and specific requests for feedback. As appropriate, it is helpful if evidence and examples, such as relevant data and documentation, can be provided.

Submissions need not cover all issues and there is no limit on the length of written submission—although a shorter submission is welcomed. For longer submissions, including a summary of your comments may be appropriate.

Written submissions, accompanied by a completed cover sheet (available at agriculture.gov.au/igabreview), can be provided:

- by email: igabreview@agriculture.gov.au, or
- by post:
IGAB Review Secretariat
Department of Agriculture and Water Resources
GPO Box 858
CANBERRA ACT 2601

Due date for submissions

Submissions on the Draft Report are due by **5pm AEDT Monday 27 February 2017**.

Submissions received after this date may not be considered in the Review Panel's Final Report.

Publication of submissions

Submissions will be published on the website of the Australian Government Department of Agriculture and Water Resources (agriculture.gov.au/igabreview), unless you request otherwise. If your submission is to be treated as confidential, in full or in part, indicate clearly on the front page.

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Summary

Australia's biosecurity system is a trade and economic asset. It underpins \$54 billion in agricultural production, \$44 billion of agricultural exports and our \$38 billion inbound tourism industry. Equally, national biosecurity efforts protect human health and social amenity, and help maintain our unique, biodiverse, natural environments.

Our national system does not exist as a single, physical or legal entity. It is built on 'shared responsibility'—the cooperation, investment and actions by all governments, industry bodies, exporters and importers, farmers, miners, tourists and the broader community. For governments, the sharing of responsibility occurs through a cooperative partnership under the Intergovernmental Agreement on Biosecurity (IGAB), which was signed by Australia's then Prime Minister, Premiers and Chief Ministers (First Ministers) in 2012.

The IGAB has created a framework for governments to coordinate and identify priority areas of reform and action to build a stronger and more effective national biosecurity system. The IGAB was an important step for governments, recognising the value of strengthening and institutionalising intergovernmental relationships, and building on the previous memoranda of understanding between Australia's governments. This Review of the first IGAB (IGAB1) recognises its significant achievements, including a strong and healthy working partnership between all governments and the development of sound national policy principles and frameworks for an effective and well-regarded system.

Nevertheless, the challenges facing stewardship of the national biosecurity system continue to build. Biosecurity risks are growing due to increased global trade and travel, increased agricultural expansion and intensification, increased urbanisation close to farmlands, and other factors such as climate change. A tight fiscal environment for governments has placed significant pressure on biosecurity budgets and the ongoing capacity of jurisdictions to meet their biosecurity commitments. Biosecurity stakeholders want a greater say in decision-making about the national system, greater alignment of biosecurity and market access efforts, more efficient delivery of government biosecurity services, and stronger arrangements for environmental biosecurity, among other things.

Australia's biosecurity system must remain strong and focussed, and build national capability and capacity to address future challenges. The Review Panel's Draft Report sets out 40 draft recommendations aimed at strengthening the national biosecurity system over the next five-year period, to be advanced by governments, industry and other parties, including under a refreshed intergovernmental agreement (IGAB2).

Key focus areas

The central theme of this Review, flowing through many of the draft recommendations, is that governments and industry/community should adopt a systematic approach to determining and planning for national priority animal, plant and environmental pests and diseases. Essentially, this involves building the national system from the ground up: pest by pest, disease by disease. It will not be possible to individually address the vast array of pests and pathogens, particularly those affecting plants, so the national system must also embrace some generic inspection and treatment practices to manage classes of pests. This is consistent with the purpose and intent of international standard development and harmonisation of risk management procedures. Some work to prioritise national biosecurity risks has already occurred, or is underway, but this process does not appear to be standardised, is incomplete

and far from comprehensive. This Review proposes a specific process to profile and plan for each national priority pest and disease, inclusive of the parties involved and funding required. This approach will allow for the ‘rolling-up’ or ‘the sum’ of the various components of the national system to provide national perspectives of system elements such as pre-border activity surveillance, response, and research and development. Only then can effective national strategies be developed, costed and effectively actioned using the principles developed under IGAB1.

The appropriate level of funding required—or ‘how much is enough’—to operate the national biosecurity system will not be clear until the suite of high-priority pests and diseases and their biosecurity requirements have been agreed and worked through, including with key industry and community players. However, there is little doubt that implementation of this Review’s draft recommendations will increase the cost of the national system. While resourcing the national system will remain a key challenge, this increased cost needs to be balanced against the cost of no additional action. Governments do have some options available to provide a more sustainable funding base, including reviewing their own cost recovery arrangements and the potential for property-based levies to contribute further to funding the national system. Governments have agreed sound national investment principles and frameworks under the IGAB—the challenge is building support within governments and with industry for implementation.

Research and innovation (R&I) underpins Australia’s science-based approach to biosecurity, but targeted investments in technological innovations can also help reduce the cost of typically high-cost activities, such as surveillance. Current arrangements do not optimise these outcomes. Clear national biosecurity R&I priorities are needed to focus investment and a new biosecurity R&I entity is needed to provide the coordination necessary to drive cross-sectoral research, technological developments and behavioural change.

This Review has found the foundation principle of ‘shared responsibility’ is not clearly understood, agreed or broadly accepted across the national system. Similarly, the roles and responsibilities of participants are not well defined or agreed. Agreeing roles and responsibilities will be an important first step in realising shared responsibility. To that end, this Review has proposed that a National Statement of Intent could outline a common and unifying approach to biosecurity for all system participants.

One of the strongest areas of debate during the course of this Review concerned the adequacy of the national system in addressing biosecurity risks impacting biodiversity and the environment. Incursions of exotic organisms harmful to Australia’s environment and community amenity are a regular occurrence and have been the focus of recent incursions and emergency responses, but national environmental pest and disease risks are yet to be systematically identified, prioritised and planned for. Environmental biosecurity considerations should be comparable to human health and primary production, and national arrangements need to be explicitly developed to address environmental risks. Environment agencies must play a far stronger and direct role in development of national biosecurity policy and in response arrangements, particularly in those situations where the primary impact of a newly introduced pest is environmental.

Understanding, by governments, industry and the community, of Australia’s progress and success in dealing with biosecurity matters is another area of focus. The Review Panel has recommended a number of actions to enhance reporting, including to the public, on the biosecurity system and the contributions of governments and industry.

The Review Panel has concluded that a refreshed agreement between Australia's governments is appropriate and necessary to ensure robust national biosecurity arrangements into the future. The Panel has proposed three priority reform areas and associated programs of work to be delivered under a new, streamlined intergovernmental agreement, which are detailed below. IGAB1 was a significant, foundation agreement for government cooperation and collaboration. IGAB2 and subsequent agreements should build on achievements to date, and demonstrate a measured and deliberate advancement in the commitments and achievements of jurisdictions. While the IGAB should remain a government agreement, its governance structures should provide the National Biosecurity Committee (NBC) with greater autonomy, and industry and community with a stronger role and voice in further developing the national system. Finally and importantly, First Ministers, should continue to authorise a strong whole-of-government mandate for jurisdictions to advance the national biosecurity agenda.

Proposed priority reform areas*

Reform areas	Outcomes	NBC work program and outputs
1. Governance and strategy	<p>A unified strategic framework for the national biosecurity system</p> <p>Improved governance of the national system</p> <p>A consistent approach to biosecurity risk prioritisation and investment across the system (for animal, plant and environmental streams)</p>	<p>Agreed roles and responsibilities for all system participants</p> <p>A National Statement of Intent, developed in collaboration with key system participants</p> <p>A new, streamlined IGAB (IGAB2)</p> <p>Formalised whole-of-government biosecurity arrangements within all jurisdictions, including through memoranda of understanding</p> <p>Defined core commitments for jurisdictions under the national system</p> <p>A stronger NBC and revised sub-committee structure, including an Industry and Community Advisory Committee, a Chief Environmental Biosecurity Officer, and Environmental Biosecurity Committee</p> <p>A revised National Framework for Cost-Sharing Biosecurity Activities</p> <p>National investment strategy</p> <p>National biosecurity research and innovation priorities</p> <p>Agreed uniform and fully inclusive categories of funding activity</p>

Reform areas	Outcomes	NBC work program and outputs
2. National priority pests and diseases	<p>Identification of national priority pests and diseases (animal, plant, environmental)</p> <p>Identification of prevention, emergency preparedness and response requirements and responsibilities</p> <p>Early detection and accurate, timely diagnosis of national priority pests and diseases</p> <p>Demonstration of Australia's pest and disease status for market access</p> <p>Identification of responsibilities for established pests and diseases</p>	<p>Implementation of a systematic national priority (exotic) pest and disease approach, including for environmental biosecurity risks</p> <p>Risk assessments for national priority pests and diseases</p> <p>Activity plans for managing national priority pests and diseases, agreed by all relevant participants, outlining risk mitigation measures, surveillance, diagnostics, response, as well as the relevant participants (including their roles and responsibilities and cost-sharing arrangements)</p> <p>Alignment of biosecurity surveillance activities with major export market risks</p> <p>Emergency response deeds for aquatic animals and exotic production weeds</p> <p>Greater landowner-led resourcing and management of nationally significant established pests and diseases</p>
3. Knowledge management and system performance	<p>Improved decision-making and operational efficiency and effectiveness</p> <p>Increased capacity to measure and demonstrate the performance of the national biosecurity system</p> <p>Improved accountability of jurisdictions for commitments under the IGAB</p> <p>Greater public understanding of the performance of the system</p>	<p>National collaboration on data and intelligence sharing</p> <p>Agreement on minimum standards and specifications for data sets</p> <p>An agreed national biosecurity information system accessible to all jurisdictions</p> <p>A performance framework and measurable performance indicators for the national system</p> <p>An independent IGAB Evaluation Program of jurisdictional commitments</p>

*This table also appears in Chapter 10 (Table 11).

Draft recommendations and requests for feedback

Knowing and owning our roles and responsibilities

Feedback request 1 The Review Panel seeks feedback on the draft roles and responsibilities of national biosecurity system participants.

Recommendation 1 The NBC and the proposed Industry and Community Advisory Committee, through an open, transparent and collaborative process, should lead the development of a draft National Statement of Intent for public consultation that outlines:

- a vision, goal and objectives for the national biosecurity system
- principles for managing biosecurity
- the meaning and application of ‘shared responsibility’
- the roles, responsibilities and commitments of participants, including accountability measures
- governance arrangements for the national biosecurity system.

The process should involve government (including local government), industry and the community.

Market access is key

Feedback request 2 The Review Panel seeks feedback on the total effort and costs associated with demonstrating area freedom by jurisdictions, and the value of that trade.

Recommendation 2 The Primary Industries Technical Market Access and Trade Development Task Group, should seek to enhance engagement with industry to ensure that Australia’s market access strategies are aligned appropriately through an agreed priority setting process, and that the degree of transparency and communication is carefully weighed against its level of risk to trade activities.

Recommendation 3 IGAB2 should strengthen consideration of market access requirements within the next NBC work program.

Recommendation 4 Jurisdictions’ biosecurity surveillance activities should include pests and diseases that pose the greatest threat to our export markets.

Recommendation 5 States and territories should utilise (or adapt) the dispute resolution process agreed by ministers in 2012 and include the key elements of that in IGAB2.

Recommendation 6 IGAB2 should clarify the roles and responsibilities of the parties with regard to international and domestic market access, including proof of area freedom.

Stronger environmental biosecurity

Recommendation 7 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 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.

Recommendation 8 Jurisdictions should institute formal arrangements between agriculture and environment agencies to define the objectives of cooperation, leading and support roles, information flows, resources and deliverables. The Australian Government agriculture and environment departments should enter into a Memorandum of Understanding, modelled on those with health and immigration agencies.

Recommendation 9 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
- invertebrate transmitted diseases as well as animal diseases.

Recommendation 10 The Australian Government should establish the senior, expert position of Chief Environmental Biosecurity Officer within the environment department. A less preferred option is to house the position in the agriculture department. The position should report on the effectiveness of Australia's environmental biosecurity arrangements and achievements. Reports should be made publicly available.

Recommendation 11 The NBC should establish and resource a new Environmental Biosecurity Committee (EBC), comprising government and external environment biosecurity experts and representatives from both the animal and plant sectoral committees of the NBC, to support the role of the Chief Environmental Biosecurity Officer. The role of the EBC should be reviewed following its work to prioritise national biosecurity risks impacting the environment.

- Recommendation 12** Greater and explicit roles should be developed for AHA and PHA in environmental biosecurity, instituted through amended constitutions and expanded board expertise.

Building the national system

- Recommendation 13** Jurisdictions should adopt a systematic approach to determine and plan for national priority animal, plant and environmental pests and diseases.
- Recommendation 14** The NBC should lead five-yearly national-level risk prioritisation for emerging animal, plant and environmental risks and pathways, in partnership with system participants, reporting to AGSOC and AGMIN.

Research and innovation

- Recommendation 15** The sectoral committees of the NBC, with the endorsement of the NBC, should develop an agreed set of National Biosecurity R&I Priorities, in consultation with system participants and in line with the agreed national priority pests and diseases. Priorities at a sectoral and cross-sectoral level need to be considered. The priorities should be developed within two years of the final IGAB review report, and should be reviewed every five years.

- Feedback request 3** The Review Panel seeks feedback on the following options for a new entity for cross-sectoral biosecurity R&I:

Option 1: Establishing a new stand-alone entity for cross-sectoral biosecurity R&I.

Option 2: Addressing cross-sectoral biosecurity R&I within an existing RDC (for example, the Rural Industries RDC).

The Panel also seeks feedback on the funding options and would welcome alternative suggestions.

Strengthening governance

- Recommendation 16** A future IGAB should remain an agreement between the First Ministers of the Australian, state and territory governments.
- Recommendation 17** First Ministers should, within IGAB2, identify lead ministers and agencies for biosecurity (assumed to be agriculture or primary industries) and require supporting whole-of-government arrangements to be in place, including through memoranda of understanding.
- Recommendation 18** First Ministers should formally establish the NBC and articulate its Terms of Reference in the IGAB.
- Recommendation 19** The NBC should include the CEO of the Australian Local Government Association, and the New Zealand Government be invited to include a representative.

- Feedback request 4** The Review Panel seeks feedback on the proposed Terms of Reference for the NBC.
- Recommendation 20** The NBC should adopt a sub-committee structure that aligns with the revised national biosecurity system objectives and national reform priorities in the IGAB. All NBC working groups and expert groups should be task-specific and, wherever possible, time-limited.
- Recommendation 21** The NBC should take steps to increase its public profile and openness, including establishing a stand-alone website. The website could be maintained by, but be separate from, the Australian Government Department of Agriculture and Water Resources, and could accommodate and centralise all information on the NBC, its committees, and their activities. Key policy frameworks, agreements and reports of the NBC should be made publicly available on the site.
- Recommendation 22** AGSOC should establish and provide oversight to an independent IGAB Evaluation Program to assess and report on implementation of each jurisdictions' commitments under the IGAB. The evaluations, or a summary of them, should be made publicly available following ministerial consideration.
- Recommendation 23** The NBC should clarify core commitments of jurisdictions for use in the independent IGAB Evaluation Program to be documented in a future IGAB.
- Recommendation 24** The NBC should report annually to AGMIN on its progress of priority reform areas. The NBC's work program and annual report should be made publicly available upon ministerial consideration.
- Recommendation 25** AGSOC should establish, as a priority, an Industry and Community Advisory Committee to provide advice to the NBC on key policies and reforms.
- Recommendation 26** The NBC should convene a dedicated annual national Biosecurity Roundtable for AHA and PHA members to provide direct input to the NBC.

Funding our national system

- Recommendation 27** The NBC and the Industry and Community Advisory Committee, in consultation with other key stakeholders, should revise the National Framework for Cost Sharing Biosecurity Activities to enable its practical application.
- Recommendation 28** The NBC, with key industry and non-government partners, should agree uniform and fully inclusive categories of funding activity for the national biosecurity system.
- Recommendation 29** The IGAB should include an ongoing commitment to the funding stocktake, with governments publicly reporting their expenditure and the high-level stocktake results under uniform and fully inclusive categories.

- Recommendation 30** All governments should review their current biosecurity expenditure, with a view to redirecting funding into areas that return the highest yields to farmers, industry and the community. This approach will require a planned and coordinated strategy of engagement and communication.
- Recommendation 31** The Risk Return Resource Allocation model should be extended to include all jurisdictions and their investments, with the Australian Government providing assistance to jurisdictions to build national capacity.
- Recommendation 32** AHA and PHA should coordinate an industry stocktake of national biosecurity system investments, making the results publicly available.
- Feedback request 5** The Review Panel seeks feedback on the following options to ensure a more rapid-response to an exotic pest or disease incursion:
- Option 1: Cost-sharing arrangements should provide for four weeks of monitoring, assessment and preliminary control strategies, while an overall assessment is conducted on the possibility of successful eradication.
- Option 2: Cost-sharing arrangements should include a default funding arrangement for when decisions cannot be quickly reached about the success or otherwise of an eradication program.
- Recommendation 33** The emergency response deeds for aquatic animals and exotic production weeds should be finalised within 12 months.
- Recommendation 34** State and territory governments should review their biosecurity cost-recovery arrangements to ensure they are consistent, appropriate and transparent.
- Recommendation 35** All levels of government could help meet their budgetary challenges by reviewing biosecurity levies and rates/charges currently or potentially applying to system participants. These should be commensurate with agreed national cost sharing principles, which the Review Panel considers should be reviewed.

Measuring system performance

- Recommendation 36** The NBC should establish a time-limited task group to progress development of a performance framework and performance measures for the national biosecurity system.
- Recommendation 37** The Australian Government should facilitate development of an integrated, national biosecurity information system to provide a common platform for all jurisdictions to share and access biosecurity data and information in the national interest.
- Recommendation 38** Data and knowledge sharing should be a core commitment of jurisdictions under the IGAB. Minimum standards and specifications should be agreed for data sets.

Recommendation 39 The Australian Government should establish, within the Department of Agriculture and Water Resources, a dedicated National Biosecurity Intelligence Unit, to coordinate and provide advice to the NBC, AGSOC and AGMIN on biosecurity intelligence covering emerging risks and pathways, and international and domestic pest and disease detection.

A future system, a future IGAB

Recommendation 40 Jurisdictions should adopt the proposed new priority reform areas and associated work program for IGAB2, and amend the IGAB in line with proposed revisions.

Acronyms and abbreviations

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
AGMIN	Agriculture Ministers' Forum
AGSOC	Agriculture Senior Officials Committee
AHA	Animal Health Australia
AHC	Animal Health Committee
ALOP	Appropriate Level of Protection
BIRA	Biosecurity Import Risk Analysis
COAG	Council of Australian Governments
CSIRO	Commonwealth Scientific and Industrial Research Organisation
EADRA	Emergency Animal Disease Response Agreement
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth)
EPPRD	Emergency Plant Pest Response Deed
IGAB	Intergovernmental Agreement on Biosecurity
IPAC	Invasive Plants and Animals Committee
NEBRA	National Environmental Biosecurity Response Agreement
NBC	National Biosecurity Committee
MPSC	Marine Pest Sectoral Committee
PHA	Plant Health Australia
PHC	Plant Health Committee
PITMATD	Primary Industries Technical Market Access and Trade Development Task Group
RDCs	Research and Development Corporations
RIFA	Red Imported Fire Ant (<i>Solenopsis invicta</i> Buren)
RRRA model	Risk Return Resource Allocation (RRRA) model, as developed by the Australian Government Department of Agriculture and Water Resources
SPS Agreement	Agreement on the Application of Sanitary and Phytosanitary Measures
WTO	World Trade Organization

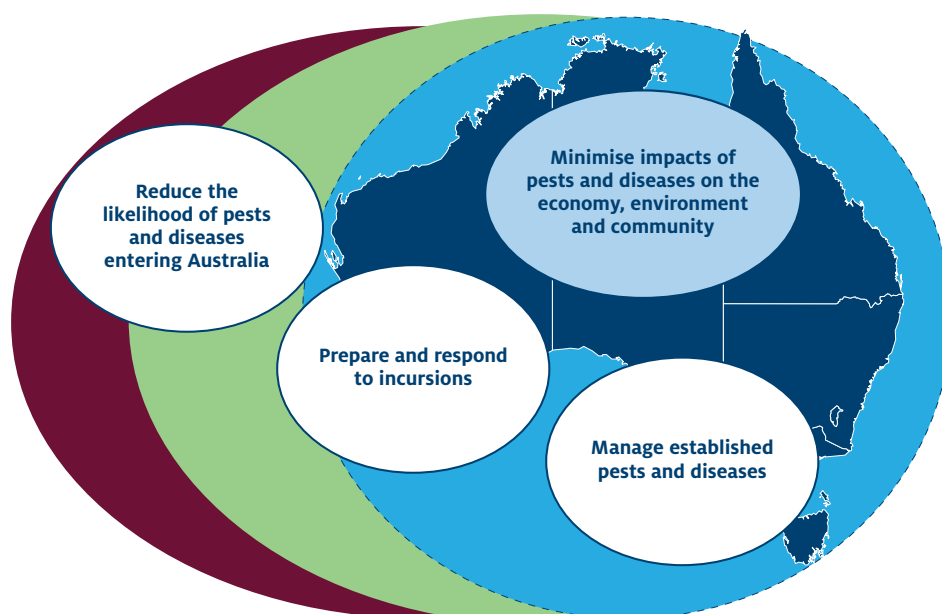
1 Australia's biosecurity system

Australia's biosecurity system plays a critical role in protecting the quality of life of all Australians and our place on the world stage: our first-class produce is safe and available to domestic and international consumers; we have access to premium agricultural trade markets; our native fauna and flora (and their diversity) are unique and of immeasurable value; we are free from many of the major animal, plant and environmental pests and diseases found in other parts of the world; and, our natural, social and urban amenities ensure we remain a highly desirable and rewarding destination for tourists and other visitors. These economic, environmental and social benefits, and Australia's reputational advantages—worth many billions of dollars—rely on a strong and focussed national biosecurity system.

All Australian governments have agreed, consistent with our obligations as a member of the World Trade Organization and signatory to the Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS Agreement), to maintain a level of protection considered appropriate for life or health within our borders—the Appropriate Level of Protection (ALOP). Australia's ALOP provides for a high-level biosecurity standard aimed at reducing risk to a very low level, but not to zero, reflecting community expectations while recognising that zero risk is not feasible. This level applies across the full range of activities that encompass the biosecurity system, where risk-based measures are applied.

Australia's biosecurity system is extensive and complex. There are many component parts covering the spectrum of pest and disease threats to Australia's production systems, people and environment (Figure 1). The system is also multilayered, involving complementary measures applied offshore, at the border and onshore and a broad range of participants, covering all Australian governments (Australian, state, territory and local), industry groups, individual producers, researchers and community members. A strong system would not be possible without contributions from and cooperation between all system participants across the full extent of biosecurity activities.

FIGURE 1 Goal and objectives of Australia's biosecurity system from the 2012 IGAB



1.1 An evolving system

Australia's biosecurity system has continuously evolved and adapted to address emerging challenges and opportunities, and to reflect changing risks, priorities and circumstances.

Since 2000, there has been significant activity across the national biosecurity system—particularly in recent years (Figure 2). All jurisdictions have introduced a range of legislative, governance and system improvements. Industry has similarly been active and increasingly engaged. However, Australia continues to experience a notable number of incursions, reinforcing the need for constant vigilance and continuous review and reform of the system.

System-wide reviews have and continue to strengthen the national biosecurity system; driving structural, behavioural change, and highlighting risks and improvements to be addressed by governments, industry and other system participants.

In 1996, Professor Malcolm Nairn AM chaired an independent review of Australia's then quarantine system (Nairn et al. 1996). A key recommendation was the adoption of the principle of shared responsibility, namely that a partnership approach be the foundation for the then quarantine system, in recognition of the role all stakeholders in the system—governments, industry and the community—have to play. The system of shared responsibility would be most effective when stakeholders were aware of each other's roles and responsibilities, and were working collaboratively toward achieving agreed outcomes.

Other recommendations focussed on environmental considerations in quarantine, increasing the profile of plant quarantine through establishing an 'Australian Plant Health Council' and a Chief Plant Protection Officer position, risks analyses for imports, and considering the broad range of views from industry and the general public in quarantine matters.

In 2005, Mr Roger Smith, a former Northern Territory Government senior official, prepared a discussion paper on biosecurity in Australia for the Primary Industries Standing Committee (a predecessor to AGSOC), highlighting the value of a national approach to biosecurity that brought together the various biosecurity components and functions from across all nine jurisdictions.

In 2008, an independent review chaired by Mr Roger Beale AO (Beale et al. 2008) built on the shared responsibility principle, arguing for a seamless system that fully involved all players, and a move from the concept of quarantine to a broader concept of biosecurity which emphasised managed risk, not zero risk. This risk-based approach broadened the focus of the system from the border only to encompass pre-border and post-border measures, and sought to direct biosecurity controls to where they were most effective.

The Beale Review also recommended the development of a National Agreement on Biosecurity to underpin a partnership approach between the Australian, state and territory governments on biosecurity, building on various existing agreements between governments. Governments' pursuit of this recommendation has taken the form of the Intergovernmental Agreement on Biosecurity (IGAB), signed in 2012 by First Ministers from all governments, except Tasmania. This agreement has become the principal agreement and collaborative mechanism for governments on biosecurity matters.

In 2011, Mr Ken Matthews AO conducted an independent assessment of Australia's preparedness for the threat of foot-and-mouth disease (Matthews 2011), including the capacity to prevent and respond to an outbreak. Recommendations covered the areas of government leadership, a need for greater focus on prevention and preparedness and clarity on responsibility and accountability for disease planning processes.

A 2013 report by ABARES put the cost of a large foot-and-mouth disease outbreak in Australia at more than \$50 billion over 10 years, indicating expectations of very large adverse economic and social impacts and financial losses (Buetre et al. 2013). The findings highlighted the importance of response preparedness and stakeholder collaboration, and the significance of market access considerations for biosecurity.

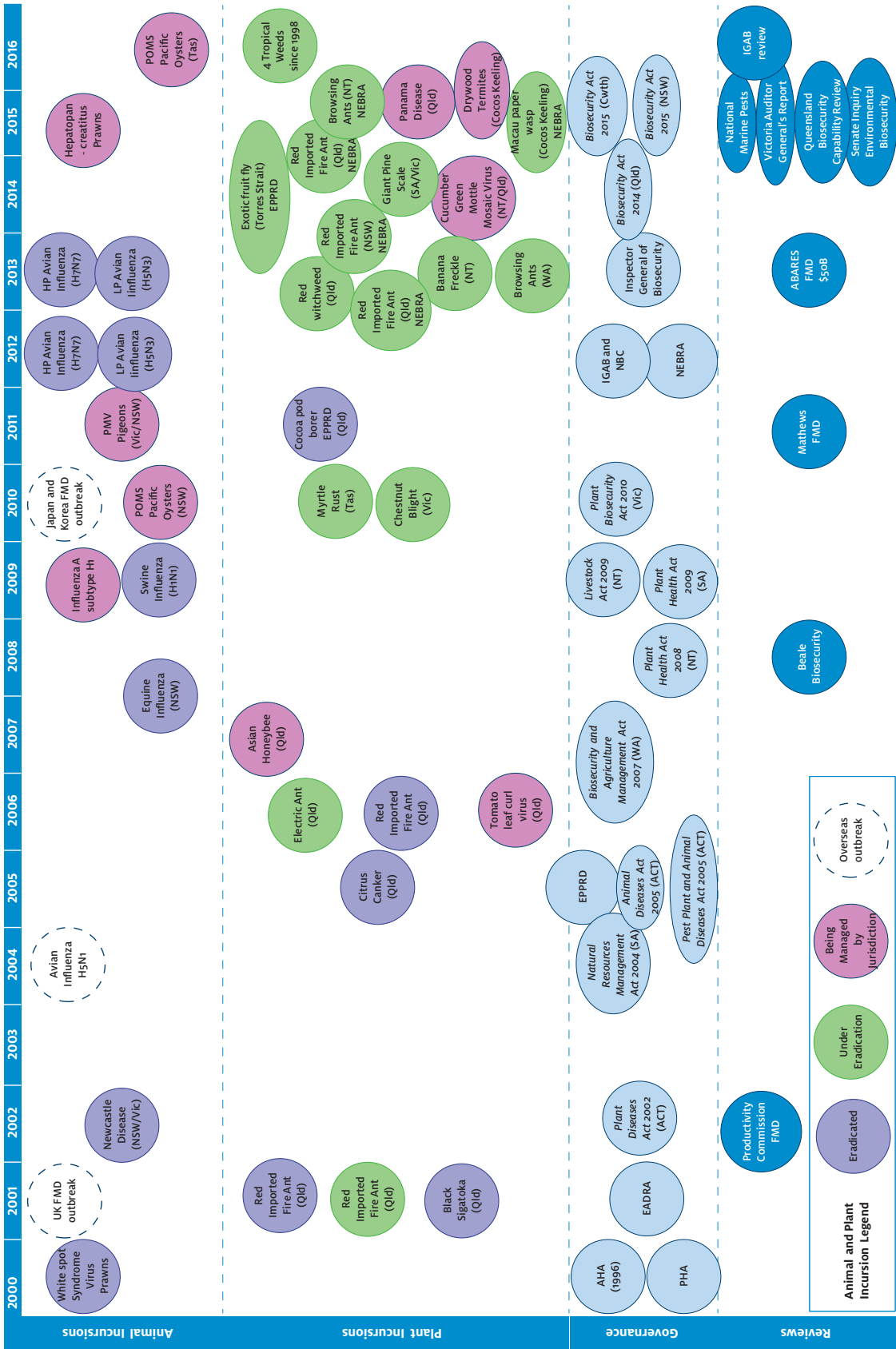
In 2015, the Australian Government led a review of national marine pest biosecurity arrangements (DAWR 2015). The review's recommendations sought to provide a new prevention focus for marine pest biosecurity, develop stronger response arrangements for dealing with incursions, and improve relationships and sharing responsibility for marine pest biosecurity between researchers, industries, governments and the community. The review also highlighted the greater cost-effectiveness and efficiency of preventive measures to reduce impacts of marine pests.

Other recent reviews and inquiries attest to the increasingly tight fiscal environment for governments, including declines in the resourcing available and capability of jurisdictional biosecurity systems. Agencies responsible for biosecurity across all governments have identified challenges in continuing to meet their national biosecurity commitments:

- In March 2015, the Queensland Government commissioned an independent report chaired by Ms Renata Brooks, on the capability of the Queensland biosecurity system (Brooks et al. 2015). The final report highlighted critical gaps in Queensland's biosecurity system, including a pressing need to build capacity to respond to incursions. The report also noted a 26 per cent reduction in staffing between 2012 and 2015.
- In May 2015, the Australian Senate Environment and Communication References Committee released its report into environmental biosecurity (Commonwealth of Australia 2015), suggesting the effective operation of the national biosecurity system is threatened by a lack of resources, including within the Australian Government departments of agriculture and environment, and within scientific bodies, such as the CSIRO.
- In August 2015, the Victorian Auditor-General reported a reduction in the Victorian Government's ability to detect, respond and prepare for an emergency response outbreak (VAGO 2015). The report highlighted a 49 per cent reduction in state recurrent funding for core livestock biosecurity activities between 2009–10 and 2014–15; staffing reductions, including specialist positions, were also highlighted.
- In May 2016, the World Organisation for Animal Health (OIE) released its assessment of Australia's veterinary services, measured against 47 criteria, with 38 given the highest competency level (Schneider et al. 2015). The report noted the high level of biosecurity in Australia, but identified inadequate staffing levels as a key issue for jurisdictions to consider.

The 2016 IGAB Review of Australia's biosecurity system and the underpinning 2012 Intergovernmental Agreement on Biosecurity is another step in the continuous improvement process, essential for maintaining the strength of the national system, its focus on priorities and ability to address areas of emerging need and concern.

FIGURE 2 Recent activity in Australia's biosecurity system



Source: Department of Agriculture and Water Resources.

1.2 Future risks and pathways

Managing biosecurity risk has become more challenging due to increasing risks, the changing nature of risks, and increases in associated management costs. Factors such as globalisation, international and interstate migration, climate change, tourism, and the increasing movement of goods are all contributing to shifts in biosecurity risks (CSIRO 2014; Grafton et al. 2015; Hajkowicz and Eady 2015).

For Australia, over the last decade the number of aircraft passengers has increased by 80 per cent, the number of sea containers imported by 82 per cent and bulk cargo imports by 16 per cent. Current volumes already present challenges requiring, in 2015–16, the border assessment, screening, inspection or clearance of 46 000 sea containers on the Country Action List, 640 000 air freight consignments (under \$1 000 in value), 138 million international mail articles, 19 million arriving international passengers, and 800 000 sea passengers and crew (DAWR 2016).

Future global growth will lead to increased trade and passenger volumes across Australia, along with change in origin of trade and passengers—with more coming from what are considered higher risk origins. Between 2013 and 2025, containerised imports are forecast to rise by 50 per cent, non-containerised imports by 27 per cent and air cargo imports are expected to be double that of air cargo exports. Dynamic changes are forecast in the maritime sector: coastal and international trading (facilitating Australia's maritime trade) is expected to see more foreign flagged vessels operating; and cruise ships are increasingly visiting low-volume regulated ports in New South Wales and Western Australia, anchoring offshore and transporting passengers to destinations in far north Queensland and north Western Australia. Significant changes are also expected in the patterns for international air travel, with inbound arrivals to rise by around 93 per cent by 2030 (DIRD 2014).

In a constantly changing biosecurity environment, Australia's biosecurity system must remain strong and focussed, and build capability and capacity to address future challenges. Future and emerging global trends will significantly change, and increase the magnitude and complexity of the biosecurity risks we face—Australia cannot rely on previous success or our geographic isolation. The CSIRO has identified a number of intersecting global megatrends that point to a future where existing biosecurity processes and practices may not be sufficient (CSIRO 2014).

Based upon feedback and information provided as part of this Review, the Review Panel considers current and likely future risks to include:

- tourism, trade and market access:
 - increased global trade volumes (including the ever-growing choice for online shopping), where export growth (increased shipping) will mean new pathways for new aquatic and other pests and diseases
 - increased imports of processed food, as processors continue to shift operations to their lowest-cost location
 - increased international scrutiny. As trading partners strengthen their own biosecurity systems and requirements, Australia's market access negotiations will be harder, including a growing need to demonstrate our pest and disease freedom
 - increased passenger air and sea travel, bringing increased international tourist entry and activity, including to more remote parts of Australia, and increasingly from countries which have not been historically represented.

- other global trends:
 - increased agricultural expansion and intensification. The trend towards fewer, larger farms may mean that outbreaks will have greater consequences for the owner of the farm and the markets supplied by the farm. Increased agricultural expansion will also have particular relevance to northern Australia where increased agricultural production may create an environment for new pests and diseases to establish
 - increased urbanisation, bringing biosecurity risks closer to agriculturally and environmentally sensitive areas
 - climate change, bringing biodiversity pressures and altering the geographical distribution of pests and diseases globally, including within and in the vicinity of Australia
 - changing consumer expectations, covering the significant growth in products such as free-range meat and eggs, and a rise in organic farming—production systems with biosecurity risk.
- financial risks:
 - sustainable funding allocation, driving greater focus on innovation and cost-saving technologies, as well as greater efficiencies in and effectiveness of the methods used to manage biosecurity risks
 - declining government resources, forcing greater government attention to areas of greater risk (and return on investment), and affecting access to qualified and experienced specialists (for example, veterinarians and plant pathologists). While this approach is logical under conditions of constrained resources, it will impact the overall level of risk, that is, it is not a risk-free decision.

A strong national biosecurity system will require a sustained focus on all these risk areas. The Review Panel has sought to assist key decision makers prepare for some of these risks by proposing a number of structural and systematic improvements, as outlined in this Draft Report.

1.3 The 2012 IGAB

The 2012 IGAB created a framework for governments to coordinate and identify priority areas of reform and action to build a stronger and more effective national biosecurity system. The agreement comprised two parts: the first part established the goal, objectives and principles of the system, as well as the purpose and scope of the agreement; the second part, the schedules, outlined the priority work areas for governments and their key decision-making committee, the NBC.

The 2012 IGAB was an important step for governments, recognising the value of further strengthening and institutionalising intergovernmental relationships—a sign of growing maturity in the national biosecurity system. The agreement has undoubtedly contributed to a stronger working partnership between all governments. While not a signatory, Tasmania has fully engaged and cooperated in the spirit of the agreement.

The achievements of the IGAB, while not necessarily well or publicly documented, are many and cover a broad range of activities across the system, including the development of significant and sound national policy principles and frameworks. Many of these achievements have been drawn upon throughout this Draft Report and include the development of:

- the National Environmental Biosecurity Response Agreement (NEBRA)
- the National Transition Program Policy Framework
- the National Framework for Benefit Cost Analysis
- the National Framework for Cost Sharing Biosecurity Activities
- the national portfolio investment optimisation model
- the national stocktake of biosecurity investment
- a framework for the management of the national surveillance and diagnostic capability
- the Plant, Animal, and Environment and Community Biosecurity RD&E strategies
- a national policy framework for the management of Established Pests and Diseases of National Significance that provides a lead role for industry and community
- the National Biosecurity Engagement and Communications Framework and the revitalisation of the Biosecurity Incident National Communications Network
- self-assessment methods that assist jurisdictions to assess and improve their emergency preparedness capability and capacity.

The 2012 IGAB was an ambitious document, detailing more than 40 priority areas for reform by governments. Perhaps not surprisingly, there remains work to complete. In 2015, the NBC conducted an internal assessment to identify the outstanding priority reform areas and determine how best to progress implementation. As a consequence, reform areas were further prioritised and streamlined. Governments have also recognised the wisdom of regular ongoing review, stipulating a minimum review of the agreement every five years.

2 Knowing and owning our roles and responsibilities

Key points

- ‘Shared responsibility’ is not clearly defined and hence poorly understood. A common understanding is yet to be realised.
- The roles and responsibilities of participants in the national biosecurity system are not well articulated and have not been agreed. Agreeing roles and responsibilities would be an important first step in realising shared responsibility.
- To date governments have appeared reluctant to provide other system participants opportunities to take greater ownership of, and responsibility for, activities in the national biosecurity system.
- A National Statement of Intent would outline a common and unifying approach to biosecurity for all system participants.
- Engagement and communication across the system is mixed; a change in culture is needed.

2.1 What is shared responsibility?

Shared responsibility has been seen as the mainstay of the national biosecurity system for some time. It has been a feature of many reviews (Nairn et al. 1996; Beale et al. 2008; Matthews 2011; DAWR 2015), and is one of the IGAB’s core principles, and it is also included in numerous frameworks that have been developed (for example, the National Biosecurity Engagement and Communication Framework).

Throughout this Review, governments, industry and community members have drawn the Review Panel’s attention to the concept. Feedback received clearly indicates that application of shared responsibility has not been clearly understood or broadly accepted by participants across the national biosecurity system. This has led to misconceptions around the concept (seen by some only as a cost-shifting mechanism), and has caused difficulties in its application:

This term [shared responsibility] whilst used extensively has never been properly articulated or achieved a common meaning amongst members of the biosecurity community. As a consequence, it means many things to many people and no-one has responsibility (Voice of Horticulture submission, pp. 2–3)

There remains a considerable lack of clarity about what shared responsibility means in practice... it is evident that a common position on what the concept does and should mean has yet to be achieved... A misunderstood rationale for why shared responsibility is necessary and a lack of clarity about the expected behavioural change is the key barrier to its use as a policy principle (Queensland Government Department of Agriculture and Fisheries submission, p. 3)

The Panel agrees with the assessments—there is confusion and a lack of clarity, made more difficult by unclear roles and responsibilities for system participants—though some progress has been made. The animal and plant emergency response deeds are founded on shared responsibility, and provide strong evidence of the benefits that come from a partnership approach. Other examples include AHA and PHA, and the General Biosecurity Duty or General Biosecurity Obligation—a regulatory articulation of shared responsibility featured in biosecurity legislation in New South Wales and Queensland (similarly, the Panel notes the Tasmanian Government has recently sought feedback on a general biosecurity obligation as part of proposed legislative changes).

Governments face a dilemma: to provide greater responsibility to participants to encourage behavioural change, or, to delay providing responsibility until behavioural change has been demonstrated. The existence of successful industry participation programs both outside (for example, Landcare) and inside biosecurity (for example, the National Bee Pest Surveillance Program) suggests that careful allocation of roles and responsibilities followed by evaluation, can be very successful. As well, there is no possibility that governments can undertake the biosecurity task alone.

In relation to shared responsibility and planning ahead, Handmer and O'Neill (2016) evaluated some of the sparse empirical evidence about the link between preparedness and actual behaviour in the face of a major disaster—the 2009 Victorian Black Saturday bushfires. Among other things, they found that being well prepared to leave is the safest option, but householders can find it very difficult to assess all the relevant factors. Since those bushfires, significant effort has been put towards wider acceptance and effective adoption of shared responsibility in natural disaster management throughout Australia, particularly bushfires (McLennan and Handmer 2014) and cyclone preparedness.

The Bushfire Cooperative Research Centre has undertaken significant work on shared responsibility, given a sharpened focus by the 2009 Victorian bushfires and the related 2010 Royal Commission (Teague et al. 2010). Reform has been pursued with the changed perspectives, behaviour and actions to be taken by individuals in disaster management (for example, in areas such as bushfire preparedness and response). Importantly, these changes had strong policy support through the COAG National Strategy for Disaster Resilience, positioning shared responsibility as a key component of a national approach to disaster management. Despite the compelling logic, the Panel is unaware of any analysis of their effectiveness, except to note that the number of deaths from more recent events has been significantly smaller.

The Panel considers opportunities exist to learn from the work on natural disasters, and these should be explored by all Australian governments.

Building on this work, the Review Panel has sought to give further clarity to the concept by proposing a simple definition for inclusion in the IGAB and other key national biosecurity system policies. The Panel acknowledges that all parties will have some, but not an equal, level of responsibility:

Shared responsibility means everyone takes responsibility for biosecurity matters under their control. Everyone has an obligation to take action to protect Australia from pests and diseases.

The application of shared responsibility for biosecurity is difficult and challenging (Higgins et al. 2016), primarily because the roles and responsibilities of participants across the national biosecurity system are not clearly understood, accepted, or consistently recognised across the system by all involved:

Governments, and industry to some degree, have failed to raise the overall general awareness of the importance of the national biosecurity system and the roles stakeholders have particularly the general community ... Government agencies generally have a very good understanding of the role[s] and responsibilities of each other however there is not the same amount of understanding around industry's role by both parties (Nursery and Garden Industry Australia submission, pp. 9–10)

Work done by [the Biosecurity Council of Western Australia] identified that stakeholders had relatively consistent perceptions about the broad roles and responsibilities of industry, government and communities—but were less sure of the more specific roles/responsibilities (Biosecurity Council of Western Australia submission, p. 1)

Also, the language used to identify stakeholders within the national biosecurity system—such as risk creators and risk beneficiaries—can be divisive. Biosecurity must be acknowledged as everyone's responsibility, and that it is in everyone's interest to be involved. Designating someone as a risk creator seems unlikely to engender a positive reaction. It may be more appropriate to recognise all stakeholders that interact with the system as 'participants'—as is the case for New Zealand's biosecurity system.

For the national biosecurity system to be effective, everyone must be aware of and acknowledge their roles and responsibilities, and those of other system participants. The Review Panel considers defining the roles and responsibilities of all participants an important first step in helping to realise shared responsibility.

To initiate this process and facilitate discussion between all system participants, the Panel has suggested a set of draft roles and responsibilities (Table 1), and is seeking feedback on these. These have been developed from information provided by stakeholders during this Review, including the Australian Government and the Plant Biosecurity Cooperative Research Centre.

Request for feedback 1

The Review Panel seeks feedback on the draft roles and responsibilities of national biosecurity system participants.

Shared responsibility has been criticised by some industry stakeholder as cost shifting. While governments will have a responsibility to assist in encouraging and involving other system participants, consideration of public and private benefits will need to be made where funding is an issue. A separate, second step would involve developing a means to measure how effectively system participants are meeting their defined roles and responsibilities.

TABLE 1 Draft roles and responsibilities of national biosecurity system participants

Australian Government	State and territory governments	Local government	Industry	General community	Non-government Organisations
<ul style="list-style-type: none"> • matters relating to the national border, including development and enforcement of quarantine • assessing potential risks associated with imported goods • negotiating and facilitating international trade and market access, including by certifying sanitary and phytosanitary conditions • monitoring and reporting Australia's pest and disease status to meet international obligations • incorporating biosecurity risks into threat abatement and recovery plans for threatened species and ecological communities • fulfilling obligations, including those under the WTO, the Convention on Biological Diversity and other international agreements and strategies • promoting biosecurity partnerships between government, industry and the community • managing pests and diseases on land under its responsibility • responding to and controlling detections of exotic pests or diseases that have passed through border controls and are directly related to an imported good • providing national leadership for strategic biosecurity issues, including responses to exotic pests and diseases, and management of nationally significant established pests and diseases • fulfilling commitments within the IGAB 	<ul style="list-style-type: none"> • biosecurity within their borders, including enforcement actions and regulatory interventions • supporting international trade and market access negotiations • negotiating and facilitating domestic trade • monitoring pest and disease status to meet domestic and international obligations • managing eradication and containment programs for nationally agreed and other pest and disease incursions • undertaking biosecurity activities on public lands under their jurisdiction, and on private land under certain circumstances • complying with international obligations • promoting partnerships between all governments, industry and the community to prevent the entry or establishment of pests and diseases • maintaining capacity to prepare for, detect and respond to exotic pest and disease incursions • supporting landholders and the community to manage established pests and diseases • managing established pests and diseases on land under its responsibility • undertaking surveillance and diagnostics to support early detection and diagnosis • regulating the keeping of plants and animals that pose significant risks • fulfilling commitments within the IGAB 	<ul style="list-style-type: none"> • managing local and regional incursion response programs • regional collaboration between local councils to deal with regional biosecurity issues • working in partnership with all governments, industry and the community • promoting reporting of new or unusual weeds, pests and diseases • enforcing pest management legislation • providing support and information to the local community on biosecurity pest and disease management • the management of pest species on local government-owned land 	<ul style="list-style-type: none"> • awareness and understanding of Australia's biosecurity system and its requirements • building risk mitigation measures into normal industry practices • complying with international and domestic obligations and regulations • maintaining capacity to prepare for, and respond to, exotic pests and diseases • promoting reporting of new or unusual weeds, pests and diseases • contributing to the surveillance network for exotic and established pests and diseases • promoting partnerships between governments, industry and the community, where a peak body • leading collective action to manage pests and diseases on behalf of their members, where a peak body • advocating biosecurity and leading biosecurity initiatives in the interest of their members, where a peak body • managing declared established pests and diseases on private lands 	<ul style="list-style-type: none"> • awareness of Australia's biosecurity requirements • awareness of Australia's biosecurity obligations, including for importing goods, and domestic and international travel • reporting new or unusual weeds, pests and diseases • contributing to community action to manage biosecurity risks and protect valuable public assets, such as parks and reserves • building biosecurity risk mitigation measures into normal practices, where a community member is a landholder/manager • managing declared established pests and diseases, where a community member is a landholder/manager 	<ul style="list-style-type: none"> • promoting awareness of Australia's biosecurity requirements to their members • disseminating biosecurity information to industry, landholders, and the community and other stakeholders • promoting reporting of new or unusual weeds, pests and diseases • working with local governments (and other governments, as required), industry, landholders, and the community to manage established pests and diseases

2.2 Greater ownership and participation

At present, the national biosecurity system is heavily reliant on Australian, state and territory governments to ensure its ongoing effectiveness. During this Review, stakeholders noted a reluctance by governments to provide other participants with opportunities to take greater ownership of and responsibility for activities in the national system. While governments have clear responsibilities for some activities (for example, regulatory and international responsibilities), the Review Panel considers opportunities exist for industry, local government and community members to play a greater role than they have in the past. Particular opportunities lie in the areas of priority setting, decision making and funding, policy development and implementation, and on-ground activities, such as surveillance, monitoring and reporting.

The willingness and ability of additional participants to take on greater roles must be recognised and acted on. At present, the full capability and capacity of participants is not appropriately recognised or utilised. In addition, some industry and community members do not fully understand how and when they can, or should, be involved in biosecurity activities, perhaps due to poorly understood roles and responsibilities.

2.2.1 A greater role for industry and the community

Australian governments should provide greater opportunities for industry to be involved in what have traditionally been their areas of discrete responsibility; involvement has been more, though not exclusively, focussed in the area of emergency response. Grain and horticulture industries, for instance, have 136 industry surveillance programs in place. Most of these programs are run by industry groups but some also invest with their state government in delivering the program (RSC 2015). For industry to realise a greater role across the system, it must be prepared for the additional commitments and accountability that will stem from this, including taking ownership of issues and working in a coordinated fashion for the national interest. In particular, industry should take greater ownership for biosecurity issues which it can drive with limited, or no, government involvement. The Livestock Biosecurity Network (LBN) is one example of such an initiative (Box 1).

Box 1 The Livestock Biosecurity Network

The LBN is an industry-led initiative founded in 2013 by the peak industry councils for cattle, sheep and wool, and is supported through ongoing contributions from the Cattle Council of Australia. The LBN plays a key role in managing on-farm biosecurity by working with producers and industry members to provide tools and information to minimise the risks to the health, productivity and market access of livestock.

One example of the LBN's on-ground work includes farm biosecurity plans. The LBN has worked extensively with state farming organisations, animal health authorities and producers to develop and deliver tools and training to assist producers in developing biosecurity management plans for their businesses. For example, trigger factors in Queensland, such as Bovine Johne's Disease management and increased activity related to gas and mineral exploration and extraction, have reinforced the need for better on-farm biosecurity management.

Source: Adapted from the [Livestock Biosecurity Network](#) website.

The Review Panel is aware that major food retailers also have sophisticated quality assurance programs in place to manage food quality and traceability. While biosecurity has not been the main focus to date, it is increasingly on the 'risk radar' for their supply chains. Fresh fruit product withdrawals due to fruit fly infestations and the 2015 outbreak of Panama disease tropical race 4 in Queensland bananas were considered prime example of how biosecurity incidents can disrupt food supply. Food retailers move a significant amount of product to a large number of locations, including internationally, to maintain quality and supply and there is significant potential for retailers to integrate biosecurity considerations into their existing assurance and traceability programs.

Industry assurance schemes (or third-party programs), developed and agreed in partnership with governments, are other examples of how greater ownership for biosecurity activities can be realised (Box 2). Stakeholders noted these benefits:

There are significant advantages to be gained through government/industry partnerships around third party programs including demonstrating the shared responsibility mantra, improving overall biosecurity at farm level and reducing business cost. Third party programs have the potential to be market drivers for change at the farm level and will improve grower's adoption of shared responsibility (Nursery and Garden Industry Australia submission, p. 13)

Box 2 Australian production nurseries certification program—BioSecure HACCP

BioSecure HACCP comprises a set of protocols and procedures that enable businesses to manage biosecurity risks by establishing effective internal quarantine processes for both imported and exported plant material, and validates many of the best management practice strategies under the Nursery Industry Accreditation Scheme Australia (NIASA).

The program is designed to assist growers in assessing their current and future pest, disease and weed risks, and guide businesses in the implementation of management strategies at critical control points. It seeks to identify internal and external (endemic and exotic) threats to the integrity of a business's biosecurity processes and preparedness. Its risk management system encourages businesses to maintain strict internal quarantine procedures and to record actions taken at critical control points.

Source: Nursery and Garden Industry Australia's [BioSecure HACCP](#) website.

However, Australia's trading partners want government certification, and government needs to have sufficient confidence in industry programs to be able to defend them, for example, the meat export program. The proactive support and involvement of governments is essential for the long-term success and overall effectiveness of such arrangements, including by addressing any impediments to their implementation.

Local government, with its close connections to local, regional and rural Australia, has much to offer the national biosecurity system. The Review Panel was reminded, on numerous occasions, of the positive contribution that local government could play in biosecurity. In the Northern Territory, industry and government stakeholders recognised the contribution and expertise that could be provided in emergency responses, for example, banana freckle. It was noted that local government could draw on its disaster management skills, and successfully apply these to biosecurity emergency response management.

The Panel believes these opportunities warrant greater consideration by all Australian governments.

General community understanding of, and participation in, biosecurity is generally considered to be low, with responsibilities unclear, and opportunities for engagement largely informal and limited. Participation is hindered by the dominant agricultural focus of biosecurity and a limited knowledge of community-level biosecurity risks, with the exception of international and domestic travellers and those responsible for on-farm biosecurity.

Australian governments are increasingly recognising the benefits of community participation in biosecurity, especially where citizen science and citizen awareness initiatives can improve surveillance. Opportunities for strengthening participation could be encouraged through already established networks such as the regional NRM organisations.

2.3 A National Statement of Intent

There is no single, overarching national policy statement or strategy shared by all system participants. At present, the national biosecurity system is made up of objectives, principles and policies embedded in various jurisdictional and industry policy documents, sectoral strategies, and emergency response deeds, which have, for the most part, been developed in parallel, but not always in conjunction with each other.

Stakeholders hold a range of views on the merits of an overarching national statement or strategy: some consider the lack of a strategy a major gap in the strategic biosecurity landscape; some consider that while current arrangements are adequate, they would benefit from improved coordination; and others noted the need for a national policy document, but recommended priority be given to more significant reforms (for example, strengthening environmental biosecurity). Nonetheless, the majority of stakeholders consulted as part of this Review were generally supportive of a jointly developed overarching national policy document:

The development of a national strategy, for example, would also provide opportunities for all stakeholders to improve their awareness of what key partners in Australia's national biosecurity systems are already doing to address biosecurity within their sectors (Australian Lot Feeders' Association submission, p. 3)

A national biosecurity statement of intent may provide a platform to establish a common understanding of the national biosecurity system among stakeholders and the broader community. It offers an opportunity to realise a shared vision of the challenges facing the system, including funding and capability (Queensland Government Department of Agriculture and Fisheries submission, p. 3)

The ECA believes a national strategy for the biosecurity system is necessary to formulate a more integrated approach (Export Council of Australia submission, p. 3)

A national strategy would give greater effect to IGAB's partnership opportunities, by enabling industry, and other stakeholders and government to work more effectively in partnership, building greater consensus on the opportunities and challenges that exist, clarifying roles and responsibilities and maximising through shared understanding and coordinated collaborations the return on resources and investments for all (Animal Health Australia submission, p. 8)

A national statement of intent, and explanation of the role that different industry sectors can play in the national biosecurity [system], could support a joint commitment and cooperation with industry. This would also provide a policy platform whereby stakeholders have an expressed shared commitment to issues concerning the environment, regional economies and security (Queensland Tourism Industry Council submission, p. 4)

The Review Panel considers a National Statement of Intent is necessary and overdue. The system and all its participants would benefit from a unifying national statement that is jointly-developed and agreed by all major participants (including all tiers of government, industry and key community representatives) and which recognises a common understanding of biosecurity, shared responsibility, and Australia's risk-based approach. This statement would articulate a national vision and goal for biosecurity, provide clarity to roles, responsibilities and accountabilities of participants, outline national priorities and principles for managing biosecurity, thereby providing a solid foundation for the national biosecurity system into the future. COAG's National Disaster Resilience Statement (COAG 2009), released on 7 December 2009, is a useful example.

The Review Panel does not consider the statement to be a lengthy document—the detail would be best captured in 2–4 pages (the roles and responsibilities discussed in this chapter would be a large component of the statement). Parties involved in its development should seek to finalise the statement within one year. The national statement should, over time, help individual governments better align their activities and jurisdictional strategies to the priorities of the national biosecurity system as part of their broader jurisdictional responsibilities.

Draft recommendation 1

The NBC and the proposed Industry and Community Advisory Committee, through an open, transparent and collaborative process, should lead the development of a draft National Statement of Intent for public consultation that outlines:

- a vision, goal and objectives for the national biosecurity system
- principles for managing biosecurity
- the meaning and application of 'shared responsibility'
- the roles, responsibilities and commitments of participants, including accountability measures
- governance arrangements for the national biosecurity system.

The process should involve government (including local government), industry and the community.

The Review Panel sees the National Statement of Intent as pivotal in the evolving government-industry-community partnership. However, all parties would need to acknowledge they are accountable for delivering on their commitments. Australian governments will also need to be mindful of the variable capacity of others involved in biosecurity, and be supportive of developing this capacity in others.

2.4 Improving engagement and communication: a cultural shift

During this Review, stakeholders highlighted the highly variable nature of government communication and engagement. Some positive comments were made about communication during an emergency response and on managing established pests and diseases. In addition, the changes made to the biosecurity roundtables (joint government-industry fora) in recent years—from information provision to genuine discussion—was also seen as a step in the right direction. The Review Panel acknowledges progress in these areas but considers more work can be done.

Other stakeholders have been critical of the way in which governments communicated biosecurity matters and engaged participants. These activities were typically characterised as a one-way flow of information and lacking genuineness:

Industry is only engaged in an advisory fashion. There needs to be a national ‘true partnership’ forum between industry and government on the biosecurity system, providing industry with the opportunity to assist in shaping and designing biosecurity measures (National Farmers’ Federation submission, p. 3)

... the operating model [for communications and engagement] is still very much working on the traditional paradigm of government making policy decisions and then providing information to industry in the guise of consultation. It is Voice of Horticulture’s view that this is notification. Even when funding is on the table the Commonwealth has proved extremely reluctant and reticent to engage in serious discussion, let alone share responsibility for its management (Voice of Horticulture submission, p. 4)

The sheep industry is concerned that the current level of engagement with industry is a fundamental flaw in the implementation and decision making process under the current agreement [IGAB]. Sound biosecurity outcomes will only be realised when effective engagement and communication between all key biosecurity stakeholders is undertaken (Sheepmeat Council of Australia & WoolProducers Australia joint submission, p. 1)

Some stakeholders have suggested a communication framework, strategy or plan could provide the solution. The Panel notes the National Biosecurity Engagement and Communications Framework (IGAB Schedule 6), endorsed by the NBC in 2013, which aimed to support and enhance government communications with a range of stakeholders but has not delivered the required change—stakeholders continue to raise their concerns.

Industry is rightly seeking greater biosecurity communication and engagement from governments across Australia. However, at the same time, there is an expectation from governments and other system participants that industry will further commit to helping address short-comings of the national biosecurity system. This maturing of the relationship between industry and governments will result in a far superior national system.

Communication and engagement is neither a project, nor the work of a committee. It is core, day-to-day business for all system participants.

A cultural change would see governments committing to better and more open communication and engagement (acknowledging that some issues must be handled sensitively). This would also mean bringing industry and community participants into decision-making processes, noting that a ‘seat at the table’ brings responsibilities and obligations for non-government participants. Where decisions are for governments only, this will mean timely and transparent communication with others.

3 Market access is key

Key points

- There is scope to sharpen the focus on international market access within the national biosecurity system.
- Negotiating access to new markets will be harder in the future as trading partners strengthen their own biosecurity systems and requirements. Pest and disease freedom will need to be demonstrated.
- The effort and resources required to maintain and improve access to existing markets is significant and should not be underestimated.
- Jurisdictions and agricultural industries need to act pro-actively and cooperatively to ensure Australia continues to remain competitive in international markets.
- Jurisdictions already have the mechanisms in place to streamline domestic market access requirements and resolve domestic trade disputes, if there is a will to do so.
- There is a lack of clarity, consensus and transparency around the roles of the Australian, state and territory governments in international and domestic trade.

3.1 Biosecurity and trade

Access to a broad range of international markets under least cost import conditions is critical to the competitiveness of Australian agriculture. Australia's clean, green image, a robust regulatory framework and favourable animal and plant health status gives our industries and primary producers a competitive advantage in relation to other exporting nations. Around two-thirds of Australia's agricultural products are exported and agriculture exports are forecast to be worth \$44 billion in 2016–17 (ABARES 2016). Australian producers are heavily reliant on exports to underpin their livelihoods largely because the domestic market is small. Australian exports are estimated to feed approximately three times that of the Australian population.

Trade in agricultural commodities depends on the existence of agreements between importing and exporting countries on technical market access conditions which relate to biosecurity and food safety. Keeping technical market access and negotiating new or improved access conditions is increasingly complex and challenging. Other exporting countries are becoming more competitive in some key markets and many importing countries are developing more sophisticated requirements to be met by exporters and certified by the Australian Government. Some markets will request Australia to provide scientific evidence of pest freedom, as we do of them.

Reciprocity is becoming a common feature of market access negotiations, with trading partners seeking access to our market for certain commodities in return for access to their market. Decisions around access to the Australian market take account of Australia's ALOP and may not always be acceptable to trading partners. However, Australia's import policies are an essential element of maintaining our favourable animal and plant pest disease status.

Stakeholders expressed a range of views during this Review on the priority that market access considerations should be given in the national biosecurity system. Views expressed to the Panel during consultation can be summarised as:

- Market access is the reason for investing in a national biosecurity system: ‘if you don’t have a good biosecurity system you can’t trade’ (key driver)
- Australia’s biosecurity system underpins international market access for Australia’s agriculture exports (key beneficiary)
- Market access is only one of the arguments for a strong national biosecurity system—environmental, human health and social amenity outcomes are also key (joint drivers and beneficiaries).

Our clean, green image clearly underpins our valuable tourism industry much of which is dependent upon utilising the natural beauty and biodiversity of the distinctly Australian environment. International visitors to Australia spent more than \$38 billion in the year ending June 2016 (TRA 2016). Nature-based tourism forms a significant component of Australia’s visitor economy. For example, [Tourism Australia’s](#) website notes that, in the year ending June 2016, 68 per cent (or five million) of international visitors engaged in some form of nature-based activity. The Queensland Tourism Industry Council drew the Panel’s attention to the significant negative consequences that biosecurity incidents can have on Australia’s tourism industry:

The integrated nature of the visitor economy, across many sectors and sensitive to various global and local economic forces, means that any risk or impact on other sectors, including agriculture, can have flow-on impacts to the success of the tourism industry (Queensland Tourism Industry Council submission, p. 3)

The 2003 global outbreak of Severe Acute Respiratory Syndrome (SARS) resulted in the annual growth of Australia’s direct tourism GDP, which measures the value added of the tourism industry at purchasers’ (market) prices, falling from 3.9 in 2002–03 to 0.3 per cent in 2003–04 (TRA 2016a). Internationally, tourism suffered the largest financial impact from the 2001 foot-and-mouth disease (FMD) in the United Kingdom, estimated to have been between £4.5 and £5.4 billion to the United Kingdom economy (UK NAO 2002).

The Review Panel believes there is scope to better align the trade, market access, biodiversity and biosecurity agendas. The driver for this should be the cost and effectiveness of the national system.

3.2 International exports

Agriculture has been one of the most significant beneficiaries of trade agreements and is well placed to capitalise on the recent free trade agreements with China (ChAFTA), Japan (JAEPA), and Republic of Korea (KAFTA), and advance other market access opportunities for Australian products. However, our ambitions for market access will not be realised without a finely tuned national biosecurity system. The New Zealand Government Ministry for Primary Industries (NZ MPI 2016) captured the relationships this way:

Biosecurity + Market Access = Lasting two-way trade relationships

3.2.1 Assessing the opportunities

The Australian Government has responsibility for market access negotiations. However, the export interests of multiple governments and multiple industries—with multiple export aspirations—means implementing such an approach is highly complex.

The arrangements for facilitating government and industry agreement on market access priorities can be opaque to those not directly party to the negotiations. While acknowledging the sensitive nature of our market access strategy, governments should consider what scope there is to publicly clarify the processes and consultation mechanisms for developing and reviewing it, without compromising our trade. Judgement will clearly be required to assess the desirable degree of transparency against the risk it poses to Australia's interests.

The Primary Industries Technical Market Access and Trade Development Task Group (PITMATD)—comprising senior representatives of agriculture and trade departments—plays a key role in shaping the trade policy framework and coordinating market access efforts by the jurisdictions. Feedback received by the Panel during this Review indicates this can be an effective forum, though there are no public outputs for non-government stakeholders to judge. It is also unclear how the work of the NBC, including any role in addressing biosecurity related trade limitations, might be taken up by or through PITMATD. This seems largely dependent upon CEOs of agriculture departments who are both members of PITMATD and the higher authority to the NBC.

Industry is seeking greater opportunity to input into market access decisions by the Australian Government. While industry takes the lead on developing commodity market access strategies (with the input of governments), the Australian Government develops the overarching priorities for international market access and country strategies on key markets (with the input of industry and states). Such arrangements have had variable outcomes for the parties depending on the balances struck during the negotiation process. Some industry stakeholders cited instances where market access wins did not align with industry priorities. On the other hand, government cited some instances where multiple market access requests by the horticulture sector were not prioritised or realistic.

The Panel notes the positive role being played by the Grains Industry Market Access Forum and Horticulture Innovation Australia Limited to facilitate development of industry priorities for new and improved market access. Agricultural industries should be encouraged to work closely with bodies such as these to robustly assess market readiness and quantify the return for effort required to gain access.

While not necessarily within the scope of this Review, the Panel also notes that government and industry stakeholders continue to express concerns around the biosecurity import risk analysis (BIRA) process and outcomes (for example, table grapes). These concerns relate primarily to competition, in other cases to contention around science, pest and disease risk, and the lack of industry engagement on any underlying strategy for the BIRA work program. In its submission, the NFF acknowledge that “industry could be engaged more on priorities to better align the departments import analysis and export market access work” (National Farmers' Federation submission, p. 7). PITMATD would appear to be the appropriate vehicle for discussing these issues.

3.2.2 Balancing our efforts

In Australia's quest to obtain new markets, hard-won and improved access for our agricultural products in existing markets must be continuously nurtured and our international reputation maintained. Key market access achievements since July 2013, published on the Australian Government [Department of Agriculture and Water Resources](#) website, indicates that approximately 50 per cent of wins concerned improved access, maintained access or restored access in our existing markets.

While incidents of temporary suspension of Australia's market access are rare compared to our exporting competitors (New South Wales Government Department of Primary Industries submission, p. 14), the Panel notes there were at least 17 instances where trade was restored in the past three years. Recent examples of non-compliance with importing countries requirements include the 2016 suspension of live cattle exports to Japan (Box 3) and repeated rejection of consignments of barley to China due to high snail numbers. Restoration of trade is usually achieved through agreement to new export certification requirements or bilateral negotiations with the importing countries. However, there is a significant economic, reputational and opportunity cost to these events occurring, even though trade may be restored within 12 months. A national biosecurity system focussed on supporting market access should have a very low tolerance for such occurrences. When such incidents occur, considerable analysis is needed to establish where the supply chain or inspection and certification processes have broken down and to institute remedial action to avoid repeat disruption to the market.

Box 3 2016 suspension of live cattle exports to Japan

In June 2016, Japan temporarily stopped accepting feeder and breeder cattle from Australia in response to some cattle testing positive for the wasting disease Bovine Johne's disease (BJD) in post arrival quarantine. Japan is Australia's only international live cattle export market that is actively eradicating BJD and has sanitary justification in applying strict import controls for this disease. An investigation by the Australian Government Department of Agriculture and Water Resources into the matter confirmed that the consignment of 300 cattle from Victoria were not prepared according to the importing country requirements. In this case, certain preparation and isolation procedures within the supply chain were not adequately followed, resulting in the live cattle exporting business having its licence to send cattle overseas cancelled. Japanese authorities reopened the \$14.6 million trade in feeder and breeder cattle from Australia in August 2016, following agreement on improved export certification processes for all consignments to ensure transparent information about the origin of all exported cattle.

Source: Australian Government Department of Agriculture and Water Resources.

While Australia's strong regulatory framework, across all jurisdictions, has a critical role to play here, industry must ensure that systems are put in place to prevent a small number of operators from adopting sub-standard practices, and potentially devastating a whole industry. Industries need to be pro-active in encouraging the use of best practise management systems across all sectors, to minimise the threat of loss of reputation and credibility, and potentially being shut out of an export market.

3.2.3 Regional differences/area freedom

The capacity to establish zones of area freedom from pests and diseases is highly valued by primary producers. Regional freedom can provide significant trade advantages especially during a biosecurity outbreak.

Jurisdictions, however, hold a range of views on the strategic approach and value of demonstrating area freedom. The Western Australian government claims there should be greater recognition of the market access benefits that regional freedom status can bring to jurisdictions (Western Australian Government submission, p.8). Western Australia is free of many pests and diseases that are present in other states and territories, largely as a result of its isolation, and implements border protection arrangements to maintain its geographic and area freedom advantage. The same might be said for Tasmania. The Review Panel notes some governments are concerned about the significant resources provided by governments to maintain proof of area freedom, despite the private benefit.

The Australian Government, on the other hand, generally seeks to minimise internal border measures but recognises, under the *Biosecurity Act 2015* (Cwlth), regional differences where there is a strong, scientific evidence for taking action. However, the Victorian Government provides the following caution:

Zoning rules for international trade need to be carefully considered as they are very costly and can be more expensive to administer than the value of trade. Australia needs to carefully consider the need to have States and Territories recognised as zones, as this effectively results in the creation of 'additional countries' (Victorian Government submission, p. 7)

The Review Panel is interested in gaining a better understanding of the total effort (including what is involved) and costs (including cost sharing arrangements) associated with demonstrating area freedom by jurisdictions, and the value of that trade, to inform the Panel's Final Report.

Request for feedback 2

The Review Panel seeks feedback on the total effort and costs associated with demonstrating area freedom by jurisdictions, and the value of that trade.

The IGAB contains commitments (Clause 7.10) around regional differences affecting imports (that is, they are a BIRA consideration) but does not deal with area freedom for exports. Australia's export markets are concerned about risks associated with pests and diseases already here, but trading partners are increasingly taking into account any local trade restrictions, when assessing the import of product from Australia.

As a nation we need to ensure that any local trade restrictions are evidence based, are no more stringent than our import measures and are consistent with our claims for exports. For example, all states recognise South Australia and Tasmania's freedom from Mediterranean fruit fly (*Ceratitidis capitata*; MedFly) and Queensland fruit fly (*Bactrocera tryoni*; Qfly)—our export market access claims of area freedom for South Australia and Tasmania are consistent with domestic measures. Conversely, all jurisdictions recognise that MedFly is present in Western Australia and require treatment of Western Australian fruit to allow interstate movement. The domestic measures in place to contain MedFly to Western Australia are consistent with our import measures (international) and protect the rest of Australia from this serious horticultural pest.

3.3 Domestic trade

Trading and transporting goods across state and regional boundaries was a common concern raised by industry (producers and retailers) and government stakeholders during this Review. Under section 7.15 of the IGAB, the states and territories (except Tasmania) have agreed to limit the application of interstate biosecurity measures to: those necessary to mitigate risks to the economy, environment and community; the least trade restrictive and scientifically-based measures; and those necessary to achieve Australia's ALOP. However, the Productivity Commission (PC 2016) identified there is little evidence that these provisions are limiting the use of trade restrictive regulations—and the Review Panel notes this concern is evident in some instances.

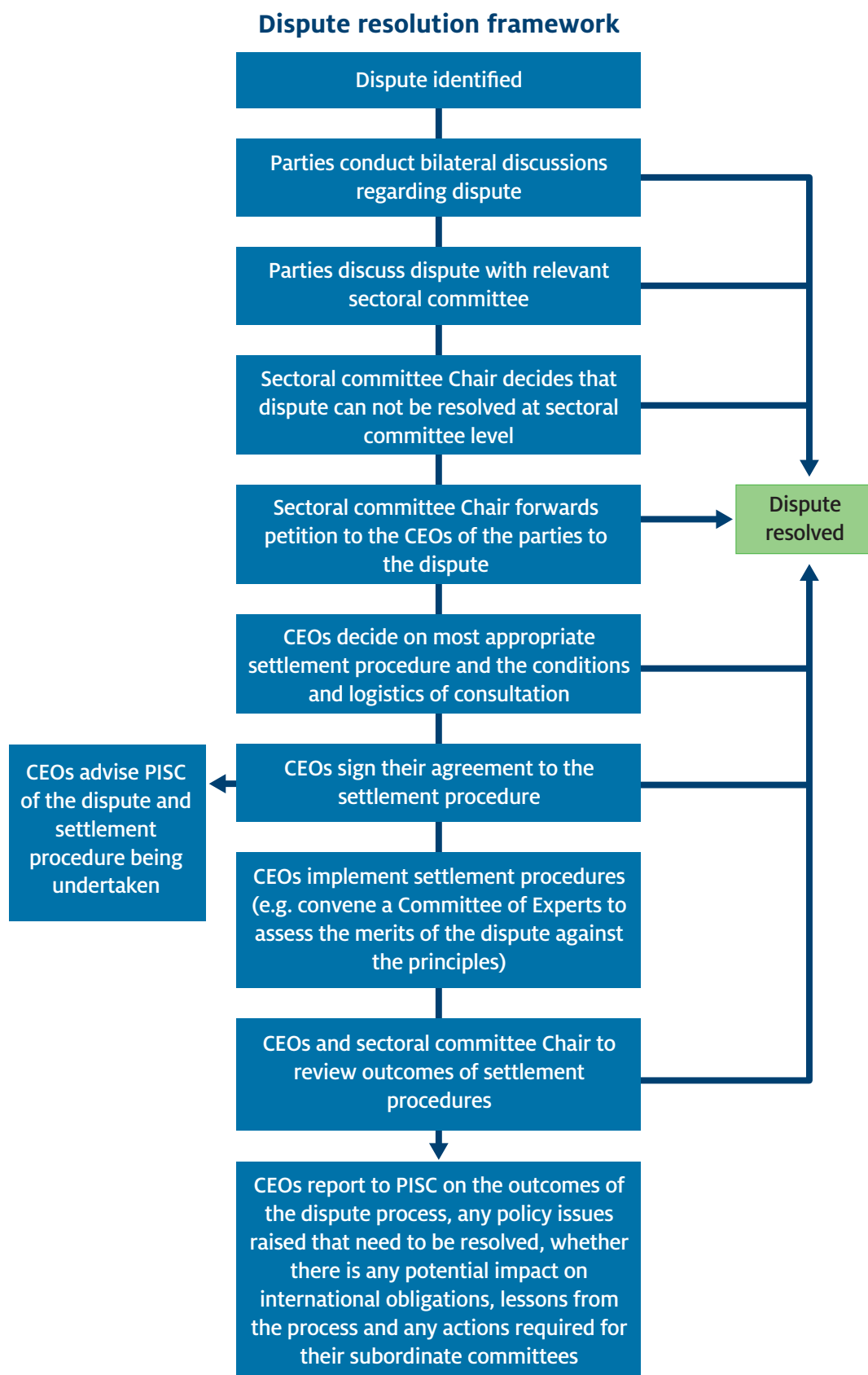
Some governments proposed the Interstate Certification Assurance Scheme which offers the opportunity to streamline domestic trade arrangements (only plant at present), with increased rigour and transparency, and could minimise domestic trade disputes. The Queensland Government believes interstate certification agreements “largely operate independently of each other and would be complemented by a more strategic approach to domestic market access” (Queensland Government Department of Agriculture and Fisheries submission, p. 8), for example, development of a harmonised policy framework.

The Nursery and Garden Industry Australia strongly addresses the need to fix domestic trade arrangements:

...that our national biosecurity system is exposed to fundamental risks due to an increasingly complex and costly domestic market access system ... The threat of non-compliance is increasing as government cost shifts and reduces business flexibility in servicing various supply chains. NGIA believes this is a direct result of governments across Australia failing to fund plant biosecurity at adequate and appropriate base levels particularly in recognition of the public good (Nursery and Garden Industry Australia submission, p. 13)

The South Australian Government believes the Australian Government should have a proactive role in resolving significant post-border quarantine issues between the states and territories, including domestic trade disputes. The IGAB (section 7.19) envisaged such a role for the Commonwealth and was the reason the Tasmanian Government did not sign the IGAB. The dispute resolution mechanism in the IGAB could not be drawn upon, even if there was a will to do so, as the Commonwealth had no legal basis for intervening. The *Biosecurity Act 2015* (Cwlth) similarly contains no such provisions.

Most domestic trade disputes are long standing and primarily concern plant products (for example, trade in potatoes between South Australia and Western Australia). A comprehensive and implementable dispute resolution mechanism was approved in 2010 by agriculture ministers and is still current. The arrangement includes a dispute resolution framework (Figure 3) and principles, along with terms of reference for a committee of experts to assess the merits of a dispute. However, jurisdictions have shown little appetite for escalating issues to agriculture CEOs and ministers, and it is unclear whether this process has ever been utilised.

FIGURE 3 Primary Industries Ministerial Council 2010 dispute resolution framework

Ultimately, the resolution of disputes will be dictated by the willingness of the parties to engage in a genuine process or to defer (and be bound by the decision of) a third party. The dispute mechanism of the then *Murray-Darling Basin Act 1993* (Cwlth), provides a robust alternative mechanism that jurisdictions might consider adapting for inclusion in IGAB2. The process (outlined in clause 133(1) of that Act) involved the following process of escalation:

- If the Commission fails to agree on any motion submitted by a Commissioner within two months, that Commissioner may refer the matter to the Ministerial Council
- If the Ministerial Council fails to resolve the matter within six months, any member may refer it to an arbitrator
- When a matter is referred to an arbitrator, any Contracting Government may give the other Contracting Governments written notice to agree to appoint an arbitrator to decide the matter
- If an arbitrator is not appointed within two months of notice being given, the Chief Justice of the Supreme Court of Tasmania may appoint an arbitrator at the request of the Contracting Government giving notice above.

The decision of any arbitrator appointed under the clause is deemed to be the decision of the Commission and binds the Commission, the Ministerial Council and the Contracting Governments.

3.4 Regulatory efficiency

For 2015–16, export earnings from agricultural commodities were around \$44.5 billion (ABARES 2016). The Australian Government, through the Department of Agriculture and Water Resources, controls exports of agricultural products under the *Export Control Act 1982* (Cwlth) and associated regulations. While the legislation requires exporters to take responsibility for ensuring that Australian agricultural products meet importing country requirements, it is the department that bears responsibility for export certification. In 2015–16, the department issued more than 407,000 export certificates and managed the export of more than 3 million animals (DAWR 2016).

The Australian Government has made a number of reforms to minimise regulatory burden and costs associated with its export and biosecurity functions. These include modernisation of department's ICT systems and service delivery arrangements, new cost recovery arrangements, introduction of the *Biosecurity Act 2015* (Cwlth) and a review of agricultural export regulation currently underway (DAWR 2016a). Similarly, the states and territories have been reviewing their biosecurity arrangements and are committed to an ongoing process of reform. Jurisdictions have also moved to accept some co-regulatory arrangements with industry, where appropriate (Box 4).

Notwithstanding these moves, stakeholders continue to raise concerns around the red tape, time delays and costs associated with biosecurity inspection and certification services. While there is no doubt room for improvement, it is largely the case that the constraints applied are a combination of trading partner requirements on imports to meet their domestic legislation or to ensure a rogue event does not occur.

The Review Panel believes potential exists for the current compliance and assurance model to evolve towards a regulatory model with appropriately weighted incentives and sanctions. As part of this, the Panel encourages governments to explore the potential for introduction

of incentive-based programs which reward a superior and sustained compliance culture by industry participants. The Australian Trusted Trader programme (Box 4) run by the Australian Border Force gives priority cargo clearances and other benefits to businesses meeting supply chain standards— this provides a good example which biosecurity regulators should seek to emulate.

Box 4 Government incentive-based programs

Australian Government Authorised Officer Program

A key feature of the regulatory framework for agricultural exports is the Authorised Officer (AO) program administered by the Australian Government Department of Agriculture and Water Resources. Under the *Export Control Act 1982* (Cwlth), non-government officers are trained and assessed to perform export inspection functions in accordance with the legislation. When undertaking these duties, the officers are regarded as Australian Government officials. There are currently 1044 external and 273 internal AO for plant-based industries. Exporters value the flexibility the program provides, for example, enabling product to be shipped at maximum quality not when government officers are available. However, such disaggregated workforce can create oversight difficulties and a robust verification process is needed to ensure Australia's international reputation for quality and reliable exports is maintained.

Interstate Certification Assurance (ICA) Scheme

The ICA scheme provides an alternative to traditional plant health certification involving government inspectors. This national scheme, administered by all states and territories, enables a business to be accredited by a state or territory plant quarantine authority to issue plant health assurance certificates for its produce. To be accredited, a business must be able to demonstrate it has effective in-house procedures in place that ensure produce consigned to intra or interstate markets meets specified plant quarantine requirements. The plant quarantine authority audits compliance by the business. The scheme seeks to provide a harmonised approach to the audit and accreditation of businesses throughout Australia and the mutual recognition of plant health assurance certificates accompanying consignments of produce moving intrastate or interstate.

Australian Trusted Trader programme

The Australian Border Force's (ABF) voluntary trade facilitation initiative, the Australian Trusted Trader programme (ATT), recognises businesses with a secure supply chain and compliant trade practices, rewarding accredited businesses with a range of trade facilitation benefits, including: a dedicated Account Manager; priority services; differentiated examinations will apply as they are recognised as low risk; and use of the Australian Trusted Trader logo. The ATT is open to Australian importers, exporters and service providers such as ports, brokers and freight companies that are active in the international supply chain. Agricultural enterprises (for example, Teys Australia) are participants in this program.

Mutual Recognition Arrangements are being established with Australia's key trading partners (for example, New Zealand Customs Service) to enable Trusted Traders to access trade facilitation benefits of the reciprocal trading partner—reducing the customs regulatory burden for Australian exporters entering foreign markets. The ABF has established an Industry Advisory Group to bring together representatives from industry and government to provide advice, feedback and input into the design and development of the ATT. Minutes of meetings are publicly available.

Source: Australian Government Department of Agriculture and Water Resources; the NBC's sub-committee on Domestic Quarantine and Market Access [ICA database](#) website; Australian Government Department of Immigration and Border Protections [ATT](#) website.

3.5 Conclusions and recommendations

Australia's world class biosecurity system is a trade and economic asset. It underpins agricultural exports, international tourism, our substantial environmental assets and the social amenity of our cities and rural communities.

There is, however, no room for complacency. As Chapter 1 shows, there are a number of significant, impending risks that will test our ability to maintain Australia's ALOP and our comparatively 'ready access' to our preferred international markets. As such, strengthened consideration of market access priorities and outcomes within the national biosecurity system and IGAB2 is warranted. Jurisdictions already have a sense of how this might be done.

The New South Wales Government Department of Primary Industries submission (p. 15) proposed the following approach:

- Identifying biosecurity related trade limitations and agreeing to priorities and processes for overcoming these issues
- Understanding what we need to do to demonstrate freedom from biosecurity threats to those markets
- Using available data (presence and absence) to build a cohesive picture of status-based programs
- Strengthening surveillance networks utilising government and non-government organisations.

The Victorian Government submission (p. 7) proposed that the IGAB formally recognise Plant Health Committee's Trade Framework, which guides government efforts to harmonise and streamline interstate and export trade conditions. The framework comprises:

- Standards for entry requirements, which are informed by: risk analysis; pest status of the importing/exporting jurisdiction; and market access needs
- Controls to ensure standards are met (for example, certification, registered establishments, inspection, documentation requirements)
- Systems of compliance to provide assurance around implementation of the controls (for example, auditing, verification, non-compliance detection).

The Review Panel would support such efforts by jurisdictions to sharpen the focus on market access within the national biosecurity system and its components via the IGAB. Enhancement and review of surveillance and diagnostic systems and research and innovation to underpin existing and future market access arrangements would be two obvious and fertile areas. A sharper focus on market access does not mean a dominant focus, as the national biosecurity system must also serve the public good. As well, care will be need to be exercised in arriving at a level of transparency in information that does not risk our trade.

Draft recommendation 2

The Primary Industries Technical Market Access and Trade Development Task Group, should seek to enhance engagement with industry to ensure that Australia's market access strategies are aligned appropriately through an agreed priority setting process, and that the degree of transparency and communication is carefully weighed against its level of risk to trade activities.

Draft recommendation 3

IGAB2 should strengthen consideration of market access requirements within the next NBC work program.

Draft recommendation 4

Jurisdictions' biosecurity surveillance activities should include pests and diseases that pose the greatest threat to our export markets.

Draft recommendation 5

States and territories should utilise (or adapt) the dispute resolution process agreed by ministers in 2012 and include the key elements of that in IGAB2.

Draft recommendation 6

IGAB2 should clarify the roles and responsibilities of the parties with regard to international and domestic market access, including proof of area freedom.

4 Stronger environmental biosecurity

Key points

- Environmental biosecurity encompasses biodiversity and ecosystems and social amenity.
- Incursions of exotic organisms harmful to Australia's environment are a regular occurrence.
- Environmental biosecurity efforts often have private as well as public benefits, but costs are largely borne by governments. Private contributions are unknown.
- Environmental considerations should be comparable to human health and primary production with respect to biosecurity, and national arrangements need to be explicitly developed (pre-border, at the border and post-border) to address environmental biosecurity risks.
- The IGAB needs to more explicitly reflect environmental considerations.
- Environment agencies need to be more engaged and play a far stronger and more direct role in the development of national biosecurity policy and in response arrangements, particularly in those situations where the primary impact of a newly introduced pest or disease is environmental.
- Stakeholders are divided on how to strengthen environmental biosecurity arrangements: create equivalent arrangements to agriculture; or integrate environment into existing arrangements.
- Australia's success in both trade and tourism depends to an increasing degree on our underpinning clean, green, biodiverse environment.

4.1 The problem for governments

Environmental biosecurity has long been viewed as subordinate, including in funding terms, to agricultural biosecurity in the national system. Biosecurity efforts for agriculture have clear economic drivers (for example, minimising production losses, maintaining and gaining market access) whereas environmental biosecurity efforts are viewed as 'public good' activities and so are left to governments to fund and implement. In reality, biosecurity incursions often have both production and environmental impacts, which blurs roles and responsibilities and decisions around who benefits and who pays.

Agriculture and primary industry agencies have, explicitly or by default, taken responsibility for environmental biosecurity, primarily because they have existing arrangements, technical expertise and structures in place upon which to draw—though they have less expertise in environmental management and risk identification to support decision-making. These agencies fund environmental biosecurity from within their existing budgets leading some government and industry stakeholders to question the financial sustainability of such arrangements and opportunity costs for primary production outcomes.

The numbers of invasive species in a region or country have been shown to be related to gross levels of trade (Paini et al. 2016). The 2015 Senate Standing Committee on Environment and Communications References Committee inquiry into environmental biosecurity

(Commonwealth of Australia 2015) found that incursions of exotic organisms harmful to Australia's environment are a regular occurrence. The Australian Government's submission to that inquiry (Australian Government 2014) detailed more than 30 incursions of exotic pests and diseases detected within Australia since 1 January 2009 with the potential to impact the environment. A significant number of these were plant pests that were found not technically feasible to eradicate. However, the Senate Committee found that evaluating the significance of this pattern of incursions is not straightforward and there are no absolute markers of success or failure against Australia's level of biosecurity protection of 'very low but not zero'.

While the Review Panel generally agrees with this finding, Table 2 shows that environmental biosecurity has dominated the emergency response efforts and agency budgets in recent years, particularly in relation to incursions of various tramp ants. Ongoing stakeholder concerns about the effectiveness of existing national arrangements to address environmental biosecurity risks elevated this issue as a key area for this Review. Of note is the number of off-deed responses, which mostly pre-dated NEBRA. The agricultural weed parasite, Red witchweed (*Striga asiatica*), was excluded from the Emergency Plant Pest Response Deed (EPPRD) (as a weed) and from NEBRA because their impact is agricultural not environmental.

TABLE 2 Nationally funded emergency responses (as at 21 September 2016)

Species	Location	Response plan duration	Response plan budget (\$m)	Australian Government (\$m)	State and territory (\$m)	Industry (\$m)
EPPRD						
Khapra beetle (<i>Trogoderma granarium</i>)	Adelaide and Kangaroo Island, SA	2015–16 to 2016–17	2.56	1.03	1.02	0.51
Exotic fruit fly in the Torres Strait	Torres Strait, QLD	2015–16 to 2017–18	1.23	0.49	0.50	0.24
Giant pine scale (<i>Marchalina hellenica</i>)	Harkaway and Mt Waverly, Vic. and Dernancourt, SA	2014–15 to 2017–18	5.87	1.47	1.50	2.90
Banana freckle	Howard Springs, Darwin, NT	2013–14 to 2017–18	24.29	6.03	6.16	12.10
Chestnut blight (<i>Cryphonectria parasitica</i>)	Ovens Valley, VIC	2010–11 to 2016–17	4.09	2.00	1.30	0.79

Species	Location	Response plan duration	Response plan budget (\$m)	Australian Government (\$m)	State and territory (\$m)	Industry (\$m)
NEBRA						
Red imported fire ant (<i>Solenopsis invicta</i>)	Brisbane airport, QLD	2015–16 to 2017–18	0.91	0.46	0.45	N/A
Browsing ant (<i>Lepisiota frauenfeldi</i>)	Darwin Port, NT	2015–16 to 2017–18	1.10	0.56	0.54	N/A
Red imported fire ant	Port Botany, NSW	2014–15 to 2016–17	1.20	0.61	0.59	N/A
Red imported fire ant	Yarwun, QLD	2013–14 to 2016–17	3.60	1.8	1.80	N/A
Macao paper wasp (<i>Polistes olivaceus</i>)	Cocos (Keeling) Islands	2015–16 to 2017–18	0.19	0.19	0	N/A
Off-deed responses						
Red witchweed (<i>Striga asiatica</i>)	Mackay, QLD	2015 to 2025	5.86	1.80	1.16	2.90
Browsing ant	Perth Airport, WA	2013–14 to 2015–16	0.14	0.14	0	N/A
Electric ant (<i>Wasmannia auropunctata</i>)	Cairns, QLD	2006–07 to 2015–16	12.88	6.44	6.44	N/A
Red imported fire ant	South-east QLD	2010–11 to 2017–18	133.30	65.00	68.30	N/A
Four tropical weeds	QLD and NSW	2010–11 to 2017–18	14.60	7.38	7.22	N/A
Total (\$m)			211.82	95.40	96.98	19.44

Source: Australian Government Department of Agriculture and Water Resources.

Red imported fire ants (Box 5) and myrtle rust are examples from the last two decades of incursions with significant environmental and cost impacts, and where the national response arrangements have been tested.

Box 5 Red Imported Fire Ant (*Solenopsis invicta* Buren)

Red imported fire ants (RIFA) are one of the world's most invasive species, causing serious impacts for the environment, agriculture, social amenity, the economy, infrastructure, and human and animal health.

RIFA were first detected in Port Brisbane and Richlands, Brisbane in 2001. Ants at Port Brisbane were eradicated in 2012 while SE Queensland has since been the subject of an eradication program. In 2006, RIFA were detected in Yarwun, Queensland and eradicated in 2010. This was the first time in the world that an established RIFA population had been eradicated (Wylie et al. 2016). In 2013, a new incursion was detected at the Port of Gladstone, Queensland, which was the first emergency response to be considered under NEBRA.

Other detections in Port Botany, Sydney (2014) and Brisbane airport (2015) are under eradication programs being cost-shared by all Australian governments. Under cost-sharing arrangements, two of Australia's six established incursions of RIFA have been eradicated and another two are very close to eradication.

The SE Queensland incursion was almost eradicated in 2003, but initial surveillance failed to gauge the extent of the outbreak. Subsequent surveillance showed the outbreak was about twice the size that it was originally thought to be. It is estimated that RIFA were there at least 20 years prior to this. In 2016, an independent review into RIFA found that it remains in the national interest to eradicate the ants and that it is technically feasible and cost beneficial to do so. Ministers agreed to continue to cost share the RIFA SE Queensland eradication program in 2016–17 in accordance with the nationally agreed 2013–18 Response Plan. Funding of a 10-year eradication plan is under consideration.

Modelling by the Queensland Government indicates that failure to eradicate RIFA in SE Queensland would impose costs of \$43 billion over 30 years (Antony et al. 2009). In the United States, RIFA currently inhabit 14 states and cost \$7 billion a year in damage and control.

Source: Antony et al. 2009; QDAF RIFA [eradication program](#) website; Wylie and Janssen-May 2016; Wylie et al. 2016.

RIFA is, and will continue to be, a major test for the national biosecurity system. It demonstrates the importance of all jurisdictions (ministers and senior officials and stakeholders) acting together in a transparent, timely and decisive manner. Concerns around 'bureaucratic delays' in funding and cost-sharing decisions was an issue frequently raised during consultation for this Review, particularly for off-deed emergency responses. These off-deed decisions take time because they do not have pre-existing agreement from Commonwealth, state or territory treasury departments and, therefore, often require ministerial approval. The Review Panel is also aware that funding and delivery (lead agency) arrangements to contain yellow crazy ants (*Anoplolepis gracilipes*) in the Wet Tropics World Heritage Area are still subject to ongoing negotiation within and between relevant jurisdictions. Yellow crazy ants are considered an established pest so do not come under the national arrangements for cost-shared eradication.

Biosecurity efforts can lose significant traction from delays in funding decisions, impacting eradication or containment, as the experience of RIFA in south-east Queensland and yellow crazy ants in far north Queensland illustrates.

4.2 Views on environmental biosecurity

Governments and biosecurity stakeholders have long debated the best way to address environmental biosecurity concerns—whether to create separate and equivalent arrangements to agriculture, or to embed environment within the animal and plant biosecurity streams.

4.2.1 What the Beale and Hawke reviews said

The 2008 Beale Review (Beale et al. 2008) concluded that more significant effort is needed on the terrestrial and aquatic environment reflecting the nature of the incursion risks involved.

The biosecurity of the environment is a concern not only for the sake of Australia’s environmental assets, but also because of the scope for wild animals and plants to act as a reservoir for pests and diseases that have broader effects (p. 138).

The Beale Review proposed, among other things, ensuring the then recommended National Biosecurity Authority was armed with the appropriate environmental (terrestrial and aquatic) technical expertise, and broadening the membership of Animal Health Australia and Plant Health Australia to encompass environmental pest and disease issues.

In responding to the recommendations of the Beale Review and environmental biosecurity arrangements under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (the EPBC Act), Hawke (2009) suggested:

- most of Australia’s ecosystems and species are threatened to some extent by invasion by diseases, pests, weeds and feral animals
- environmental considerations should be equal to human health and primary production in all stages of Australia’s approach to managing biosecurity—pre-border, at the border, post-border
- an integrated governance model is preferred for implementing the Beale Review recommendations provided that environmental outcomes are not compromised by a ‘culture’ favouring trade and primary production.

4.2.2 What governments and stakeholders told us

The Australian Government Department of Agriculture and Water Resources asserts it is difficult and not desirable to manage biosecurity risk to the environment in isolation from managing biosecurity risk to animal, plant and human health.

The 2015 Senate inquiry examined the framework in place for environmental biosecurity including the proposal by the Invasive Species Council and others to establish Environment Health Australia. The proposal was resoundingly opposed by the Australian Government (agriculture and environment portfolios) and AHA and PHA. The inquiry’s final report (Commonwealth of Australia 2015) proposed better coordination and information between existing organisations and agreements. The Review Panel notes that the Australian Government is yet to respond to the inquiry’s recommendations.

Within the current NBC model, environmental issues and risks appear to be distributed amongst the NBC's sub-committees as follows:

- Biosecurity risks and incursions with production and non-production (environmental) risks are handled by the Animal Health and Plant Health Committees.
- Biodiversity and agricultural impacts of established pests and diseases (including weeds and freshwater pests) are handled by the Invasive Plants and Animals Committee.
- The Marine Pest Sectoral Committee (MPSC) deals with non-production risks and incursions.
- Animal Health Committee deals with diseases impacting native wildlife and aquatic (production) animals. AHC members include Wildlife Health Australia, an environmental non-government organisation.
- The Plant Health Committee deals with tramp ants, and specifically RIFA, presumably because it has technical expertise relevant to invertebrates.
- Some environmental responses to a species are covered by NEBRA while other responses for the same species are not.

Jurisdictions cited past attempts to treat environment issues as a separate stream under the NBC but consider this approach inefficient and duplicative. Additionally, some have highlighted that the environment also benefits from the broader system efforts (pre-border, border measures and surveillance). The Australian Government Department of Agriculture and Water Resources and representatives from other jurisdictions believe stakeholders are simply not aware of the full scope and breadth of activities undertaken by governments that support the management of biosecurity risks to the environment. That is, the issue is primarily one of transparency. Regardless, non-government stakeholders continue to view the arrangements for environmental biosecurity as immature, *ad hoc* and underfunded at all points in the system.

A contributing factor to the lack of transparency is there is no equivalent to Wildlife Health Australia (WHA) for 'non-wildlife biodiversity', and so no direct conduit to environment organisations or the community. WHA is funded by the Australian Government and public donations to coordinate and provide input on diseases in native wildlife which may affect the natural environment and be passed on to production animals. The Australian Government could consider an expanded remit for WHA, covering biodiversity more broadly.

The Invasive Species Council, Wildlife Queensland, environmental stakeholders and others asserted that the issue lies in the fact that biosecurity is currently an agriculture commodity based system. In its submission, the Invasive Species Council drew the Review Panel's attention to their view of the level of preparedness in agricultural biosecurity compared with environmental biosecurity (Table 3, compiled in 2015), highlighting limited systematic surveillance for environmental biosecurity and few early detection and rapid response plans.

Biosecurity stakeholders, including government departments, have also expressed concerns about emergency response arrangements for environmental pests and diseases. NEBRA sets out emergency response arrangements for responding to nationally significant biosecurity incidents, primarily impacting the environment and/or social amenity, and where the response is for the public good.

TABLE 3 Invasive Species Council Submission: Comparing industry and environmental preparedness*

Measure	Agricultural biosecurity	Environmental biosecurity
Contingency planning		
Institutions	Plant Health Australia Animal Health Australia Wildlife Health Australia	Government implements NEBRA Obligations Few tangible outputs
Funds*	\$20M over 5 years to PHA, AHA	Minimal
Contingency plans	90 industry plans	2 tramp ant plans, 1 myrtle rust plan
Risks identified		
Vertebrate pests	159 mammal, bird, reptile and amphibian species rated extreme threat	
Animal pests and diseases	65 animal diseases	None identified
Plant pests and diseases	348 priority plant pests	None identified
Marine pests	23 priority species, 35 on trigger list	
Invasive plants	None	None (apart from inadequate 2000 weed alert list)
Strategies		
Biosecurity strategy	National plant biosecurity strategy Animal Health Australia strategic plan	No equivalent
Diagnostic strategy	National plant biosecurity diagnostic strategy	No equivalent
Surveillance strategy	National animal health data standards National plant biosecurity surveillance strategy National animal health information standards National sentinel hive program National significant disease investigation program	No equivalent
RD&E strategy	National plant biosecurity RD&E National Animal Biosecurity RD&E strategy	Draft national environment and community RD&E strategy
Plans and protocols		
Biosecurity plans	17 plant industry biosecurity plans 30 animal disease strategies	No equivalent
Diagnostic protocols	127 national diagnostic protocols	No equivalent (1 for myrtle rust relevant)
Biosecurity manuals	17 industry-specific biosecurity manuals 15 livestock industry manuals	No equivalent
Emergency response agreement	80 plant diseases 65 animal diseases	Response decided on national significance and other criteria
Stakeholder involvement		
Consultative committees	14 industry-specific committees	No formal structure
Incursion responses	Industry stakeholder participation	No community involvement
Contingency planning	Industry membership of Plant Health Australia, Animal Health Australia	No community involvement

*The Review Panel has not verified the table elements.

Source: Invasive Species Council submission, (p. 27).

NEBRA is highlighted as one of the key achievements under the IGAB. It is a government-only agreement that has been triggered on five occasions to date, primarily for tramp ants (refer Table 3). Environmental biosecurity stakeholders have questioned the workability of NEBRA stating that it ‘sets the bar too high’. For example, the need for consensus from all governments to trigger a biosecurity incident response. Some stakeholders also highlighted that neither NEBRA nor any other agreement will be able to address airborne environmental pest incursions (such as rusts, and airborne insects) or, incursions into marine and freshwater ecosystems, as these are rarely ever eradicable pests and diseases.

While these issues should be examined as part of the five-year review of NEBRA to be conducted in 2017, a fundamental driver of success is the level of commitment by Australian, state and territory governments to support financially, decisions agreed to under NEBRA.

However, it is worth noting that in the primary industry sectors, the relevant industry commits funds, along with the Australian, state and territory governments, to an agreed eradication program, in accord with the relevant deed. The relevant industry is financially exposed to the cost of a control program, and this in itself provides an additional external check to ensure a prudent assessment and evaluation prior to committing substantial funds to an eradication program. No such external party with financial exposure exists in the context of environmental pests and diseases, and governments are rightly concerned about the potential to inappropriately allocate taxpayer funds to eradication programs that have little or no chance of success.

Draft recommendation 7

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 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.

4.3 Governing for environmental outcomes

Responsibility for environmental biosecurity is shared across jurisdictions, government agencies and other systems participants. However, current governance structures and relationships built around ‘integrating’ the consideration of environmental biosecurity risks are, despite best endeavours, not advancing the scope of work needed to identify and mitigate those risks—and current activities and outcomes are largely invisible to those external to the NBC.

4.3.1 Clearly defined lead and support agencies

The national biosecurity system’s goals and objectives under the IGAB aim to minimise the harm that exotic pests and diseases can have on the Australian economy, environment and community. While the IGAB is the fundamental agreement between governments for biosecurity, national cooperation is reinforced by other government agreements including the 1992 Intergovernmental Agreement on the Environment (IAE) and 1997 Heads of agreement on Commonwealth and state and territory roles and responsibilities for the Environment (COAG 1997), which respectively state:

The parties recognise the threat posed to both the natural environment and agricultural and agricultural production by pest species of introduced plants and animals and acknowledge that a cooperative national approach to their control has the potential to produce savings from a reduction of duplication of existing effort. The parties agree that the Commonwealth's role should be one of facilitating the coordinated State efforts within this national approach. Due to the nature of the threat, coordination of a national approach should be undertaken through the Australian and New Zealand Environment and Conservation Council, the Australian Agricultural Council and the Australian Fisheries Council (1992 IAE Schedule 9: Nature conservation)

The Commonwealth interest involves co-operation with the States to avoid or minimise risks to the environment arising from the import and export of animal and plant material that could contain anything that could threaten Australia's native flora or fauna and their natural environment (1997 Heads of agreement: Attachment 1)

With the streamlining of COAG ministerial council arrangements in 2013, governments jointly tasked the Agriculture Ministers' Forum (AGMIN) and its sub-committee, the NBC, with national coordination of biosecurity. This effectively assigned agriculture portfolios with lead responsibility for biosecurity in each of the jurisdictions and, to a significant extent, appears to have let environment agencies 'off the hook'. At the Australian Government and state and territory levels, there have been varied levels of engagement by the environment agencies, and a willingness by them to let the agriculture portfolio have carriage of biosecurity.

While current arrangements can and do deal with environmental biosecurity matters, this does not occur on a systematic or transparent basis. The Review Panel believes environment agencies and stakeholders must be more engaged in the formulation of national policy positions on biosecurity, and to provide agriculture agencies with the technical expertise on environmental risks:

Environment need to identify the environmental biosecurity issues. Agriculture runs the machine but they need the knowledge, priorities and technical expertise to come in (Australian Government)

The Review Panel recommends that 'lead' biosecurity agencies (agriculture) should have formalised arrangements with their 'support' biosecurity agencies (environment, national parks, fisheries, regional development, defence et cetera). Some state agencies have formalised arrangements in place, but these are a minority. For example, the South Australian departments of Primary Industries and Regions South Australia (PIRSA) and Environment, Water and Natural Resources have a memorandum of understanding (MoU) to facilitate resource and information sharing, including staff. For the Australian Government, MoUs have been signed between the then departments of Agriculture and Health, and Agriculture and Customs and Border Protection. However, no such arrangement exists with environment.

Draft recommendation 8

Jurisdictions should institute formal arrangements between agriculture and environment agencies to define the objectives of cooperation, leading and support roles, information flows, resources and deliverables. The Australian Government agriculture and environment departments should enter into a Memorandum of Understanding, modelled on those with health and immigration agencies.

The Australian Government Department of Environment and Energy has responsibility for national threatened species under the EPBC Act, and for meeting Australia's international obligations, including controlling alien species, under the Convention on Biological Diversity. Any MoU between agriculture and environment should capture how biosecurity risks will be addressed through threat abatement planning processes under the EPBC Act and, where these overlap with NEBRA or another response deed, how responsibilities are assigned.

4.4 Institutionalising environmental biosecurity

Agricultural agencies consider that national arrangements under the IGAB and the NBC can and do address biosecurity risks to the environment (for example, RIFA), while environment lobby groups and organisations have observed these arrangements can skew the focus of the biosecurity system towards the production sector, where the cost/benefit is clearer. Both of these perspectives are valid, but evidence to date indicates that environmental biosecurity risks are yet to be fully defined, and preparedness, surveillance and response arrangements are not yet mature.

IGAB2 should address this through clearer commitments to environmental biosecurity throughout the agreement and focus on environmental biosecurity as part of a future NBC work program. The work to be done should centre on establishing an agreed national list of priority pests and diseases likely to impact the environment and progress systematically through the approach described in Chapter 5, to ensure the capacity and capability to prepare and respond.

Draft recommendation 9

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
- invertebrate transmitted diseases as well as animal diseases.

Such a program of work is unlikely to occur without dedicated senior leadership, resources and technical expertise. The Review Panel believes the Australian Government should establish the senior expert position of Chief Environmental Biosecurity Officer located within the environment department to perform a national leadership role similar to the Chief Veterinary Officer and Chief Plant Protection Officer in the national biosecurity system. As part of the duties of the position, the Chief Environmental Biosecurity Officer should report on the effectiveness of Australia's environmental biosecurity arrangements and achievements. Reports should be made publicly available.

A less-preferred alternative is for the Chief Environmental Biosecurity Officer to be located within the agriculture department. Agriculture manages biosecurity risks arising through the movement of people, goods and conveyances, but needs the expertise of the environment department in environmental risk identification and management, including for the environmental outcomes of 'natural pathway' environmental pest introductions (for example, things that 'blow in'). The Review Panel acknowledges the environment department will not be 'expert' in many areas but it has well-developed networks of experts and would be more able than agriculture to identify and marshal these when needed.

The Chief Environmental Biosecurity Officer would lead work to prioritise national biosecurity risks impacting the environment (terrestrial, marine, aquatic) and social amenity (Chapter 5). They would be supported by and chair a new Environmental Biosecurity Committee, comprising government and external environment biosecurity experts. Membership of this committee would also include appropriate representatives from both the animal and plant sectoral committees of the NBC. Once its work on national priority pests and diseases is completed, the future role of the Committee could then be reviewed. Replicating the Chief Environmental Biosecurity Officer at the state/territory level is not intended, nor deemed necessary under these new arrangements.

Draft recommendation 10

The Australian Government should establish the senior, expert position of Chief Environmental Biosecurity Officer within the environment department. A less preferred option is to house the position in the agriculture department. The position should report on the effectiveness of Australia's environmental biosecurity arrangements and achievements. Reports should be made publicly available.

Draft recommendation 11

The NBC should establish and resource a new Environmental Biosecurity Committee (EBC), comprising government and external environment biosecurity experts and representatives from both the animal and plant sectoral committees of the NBC, to support the role of the Chief Environmental Biosecurity Officer. The role of the EBC should be reviewed following its work to prioritise national biosecurity risks impacting the environment.

Consideration also needs to be given to how conservation and other community groups (for example, natural resource management and expert non-government representation) might best input to this work. In its submission, the Wildlife Preservation Society of Queensland rightly points out that community organisations, while resource poor, are willing agents of environmental biosecurity if given such a role (p. 3). While conservation non-government organisations (NGOs) are many and varied, there are a number of umbrella organisations (for example, signatories to the Invasive Species Council submission) that could lend knowledge

and expertise. Wildlife Health Australia appears to be a good model where the government and community through donations contribute to its work. In Chapter 7, the Review Panel has proposed a new NBC biosecurity stakeholder advisory committee, to include environment and community representatives.

To complement these arrangements greater clarity around the roles of AHA and PHA in environmental biosecurity is needed. AHA and PHA are national coordinators of the government-industry partnerships for animal and plant biosecurity. They also carry some responsibility for environment issues where production-based pests and diseases also impact the environment and native species. However, the Panel notes the constitutions and strategic plans of the companies are not enablers of environmental biosecurity, and there is scope to build board and company expertise in this area. Further, of AHA's 32 members, only two associate member organisations (Wildlife Health Australia and Zoo and Aquarium Association), have environmental affiliations. Of PHA's 58 members, there are none with environmental biosecurity expertise.

Draft recommendation 12

Greater and explicit roles should be developed for AHA and PHA in environmental biosecurity, instituted through amended constitutions and expanded board expertise.

To provide clearer evidence of the IGAB's commitment to environmental biosecurity, the inclusion of the precautionary principle in the IGAB was suggested in submissions. This issue—the application of the precautionary principle, as spelt out in the EPBC Act, when considering biosecurity risks—was also reviewed by the 2008 Beale Review. The Beale Review Panel concluded that, while it was sympathetic to the idea, the precautionary principle, as spelt out in the EPBC Act, was “unlikely to be consistent with the requirements of the SPS Agreement” and its application might lead to Australia being in breach of its obligations under the Agreement, leaving Australia open to challenge under the WTO dispute settlement procedures. This panel sees no compelling reason to differ.

5 Building the national system: pest by pest, disease by disease

Key points

- In an environment of constrained and finite resources there is a fundamental need to ensure investment in biosecurity targets priority risks with actions, to yield the greatest return possible.
- Risk identification and assessment requires ongoing attention.
- Some biosecurity risks and pathways are well known but there are significant knowledge gaps, especially for non-traditional risks and pathways.
- Australia has a mixture of biosecurity strategies and policies that have been tailor-made for each jurisdiction, taxon and/or agency. There should be an agreed national approach for prioritising exotic pest and disease risks—across the taxa—to guide governments' investments.

Australia's biosecurity system is a complex machine. There are many different players, many activities in which they participate, and a range of biosecurity risks to be managed. There is an elaborate web of interrelationships which is difficult to understand and navigate. The complexity of the national biosecurity system is unlikely to lessen over time if parties continue to devise strategies and plans, which do not have a common foundation. With the exception of the three emergency response deeds there is little evidence of a systematic approach, involving all system participants, to planning and responding.

The national biosecurity system, which brings together the work and priorities of all jurisdictions and industries, would benefit significantly from a clear, agreed statement of national priorities. It needs an unambiguous and consistent process that prioritises the animal, plant and environmental pests and diseases that pose the most significant risks and systematically works through these to establish the effort and resources required to address these risks in a manner that provides the greatest return.

5.1 Determining national priorities

Determining national priority pests and diseases is not a new idea. The Beale Review (Beale et al. 2008), in the context of advocating a stronger risk-based approach to biosecurity, identified the need for the development of a list of national priority exotic pests and diseases, with their respective pathways, on the basis of the likelihood of incursion and the pest and disease impacts (Beale Recommendation 45). The United States Government has a high-priority plant pest and disease list of about 50 to 60 species (RSC 2015). The Review Panel strongly supports this approach.

Some progress to national prioritisation has occurred but it is varied:

- For animal pests and diseases, the AHC has agreed to a national list of notifiable animal diseases, based on the list of diseases notifiable to the OIE (World Organisation for Animal Health). A national list of reportable diseases of aquatic animals (50 as at April 2016) has also been agreed by the AHC.
- For environmental pests and diseases, work to determine priorities cannot be readily located; the Review Panel is aware that work to determine marine priority pests and diseases is underway, and that a number of biosecurity key threatening processes have been identified under the EPBC Act. However, systematic prioritisation of risks to other ecosystems (freshwater, estuarine, and terrestrial environments) is likely yet to be completed. The Panel notes that ABARES has commenced a project to identify potential invasive species with predominantly environmental impacts, expected for publication in 2017.
- The Plant Health Committee (PHC) has recently agreed its national ‘top 40’ priority pests and diseases, a list which was endorsed by PHC members through a national elicitation process that considered economic, social and environmental impacts.
- For weeds, the Panel notes that ABARES has commenced a weed threat assessment and categorisation process to identify priority threats and segment them between environment and production, expected for publication in 2017.

Building on the approach taken by the PHC, the Review Panel recommends the adoption of a single agreed systematic approach to determine and plan for national priority animal, plant and environmental pests and diseases, based on the outline below.

Draft recommendation 13

Jurisdictions should adopt a systematic approach to determine and plan for national priority animal, plant and environmental pests and diseases.

5.1.1 Profiling priorities

1. **Identify pests and diseases of concern:** The relevant NBC sectoral committee should identify all (exotic) pests and diseases of concern, incorporating advice from industry or community members (as relevant), experts, and other key system partners.
2. **Conduct preliminary assessment:** To be considered a national priority, the compiled list must be assessed against thresholds or criteria. This would include that they are limited to exotic pests and diseases with national impact (economic (including trade), environmental or social); potential to spread or establish in Australia; and a clear benefit from national effort and/or response. This process, which would serve as a preliminary risk assessment, should involve subject matter experts and expertise beyond the relevant sectoral committee.

Pests and diseases that do not meet the national thresholds or criteria could continue to be managed appropriately by jurisdictions and/or the relevant industry or industries.

3. **Establish a priority list:** The relevant NBC sectoral committee agrees and publishes the national lists for priority animal, plant and environmental pests and diseases.

These lists of pests and diseases will not be static. It should be expected that new and unanticipated risks will arise from time to time, and attention given to their inclusion. The United States Government reviews its prioritised plant pests and diseases every two years (RSC 2015), however, given the resources that are likely required to complete the initial Australian lists and their biosecurity requirements, a review every five years seems more pragmatic.

5.1.2 Filling out the picture—pest and disease activity planning

Once a national priority list has been agreed, the relevant NBC sectoral committee, with involvement of relevant system participants, should determine, for each national priority pest and disease, the planning activities required. This should include:

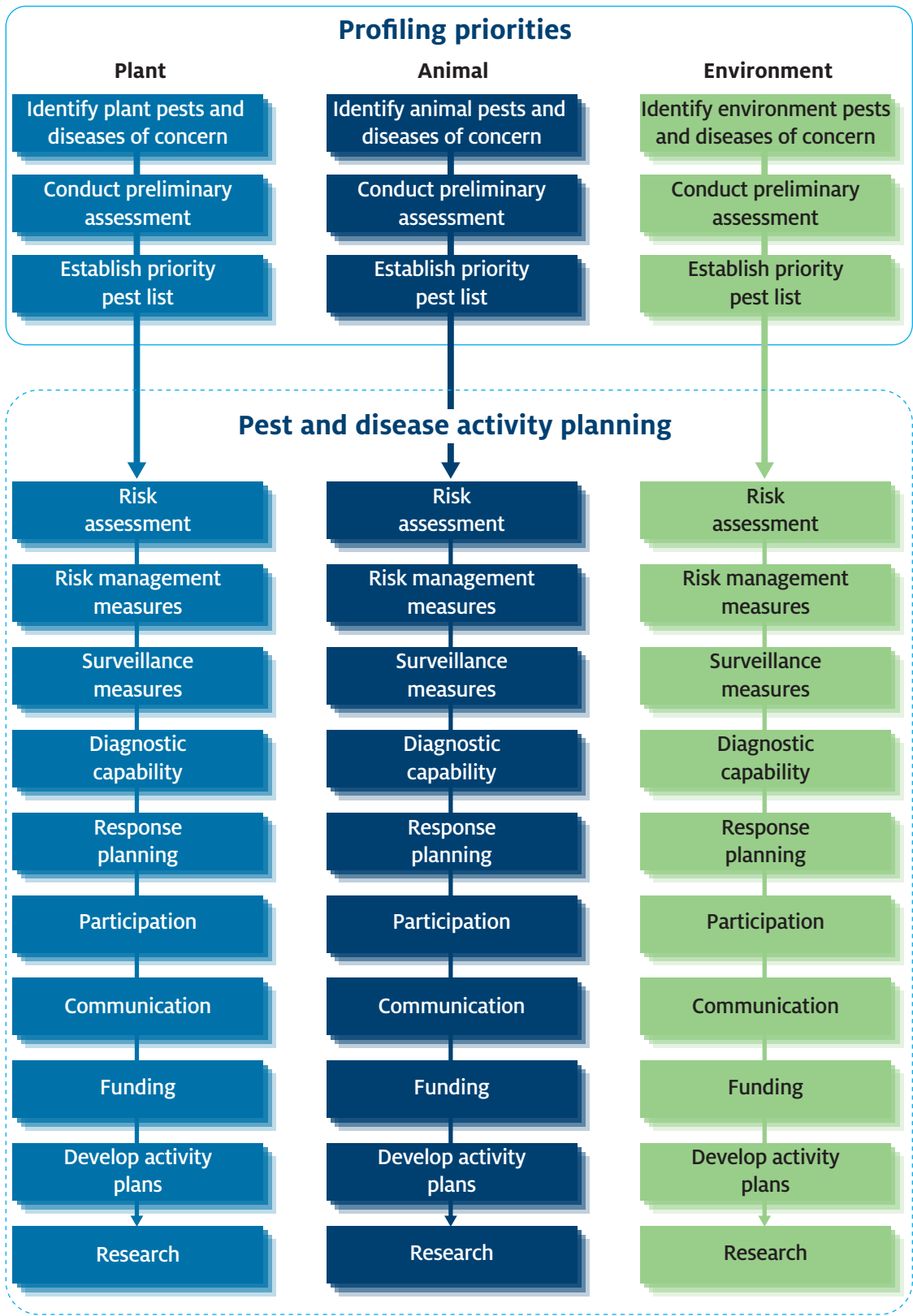
1. **Risk assessment:** a comprehensive risk assessment, building on the preliminary work (above), to determine the pathways and likelihood of entry (pre-border, at the border and post-border), intervention points and potential impacts on the various sectors and hosts.
2. **Risk management measures:** determine measures available to reduce the risk of entry, spread or establishment (that is, prevention).
3. **Surveillance measures:** determine measures (capability and/or programs) required to ensure adequate surveillance (pre-border, at the border, and post-border).
4. **Diagnostic capability:** determine measures required to ensure adequate diagnostic capacity, including likely future diagnostic capability.
5. **Response planning:** determine measures for responding to or managing an incursion, including contingency measures and measures to support trade and exports.
6. **Participation:** determine those (from across the system—government, industry and community) involved in management of the national priority pest and disease based on agreed roles and responsibilities.
7. **Communication:** determine the communication needs for the national priority pests and disease, including avenues for awareness raising.
8. **Funding:** determine the funding required for all management activities, including identifying funders and develop cost-sharing arrangements, as appropriate.
9. **Develop activity plans:** develop plans outlining arrangements and expectations for the national priority pest or disease. A plan would include the range of measures from prevention to incursion response and would include responsibilities and cost sharing for all relevant participants.
10. **Research:** determine the research gaps in managing the risk, including where research may fill a gap from any of the above areas.

This process is illustrated in Figure 4.

It is highly likely there will be common elements to the activity plans developed for the agreed priority pests and diseases, which the Review Panel anticipates will reduce the overall effort required. In almost all cases, there will be existing activities underway to manage the identified risk; any gaps in activities must be a priority for action.

There may also be opportunities for cross-committee collaboration and efficiencies once the initial sectoral work has been completed. The Panel believes there will need to be technical input from across the NBC's sectoral committees to assist the finalisation of the plans for priority environmental pests and diseases.

FIGURE 4 Determining national plant, animal and environmental pests and diseases



5.1.3 Ongoing work

Determining national priorities is not a one-off process. Ongoing risk identification and assessment is critical. Future and emerging global trends will significantly change, and increase, the complexity of the biosecurity risks facing Australia.

To this end, national priority animal, plant and environmental pests and diseases should continue to be revised in light of intelligence on present or emerging risks. The Review Panel recommends that the priority pest and disease lists be reviewed no less than every five years, noting that there may be some reasons to review these lists earlier (for example, identification of new pathways, hosts and treatments). The NBC sectoral committees should oversee this process, including through joint meetings, to allow discussion of pests and diseases or pathways with cross-system impacts and guidance to sub-committees on cross-system efficiencies. The sectoral committees should report their progress to the NBC; progress reporting to AGSOC and AGMIN should be included in the NBC's annual report to agriculture ministers (refer draft recommendation 25).

Draft recommendation 14

The NBC should lead five-yearly national-level risk prioritisation for emerging animal, plant and environmental risks and pathways, in partnership with system participants, reporting to AGSOC and AGMIN.

5.2 Benefits and opportunities

There are significant benefits to a systematic and programmatic approach to the national pests and diseases prioritisation process:

- national clarity. All participants in the system including the public will have a clear understanding of what is important in the national system and a clearer understanding of the full suite of activities needing to be funded under the national system. Perhaps less helpfully in some cases, Australia's priorities will also be clear to our trading partners, which are likely to use the information to their advantage
- the 'sum' of the national biosecurity system. The proposed approach will allow a 'rolling-up' of the system, made up of its various components, including a national perspective on system elements such surveillance, response, research and development needs, and the total cost of these. While the nature of the task means that the financial commitment involved cannot be specified in advance of the prioritisation process, *ad hoc* and unstructured funding needs will be minimised. Over time, this process will yield significant cross-system efficiencies, as well as provide the base-level knowledge and information necessary for development of, for example:
 - national investment strategies (for example, for the NBC, individual jurisdictions, agricultural industries)
 - national surveillance plans (for example, for animal, plant and environment; geographic regions; industry, community or government; or area freedom purposes)
 - a national biosecurity R&I plan
 - a national perspective on all pathways for exotic pests and diseases.

- enhance market access work. Giving greater focus to priority exotic pests and diseases (including those with significant adverse economic impacts) will help align activities such as surveillance with Australia's trade and market access priorities—the national system will be better prepared to generate evidence to underpin Australia's claims of absence and area freedom
- resource allocation. Consistent with the IGAB principles, the finite resources within the national system will give a greater return if focussed on exotic pests and diseases that will negatively impact the national economy, national industries, the environment and social amenity
- resource sharing. There will be better identification of resource-sharing opportunities for managing national priority exotic pests and diseases. For example, resources, such as laboratories, used by the Australian Government's Northern Australian Quarantine Strategy (NAQS) could be better shared with the governments of Queensland, Western Australia and the Northern Territory
- jurisdictional collaboration. Addressing agreed national priority risks will focus national effort from across all jurisdictions, creating formal opportunities for collaboration and sharing of resources and expertise
- research to address gaps. Gaps identified in managing national priority pests and diseases will receive significant focus above other competing areas of the system. Further, there will be a clear national system priority focus to research and opportunities for technological innovation to address and improve national system gaps and priorities; research and innovation is discussed further in Chapter 6
- sharing responsibility. Involving the relevant system participants in the development of these programs will achieve a clearer understanding of how the individual components of the system can be better shared by its participants. Identifying a role for industry and community members will help give 'shared responsibility' a practical focus. Plans developed that outline responsibilities and costs should be based on a standard template
- addressing concerns raised. This prioritisation process and activity planning approach proposed by this Review Panel will help respond to the many comments received by the Review Panel in relation to the fragmented nature of the system and its activities, and around declining resources allocated to, and capability in, surveillance and diagnostics.

6 Research and innovation

Key points

- Research and innovation (R&I) underpin Australia's science-based approach to biosecurity.
- There is no lead agency, national prioritisation process or coordination for biosecurity R&I in Australia. Multiple funders and providers are involved in these activities, with the role of some players unclear.
- A number of existing national biosecurity R&I strategies are not able to provide sufficient clarity to reflect the priority needs of the national biosecurity system.
- Environmental biosecurity has been a significant research gap.
- New national biosecurity R&I priorities and a new national entity for cross-sectoral biosecurity R&I would help provide leadership and coordination and better target investment.

6.1 The key role of biosecurity R&I

Innovation driven by research, development and extension is vital to Australia's scientific, risk-based approach to biosecurity. Research outcomes inform decisions of governments and industry, and help to improve the efficiency of biosecurity operations, maintain Australia's favourable pest and disease status (through the ongoing development and application of science-based measures), and ensure an adequate scientific and technical capacity is maintained.

New and more innovative ways of undertaking biosecurity activities are needed now and into the future to ensure a robust, responsive and affordable national biosecurity system. Future biosecurity research and innovation (R&I) investment must be directed at identified research priorities and gaps in line with the pest and disease prioritisation process proposed by this Review.

Targeting investment to technological innovations has the potential to generate significant benefits for the national biosecurity system, covering the range of activities across the national system such as surveillance, monitoring, laboratory diagnosis, data sharing and analytics. This could include helping to reduce the cost of typically high-cost activities (such as surveillance, Box 6), and improve early detection of exotic pests and diseases to increase the likelihood of eradication (thereby avoiding the high costs associated with subsequent containment or management measures).

Box 6 Environmental DNA (eDNA) water sampling for Tilapia species

Tilapia, a popular aquarium fish, were illegally introduced into Australian waterways in the 1970s. Two species—Mozambique Tilapia (*Oreochromis mossambicus*) and Spotted Tilapia (*Tilapia mariae*)—have established populations in various sites in Queensland, Victoria, Western Australia and on the NSW far north coast. Populations of Mozambique Tilapia in southern Queensland are as little as three kilometres from the Murray-Darling Basin, and pose a significant threat to the native fish of the basin (Hutchison et al. 2012). The biological and behavioural characteristics of tilapia, including traits such as aggressive behaviour, broad environmental tolerances and high fecundity, have aided the spread and subsequent establishment of new populations.

Early detection is a key factor of the success of eradicating an incursion by tilapia to a new region, as tilapia cannot be effectively removed by current methods once they become established. Traditional surveillance methods, involving periodic fish surveys using various methods such as electrofishing and netting, are resource intensive and may not detect the presence of tilapia in low numbers. Technological advances like eDNA, capable of detecting the DNA of tilapia in a water sample, have proven to be an effective early detection tool, and are likely to greatly enhance the capacity of future surveillance programs; by providing rapid presence/absence data from a large number of sites.

Source: adapted from the NSW Government Department of Primary Industries [Tilapia](#) website and Noble et al. 2015.

Research into new technologies must involve end-users to ensure research outputs can be feasibly adopted. Greater potential exists for R&I outcomes that directly engage industry and the community in biosecurity activities, particularly in areas such as surveillance and diagnostics. The Review Panel considers these opportunities should be explored, as well as factors that limit the uptake of new biosecurity technologies; such as access to reliable internet services in rural and regional Australia (Commonwealth of Australia 2016).

The importance of biosecurity R&I to the national biosecurity system was highlighted by stakeholders throughout this Review, with ongoing support needed for traditional science disciplines—such as animal and plant pathology, veterinary science, epidemiology and entomology—and the development of new technologies identified as equally important components of an appropriate research capacity.

Stakeholders identified detection and surveillance, environmental biosecurity, market access assurance, and technology transfer as areas that would benefit from future investment in targeted R&I. Emerging technologies with potential to improve the efficiency of biosecurity activities identified by stakeholders covered: autonomous and drone surveillance; robotics and artificial intelligence (Mohanty et al. 2016); ‘Big data’ and analytics; ‘point of need’ field testing; alternative treatment methods (for example, as a replacement for methyl bromide); and, innovations from various fields of science (for example, as next-generation sequencing, antimicrobial resistance, and new biological controls).

6.2 Current state of biosecurity R&I

Throughout this Review, stakeholders have provided comments on a range of issues relevant to biosecurity R&I. The Review Panel has grouped these under four broad areas.

6.2.1 Narrow research priorities and unsupported strategies

Biosecurity is one of many existing priorities for overarching national research and development. These national priorities are intended to guide biosecurity R&I investment decisions of the Australian, state and territory governments, as well as the key recipients and funders of biosecurity R&I (such as the RDCs, CRCs and CSIRO).

The two sets of national priorities relevant to biosecurity R&I are the National Science and Research Priorities and the National Rural R&D Priorities. However, as they stand, they provide little clarity or substantive guidance on R&I priorities for the national biosecurity system. Under these two sets of priorities, biosecurity is limited to the issue of food security and understanding pest and disease pathways. For example, the National Rural R&D Priorities, as published in the 2015 Agricultural Competitiveness Whitepaper, states:

To improve understanding and evidence of pest and disease pathways to help direct biosecurity resources to their best uses, minimising biosecurity threats and improving market access for primary producers (2015 Agricultural Competitiveness White Paper, p. 98)

In addition, on 18 November 2016, the Australian Government Minister for Industry, Innovation and Science provided CSIRO with the government's Statement of Expectations for the organisation, which included enabling development of new research and technologies for biosecurity.

A multitude of strategies (general and specific) seek to build on the national research priorities relevant to biosecurity (Table 4), comprising:

- national biosecurity R&I strategies
- other strategies related to biosecurity
- national industry RD&E strategies.

TABLE 4 Strategies relevant to biosecurity R&I

National biosecurity R&I strategies	Other strategies related to biosecurity	National Industry RD&E Strategies
Animal Biosecurity RD&E Strategy	Australian Pest Animal Strategy	Fourteen industry-specific strategies under the National Primary Industries RD&E Framework (e.g. Beef Production National RD&E Strategy, Cotton Sector National RD&E Strategy, Grains Industry National RD&E Strategy).
Plant Biosecurity RD&E Strategy	Australian Weeds Strategy	
Environment and Community Biosecurity RD&E Strategy	National Bee Pest Surveillance Strategy	
	National Fruit Fly Strategy	
	National Plant Biosecurity Strategy	
	National Plant Biosecurity Diagnostic Strategy	
	National Plant Biosecurity Surveillance Strategy	

Two of the national biosecurity R&I strategies—the Animal Biosecurity RD&E Strategy and the Plant Biosecurity RD&E Strategy—have been developed under the National Primary Industries Research, Development and Extension (RD&E) Framework. These strategies, which are notable achievements under the IGAB, seek to provide the future direction to improve biosecurity R&I for the animal and plant industries.

They detail generic areas of research required to achieve a coherent national biosecurity system for animal and plant pests and diseases. However, stakeholders consistently raised concerns over the implementation of these strategies, which was characterised as slow due to resourcing issues, and lacking a unified, national approach to coordination and delivery:

Progress on the strategy [Animal Biosecurity RD&E Strategy] is slow, essentially due to the competing priorities of participants who have already committed resources to their own respective organisational strategies and performance criteria, as well as the National Rural Research and Development Priorities. New sources of funds targeting the agreed identified priorities would accelerate progress (Animal Health Australia submission, p. 19)

Effective governance and national willingness to co-invest needs to be established to obtain significant benefits from the strategies' implementation. Participation is required from Commonwealth and state/territory agencies, research and development corporations, universities and other RD&E provider organisations (South Australian Government submission, p. 7)

While AHA and PHA had a lead role in their development and are “tasked” with their implementation, the strategies' implementation committees (based within AHA and PHA) have no authority to prioritise R&I or direct funding or resources. Adding to the maze of accountabilities is that AHA and PHA report to the Research & Innovation Committee (AGSOC R&I), an advisory sub-committee of the AGSOC, rather than through (or to) the NBC.

As Table 4 shows, a number of industry-specific R&I strategies and several biosecurity strategies also seek to direct R&I investment. Stakeholders raised various concerns about the plethora of strategies, including the level of industry involvement in their development, and the variability and overall effectiveness of the strategies in achieving their aims:

It is perhaps symptomatic of the current fragmented nature of Australia's biosecurity system that there are already a number of national [plant] biosecurity strategies ... The degree to which these strategies and others operate and achieve their aims is extremely variable and appears to rely as much on individuals rather than a supportive system (Voice of Horticulture submission, p. 4)

The overall picture of strategies developed and in use across the national biosecurity system is overly complex, bordering on confusing. The biosecurity-specific strategies are predominantly sectoral, are not supported by funding for implementation and stakeholders noted that some were developed without incorporating the views of a broad range of system participants. The various national industry specific RD&E strategies have an oblique and inconsistent focus on biosecurity and its importance to the particular industry in question.

Numerous stakeholders drew the Review Panel's attention to the lack of an equivalent national environmental biosecurity RD&E strategy. The Panel notes that a National Environment and Community Biosecurity RD&E Strategy 2016–19 was released by the NBC in November 2016, though the level of public input to its development is unclear. The Panel also understands that a lead agency or organisation responsible for implementing this strategy is yet to be determined.

6.2.2 Many players but no captain

Biosecurity R&I in Australia is closely linked to the broader agricultural research, development and extension system, which has evolved considerably over the last two decades (PC 2011; Hunt et al. 2014). Multiple funders and providers are involved, however, there is no lead agency, national prioritisation process or coordination for biosecurity R&I in Australia.

Biosecurity research activities are primarily funded by the Australian, state and territory governments, and the rural Research and Development Corporations (RDCs)—industry contributes significant funding to the RDCs through commodity-based levies. Key providers of biosecurity R&I include the CSIRO, state and territory government agencies through their research and diagnostic facilities, and a number of universities (Table 5).

TABLE 5 Key players in biosecurity R&I in Australia

Funders	Providers	Other role (unclear)
Australian ¹ , and state and territory governments	CSIRO	AGSOC R&I committee
Rural Research and Development Corporations ²	State & territory research facilities	Animal Health Australia
Cooperative Research Centres ² (e.g. Plant Biosecurity; Invasive Animals)	Universities	Plant Health Australia
	Private consultants	

¹ Australian Government initiatives include the Australian Research Council's Linkage and Discovery programmes, Rural R&D for Profit Programme and Cooperative Research Centres (CRC) Programme.

² Both the RDCs and CRCs receive funding from industry and government sources.

6.2.3 Ad hoc and short-lived investments—RDCs and CRCs

The RDCs are key funders of biosecurity R&I. These industry-focused organisations receive significant funding each year from both industry (commodity-based levies) and the Australian Government (matching funding), which is invested in a portfolio of research and industry service activities for the benefit of their respective industry or industries. The RDCs are required to take into account both industry and nationally agreed government priorities (which include biosecurity) in their strategic planning processes and investment decisions. The extent to which they take into account the animal and plant biosecurity strategies is not clear, as this is not clearly reported.

Of similar significance is the extent to which the RDCs collaborate in jointly-funded biosecurity R&I. As biosecurity is largely 'blind' to commodities and geography, the capacity of multiple RDCs to co-invest in areas of joint concern should be obligatory. The leadership inherent in the Council of Rural RDCs could ensure RDCs jointly invest in biosecurity issues of both national interest and impact cross-sectoral needs.

The RDCs' investments in biosecurity R&I, as publicly reported in their various corporate documents (including annual reports, annual operating plans, and strategic plans), vary considerably and, in some cases, are relatively small when compared with their overall annual R&I spend (Table 6).

TABLE 6 Investments made by RDCs on biosecurity R&I

Organisation	2012–13			2013–14			2014–15		
	Total R&I spend (\$)	Estimated biosecurity spend (\$)	Biosecurity spend (% of total)	Total R&I spend (\$)	Estimated biosecurity spend (\$)	Biosecurity spend (% of total)	Total R&I spend (\$)	Estimated biosecurity spend (\$)	Biosecurity spend (% of total)
Australian Livestock Export Corporation Ltd*	\$1 090 000	\$0	0.0%	\$1 440 000	\$0	0.0%	\$1 640 000	\$0	0.0%
Dairy Australia Ltd*	\$56 150 000	\$1 123 000	2.0%	\$38 500 000	\$154 000	0.4%	\$40 200 000	\$200 000	0.5%
Forest and Wood Products Australia Ltd*	\$5 480 000	\$328 800	6.0%	\$5 380 000	\$53 800	1.0%	\$6 080 000	\$182 400	3.0%
Australian Egg Corporation Ltd*	\$3 730 000	\$73 693	2.0%	\$2 590 000	\$22 805	0.9%	\$5 080 000	\$169 326	3.3%
Australian Wool Innovation Ltd*	\$65 100 000	\$3 143 000	4.8%	\$73 790 000	\$2 600 000	3.5%	\$58 590 000	\$2 082 000	3.6%
Australian Pork Ltd*	\$9 120 000	\$397 425	4.4%	\$9 660 000	\$822 995	8.5%	\$9 780 000	\$466 473	4.8%
Meat & Livestock Australia Ltd*	\$79 600 000	\$4 537 200	5.7%	\$95 800 000	\$5 556 400	5.8%	\$92 900 000	\$4 830 800	5.2%
Australian Grape & Wine Authority^	\$18 030 000	\$497 628	2.8%	\$22 160 000	\$986 120	4.5%	\$21 880 000	\$1 162 000	5.3%
Australian Meat Processor Corporation Ltd*	\$17 700 000	\$984 512	5.6%	\$11 800 000	\$421 862	3.6%	\$13 100 000	\$744 316	5.7%
Fisheries RDC^	\$22 130 000	\$1 447 000	6.5%	\$22 870 000	\$1 921 000	8.4%	\$24 850 000	\$1 840 000	7.4%
Rural Industries RDC^	\$14 200 000	\$1 060 000	7.5%	\$14 580 000	\$1 071 000	7.4%	\$13 240 000	\$1 494 000	11.3%
Horticulture Australia Ltd*/Horticulture Innovation Australia Ltd*	\$75 100 000	\$6 759 000	9.0%	\$76 700 000	\$6 903 000	9.0%	\$51 970 000	\$6 236 400	12.0%
Cotton RDC^	\$14 900 000	\$3 799 500	25.5%	\$18 200 000	\$4 368 000	24.0%	\$19 240 000	\$2 501 200	13.0%
Sugar RDC^/ Sugar Research Australia Ltd*	\$7 757 000	\$987 000	12.7%	\$7 700 000	\$1 097 000	13.0%	\$28 720 000	\$4 641 152	16.2%
Grains RDC^	\$159 240 000	\$13 370 000	8.4%	\$166 370 000	\$22 780 000	13.7%	\$194 100 000	\$34 700 000	17.9%

* Industry owned company ^ Corporate Commonwealth Entity.

Note: 1) Comparisons between RDCs are limited by inconsistent reporting (varying levels of detail of biosecurity R&I investment).

Note: 2) Livecorp's biosecurity R&I is conducted through MLA.

Based on a three-year average between 2012 and 2015, the RDCs' collective annual investment on biosecurity R&I is estimated at around \$49 million, which is 8.7 per cent of an average total annual R&I spend of \$566 million. However, this proportional figure of total RDC expenditure, does not capture the highly variable investment levels across the RDCs, which ranges from 0.5 per cent to 25.5 per cent by individual RDCs.

Nonetheless, the annual average spend (\$49 million) made by the RDCs is a sizeable investment on biosecurity R&I. Given this quantum, the Australian Government should: ensure RDC funding is being directed to priority areas in line with nationally agreed biosecurity R&I priorities; and, reconsider the available accountability mechanisms, including mandating, through statutory funding agreements, consistent reporting of how RDCs expenditure and biosecurity research outcomes meet R&I priorities established by the NBC.

Stakeholders identified various limitations for biosecurity R&I funded through the RDCs. Research generally addresses priorities with more immediate benefits for the producer (such as increasing yield, reducing the cost of production and improved nutrition) and with application to a single industry or sector.

Significant biosecurity R&I funding has also been directed to specific, time-limited Cooperative Research Centres (CRCs). These have included the CRC for Australian Weed Management (ceased in 2008), and the Australian Biosecurity CRC for Emerging Infectious Disease (ceased in 2010). Current biosecurity related CRCs include the Invasive Animals CRC (to cease in 2017) and the Plant Biosecurity CRC (to cease in 2018).

For example, the Plant Biosecurity CRC's Investment Plan for 2012–18 allocated \$128 million of research resources over the six-year funding period, equating to an average annual investment of around \$21.3 million on plant biosecurity R&I activities.

The continuation of many biosecurity-related CRCs has been contingent on securing extensions for further terms of operation under the CRC Programme. Changes to the programme, following a 2015 review (Miles 2015), now limit CRC funding to a maximum of 10 years with no funding extensions possible.

Stakeholders noted the long-term impacts on biosecurity R&I that have occurred where CRCs have closed without appropriate transition arrangements. These include the loss of valuable scientific knowledge and expertise, subsequent fragmentation of research activities, and difficulties in securing ongoing funding for research from other sources.

The Review Panel notes work underway to transition the Invasive Animals CRC to the Centre for Invasive Species Solutions (CISS). This transition is a positive move for continuing the CRC's work without interruption, albeit initially at least, for established animal pests and diseases (Box 7). The development of novel solutions to existing problems may also raise issues of relevance for responses to exotic incursions. This is consistent with the NBC's proposed approach to dealing with established pests and diseases, as outlined in its 2015 discussion paper on modernising Australia's approach to managing established pests and diseases of national significance (NBC 2015), in which roles and responsibilities for government, industry and the community are consistent with insights from the generalised invasion curve.

Box 7 The biocontrol of European rabbits

European rabbits (*Oryctolagus cuniculus*) are a nation-wide threat to Australia's biodiversity and agriculture. Competition and land degradation by rabbits is listed as a key threatening process (DEWHA 2008). Rabbits are one of Australian agriculture's most costly vertebrate pest animals.

Rabbit biocontrol agents, such as Myxoma virus (MV) and Rabbit Haemorrhagic Disease Virus (RHDV), have limited rabbit numbers to around 15 per cent of their potential population, and without them the cost for agriculture alone would be in excess of \$2 billion a year. The cumulative economic benefits for agriculture alone from MV and RHDV over 60 years are estimated at \$70 billion. Effective control has also reduced the impacts on many nationally listed threatened species, and improved landscape condition.

However, rabbits and viral biocontrol agents are considered a continual 'arms race' as rabbits gradually develop genetic resistance and the virulence of the viral biocontrol agent progressively reduces.

To efficiently manage rabbit impacts, investment in a pipeline of biocontrol agents is needed to ensure an effective agent can be released every 8 to 10 years. A new Korean strain of RHDV (RHDV1 K5) is set to be released in 2017. Since the early 1990s, the Invasive Animals CRC and its predecessor organisations have been leading rabbit biocontrol research in collaboration with government and research agencies and industry partners.

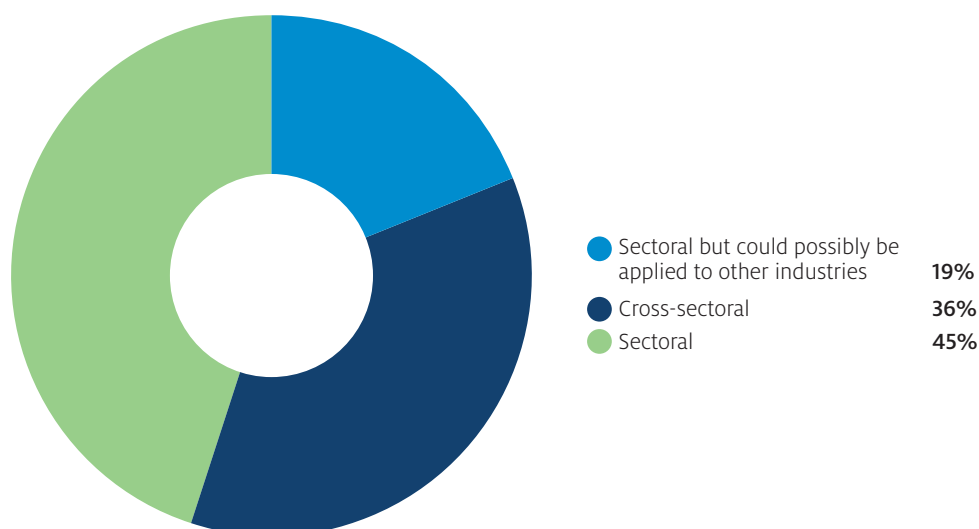
Source: adapted from Gong et al. 2009; Cooke et al. 2013; Cox et al. 2013; Wishart and Cox 2016.

Separately, the Plant Biosecurity CRC has also considered options for transitioning its work beyond 2018 (Keogh and Goucher 2016) and has recently released its proposal for SmartBiosecurity: Australasian Plant Biosecurity Collaborative Science Institute.

6.2.4 Cross-sectoral research: a substantial gap

Current cross-sectoral research efforts are inadequate to support the national biosecurity system into the future. Examples of significant cross-sectoral research priorities and gaps put to the Review Panel include: alternatives to methyl bromide treatments, technological solutions for detecting hitchhiker pests at the border; electronic sampling for commodities (for example, contaminants in grain); improving pest and disease surveillance and monitoring across Australia; market access; and social research, including behavioural change, practice change, collaboration, terminology and communication.

The Plant Biosecurity RD&E Strategy Implementation Committee's analysis of the 2015 National Plant Biosecurity Status Report (NPBRDES IC 2016) showed that, of the 578 projects from the status report, 64 per cent (370 projects) were considered to be sectoral and 36 per cent (208 projects) cross-sectoral (Figure 5).

FIGURE 5 Breakdown of projects under the 2015 National Plant Biosecurity Status Report

Source: Plant Biosecurity RD&E Strategy Implementation Committee.

Importantly, the analysis concluded that 110 of the 370 sectoral projects could be adapted for use by other sectors (that is, be cross-sectoral). Adapting this research will require additional resources, which may possibly have been avoided through better coordination during project development. This highlights that cross-sectoral opportunities for biosecurity R&I benefits are being missed, and that there are inefficiencies in the research being undertaken.

6.3 A new approach

Australia's national biosecurity system has, historically, derived significant benefits from the current approach to R&I. However, there are limitations and the system does not have the required structure, focus, capacity or capability to address both existing and emerging biosecurity challenges. Biosecurity R&I is not a short-term investment and has clear cross-sectoral benefits. For too long, these benefits have been undervalued and under-realised.

Into the future, R&I, especially technology and innovation, will play an increasingly important role in a future where biosecurity challenges are more complex. There must be better articulation, especially by governments, of the importance of investing in R&I to address and prepare for serious biosecurity risks and threats.

6.3.1 National biosecurity R&I priorities

To better target investment in biosecurity R&I, biosecurity R&I strategies and frameworks must align with the agreed national biosecurity R&I priorities. The Review Panel believes that development of a new set of National Biosecurity R&I Priorities would deliver clarity to the national biosecurity and R&I systems.

These would be informed by priority research areas and gaps arising from the national animal, plant and environmental pest and disease prioritisation process proposed by this Review (see Chapter 5). The Panel believes priorities should particularly address cross-sectoral and cross-system issues in areas such as surveillance and early detection and market access.

Draft recommendation 15

The sectoral committees of the NBC, with the endorsement of the NBC, should develop an agreed set of National Biosecurity R&I Priorities, in consultation with system participants and in line with the agreed national priority pests and diseases. Priorities at a sectoral and cross-sectoral level need to be considered. The priorities should be developed within two years of the final IGAB review report, and should be reviewed every five years.

Over time, including when reviewed, the existing biosecurity R&I strategies and frameworks should be better tailored to the new National Biosecurity R&I Priorities.

6.3.2 Seizing existing opportunities

In the immediate term, the Panel offers three suggestions for ongoing work to better position the national biosecurity system to respond to present and future challenges:

- Strengthen the requirements for RDCs to invest in and report against the new National Biosecurity R&I Priorities through additional provisions in each RDC statutory funding agreement.
- Improve opportunities within existing RDC fora (for example, the Council of Rural RDCs or AGSOC R&I Committee) to more actively and deliberately collaborate on cross-sectoral biosecurity R&I, maximising their investment outcomes and benefits to their industry constituents (especially where there may be coordinated or composite benefits for levy payers paying multiple levies).
- Explore strategic joint government-industry investment options for particular biosecurity challenges. Examples include the SITplus Partnership initiative and New Zealand's Primary Growth Partnership initiative, demonstrating the benefits of industry-led and sector-connecting investment programs for developing solutions to key industry problems (Box 8).

Box 8 Model R&I partnerships

Primary Growth Partnership (New Zealand)

The New Zealand Government Ministry for Primary Industries (MPI) reports that more than 50 companies are involved in Primary Growth Partnerships programs that enable research, development and innovation that no individual organisation could undertake alone. As at April 2016, MPI indicates \$727 million of committed investment by MPI and industry over the life of programs, covering nine primary industry sectors, with an anticipated 32:1 return on investment, which equates to an estimated contribution of \$6.4 billion to New Zealand's GDP from 2025.

Source: The New Zealand Government's [Primary Growth Partnership](#) website.

SITplus Partnership

SITplus is a five-year \$45 million research and development partnership seeking to deliver a transformative pest management solution to Queensland fruit fly, a major horticultural pest. The partnership has brought together various stakeholders from across government, industry and research, including Horticulture Innovation Australia Limited, Macquarie University, the CSIRO, Plant and Food Research Australia, and the Australian, New South Wales, Victorian and South Australian governments.

Source: Chapman 2016; Horticulture Innovation Australia Limited's [SITplus](#) website.

6.3.3 Future-focussed biosecurity R&I

A robust national biosecurity R&I function is vital to the national biosecurity system. A future-focussed biosecurity R&I capability and capacity will help ensure Australia's favourable pest and disease status is maintained, and keep Australia ahead of the game. Institutional structures for biosecurity R&I must be supported by more enduring arrangements than they have to date. Stakeholders highlighted the necessity of a long-term, sustainable approach to these activities, including funding:

Research should be ongoing. Diagnostics, surveillance, response methodologies and treatments need to be continually developed as new technology becomes available and old systems become redundant. The research tap cannot be turned on and off and still expect effective innovation (Biosecurity Council of Western Australia, submission, p. 3)

Stakeholders noted the need for a new approach to biosecurity R&I in Australia, and posed various options for a new construct. These included: a network of national and international universities; a new biosecurity R&I entity, such as a CRC, RDC, or a centre of excellence; or, better national coordination of current activities, by housing biosecurity R&I within an existing RDC or other suitable organisation (such as CSIRO, RIRDC, AHA or PHA). A recent review of plant biosecurity RD&E in Australia by Keogh and Goucher (2016), proposed a new enduring Plant Biosecurity Research Corporation to fund strategic and plant-sectoral biosecurity R&I projects, and provide opportunities for training and development of future industry research capability. Funding was to be provided equally by industry, and Australian, state and territory governments.

The Review Panel considers the most desirable option to be a new national biosecurity R&I entity, though broader than that posed by Keogh and Goucher (2016). Such a body must have a clear cross-sectoral mandate—encompassing animal, plant, and environmental biosecurity, market access opportunities and broader research disciplines such as social science. In doing so, it would take on a distinct but complementary role to that of the proposed Centre for Invasive Species Solutions. The Panel acknowledges that a new entity may not entirely address the fragmented biosecurity R&I problem, without other mechanisms to incorporate players, such as universities and private funders.

The Review Panel is seeking feedback from stakeholders on options to establish a new cross-sectoral entity, recognising there are advantages and disadvantages to the two options detailed below. Stakeholders may also have an alternative proposal to draw to the Panel's attention.

Option 1: Establishing a new stand-alone entity for cross-sectoral biosecurity R&I

A future stand-alone entity would take on a national leadership and coordination role for cross-sectoral biosecurity R&I (for example, providing stronger direction to and ownership of R&I strategies) and take the lead role in addressing the new National Biosecurity R&I Priorities proposed by this Review (with flexibility to respond to changing priorities). The Review Panel considers that AHA and PHA could have a formal relationship with the entity, using their existing arrangements and expertise.

A future entity should have a sustainable funding platform, including funding to maintain appropriate scientific and technical capacity (for example, veterinarians, animal and plant pathologists, entomologists, social scientists and economists). Further, a single entity is arguably more cost-effective than existing arrangements whereby multiple players lack a focus on cross-sectoral R&I.

Funding could be sourced from a new national charge applied to incoming passengers. By way of precedent, in January 2016, the New Zealand Government introduced a Border Clearance Levy (incoming) of approximately \$20; the Great Barrier Reef Marine Park Authority levies most commercial activities and tourism activities within the marine park including a visitor charge of \$6.50 per day.

Alternatively, if there is no appetite for the proposed levy funding model, a proportion (for example, 5 or 10 per cent) of Australian Government funds currently directed to existing RDCs (matching funding) could be redirected towards the proposed new biosecurity R&I entity. This would require legislative change which would likely be contentious given the national priorities may not align with specific industry priorities.

Option 2: Addressing cross-sectoral biosecurity R&I within an existing RDC.

National cross-sectoral biosecurity R&I issues could be addressed, on a smaller scale to Option 1, within an existing RDC.

Most RDCs do not hold responsibility for cross-sectoral biosecurity R&I—the majority of their expertise lies in industry-specific issues. The Rural Industries Research and Development Corporation (RIRDC) would have an ability to manage cross-system biosecurity issues given its whole-of-agriculture focus. The limitations include the present size of the organisation, compared to other RDCs, and the need for additional resourcing.

Funding for this additional function to be provided by RIRDC, could come from the redirection of a proportion of both Australian Government matching funds and industry specific levy monies from within the existing RDC system, for the specific purpose of cross-sectoral biosecurity R&I. This proposal would limit the need for substantial change to existing RDC funding structures and increase the pool of existing RDC funds directed to cross-sectoral biosecurity R&I issues. However, it too would require legislative change, which is also likely to be contentious.

Request for feedback 3

The Review Panel seeks feedback on the following options for a new entity for cross-sectoral biosecurity R&I:

- **Option 1:** Establishing a new stand-alone entity for cross-sectoral biosecurity R&I.
- **Option 2:** Addressing cross-sectoral biosecurity R&I within an existing RDC (for example, the Rural Industries RDC).

The Panel also seeks feedback on the funding options and would welcome alternative suggestions.

7 Strengthening governance

Key points

- The IGAB and the NBC have been pivotal in fostering improved government collaboration.
- First Ministers should continue to provide jurisdictions with a strong mandate under the IGAB for advancing national biosecurity arrangements.
- The NBC must improve its transparency and accountability.
- IGAB governance structures should provide industry and community with a stronger voice and role in the further developing the national system.

7.1 A strong mandate

The IGAB was authorised under previous COAG arrangements. As an agreement between First Ministers, the IGAB provides a strong mandate for advancing national biosecurity capacity and capability. This Review has confirmed that national biosecurity is a whole-of economy and whole-of-government responsibility—affecting trade and market access, tourism, farm productivity, environmental quality, human health, native species and biodiversity. Subsequent agreements must maintain the authority provided by First Ministers of Australian, state and territory governments. Anything less would effectively devalue national biosecurity efforts and impede further development of the national system.

Draft recommendation 16

A future IGAB should remain an agreement between the First Ministers of the Australian, state and territory governments.

First Ministers have tasked Australian, state and territory ministers responsible for biosecurity with implementation and administration of the IGAB, in consultation with other relevant ministers. This has traditionally been ministers responsible for agriculture or primary industries. In practice, it is difficult to judge the level of engagement of ‘lead’ ministers for biosecurity with other ministers (for example, environment, natural resources, fisheries, regional development, health and defence) as there are no formal mechanisms to facilitate this. Consultation with ‘support’ biosecurity ministers may well occur but these key relationships warrant clearer and greater recognition in the IGAB.

For government agencies, the need for clearly defined ‘lead’ and ‘support’ biosecurity roles is particularly important, and Chapter 4 demonstrated this in the context of environmental biosecurity. However, the delineation of roles should extend beyond agriculture and environment. Each jurisdiction should have whole-of-government arrangements in place, inclusive of central agencies, to support their role in the national biosecurity system and the delivery of their commitments under the IGAB.

First Ministers could facilitate this by clearly identifying their lead minister and agency for biosecurity under the IGAB and requiring supporting agencies and arrangements to be delineated, public and in place. Given the experience and knowledge accumulated, agriculture would be the logical lead discipline. MoUs between relevant agencies would be appropriate, modelled on those between the Australian Government agriculture, health and immigration agencies. All jurisdictions should consider formalised arrangements between their agriculture agency and environment, regional development, defence (Australian Government only), and others as relevant.

Draft recommendation 17

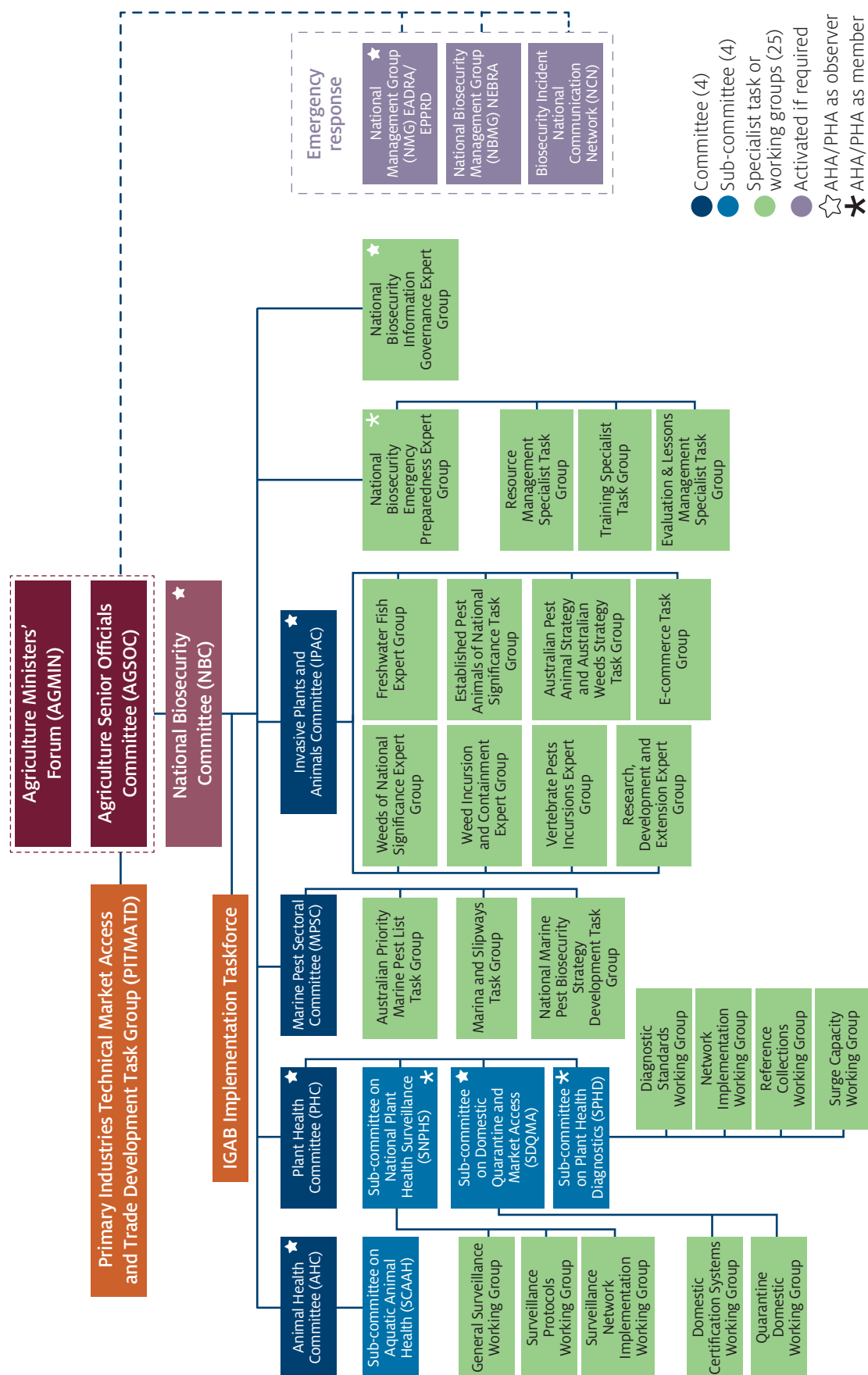
First Ministers should, within IGAB2, identify lead ministers and agencies for biosecurity (assumed to be agriculture or primary industries) and require supporting whole-of-government arrangements to be in place, including through memoranda of understanding.

7.2 An empowered National Biosecurity Committee

The NBC is the key body responsible for implementing the priority reform areas in the IGAB and coordinating national biosecurity arrangements. It provides advice and reports to AGSOC and AGMIN.

The NBC is supported by various committees, sub-committees and working groups (Figure 6); in total, there are currently 35. This structure has been reviewed and adjusted at various points in the past.

FIGURE 6 IGAB governance arrangements



7.2.1 Authority and membership

There is a lack of clarity around the authorisation and remit of the NBC. The common understanding, reflected in the NBC's Terms of Reference, is that the NBC is formally established under the IGAB. However, the IGAB states the NBC is:

The committee established, independently of this Agreement, responsible for biosecurity matters, and tasked with managing a national, strategic approach to emerging and ongoing biosecurity policy issues (2012 IGAB, p. 19)

The NBC should be integral to and not independent of the IGAB. First Ministers through the IGAB should formally establish the NBC and articulate its Terms of Reference. Given that the authority of the IGAB comes from being established by First Ministers, it is logical that the main body implementing the IGAB objectives be similarly authorised by First Ministers.

There is no national biosecurity system without national cooperation by Australian governments, and this has been the NBC's focus to date. The Australian Government Department of Agriculture and Water Resources NBC website notes the committee's core objective is "to promote cooperation, coordination, consistency and synergies across and between Australian governments". This is an entirely appropriate role, but the NBC should equally be the policy powerhouse for the national system—and needs a remit and identity to match. The terms of reference for the NBC should reflect the policy and decision-making role the NBC needs to play under a future IGAB.

Draft recommendation 18

First Ministers should formally establish the NBC and articulate its Terms of Reference in the IGAB.

Membership of the NBC is primarily made up of senior officers from the Australian, state and territory agriculture agencies and some environment representatives; AHA and PHA are observers. Not surprisingly, the views of agriculture agencies tend to dominate NBC discussions and there is a need to bring a more balanced set of views to national discussions on biosecurity.

The IGAB and the NBC are not yet truly 'intergovernmental' as local government is not a party to the arrangements. Given local government's role in biosecurity (some responsibilities under the national system include established pests and diseases, and local emergency response) and the increasing risk from peri-urban activities, formal involvement would provide for a more inclusive structure. The expertise and support of local governments could be better recognised and utilised by other levels of government. Accordingly, the Review Panel recommends the NBC include the Chief Executive Officer of the Australian Local Government Association (ALGA). Separately, governments may also wish to consider the representation of local government at AGSOC and AGMIN—the ALGA is already represented on COAG, COAG councils and other intergovernmental fora, including in the areas of transport and infrastructure, disability reform, and law, crime and community safety.

The Panel notes that New Zealand Government is represented on AGSOC and AGMIN and is also an observer on some of the NBC's underlying committees (for example, the Marine Pest Sectoral Committee (MPSC)), but New Zealand is not represented on the NBC. The Panel recommends the New Zealand Government be invited to join the NBC, to further strengthen

the existing Trans-Tasman partnership in biosecurity. The Panel acknowledges New Zealand is sometimes a trade competitor, but any conflicts can be appropriately managed by the NBC.

Draft recommendation 19

The NBC should include the CEO of the Australian Local Government Association, and the New Zealand Government be invited to include a representative.

In sum, the Review Panel has proposed Terms of Reference for the NBC (Box 9) to be included in the IGAB as a schedule.

Box 9 Proposed NBC Terms of Reference

The National Biosecurity Committee (NBC) is established by First Ministers of all Australian governments under the Intergovernmental Agreement on Biosecurity (IGAB).

The objective of the NBC is to strengthen national biosecurity through:

- providing expert strategic and policy advice to ministers responsible for biosecurity (AGMIN)
- ensuring an effective national biosecurity capability is maintained
- coordinating biosecurity investment in the national interest
- establishing effective arrangements for the regular sharing of intelligence and performance information on the national biosecurity system
- promoting cooperation, collaborating and consistency across and between Australian governments
- jointly investing in annual program of work to strengthen national arrangements
- establishing and maintaining lists of national high-priority animal, plant and environmental pests and diseases and their biosecurity requirements
- overseeing development of, and reporting against, a performance framework and measures for the national biosecurity system.

The NBC is chaired by the Secretary of the Australian Government Department of Agriculture and Water Resources. Membership comprises senior officials from the Australian, state and territory and New Zealand primary industry and/or environment departments. Jurisdictions may have up to two representatives, but bring a single position to the committee on matters for resolution. The CEO of the Australian Local Government Association is also a member. New Zealand will be invited to send a representative to NBC meetings.

The NBC will establish sectoral sub-committees, and from time to time will establish time-limited expert groups to facilitate effective operations. The NBC will task these committees and subgroups.

Request for feedback 4

The Review Panel seeks feedback on the proposed Terms of Reference for the NBC.

7.2.2 Committee structure

The NBC's current committee structure is extensive, comprising:

- Four primary sectoral committees—AHC, PHC, MPSC and IPAC. These committees are supported by a further 24 sub-committees, working groups and expert groups.
- Two cross-system expert groups—the National Biosecurity Emergency Preparedness Expert Group (supported by a further three task groups) and the National Biosecurity Information Governance Expert Group.
- Two committees that operate in the event of a biosecurity response—the National Management Group and the Biosecurity Incident National Communication Network.

The existing committee structure does not provide clarity about which committee is responsible for specific issues. For example, it is unclear which committee should deal with new pests or established pests, plants versus pests that are plants and which committees should deal with environmental issues.

The Australian Government suggests (submission, p. 2) there could be better coordination and linkages between the committees and sub-committees to ensure greater transparency, sharing of information, cross-sectoral utilisation of the work of the committees.

The Review Panel has proposed revised objectives and priority reform areas for the national system under the IGAB; a greater focus on market access and environmental biosecurity; and greater sharing of responsibility for established pests and weeds among system participants. As a consequence, the Panel considers there is need to modify the NBC sectoral committee structure, along with the terms of reference for relevant sub-committees. The Panel has also attempted to minimise changes from the existing structure except where it believes there is a strong case to do so.

As detailed in Chapter 4, the Panel has proposed a new Environmental Biosecurity Committee with responsibility for non-production based terrestrial, aquatic and marine pests (including invertebrates) and diseases. While these areas will require different expertise and management approaches, these can be accommodated in different streams of work under the oversight of the Chief Environmental Biosecurity Officer.

The Panel also considers much of the work of the IPAC is now at a mature stage and implementation responsibility for some of its activities could be owned and advanced by other bodies, potentially including the new Centre for Invasive Species Solutions (CISS) (once established in 2017). The animal, plant and environmental sectoral committees of the NBC should maintain policy responsibility for nationally significant established pests and diseases, where these are linked to major biosecurity risks (for example, where established species are major vectors for national priority pests and diseases).

To reflect these changes, and give a deliberate biosecurity focus to the NBC and its sectoral committees, the Panel is suggesting a revised Animal Biosecurity Committee (ABC), renaming the Animal Health Committee, and a revised Plant Biosecurity Committee (PBC), renaming the Plant Health Committee. All production animal biosecurity issues would be handled by the ABC; all production plant biosecurity issues would be handled by the PBC. This would alter the responsibilities of the existing committees and the Panel acknowledges that some issues would be left unresolved.

Draft recommendation 20

The NBC should adopt a sub-committee structure that aligns with the revised national biosecurity system objectives and national reform priorities in the IGAB. All NBC working groups and expert groups should be task-specific and, wherever possible, time-limited.

7.2.3 Culture and transparency

The Review Panel has had a number of opportunities to engage with members of the NBC during this Review, and has observed that the culture of the NBC is positive with members that are committed, engaged, and constructive. However, the committee is perhaps overly reliant on key people, goodwill and informal arrangements.

External stakeholders have commented on the levels of change in government ministers and officials involved in the national biosecurity system—pointing out that all agriculture ministers and agency heads have changed during the period covered by the current IGAB. Similarly, most NBC members are relatively new. The Panel believes there is scope to codify past and formalise present NBC decision-making processes to ensure that corporate knowledge and positions and decisions reached by the committee endure beyond the current NBC participants.

Stakeholders have also been critical that governments, the NBC and its sub-committees have not been sufficiently open about their activities—and the Panel agrees.

It is very hard for industry to see the outcomes of the IGAB and even industry members who are active in the biosecurity space struggle with the complexity and hierarchy of the various governments committees and bodies that act in this area (Northern Territory Farmers Association submission, p. 4)

The work of the National Biosecurity Committee and its committees is general [sic.] opaque to the public. Recently [the] National Biosecurity Committee has started issuing communiques after their meetings, but the level of detail in the communiques does not allow any meaningful understanding of what was discussed (Invasive Species Council submission, p. 12)

The NBC structure and work program lack transparency. Publicly available information on the work of the NBC and its sub-committees is limited and outdated—for example, websites are not always kept up to date, and communiqués can lack meaningful information. Even taking into account the need to ensure Australia's trade interests are not compromised, there also appears to be a tendency for the NBC to be overly risk-averse in sharing biosecurity information, data and intelligence.

The Review Panel has already noted the significant achievements of the IGAB against its priority reform areas, since its introduction in 2012 (refer Chapter 1). However, many of these achievements, including key policy frameworks, are not publicly available to inform all system participants. The Panel considers the NBC could do more to improve its transparency.

Draft recommendation 21

The NBC should take steps to increase its public profile and openness, including establishing a stand-alone website. The website could be maintained by, but be separate from, the Australian Government Department of Agriculture and Water Resources, and could accommodate and centralise all information on the NBC, its committees, and their activities. Key policy frameworks, agreements and reports of the NBC should be made publicly available on the site.

7.2.4 Commitment and accountability

The success of the national biosecurity system depends on all governments meeting their 'core' or 'baseline' commitments under the IGAB and the various emergency response deeds. However, recent reports have indicated that reductions in consolidated revenue budget allocations have compromised the ability of some jurisdictions to meet those commitments and to collaborate on significant national biosecurity policy initiatives under the IGAB, which are designed to create a more effective and sustainable system.

For example, the August 2015 report by the Victorian Auditor General (VAGO 2015) found that funding for core livestock biosecurity activities in Victoria had decreased by 49 per cent over the last five years. This has weakened Victoria's capacity to detect, prepare for and respond to emergency animal disease outbreaks, which can have devastating economic impacts. The 2015 Queensland biosecurity capability review (Brooks et al. 2015) found that the increasing number, scale and scope of exotic pests and disease threats would likely exceed Biosecurity Queensland's resources and capacity. Other jurisdictions have reported similar reductions in resourcing and identified associated increases in risk. The Australian Capital Territory has indicated that due to its size, location and land tenure, it works closely with New South Wales to assist with delivery of biosecurity related to agricultural production.

The NBC members are rightly concerned that there is no material reduction in the combined or individual effort of jurisdictions under the IGAB; or for industry under the emergency response deeds. However, there are no national mechanisms in place for ongoing accountability among jurisdictions.

The Review Panel recommends governments establish an independent IGAB Evaluation Program to provide the Australian community a structured assessment of the performance of each jurisdiction, including the Australian Government, in meeting its commitments under the IGAB. These evaluations would be included in the list of priorities for the next five years under the IGAB. Jurisdictions commitments and other metrics for evaluation would be detailed by the NBC. These commitments and the evaluation process should acknowledge the operational constraints of the smaller jurisdictions. For example, the expectations of the Australian Capital Territory, relative to its neighbour, New South Wales.

Such evaluations can provide new insights and an independent or expert perspective. They are not punitive assessments, rather, they are designed to be facilitative and build capability and help manage risks and, importantly, promulgate the lessons learned among the jurisdictions. Further, they are not intended to replace the periodic capability reviews self-initiated by jurisdictions.

AGSOC should be the body that establishes and provides oversight to the independent IGAB Evaluation Program. All jurisdictions should be reviewed within the period of the next IGAB and so the evaluations should be targeted and time-limited. The evaluations should be conducted as an external review by independent assessors.

There is significant value in these evaluations being publicly available, however, there are likely to be trade sensitivities, for example, which, if made public, would not be in the national interest. AGSOC should give some consideration to the release of a summary or the full report.

Draft recommendation 22

AGSOC should establish and provide oversight to an independent IGAB Evaluation Program to assess and report on implementation of each jurisdictions' commitments under the IGAB. The evaluations, or a summary of them, should be made publicly available following ministerial consideration.

Draft recommendation 23

The NBC should clarify core commitments of jurisdictions for use in the independent IGAB Evaluation Program to be documented in a future IGAB.

Finally, the Review Panel notes the commitment within the IGAB (Schedule 1, 5.1) that the NBC must report annually to ministers responsible for biosecurity on implementation on the activities carried out under the IGAB. The Panel is aware a 2015 report was provided to AGSOC and AGMIN in accordance with the clause but it is not clear whether there have been any other reports.

The Panel re-affirms this important commitment. The NBC should report annually to AGMIN about its work program and implementation of the priority reform areas under the IGAB. Such reports should be concise and publicly available. The public report could usefully present national system data and information in the form of a National Biosecurity System at a Glance summary document, including the available data and information listed in Appendix F, and highlight other achievements which may, for example, include efforts to streamline and improve the efficiency of the national arrangements.

Draft recommendation 24

The NBC should report annually to AGMIN on its progress of priority reform areas. The NBC's work program and annual report should be made publicly available upon ministerial consideration.

7.3 Bringing other voices into the tent

During consultation for this Review industry and community stakeholders were critical of their lack of involvement in the development and implementation of the IGAB:

The IGAB construct is still based on the past 200 years of managing biosecurity across Australia with the participants being restricted to government agencies with the exclusion of other stakeholders. This also extends to the various committees, sub-committees and working groups that operate under the remit of IGAB ... NGIA does not consider 'engagement or having input' as being a part of the decision making apparatus as history has shown this is often 'process' driven with decisions still made by government to suit government agendas (Nursery and Garden Industry Australia submission, p. 7)

Jurisdictions acknowledge the desire of peak industry bodies and community groups to be part of the biosecurity decision-making process but defend the need for governments only agreement in the first instance:

The IGAB was developed in order to allow Commonwealth, state and territory governments to agree on what the national biosecurity system should encompass ... The IGAB was not intended to be the only document or mechanism to underpin the national biosecurity system. It was always envisaged that there should be a higher level document outlining the national biosecurity system including stakeholders and partnerships (New South Wales Government Department of Primary Industries submission, p. 1)

The IGAB does not provide a means to adequately address the need to engage with industry and other stakeholders in implementing the national biosecurity system. However, this relationship between government and stakeholders within the national biosecurity system is important and should be captured through other mechanisms, rather than seeking to amend the primary purpose of the IGAB (Australian Government submission, p. 2)

The IGAB promotes shared responsibility for biosecurity among a diverse range of participants and provides (under clause 2.3) opportunities for governments and other parties to work together to strengthen the national biosecurity system. While jurisdictions have developed a National Biosecurity Engagement and Communications Framework, they recognise this area is significantly underdone and there is considerable room for improvement to more effectively engage with a greater range of stakeholders on biosecurity.

The Review Panel has strongly supported the development of a National Statement of Intent for the biosecurity system to be endorsed by major stakeholders in the system. The statement would sit alongside the IGAB, the emergency response deeds and jurisdictional biosecurity strategies as foundations of the national biosecurity system. The National Statement of Intent is further detailed in Chapter 2.

The Panel also recognises the efforts made by governments to engage with non-government stakeholders through the state and national Biosecurity Roundtables. The Panel received consistent comment from non-government stakeholders on the positive nature of these events and the improvements in more recent times to effect genuine consultation through more open and robust discussion.

There is, however, scope for non-government stakeholders to be afforded a more direct means of input to the work of the NBC.

The Review Panel recommends AGSOC establish a 15-person (minimum) Industry and Community Advisory Committee to sit alongside the NBC under the IGAB structure. The advisory committee would provide advice to the NBC on key policies and activities, including development of the National Statement of Intent, and meet jointly with the NBC at least twice per year. Membership of the committee should comprise peak industry and community bodies, which should include shipping, tourism, trade, environment and community representatives. Consideration should be given to rotating membership every three years. The Australian Government Department of Agriculture and Water Resources could provide the secretariat.

To further strengthen the NBC's consideration of the views of signatories to the emergency response deeds, the Review Panel recommends an annual national Biosecurity Roundtable open to all AHA and PHA members. Information discussed and received will be compiled and feed directly into the NBC, including the relevant sectoral committee(s).

Draft recommendation 25

AGSOC should establish, as a priority, an Industry and Community Advisory Committee to provide advice to the NBC on key policies and reforms.

Draft recommendation 26

The NBC should convene a dedicated annual national Biosecurity Roundtable for AHA and PHA members to provide direct input to the NBC.

7.4 An updated governance structure

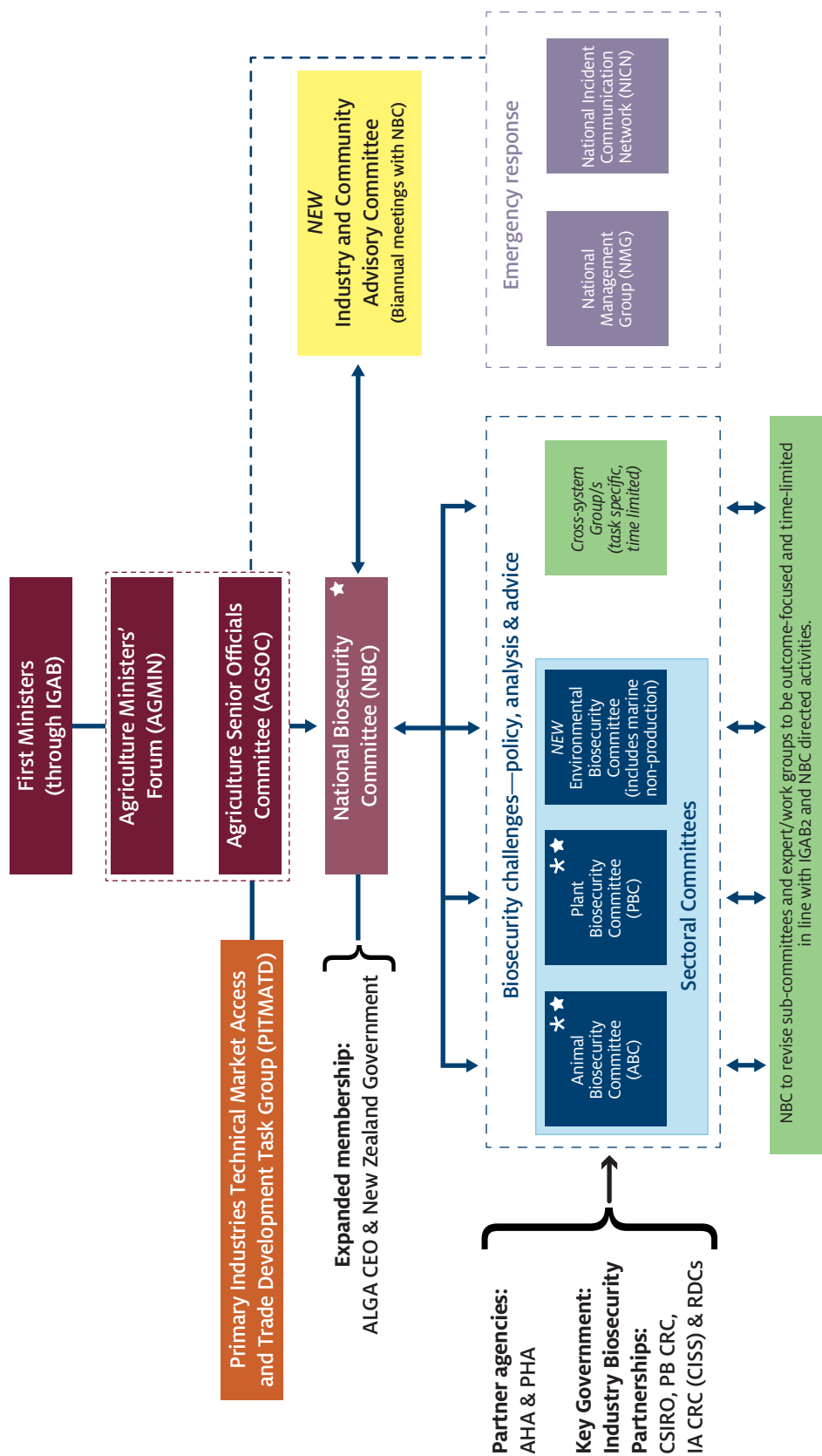
Effective and stronger governance of the national biosecurity system requires a strong mandate, strong leadership, a sound strategy, and a finely tuned and focused set of supporting arrangements.

This chapter has proposed a number of modifications to the existing governance structure and these are summarised below, and illustrated in Figure 7:

- a new IGAB agreed by First Ministers of all jurisdictions
- nomination by First Ministers of a lead biosecurity minister and agency for each jurisdiction, and jurisdictional arrangements that facilitate a whole-of-government view
- AGMIN being the operational ministerial forum
- the NBC with a stronger mandate from First Ministers under the IGAB, including new terms of reference and expanded membership
- including local government membership on the NBC, and inviting the New Zealand Government to have a representative on the NBC
- the establishment by AGSOC of the Industry and Community Advisory Committee to sit alongside the NBC
- the new position of Chief Environmental Biosecurity Officer within the Australian Government environment department or less desirably the agriculture department
- revised arrangements for sectoral committees: including a new Environmental Biosecurity Committee responsible for terrestrial, aquatic and marine (non-production) environmental and social amenity biosecurity issues, and some changes in responsibilities for the Animal Biosecurity Committee (ABC) and Plant Biosecurity Committee (PBC)
- greater sharing of responsibility for established pests and weeds among government and non-government parties in the system. This is consistent with the NBC's proposed approach to managing established pests and diseases of national significance (NBC 2015)
- ensuring cross-system groups (existing and new) are task-specific and, wherever possible, time-limited

- bringing together the National Management Group and the National Biosecurity Management Group as one body given they have identical membership—the Review Panel recognises this is largely a cosmetic change but is required given the Australian Government Organisations Register (Australian Government Department of Finance) formally recognises the two existing bodies. The upcoming review of NEBRA could effect the required changes
- the participation of partner agencies (AHA and PHA) and other bodies (RDCs, CSIRO, Plant Biosecurity CRC (PB CRC), Invasive Animals CRC/Centre for Invasive Species Solutions (CISS), among others) in sub-committees to be further considered by the NBC.

FIGURE 7 Proposed governance structure



☆ Revised ToR and membership to a) elevate consideration of market access and the environment; b) reduce NBC's focus on asset protection and agricultural productivity issues (which can still occur outside NBC structures).

★ Environmental issues affecting animal and plant production to be managed by ABC and PBC.

8 Funding our national system

Key points

- The funding of the national biosecurity system is complex and multi-faceted, and in some cases there is a lack of transparency.
- Some aspects continue to be funded through agreed arrangements and long standing commitments, whereas other biosecurity priorities fall short of the appropriate levels of funding.
- Governments and industry are facing, and will continue to face, ongoing resourcing challenges.
- Governments have agreed national investment principles and frameworks under the IGAB. The challenge is building support within governments for implementation.
- The appropriate level of funding will be clearer once the suite of high-priority pests and diseases, and their biosecurity requirements at the agreed residual level of risk, have been agreed and worked through.
- Investment by industry and contributions from community, especially through rates and levies, warrant greater acknowledgement.
- Industry involvement in investment decision-making is primarily confined to emergency responses.
- Governments have some options available to support a more sustainable funding base.

8.1 The shared funding challenge

The success of the national biosecurity system is reliant on sustained levels of well-targeted investment over time, underpinned by strong funding principles and arrangements that are nationally coordinated, consistently applied and well communicated.

There are obvious funding pressures across the national system, and these are not limited to a particular jurisdiction. Reports from the Australian (Commonwealth of Australia 2015), Victorian (VAGO 2015) and Queensland (Brooks et al. 2015) governments have identified that reductions to core government biosecurity resourcing (that is, overall financial and staffing levels) are placing further pressures on the system to manage biosecurity risks; governments have responded to these reports with additional targeted funding injections.

From the Review Panel's perspective, the funding pressures arise primarily from a combination of the following issues:

- static or declining government biosecurity budgets, reflecting competing priorities for funding (for example, health and education)
- absence of an agreed suite of high priority pests and diseases and their biosecurity requirements
- inefficient resource allocation (investments with low returns)
- an overdependence on public investment due to immature cost-sharing arrangements

- increasing biosecurity risks and efforts (refer Chapter 1)
- growing demand for biosecurity services (for example, export/domestic certification).

Resourcing the national biosecurity system, however, is not the responsibility of governments alone. The Panel recognises the system is funded through a variety of means: government appropriations, fees and charges for services, levies and other financial contributions. There are also noteworthy financial, in-kind and voluntary contributions made by landholders and other industry participants. Altogether, funding and resourcing the national system is a responsibility of all system participants.

The Review Panel received comments from across governments, industry, community organisations and individuals, suggesting broad concern that existing funding and resourcing arrangements are inadequate and *ad hoc* and, if continued, will not be able to support the national biosecurity system into the future. Many industry members have commented that reductions in government expenditure correspond to increased ‘cost-shifting’ to industry. They have raised concerns about a decline in the number of specialists (including government veterinarians and plant pathologists). A snapshot of these comments is below:

[There is] no overall funding model for a national framework/and system. Individual components maybe funded but how the system should operate and be paid for has not been addressed. Under the current framework, initiatives are funded piecemeal and under ephemeral funding models. These initiatives run the risk of falling by the wayside when the focus turns to other aspects (other ‘hot topics’) of biosecurity. Logically, agreement on operation and funding cannot occur until there is some agreement amongst parties as to what a national framework should be... In many cases we have seen a diminution of capacity as jurisdictions have reduced commitments and funding to biosecurity. Similarly the resources at the Commonwealth level have not kept pace with the increase in risk as trade and passenger movements increase (Voice of Horticulture submission, pp. 3–4)

Industry has also witnessed the disproportionate reduction in government investment in plant biosecurity across Australia relevant to animal biosecurity which questions state/territory government capacity to meet their obligations. Industry faces significant pressure in sourcing general funding with most relying on industry RD&E levies ... (Nursery and Garden Industry Australian submission, p. 11)

Substantial reductions in State government services and funding now jeopardise our national system of biosecurity. For example, our experts dispute the claim [from the IGAB Review Discussion Paper] that Australia enjoys a ‘robust diagnostic systems and capacity’ compared to international benchmarks. The national veterinary diagnostic system has been degraded as a result of State government funding cuts.... (The University of Sydney submission, p. 3)

Without clear, consistent and collaborative approaches to prioritisation it is difficult to ensure investment is going into the best areas (Biosecurity Council of Western Australia submission, p. 2)

On the other hand, some of the apparent reductions in services to biosecurity by governments across the country have occurred when new systems with built in efficiencies that reduce costs to governments, and at the same time maintain or enhance the service, have been implemented. For example, the reduction in the number of small veterinary laboratories has

been addressed by significant capital investments in large centralised and modern facilities with significantly superior diagnostic capacity, utilising modern transport logistics.

As well, state and territory treasuries with competing priorities from the community, rightly look to ensure that all system participants are sharing in the cost of our national biosecurity system. It is appropriate for governments to continually question whether all participants are pulling their weight, and to be assured that governments are not being used as an automatic default funder. If this process is conducted in partnership with all participants, it should be possible to identify appropriate cost-sharing, versus inappropriate cost-shifting.

8.2 Guiding principles and frameworks

In its deliberations on funding the Review Panel has given consideration to funding principles and frameworks under the IGAB, and has sought to make some observations.

8.2.1 The IGAB investment principles

The principles in the IGAB give direction to governments on their investments for biosecurity activities (IGAB, 4.1(v–vii)):

- v) Activity is undertaken and investment is allocated according to a cost-effective, science-based and risk-management approach, prioritising the allocation of resources to the areas of greatest return.
- vi) Relevant parties contribute to the cost of biosecurity activities:
 - a) Risk creators and risk beneficiaries contribute to the cost of risk management measures in proportion to the risks created and/or benefits gained (subject to the efficiency of doing so), and
 - b) Governments contribute to the cost of risk management measures in proportion to the public good accruing from them.
- vii) Governments, industry and other relevant parties are involved in decision making, according to their roles, responsibilities and contributions.

The investment principles are sound and throughout this Review, there has been wide support for maintaining them in a future IGAB and as part of a future system. However, many stakeholders identified the difficulty of seeing the impact these principles have made (and are making) to the national system, particularly on the allocation of funding and processes for decision making. The Review Panel supports this assessment, noting that there is limited evidence of practical implementation of these principles by jurisdictions, which are yet to fully address this challenge.

8.2.2 The National framework for Cost Sharing Biosecurity Activities

The National framework for Cost Sharing Biosecurity Activities, agreed by the NBC, establishes for governments the key principles underpinning a cost-sharing model for biosecurity activities, including detailing the available funding mechanisms. The framework is consistent with the objectives and principles of the system as outlined in the IGAB and is a valuable statement of principles.

The Review Panel recognises that there is a need for an agreed framework or model to guide the application of cost sharing arrangements to biosecurity activities by all parties. However, the framework does not provide sufficient guidance to facilitate practical implementation by system participants; is somewhat arbitrary on potential funding mechanisms (for example, a national biosecurity levy); and, to date, reflects a government-only view of cost sharing.

There would be benefit in the NBC and the proposed new Industry and Community Advisory Committee revising the framework, in consultation with key stakeholders, with a view to its practical application to system participants.

In arriving at this view, the Panel was aware of other funding frameworks similarly aimed at guiding funding, cost-recovery and investment such as those covered in the 2013 Review of funding framework for NSW Local Land Services conducted by the Independent Pricing and Regulatory Tribunal (IPART 2013). In its review, IPART outlined a hierarchy of funding mechanisms for regulatory and non-regulatory activities. In summary:

- A direct fee-for-service should be the default funding mechanism and is preferable to a rate or levy in principle because it provides as close as possible a link between the activity and the charge. Fees are likely to be most appropriate where there are clear private benefits to an identifiable party (such as an individual landholder).
- If a fee-for-service is ruled out because it is not efficient, effective or feasible, then the use of a rate or levy might be appropriate where:
 - the activity is of a general industry nature rather than of immediate application to one identifiable firm (or person)
 - it is difficult or impossible to identify the users of a particular service or the extent of their use
 - although the users can be identified, charging a direct fee would impede the objectives of the activity, for example, by creating a perverse incentive
 - administrative complexity means that it is simpler and cheaper to recover regulatory costs for a defined industry through a single industry levy rather than by collecting a large number of smaller fees.
- In some cases, administration, transaction and compliance costs may mean that even an industry levy is impractical or too expensive. In such cases, taxpayer funding may be preferable (though a last resort).

The Productivity Commission (PC 2001) has also provided considerable advice on the application of cost-recovery mechanisms.

Draft recommendation 27

The NBC and the Industry and Community Advisory Committee, in consultation with other key stakeholders, should revise the National Framework for Cost Sharing Biosecurity Activities to enable its practical application.

8.2.3 The national portfolio investment optimisation model

The NBC's national portfolio investment optimisation model categorises government investments across the range of biosecurity activities. The model seeks to provide a considered and holistic approach to investment to help understand investment returns. The model provides five investment categories (IC) (Table 7), which reflect the suite of biosecurity activities across the system. The Australian Government also reports on a sixth category (export facilitation).

TABLE 7 The national portfolio investment optimisation model categories

Investment category	Description
IC1	Prevention of exotic/emergency pests and diseases (pre-border and border)
IC2	Preparedness for exotic or emergency pests and diseases, including early detection (surveillance)
IC3	National eradication/containment programs (cost-shared national programs)
IC4	Management of established pests and diseases of national significance
IC5	Management of other established pests and diseases
IC6	Export facilitation (Australian Government only)

The foundation for the investment model is the 2008 generalised invasion curve (invasion curve) developed by the Victorian Government, as detailed in the Discussion Paper for the IGAB Review. The invasion curve includes indicative economic returns, with the return on investment higher for prevention than for ongoing management of established pests and diseases. For the latter, return on governments' investment is improved when their investment supports collective industry and/or community action (compared to government as sole investor). The sixth investment category, and its return on investment, does not feature in the invasion curve.

The invasion curve has been useful in demonstrating the correlation of activity, area occupied and time, and has helped system participants further the maturity of the national biosecurity system. However, given the complexity of the national system and further development of national arrangements, jurisdictions have seen a need to adapt the invasion curve. The NBC's agreed categories of investment reflect 'the curve's' next evolution, though there will be an ongoing need to validate returns on government investment across the system for the model to remain valid.

8.2.4 Categorising activities of the system

While the Review Panel supports the steps taken to establish new investment categories and recognises their value for decision-making purposes, these should have utility beyond funding and investment. Uniform categories for the national biosecurity system should reflect the full suite of activities for all system participants and support a range of analyses. All system participants should be encouraged to publicly report their activities, including investments, on a consistent basis to build a better understanding of the system's efficiency and performance.

At present, there is limited ability for system participants beyond jurisdictions to categorise their contributions to and participation in the system. This includes capturing the activity relevant to the IGAB priorities, as well as the activities and funding of AHA, PHA, RDCs, CSIRO, and any state and territory-level bodies.

The Review Panel recommends a single categorisation of system activities be agreed by jurisdictions, in collaboration with key industry members and non-government partners. As part of this reconsideration, attention should be given to categories of the national priority planning process and the subsequent activity planning. System categories must be clear to avoid confusion, distortion or manipulation.

Draft recommendation 28

The NBC, with key industry and non-government partners, should agree uniform and fully inclusive categories of funding activity for the national biosecurity system.

8.3 How much is enough?

The overall funding situation of the national biosecurity system is complex, multi-faceted and unclear, meaning there is no picture of total investment in the national system. This is primarily because the range of investments and contributions by key parties is not routinely captured, reviewed or invested on a national basis. Governments have sought to address this in recent years for public investment but there is much work still to be done, including by non-government parties, before questions of ‘how much (funding) is enough’ can be answered.

8.3.1 Jurisdictions: The national stocktake of biosecurity investment

The national stocktake of biosecurity investment uses the national portfolio investment optimisation model’s six investment categories to provide a structured assessment of how all Australian governments are investing in biosecurity.

Reported through the NBC, the stocktake captures estimates of jurisdictions’ overall investment in biosecurity with results available for total state and territory investment and total Commonwealth investment. The stocktake has been completed for the 2013–14 and 2014–15 financial years; the stocktake for 2015–16 is underway.

The Review Panel considers that the National Stocktake should continue to be undertaken each year, and included as a commitment in a future IGAB. The results of the stocktake should also be publicly reported, including the overall jurisdictional expenditure.

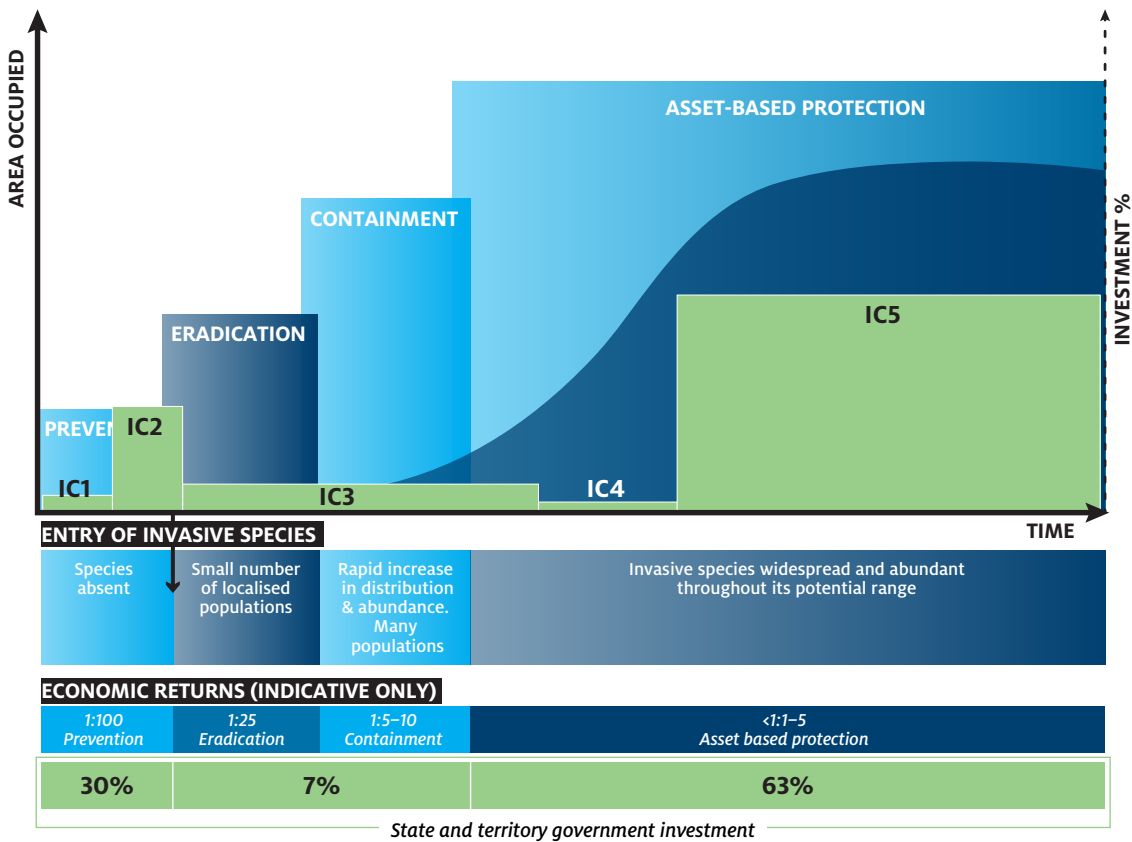
Draft recommendation 29

The IGAB should include an ongoing commitment to the funding stocktake, with governments publicly reporting their expenditure and the high-level stocktake results under uniform and fully inclusive categories.

The stocktake estimates total biosecurity investment by jurisdictions in 2014–15 to be around \$650 million (excluding the cost of the export facilitation function performed by the Australian Government—IC6). This includes a total of \$300 million in cost recovered funds, collected by governments for the delivery of biosecurity services to industry. Of note, approximately 63 per cent of state and territory investment is directed at areas where the return is generally lower, that is established pests and diseases (Figure 8). Individually, states and territories spend between 49 and 72 per cent of their biosecurity funds on established pests and diseases.

Benefits to farmers, industry and the community would flow if the current expenditure profile of the state and territory jurisdictions could be reformed to align more closely with agreed national biosecurity priorities.

FIGURE 8 State and territory government biosecurity investment in 2014–15



Source: 2014–15 national stocktake of biosecurity investment.

For several years now, governments have acknowledged the superior return on investment at the prevention and early detection (left-hand) side of the invasion curve. However, governments appear hamstrung in redirecting investments there. The Australian Government submission to this Review highlighted the need to reconsider allocation of resources in light of the results of the biosecurity stocktake, but emphasised it would be difficult to generate support for directing funding away from the right-hand side of the curve.

The Review Panel acknowledges that some traditional patterns of investment can be driven by industry and political imperatives. However, the Panel hopes that the recommendations here will assist jurisdictions, and facilitate the decision-making process as to where to invest their limited taxpayer funds. Hopefully this will be into areas where the returns to producers, the industry and community are greatest.

Draft recommendation 30

All governments should review their current biosecurity expenditure, with a view to redirecting funding into areas that return the highest yields to farmers, industry and the community. This approach will require a planned and coordinated strategy of engagement and communication.

Jurisdictions need to do more to demonstrate and communicate ‘the case’ for particular investment approaches. Use of tools like the Australian Government’s Risk Return Resource Allocation (RRRA) model will assist in this process.

Furthermore, all industry and farm lobby organisations also have a responsibility to inform themselves, and their constituents, of where the real return on investment to farmers is. Issues that are often short term, local, and sometimes high profile and media susceptible, can readily draw funds away from those biosecurity challenges that need to be addressed, and will have a superior financial benefit to farmers.

8.3.2 Risk Return Resource Allocation model

The Australian Government’s RRRA model can be used to inform advice on the return (in terms of reduced risk) for investments to manage biosecurity risk and improve confidence that resources are allocated to areas of greatest risk reduction (Box 10). A full explanation of the model is at Appendix D.

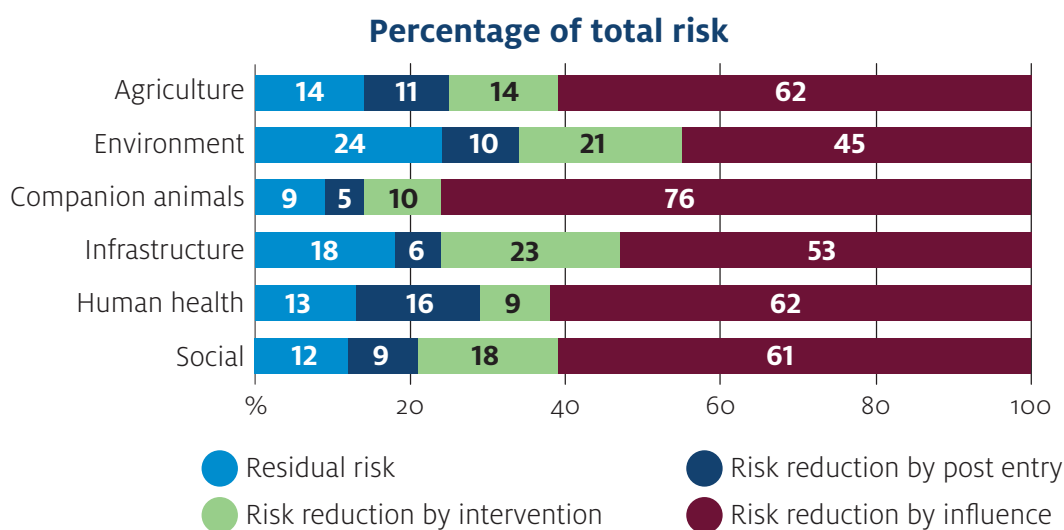
Box 10 Risk reduction from Commonwealth investments

The RRRA model estimated the contribution, through pre-, at and post-border investments, by the Australian Government Department of Agriculture and Water Resources to reducing biosecurity risk. Post-border investments by the states and territories are not captured by the model and were, therefore, not considered as part of the analysis.

The RRRA model estimates risk reduction due to the effect of biosecurity controls in reducing the approach rate of organisms of biosecurity concern via goods, conveyances, people and natural means (influence), reducing the number of organisms that are released from biosecurity control and enter Australian territory (physical intervention at border), and reducing the number of those organisms that establish and spread (post-entry controls).

About two thirds of the overall risk reduction is the result of biosecurity controls that influence the approach rate for organisms of biosecurity concern (pests, diseases and weeds). This includes the influence border processes have on passengers and importers to reduce the approach rate. The corresponding return on investment (ROI) is very high (128) compared to the ROI for the direct effect of at border interventions (20).

The study found that with the modelled \$340 million investment in biosecurity controls by the department, Australia avoids a \$24 billion long-term cost to the economy.



Contributions to overall reduction in risk across continuum for each risk category. Influence refers to anything that effects the approach rate, intervention refers to border activities and post-entry refers to the direct effects of surveillance, preparedness and response activities.

Source: Australian Government Department of Agriculture and Water Resources.

The national biosecurity system and its participants need tools like the RRRA model to guide investment decisions and help ensure the greatest return on investments.

The Review Panel considers that the RRRA model should be extended to all biosecurity investments. In the first instance, the model should be extended to investments from all jurisdictions. The Australian Government should provide the necessary assistance and technical expertise to all jurisdictions to build this capacity across the national system and ensure national consistency of use.

Draft recommendation 31

The Risk Return Resource Allocation model should be extended to include all jurisdictions and their investments, with the Australian Government providing assistance to jurisdictions to build national capacity.

8.3.3 Industry investment

Under present reporting arrangements, it is not possible to establish the total investment (financial or in-kind) by industry in the national biosecurity system. Industry contributions are not captured in the national stocktake other than levies or fees-for-service which pass through government accounts. Overall, the feedback from industry indicates that industry contributions are significant and increasing. It is the Review Panel's view that industry should give greater recognition to its significant investments by undertaking its own investment stocktake based upon future agreed categories of activity for the system (as described in section 8.2.4). The Panel considers that AHA and PHA would be best placed to coordinate this task, with guidance from the NBC, to ensure data integrity and compatibility with government stocktake results.

Draft recommendation 32

AHA and PHA should coordinate an industry stocktake of national biosecurity system investments, making the results publicly available.

Throughout the Panel's consultation, many stakeholders commented that the present funding arrangements did not accurately cover all system participants. Concerns were raised that some primary industry sectors stood to benefit from, but did not contribute to, national emergency response arrangements.

While there is a perception of multiple 'free riders', this is not the case. Analysis undertaken for this Review by ABARES has shown that for 2014–15 approximately \$51.4 billion (or 95 per cent) of Australia's total Gross Value of Production (GVP) of \$54.3 billion (excluding forestry and horse production) is covered by signatories to the emergency response deeds. This is a considerable contribution from industry and demonstrates the overwhelming partnership between industry and government in emergency responses. Of the five per cent not covered, (approximately \$2.8 billion), the products (or categories of product) with a production value of more than \$100 million are listed in Table 8.

TABLE 8 Commodities with a production value of more than \$100 million not covered under existing emergency response deeds

Product	Production in 2014–15 (\$m)
Hay and silage	1 402.6
Cut flowers	296.2
Fresh tomatoes	285.4
Mushrooms	273.6
Cultivated turf	217.3
Livestock slaughter and other disposals, other NEC	154.3
Other fruit NEC	141.0

Note: NEC=Not elsewhere classified.

ABARES analysis of Australia's total exports against the signatories to the emergency response deeds tells a similar story. The proportion of farm and forestry exports (excluding horses temporarily exported for racing) covered by signatories to the emergency response deeds is around 87 per cent.

Encouraging the above remaining industries to sign up to the emergency response deeds would strengthen the national partnership, and the national system.

Also, it needs to be remembered that while there is significant industry involvement with respect to emergency responses, for other aspects of the national biosecurity system, industry input is less well understood, though believed to be less than government. As noted in Chapter 2, there are currently 136 industry surveillance programs in place in the grains and horticulture industries, with most of these programs run by the industry groups. Some industries also invest with state governments in delivering their surveillance programs. Opportunities exist for producers, industry and the community to play a greater role in pest and disease monitoring and surveillance, for example, with new in-crop/in-herd diagnostics, drone sampling technology and direct communication to sophisticated data retrieval, storage and analysis systems. Development of improved monitoring, surveillance and diagnostics will be central to ensuring market access to our export oriented agricultural industries.

Beyond agriculture, the Australian Government submission (p. 12) highlighted implementation of the shared responsibility principle would need to take account of sectors other than agriculture that could be 'beneficiaries or risk creators' (system participants), including mining; tourism; infrastructure, building and construction; transport (shipping, ports, road and rail); environment (exotic plant or animal collectors, national parks, zoos and aquaria); and defence (movement of personnel and equipment in and out of Australia).

The Review Panel considers significant scope exists to involve identified sectors and industries in funding decisions and implementation of frameworks that will apply to them—to date this does not appear to have occurred, despite the clear commitment of governments to do so in the IGAB. Governments and industry have collaborated well in discussions and decisions on funding for emergency responses but there remain ample opportunities to rectify this for situations outside of a crisis.

Governments engaging with the national biosecurity system participants is also a significant issue for the funding-relevant work of the NBC. Three key projects of the NBC to help direct investment, which were listed in this Review's terms of reference, are not yet public documents. This makes any assessment of their value or use impossible for those outside of government, including use to direct their own activities and investment. Transparency between all system participants is critical.

8.3.4 National priorities and activity planning

The Review Panel does not believe that it is possible to determine the funding required for the national biosecurity system unless there is clarity in the funding required for addressing national priority pests and diseases.

The Panel's proposed approach to national priority pests and diseases (Chapter 5) will allow a 'rolling-up' of the funding required to give a more informed picture of the total cost of the national system. Importantly, the proposed approach should also help all system participants understand their responsibilities, and required contributions and investment (financial and in-kind contributions and must be appropriately recognised) in addressing the priority pest or disease.

Addressing all biosecurity activities (for example, pre-border, surveillance and diagnostics) through this process would identify any gaps, including activities not or underfunded, and substantially increase the attention given to any static or declining investments in these areas. The proposed approach can establish a total cost of each activity, such as pre-border, surveillance or diagnostic activities. It will also enable application of the acceptable residual level of risk to be decided.

Importantly, the approach also recognises the imperative for ongoing funding for capability, covering qualified staff, specialist positions and specific skills, and the efficiencies gained from partnerships between researchers and industry.

8.3.5 Rapid (emergency) response capacity

The EPPRD, Emergency Animal Disease Response Agreement (EADRA) and NEBRA contain provisions for managing an emergency response to an incursion, including details on the resourcing. The Review Panel received several comments from stakeholders during consultation about instances of funding and resource pressures at the time of an exotic pest or disease detection/incursion. Being able to respond and eradicate or contain quickly must be a key capacity of the national biosecurity system.

Among others, the Queensland Government Department of Agriculture and Fisheries has highlighted the problem:

Both the EADRA and the EPPRD set out clear expectation and rules for funding that recognise the public and commercial benefits of biosecurity risk management. However, in practice, technical requirements around feasibility of eradication and the delay between the Incident Definition phase and agreement to a response plan leave state governments bearing costs and risks. A second challenge associated with the present cost sharing deeds are the term of funding and reporting requirements ... [For] incidents which fall outside the current deed arrangements, [they] require collective agreement between national partners to navigate a cost sharing approach ... The absence of an agreed process to triage and rapidly resolve such incidents is again a concern for state governments, and has been raised in response to previous reviews of these deeds (p. 4)

Whether an incursion is managed under a deed or off-deed, making available money and resources immediately at the time of an incursion should allow a more efficient response; rather than allowing a pest or disease to spread further while decisions about eradication feasibility and who will pay for the response are made. There must be an ability to rapidly access 'no-regrets' funds for rapid responses.

The Review Panel recognises there are provisions within the existing emergency response deeds but it appears that they are not working effectively. The Panel is seeking feedback from stakeholders to clarify this issue and provided two options to strengthen jurisdictions' ability to respond, and calls for feedback on the suggestions.

Request for feedback 5

The Review Panel seeks feedback on the following options to ensure a more rapid-response to an exotic pest or disease incursion:

Option 1: Cost-sharing arrangements should provide for four weeks of monitoring, assessment and preliminary control strategies, while an overall assessment is conducted on the possibility of successful eradication.

Option 2: Cost-sharing arrangements should include a default funding arrangement for when decisions cannot be quickly reached about the success or otherwise of an eradication program.

The Panel has observed the progress on the development of emergency response deeds for aquatic animals (aquaculture and wild) and exotic production weeds. These deeds will address key gaps in the national emergency management arrangements and should help minimise the number and need for negotiation of special off-deed arrangements. While there are a range of discussions underway, the Panel recommends jurisdictions, relevant industries and community groups facilitate the prompt conclusion to these discussions to ensure the aquatic and exotic production weed deeds are prepared without delay.

Draft recommendation 33

The emergency response deeds for aquatic animals and exotic production weeds should be finalised within 12 months.

8.4 Sustainable funding

The Review Panel has given consideration to areas that may help ensure sustainable biosecurity funding into the future, with application to individual jurisdictions and the national biosecurity system. The Panel has, for the draft report, not made any firm recommendations for jurisdictions and system participants. Rather, the following options are provided for stakeholder discussion and feedback.

8.4.1 A national investment strategy

At present, there is a range of *ad hoc* approaches to funding biosecurity activities in the national biosecurity system—by governments and industry. A national investment strategy, as proposed by the Australian Government, would give greater structure and a more strategic focus to investment across the system and would increase the transparency of investment

decisions. A strategy would be publicly available and connect a range of tools, frameworks and principles that support and guide national biosecurity investment decision making. Tools and frameworks could include the approach to determining the national priority pests and diseases, the RRRRA Model (Box 11), and the national stocktake.

Box 11 Change in trade and patterns and exposure to biosecurity risk

The number of passengers, shipping and containerised cargo arrivals are forecast to nearly double by 2025 (DIRD 2014). The possible effect of this increase on biosecurity risk to Australia, and its management by the Australian Government Department of Agriculture and Water Resources, was explored using the RRRRA model.

Four RRRRA model entry pathways were examined: passengers (via air and sea), vessels greater than 25 metres, sea containers (external surfaces only) and timber (bulk timber and wooden manufactured articles). The RRRRA model results for the management of biosecurity risk used 2014–15 trade data and costs (Australian Government only) as a baseline for three 2025 management scenarios:

Scenario 1 (Fixed investment): Border clearance costs are maintained at the current level.

Scenario 2 (Fixed intervention rate): Border clearance processes adjust to changing volume (document processing and intervention rates).

Scenario 3 (Fixed residual risk): Border clearance processes (intervention rates and effort) are increased in an attempt to maintain residual risk at the 2014–15 levels.

The biosecurity system in 2014–15 spent \$0.09 billion in managing the risks for the four entry pathways (passengers, vessels >25m, containers and timber), which the RRRRA model calculates benefited Australia by \$2.4 billion.

The analysis shown in the table below assumes no other adjustments, pre- or post-border, are made to manage risk.

Scenario	Units millions/ year	Investment \$b	Risk		ROI ²
			Reduction ¹ \$b	Residual \$b	
Current (2014–15)					
All pathways	197	0.34	23		
4 pathways	19	0.09	2.4		
Future (2025)					
4 pathways	32				
Sc1: Fixed investment rate		0.09	3.3	3.4	38
Sc2: Fixed intervention		0.13	3.8	2.9	29 (12)
Sc3: Fixed residual risk		0.25	4.7	2.1	19 (7)

Note 1 Risk reduction is the estimated reduction in exposure to biosecurity risk as a result of having biosecurity controls in place.

Note 2 Marginal ROI (in brackets) is the return on the additional investment needed to maintain current policy settings for border interventions or to attempt to maintain residual risk at current levels.

Box 11 Change in trade and patterns and exposure to biosecurity risk (cont...)

The analysis shows, based on estimated volume for the four entry pathways for 2025, that while increasing the investment in biosecurity interventions at the border provides a benefit (refer to Risk Reduction column), it would not be sufficient to keeping residual biosecurity risk at the 2014–15 level of \$1.7 billion. Indeed, even tripling the investment in interventions to \$0.25 billion (Scenario 3), while providing a benefit of \$4.7 billion, only manages to reduce the residual risk to \$2.1 billion. This highlights the importance of seeking innovative approaches, not just border interventions, to biosecurity risk management.

This finding is reinforced by the return on investment (ROI) analysis for the four pathways. In the fixed intervention rate and fixed residual risk scenarios (Scenarios 2 and 3), although investment has increased (to \$0.13 billion and \$0.25 billion respectively), the overall ROI has reduced (29 and 19 respectively) and the marginal return on the additional investment is about half (12) or a quarter (7), respectively, of the baseline ROI (27).

Source: Australian Government Department of Agriculture and Water Resources.

The strategy might initially focus on government investment of public funds and externally sourced funds (which are co-invested by governments alongside the public funds) in biosecurity activities. It should set out a long-term direction for governments to improve the returns on their investment and ensure their funding is sustainable into the future, and include commitments to regular review and assessment of governments' achievements and improvements in these areas. The strategy could be expanded to include investments by industry on completion of their national biosecurity investment stocktake.

8.4.2 Cost recovery in focus

All jurisdictions recover some of the costs of services they provide to national biosecurity system participants (for example, importers, exporters and producers). These are not costs shifted to industry arbitrarily. Industries paying for these services generally recognise the benefits to them and the nation more generally, and acknowledge this as an appropriate means of their taking responsibility in biosecurity risk management. For governments, recovering the cost of these services is vital for the financial viability of the national system.

The Review Panel notes the Productivity Commission's report on cost recovery by government agencies (PC 2001), which, among other conclusions, observed that well designed cost-recovery arrangements can promote economic efficiency and equity.

In 2015, the Australian Government Department of Agriculture and Water Resources substantially reformed its cost recovery arrangements as part of a strategy to provide long-term funding stability. Some previous cost-recovery arrangements had not kept pace with changes to import and export certification systems and adjustments in the department's operations. Further, the arrangements had been developed in isolation, which had led to inconsistent approaches to costing similar activities. There were problems relating to the equity, efficiency and sustainability of these cost recovery arrangements.

For biosecurity services, six existing arrangements were consolidated into one, fees were streamlined and standardised, and a new cost-recovery model was implemented that divided the 17 biosecurity activities into four cost groups. The revised arrangements, now in place, have ensured an equitable contribution to all users of the Australian Government's services, a reduced number of fees and charges and, importantly, improved transparency for the department's clients. For the Australian Government Department of Agriculture and Water

Resources, in excess of \$330 million is recovered annually, representing more than 68 per cent of the costs of its biosecurity activities; the remaining portion comes from general government appropriations from taxpayers.

There are significant advantages to stronger cost-recovery arrangements. Importantly, determining the areas of improvement will require the jurisdictions to more comprehensively understand their actual costs of delivering services, including those benefiting from the service that may not have yet been identified as well as the costs of staff and resources directly and indirectly involved.

The Australian Government has clearly benefited from its 2015 review, and not only through the increased recovery of funds. The Review Panel supports the Australian Government's suggestion that all states and territories review the delivery of their biosecurity services and cost-recovery arrangements, and seek guidance from the Australian Government on the process.

Draft recommendation 34

State and territory governments should review their biosecurity cost-recovery arrangements to ensure they are consistent, appropriate and transparent.

8.4.3 Property-based rates and levies

The Review Panel notes the trend towards property-based levies being implemented by governments around Australia, particularly for contributions to emergency services (Box 12). Of note to the biosecurity community is that the Queensland emergency service agency received \$457.4 million in levies in 2015–16 and Victoria is forecast to raise revenue of \$674 million in 2016–17 from its fire services property levy.

Box 12 Property-based levies for emergency services

Victorian Fire Services Property Levy (FSPL)

From 1 July 2013, the Victorian Government replaced the insurance-based fire services levy, as recommended by the Victorian Bushfires Royal Commission. The FSPL is collected in accordance with the *Fire Services Property Levy Act 2012* (Vic), which legislates that all Victorian property owners are liable for a financial contribution (via the FSPL included on their annual council rates notice charge) to Victoria's fire services.

The Metropolitan Fire and Emergency Services Board and the Country Fire Authority are largely funded by the FSPL which is collected by councils, and the Victorian Government. Councils collect 87.5 per cent of MFB budget and 77.5 per cent of CFA budget from Victorian property owners. The Victorian Government contributes the remaining 12.5 per cent of the MFB budget and 22.5 per cent of the CFA budget.

The Victorian Department of Treasury and Finance 2016–17 Budget forecasts revenue of \$674 million from the FSPL.

Source: Victorian Government [Fire Services Property Levy](#) website.

Box 12 Property-based levies for emergency services (cont...)

The NSW Emergency Services Levy

The majority of the funding for the NSW State Emergency Services, NSW Rural Fire Service and Fire and Rescue NSW currently comes from an Emergency Services Levy (ESL) imposed on property insurance policy holders. The levy funds these services, supporting the work they do to help NSW residents protect their properties from fire, flood, storms and other natural disasters.

The NSW Government determines the total budget for the emergency services authorities and requires insurance companies to contribute 73.7 per cent of the total. The balance is provided by the Treasury (14.6 per cent) and local councils (11.7 per cent).

In December 2015, the NSW Government announced its intention to reform the way the emergency services funding operates by moving away from the insurance-based ESL model to a new property-based model, called the Emergency Services Property Levy (ESPL). The rationale for the change is to create a fairer system, where the funding for the emergency services will be shared by all property owners who may need to use the services, not just those who elect to take out property insurance.

The 2016–17 financial year is the last year in which the ESL will be charged by insurance companies, with the ESPL coming into effect on 1 July 2017. The NSW Government expects the change to result in a reduction in the cost of property insurance and encourage more people to insure their properties. The new ESPL will be collected by on behalf of the NSW government, alongside council rates.

Source: NSW Government [Insurance Monitor](#) website.

Queensland Government Emergency Management Levy

Queensland Fire Emergency Services (QFES) is funded to deliver a wide range of fire and emergency management and recovery services through emergency management levies paid by prescribed property owners across the state.

The emergency management levy is established by the *Fire and Emergency Services Act 1990* (Qld) (the Act) which applies a levy on properties within levy districts. The Act places a legal obligation on local governments to administer the levy, which is collected through local government rate notices.

The levy is applied to all Queensland property to ensure there is a sustainable funding base for fire and emergency services and recognises that all Queenslanders are at risk from a wide range of emergencies including floods, cyclones, storms as well as fire and accidents.

The levy remains the primary source of funding for QFES. In 2015–16, QFES received income from continuing operations totalling \$622.2 million, of which 74 per cent (or a total of \$457.4 million) came from emergency management levies.

Source: Queensland Government [Emergency Management Fire and Rescue Levy](#) website; Queensland Fire and Emergency Services 2015–16 Annual Report.

In some jurisdictions, biosecurity activities are already funded by contributions from local landholders or local governments, however there is no consistent or necessarily equitable national application of levies on landholders for biosecurity activities.

Confusion is further exasperated by the fragmented biosecurity systems and programs adopted by state and national jurisdictions. On the whole in [Western Australia], producers and growers are contributing funding up to six times towards biosecurity programs without having clear understanding of how this money is being spent on the ground, whether outcomes are being achieved or analysis of budgetary breakdowns (The Western Australian Farmers Federation submission, p. 5)

The New South Wales Government has highlighted to the Review Panel the benefits of its existing model that captures landholder contributions and how it can be used as a model for increasing local and regional participation in decision making while still addressing regional, state and national biosecurity priorities (Box 13).

Box 13 NSW Local Land Services

Under the *Local Land Services Act 2013* (NSW), Local Land Services (LLS) must charge rates on all parcels of land that are classified as rateable under the Act. Each region has a minimum rating area for properties. The rateable area is generally 10 ha in coastal and tablelands areas and is larger (40 ha in the Western Division and 20 ha in some parts of Murray and Riverina Regions) in more western regions.

Rates are charged on a two-tier basis, involving a general rate paid by all landholders and an animal health rate paid by eligible ratepayers. Each rate type consists of a base charge plus a variable component. The base charge is a uniform charge on all rateable land. Rates help pay for the biosecurity and animal health services in each region. Examples of biosecurity projects include outbreaks of fire ants and avian influenza, state-wide wild dog management programs, and pest and weed support programs to help minimise the impact on agricultural productivity.

LLS rates raised \$32.6 million or about 23 per cent of LLS funding in 2015–16. As well as rates, the NSW Government contributes funding through Catchment Action NSW, which provides on-ground programs to support biodiversity, native vegetation, threatened species and Aboriginal cultural heritage initiatives. The Australian Government also contributes funding through the National Landcare Programme, which helps drive sustainable agriculture, as well as supporting the protection, conservation and rehabilitation of Australia's natural environment.

Source: NSW Government [Local Land Services website](#); Local Land Services Annual Report 2015–16.

In its Pest Animal Management Review draft report (NRC 2016), the New South Wales Natural Resources Commission (NSW NRC) recommended reducing the minimum rateable area for landholders to better reflect the biosecurity risks created by smaller landholders—specifically, the NSW NRC proposal is to reduce to two hectares the minimum rateable area (from 10 hectares). The Panel suggests reducing the rateable area to small parcels of land (for example, two hectares) be a consideration for all state and territory governments, given the increasing risks attached to peri-urban activities.

The NSW NRC's recommendation to reduce the minimum rateable area is entirely consistent with an intention to raise the profile and ownership of biosecurity issues for all landholders, especially those within peri-urban areas. The NSW NRC also highlighted the consistency of the recommendation with the 2008 Beale Review (Beale et al. 2008).

In the longer term, all jurisdictions may wish to consider moving from a size threshold to a local-level levy for all landholders or rate payers. A levy applied to all landholders across the country would further increase the awareness of biosecurity issues and ensure biosecurity risk management is a responsibility shared by all Australians.

With increasing population density in our cities, public amenities such as community parks, sporting fields, golf courses and national parks are likely to increase in their use and reliance. Incursions that threaten these increasingly popular environments and spaces should be the responsibility of all community members.

Draft recommendation 35

All levels of government could help meet their budgetary challenges by reviewing biosecurity levies and rates/charges currently or potentially applying to system participants. These should be commensurate with agreed national cost sharing principles, which the Review Panel considers should be reviewed.

Finally, some stakeholders have raised with the Review Panel the need for greater flexibility in agricultural production and biosecurity levies relevant to the RDCs, AHA and PHA, especially around the components of the levies. For some industry levies, the component parts are legislated, limiting the industry's ability to redirect funding to activities the industry considers important, which may include biosecurity. Amending the component parts requires a complex and lengthy legislative approval and amendment process by industry and the Australian Government. Giving industries greater flexibility in the apportionment of the component parts of a levy could provide industry the flexibility it needs to effectively respond to biosecurity risks.

The Panel noted that these issues had also been canvassed in the 2015 Senate inquiry into agricultural levies (Commonwealth of Australia 2015a), with that inquiry recommending that the department conduct 'a review of the process to establish and amend agricultural levies including modifications to levy components'. The Australian Government agreed with this recommendation and the Department of Agriculture and Water Resources has commenced work to identify options to make the system more responsive and less costly for industry. This work will include reviewing the Levy Principles and Guidelines to clarify the process for introducing and amending levies and assessing the potential for delegating some decisions relating to established levies. The Panel further noted that the Australian Government had decided to align 25 levies-related instruments scheduled to sunset over the coming years to allow for a thematic review to be undertaken which, among other things, would offer opportunity to address unnecessary duplication and/or inconsistencies in these instruments.

8.4.4 Incoming passenger charge

A Passenger Movement Charge (PMC) is applied to passengers departing Australia. The current charge of \$55 will increase to \$60 from 1 July 2017, following recent amendments passed by the Commonwealth Parliament. The charge has increased a number of times for various reasons since its introduction, including for biosecurity management (Table 9). The revenue collected from the PMC has steadily increased each year from 2008–09 (Table 10).

TABLE 9 Passenger Movement Charge from 1995 to 2017

Year	Charge
Before 1995	Departure Tax \$25
1995	\$27 (Offset costs of border agencies)
1999	\$30 (Sydney 2000 Olympics levy)
2001	\$38 (Foot-and-mouth disease levy)
2008	\$47 (National aviation security measures)
2012	\$55 (Asian marketing fund & tourism industry regional development grant)
From 1 July 2017	\$60 (part of changes to the Australian Government's working holiday maker reform package)

Source: Tourism and Transport Forum.

TABLE 10 PMC revenue collected from 2008–09 to 2015–16

Year	PMC revenue (\$'ooo)
2008–09	502 810
2009–10	571 322
2010–11	615 469
2011–12	646 343
2012–13	776 991
2013–14	846 611
2014–15	881 298
2015–16	913 468

Source: Australian Government Department of Immigration and Border Protection annual reports 2008–09 to 2015–16.

The Review Panel has already suggested the introduction of an incoming passenger charge to fund cross-sectoral biosecurity research and innovation (Chapter 6). While the Panel favours the introduction of a new charge for this purpose, the charge could, if desired, also be directed to funding other specific components of the national biosecurity system. The Panel, however, recommends any charge (or increase) be more clearly linked to biosecurity, risks, activities and outcomes, including awareness raising.

By way of precedent, in January 2016, the New Zealand Government imposed an additional border clearance levy of NZ\$18.76 for air passengers and NZ\$22.80 for cruise ship passengers, to be directed towards recovering biosecurity and border protection costs. This charge is additional to New Zealand's existing passenger service charges (a NZ\$12.50 charge to both incoming and outgoing passengers).

9 Measuring system performance

Key points

- Evidence suggests the national biosecurity system continues to protect Australia from many exotic pests and diseases.
- Developing performance measures to assess whether the national biosecurity system as a whole, or different aspects of the system, are meeting the agreed goals and objectives, should be actioned under IGAB2.
- Data sets needs to be agreed in advance to ensure trends can be reliably identified.
- Relying solely on administrative data and government sources for information will likely lead to system performance and intelligence gaps.
- All jurisdictions must contribute to national data and intelligence sharing efforts.
- Newly commissioned projects by the Australian Government to determine the value and health of the national biosecurity system, and develop an advanced data analytics capability, should assist jurisdictions in the medium-term.

9.1 Benefits of national biosecurity

Australia's biosecurity system continues to protect the nation from many exotic pests and diseases. The Australian Government's submission (p. 1) highlighted the many benefits of the national system, including:

- reducing the cost of agricultural production
- reducing the impact of pests and diseases on our environment (including associated negative impacts on agricultural productivity and associated amenity)
- safeguarding the health of our community
- supporting animal and plant health
- supporting a profitable agricultural industry through improving and maintaining market access
- supporting a healthy and biodiverse environment underlying much of Australia's tourism.

The feedback from governments, industry and the broader community throughout this Review indicates that the national biosecurity system is highly valued and generally effective. The Australian Government (submission, p. 21) considers the national system inherently valuable but its value is difficult to quantify because it has a 'complex interplay of parts across supply chains, geographies, jurisdictions and stakeholders'. Many of the benefits are also intangible or non-market.

Stakeholders cited many instances where prevention, eradication and containment measures were proven to be effective—citing for example: recent detection and destruction of Khapra beetle larvae in South Australia and Western Australia; eradication of red imported fire ants (RIFA) at Port Botany, New South Wales; containment of RIFA in south-east Queensland; proof of area freedom from a range of pests and diseases (for example, Rabies and *Varroa destructor* mite); and securing market access for Australian nectarines to China. At the same time, it is widely acknowledged that there are many areas where the effectiveness of the national biosecurity system can and should be improved. The draft recommendations proposed throughout this report are directly aimed at achieving this.

The Australian Government has also moved to fill key knowledge and information gaps, which should help jurisdictions demonstrate to all key players the national benefits of an appropriately resourced national biosecurity system.

The Centre of Excellence for Biosecurity Risk Analysis (CEBRA) is undertaking two key projects (Box 14) for the Department of Agriculture and Water Resources, which should help all system participants better understand the overall value and health of the national biosecurity system.

Box 14 Australian Government knowledge building projects

‘Value of Australia’s biosecurity system’

Australia’s biosecurity system provides substantial benefits to the Australian community by managing the risk of pests and diseases causing harm to human, animal and plant health, the environment and the economy. The system is inherently valuable but this value is difficult to quantify.

This project will develop reliable methods to value the components of the biosecurity system. That is, the benefits obtained from the prevention of economic, environmental, social and human health losses. The net benefit will take into account direct and indirect costs, to taxpayers and businesses, of the operating parts of the biosecurity system.

It is anticipated that through this work, a better understanding of the importance, strengths and weaknesses of the biosecurity system will be obtained, which in turn will help guide investment for the system into the future. The project will run over several years with methods developed and indicative results generated in the first year.

‘Health of Australia’s biosecurity system’

A substantial investment is made by governments, industry and the community to the Australian biosecurity system. In a healthy system, these investments should be directed to ensuring Australia’s ALOP is effectively applied and that the system is able to adapt quickly to new and emerging threats.

Building on results from the “Value of Australia’s biosecurity system” project, this project will develop the means to clearly describe and measure the health of the biosecurity system against benchmarks of acceptability. This will provide a basis for identifying if and where improvements should be made. The project will run over several years with methods developed and tested in the first year.

Source: Australian Government Department of Agriculture and Water Resources.

The CEBRA projects have the potential to generate valuable information and insights including shortcomings in assessing and reporting system performance, but these are recognised as multi-year projects with considerable challenges and uncertainties to resolve.

9.2 Performance measurement and reporting

As part of its terms of reference (Appendix A) the Review Panel was asked to provide recommendations on the development of measurable indicators to assess whether the national biosecurity system is achieving its objectives. Performance data can support and better direct investment decisions, identify key risk areas within the national system, and improve the management and effectiveness of existing and operations. Most biosecurity stakeholders supported this view. However, the national system is complex with many interrelated components and intangible outcomes. This makes measuring the system's performance and overall success fundamentally difficult, but not impossible.

Across the national system, there are many elements that can be measured, covering inputs (for example, dollars spent), outputs (for example, the passengers or containers cleared) or outcomes (for example, a pest or disease managed, or access to a market gained). In the absence of appropriate data, qualitative assessments (for example, case studies) and expert opinion are accepted means of 'filling in the gaps'.

Government agencies are required to have performance frameworks in place to assess the effectiveness of their activities, including for biosecurity. The performance frameworks for biosecurity are evolving but at present vary considerably in their sophistication and coverage. Jurisdictional performance measures are articulated in agency corporate plans, strategies and annual reports, but there is no consistency between them and no capacity to 'roll them up' to capture the *national* system and assesses *national* performance. However, there are still lessons to learn from existing jurisdictional systems.

9.2.1 Australian, New Zealand and Victorian government examples

A logical starting point for identifying performance measures for the national biosecurity system is to examine how organisations with national roles and responsibilities for biosecurity define and measure their success. Both the Australian and New Zealand governments have integrated biosecurity and food safety performance frameworks and measures (refer Appendix F).

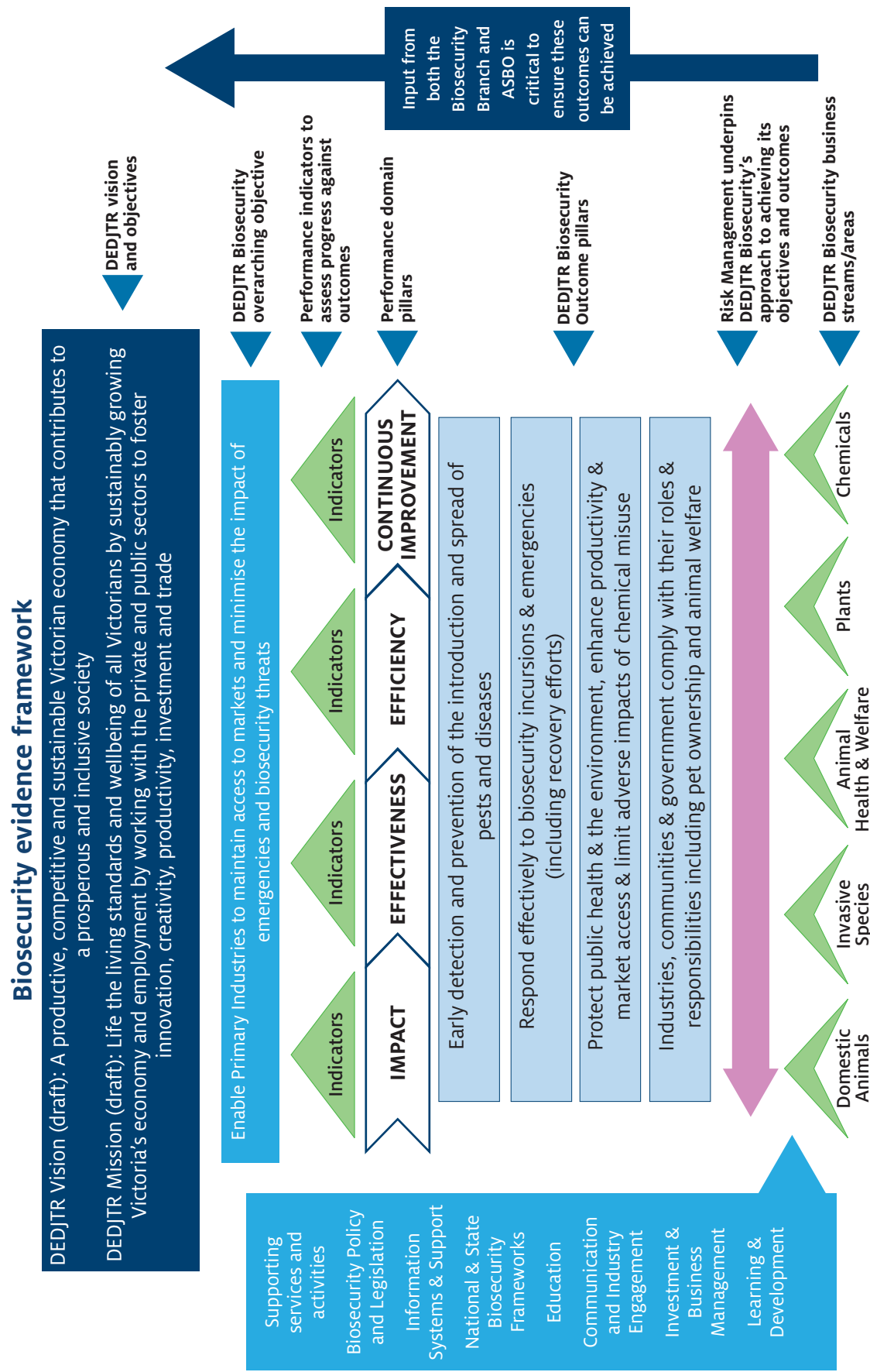
The performance framework of the Australian Government is, not surprisingly, focussed on the effectiveness of biosecurity controls: on the movement of people, animal, plants, food and cargo into and out of Australia; market access; and emergency responses. Of note is the inclusion of a target measure for the IGAB: that it 'is found to be effective in managing the national biosecurity system'. This infers there will also be a set of performance measures for the IGAB.

New Zealand's framework has similar coverage but there are notable differences in emphasis. For example: less emphasis on imports; and more emphasis on measuring stakeholder engagement, satisfaction and voluntary compliance. New Zealand's approach appears to be more advanced; more positively framed, and able to encompass a broader range of parties and system activities. It also includes a set of progress indicators.

These ‘national’ frameworks are useful examples upon which to draw but would need to be adapted and significantly built upon for the purpose of assessing whether the national biosecurity system is meeting its objectives. Like other performance frameworks, they exhibit a certain level of selectivity and pragmatism—reflecting the capacity of ‘responsible party’ in question to intervene or control an outcome.

The Victorian Government, through Agriculture Victoria, has developed and implemented its Biosecurity Evidence Framework (BEF) to collect, aggregate and analyse performance data. The BEF was introduced in response to past performance and audit findings by the Victorian Auditor-General’s Office (VAGO 2015), which indicated a need to improve evidence collection capability and a more accurate picture of the achievements of Victoria’s livestock biosecurity programs and efforts. Under the framework, performance indicators have been assigned to each biosecurity business area (for example, domestic animals, invasive species and plants), which progressively collect and enter data to support consistent measurement of performance against the state’s biosecurity goals (Figure 9).

FIGURE 9 Victorian Government's Biosecurity Evidence Framework



Source: Adapted from Victorian Government submission.

The Victorian Government proposes that a similar program logic be developed and agreed for Australia's biosecurity system to guide the selection of national measures of success. Such a process would articulate short and medium-term outcomes, identify strategic and targeted interventions (using a risk-based approach), and identify the data and supporting evidence required. The Review Panel supports this view.

The Panel notes that the scope of the BEF is broader than biosecurity and encompasses animal health and welfare and chemical streams, as do the performance indicators and metrics used to evaluate its success. The Panel is not suggesting this scope for the national biosecurity system framework.

Development of a biosecurity performance framework and meaningful performance indicators, to support both national decision-making and public reporting, will require a commitment of effort and resources from jurisdictions and key partner organisations. As our Discussion Paper flagged, this also needs to be a cost-effective activity. Jurisdictions will need to establish, at the outset, the level and duration of resources they are prepared to allocate to this work. The Review Panel recommends that the NBC establish a time-limited task group to advance development of a performance framework for the national system. The Panel would expect the framework and performance measures to cover the various aspects of the national biosecurity system (for example, national priority pests and diseases, surveillance, emergency response, and funding and investment) and their interaction with areas including trade, market access and tourism. It may be appropriate that the remit of the existing National Biosecurity Information Governance Expert Group (NBIGEG) be expanded to include performance measurement.

9.3 Knowledge and data

Ready access to comprehensive and reliable data and information is essential for anticipating, responding to and managing national biosecurity risks, substantiating Australia's claims about its pest and disease status, and for decision-making, policy development, and performance measurement. As the New South Wales Government Department of Primary Industries pointed out, all jurisdictions, industries and relevant non-government organisations hold data of relevance to the national biosecurity system. This brings both challenges and opportunities.

The national biosecurity system does not have, or necessarily need, a single holder of expert knowledge or national data repository. However, where there are multiple data and knowledge holders (as is currently the case) there must be agreed sources and common data format of data so that valid comparisons and assessments can be made (for example, ABARES data in the case of Agriculture) and IT systems capable of communicating with each other (that is, through inter-operable technology platforms).

The NBC, through the NBIGEG, has made noteworthy progress towards improving cooperation between jurisdictions in collecting, collating, analysing, storing and sharing biosecurity information; there have been flow-on effects in improving decision making and operational efficiency. The Review Panel recognises the work already completed in this area, including the development of nationally consistent minimum dataset specifications and standards, where the dominant focus has been emergency responses:

Data standards for sectoral groups should remain a high priority to ensure data sets are comparable for analysis. A good example is the weeds metadata standards. The weeds metadata standards align to biosecurity activities such as inspections, compliance, extension, and control activities allowing state and national views to be presented in a meaningful way (New South Wales Government Department of Primary Industries submission, p. 19)

Outside of government, there are likely opportunities for industry and the community to better contribute their data relevant to biosecurity. The Panel was advised of several existing industry data sets which could be better utilised, including for substantiating future area freedom claims. Separately, one stakeholder highlighted the need to better address the availability of data generated through industry-funded research, especially where the findings could have market access impacts.

There are various software and technology platforms in place to manage the collection, collation and analysis of biosecurity data. The Australian Government has highlighted problems with some existing data systems used:

Current systems, many of which have manual processes, are non-integrated, inefficient and do not support assessments of risks or change to pest status where circumstances change (Australian Government submission, p. 22)

However, recent developments by and across jurisdictions have contributed substantially to addressing this shortcoming (Box 15).

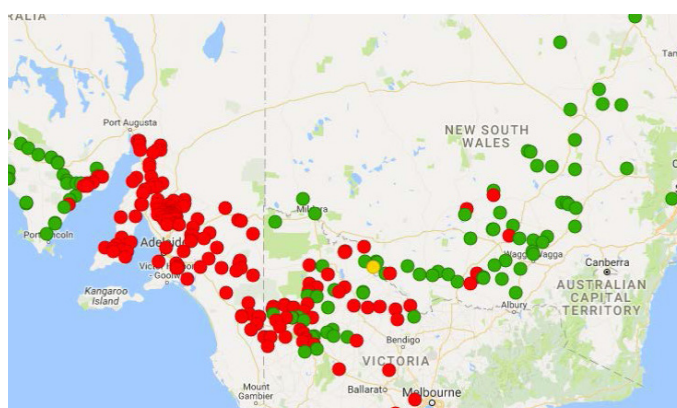
Box 15 MAX and AUSPestCheck initiatives

MAX

Developed by the Victorian Government, MAX is a software platform for managing, collecting and reporting textual and spatial data. It can be customised for a variety of purposes, including real-time reporting, and in variety of settings (for example, field work on mobile devices). For example, Max was used by Victoria when responding to the 2014 Giant Pine Scale outbreak in Melbourne, where there was no information system in place to manage the resulting biosecurity data at a tree level. A template for foot-and-mouth disease was adapted to manage trees instead of animals and field staff were able to use iPads to gather field surveillance data and report it in real time. MAX is also used by five other jurisdictions for different purposes, covering both routine and emergency biosecurity activities.

National Surveillance System for Weeds and Plant Pests: Virtual Coordination Centre

PHA has developed a sophisticated virtual surveillance centre, called AUSPestCheck, capable of providing and receiving national surveillance information on weeds and plant pests from a wide range of stakeholders. The project was completed in March 2016 and negotiations with funders are underway to enhance the system and to incorporate it into national biosecurity surveillance arrangements. The system uses mobile technology and a secure cloud environment to pull together surveillance data from multiple sources at minimal cost. It then produces a map of where checks for pests have been made and where pests are found or not found. The mapping facility has already been used to track the spread of Russian wheat aphid (*Diurphis noxia*) since its discovery in South Australia in May 2016 (refer map insert).



Box 15 MAX and AUSPestCheck initiatives (cont...)

Ultimately, the system will be capable of receiving and integrating data from multiple surveillance systems, and delivering integrated surveillance data to those working in weed and pest management in Australia.

Source: AUSPestCheck output of Russian Wheat Aphid distribution as at 14/10/2016, available at [AUSPestCheck](#).

The Australian Government Department of Agriculture and Water Resources has indicated that more sophisticated data capture, use and analysis will be greatly improved through the implementation of its proposed Biosecurity Integrated Information System (BIIS) in early 2017 (subject to Commonwealth approval). The BIIS is intended to improve the department's ability to collect, collate and analyse information to support better and more timely decision-making.

The department is also developing an advanced analytics capability to utilise the information captured by the BIIS, which is expected to improve: biosecurity risk profiling and analysis, including invasive pathway modelling; pest and disease detection and prediction; demonstration of proof of area freedom; community-based data for biosecurity risk management; and management of biosecurity regulatory compliance.

[Data analytics] will answer questions about what has happened and why (descriptive analytics), and what might happen in the future (predictive analytics), through the application of modelling and data analysis (Australian Government submission, p. 22)

The Review Panel recognises the immense potential of the BIIS and data analytics system to inform not only the Australian Government, but all jurisdictions. To that end it will be important that such an investment allows for interoperability of the BIIS with relevant state systems.

Interoperability of system is also important to allow near real-time and seamless data sharing. Modern technology platforms allow interoperability and all jurisdictions should be encouraged to upgrade their technology where required (New South Wales Government Department of Primary Industries submission, p. 20)

The Panel received comments from governments critical of each other for not making data and information sources nationally available or accessible. In particular, consistent comments were made about the need for the Australian Government to share information and intelligence with jurisdictions on, for example, border interceptions.

It is critical that all jurisdictions, which have joint responsibility for the stewardship of the national biosecurity system, are willing and able to share knowledge and data in the national interest. The NBC could draw upon the approach taken by Australia's national counter terrorism agencies and its Australia-New Zealand Counter-Terrorism Committee, which have governance structures and data platforms in place to routinely gather, share and present intelligence information to senior government decision-makers. The Review Panel recommends that the Australian Government Department of Agriculture and Water Resources resource a dedicated intelligence unit to similarly equip the national biosecurity system leadership.

Draft recommendation 36

The NBC should establish a time-limited task group to progress development of a performance framework and performance measures for the national biosecurity system.

Draft recommendation 37

The Australian Government should facilitate development of an integrated, national biosecurity information system to provide a common platform for all jurisdictions to share and access biosecurity data and information in the national interest.

Draft recommendation 38

Data and knowledge sharing should be a core commitment of jurisdictions under the IGAB. Minimum standards and specifications should be agreed for data sets.

Draft recommendation 39

The Australian Government should establish, within the Department of Agriculture and Water Resources, a dedicated National Biosecurity Intelligence Unit, to coordinate and provide advice to the NBC, AGSOC and AGMIN on biosecurity intelligence covering emerging risks and pathways, and international and domestic pest and disease detection.

10 A future system, a future IGAB

An overarching theme for the IGAB Review was the extent to which the national biosecurity system and its underpinning IGAB, is fit for the future.

10.1 A future system

It is clear that governments and the NBC have made enormous progress over the last four years in developing principles, protocols and collegiate working relationships to operationalise the IGAB. It is also clear that governments are committed to a path of reform and continuous improvement of the national biosecurity system. Similarly, industry continues to adapt and respond to the evolving domestic and international biosecurity landscape, driven in large part by the trade and market access opportunities that beckon. Non-government stakeholders are also looking to play a more active role. There is much more that all parties in the national system need to do, and could do, in a spirit of partnership and collective action.

The Review Panel has made a number of recommendations aimed at strengthening the national biosecurity system in the near term. The Panel has consciously pitched its recommendations as achievable next steps to be implemented in the ensuing five-year period (or the period covered by the next IGAB). However, the Panel has taken a much longer-term perspective than this. The recommendations were devised in the context of a longer-term direction—say 10 to 15 years hence—for the national biosecurity system; a future system that might exhibit the following features and characteristics:

- a national biosecurity strategy devised, owned and implemented by governments, industry and the community
- community-wide understanding and ownership of biosecurity equal to that of bushfire preparedness and response
- a co-regulatory model for export certification endorsed by Australia's main trading partners
- a dedicated national data analytics and intelligence capability supporting decision-making by all jurisdictions
- a R&I model that nurtures world-leading surveillance and early detection technologies
- one emergency preparedness and response agreement for the national priority animal, plant and environmental pests and diseases
- one entity responsible for implementation and administration of the deed, potentially 'Animal and Plant Health Australia'
- an Australia–New Zealand 'IGAB' (an agreement between Australia's jurisdictions, including local government, and New Zealand)

- regional biosecurity agreements between the Australian Government and its key trading partners
- regular public reporting against key metrics on the state of Australian biosecurity supported by independent evaluation.

10.2 A future IGAB

The terms of reference for this Review sought feedback on the suitability of the agreement to underpin the national biosecurity system into the future. One of the key tests of the suitability of the agreement is whether the parties to that agreement, and parties impacted by that agreement see its value. The Commonwealth, all states and the Australian Capital Territory provided submissions in support of the IGAB and its role in underpinning the national system, while at the same time, identifying key areas for improvement.

The need for an agreement across jurisdictions is critical ... Victoria considers that the IGAB needs to be contemporary, legally binding, evidence based and specific (Victorian Government submission, p. 4)

The NSW Government is strongly committed to the IGAB ... The IGAB has provided government parties with a strong framework for addressing national biosecurity issues. Through cooperation and collaboration with peak industry bodies, there has been much progress in many priority reform areas (New South Wales Government Department of Primary Industries submission, p. 1)

The IGAB is acknowledged as an important national initiative and should continue to improve national biosecurity effectiveness, capacity and integrated systems. It is appropriate that it stays at the First Ministers level for signing and flags investment priorities to central agencies (South Australian Government submission, p. 2)

The Western Australian agencies involved in biosecurity strongly support the purpose of the IGAB. IGAB and NEBRA are important tools for establishing a common vision and commitment to biosecurity between jurisdictions for management of pests and diseases (including zoonotics) (Western Australian Government submission, p. 2)

Non-government stakeholders were generally supportive of a biosecurity agreement but have been almost uniformly critical of a lack of involvement in its development. The Queensland Government Department of Agriculture and Fisheries captured this feedback well:

IGAB seeks to build relations with industry and community groups, but did not involve them in its original development. As a result, implementation of the principles and directions of IGAB has suffered from a lack of stakeholder input. Moreover, industries and members of the community have not felt their contributions to the national biosecurity system have been appropriately recognised (submission, p. 2)

The Review Panel has clearly heard this message and has made a number of recommendations to assist in providing industry and community with a stronger voice in the national biosecurity system.

The Panel's view is clear, a refreshed agreement between Australia's governments is appropriate and necessary to ensure robust national biosecurity arrangements into the future. IGAB1 was a significant foundation agreement for government cooperation and collaboration. IGAB2 and subsequent agreements should demonstrate a measured and deliberate advancement in the commitments by jurisdictions, reflective of the evolving partnership between governments and increasing sophistication of national biosecurity arrangements.

The 2012 National Healthcare Agreement provides a useful model of what might be achievable for a future, mature biosecurity agreement. The National Healthcare Agreement sets out the mutually agreed objective, outcomes, performance indicators, performance benchmarks and national minimum data sets that will guide Australian and states and territory governments in the delivery of services across the health sector. It also articulates policy and reform directions, and the roles and responsibilities of the respective governments. As a mature agreement, its emphasis is on a robust primary agreement, rather than on detailed schedules and work programs.

One of the key areas for simplification of the IGAB concerns its schedules. Governments acknowledge that the schedules proposed an extensive body of work which was not able to be matched by the individual and collective capacity of jurisdictions to implement. The NBC has since reviewed and reprioritised the schedules in light of this and to reflect changed priorities for the national biosecurity system. This is appropriate and the NBC should be afforded the flexibility without being overshadowed by an overly prescriptive list of tasks in the IGAB.

Accordingly, this Review has proposed three priority reform areas (Table 11) for inclusion in IGAB2. The specific tasks and activities should be developed by the NBC and approved by ministers responsible for biosecurity, separately. The NBC should report annually to ministers. The NBC's work program under the IGAB and its annual report to ministers should be made publicly available. A periodic independent assessment of the effectiveness of IGAB should be undertaken and made public.

As required by the Review terms of reference, the Panel has examined the structure and content of the 2012 IGAB document. This Draft Report review report makes a number of comments, findings and recommendations that should be reflected in IGAB2. These are summarised in Table 12.

Draft recommendation 40

Jurisdictions should adopt the proposed new priority reform areas and associated work program for IGAB2, and amend the IGAB in line with proposed revisions.

TABLE 11 Proposed priority reform areas

Reform areas	Outcomes	NBC work program and outputs
1. Governance and strategy	<p>A unified strategic framework for the national biosecurity system</p> <p>Improved governance of the national system</p> <p>A consistent approach to biosecurity risk prioritisation and investment across the system (for animal, plant and environmental streams)</p>	<p>Agreed roles and responsibilities for all system participants</p> <p>A National Statement of Intent, developed in collaboration with key system participants</p> <p>A new, streamlined IGAB (IGAB2)</p> <p>Formalised whole-of-government biosecurity arrangements within all jurisdictions, including through memoranda of understanding</p> <p>Defined core commitments for jurisdictions under the national system</p> <p>A stronger NBC and revised sub-committee structure, including an Industry and Community Advisory Committee, a Chief Environmental Biosecurity Officer, and Environmental Biosecurity Committee</p> <p>A revised National Framework for Cost-Sharing Biosecurity Activities</p> <p>National investment strategy</p> <p>National biosecurity research and innovation priorities</p> <p>Agreed uniform and fully inclusive categories of funding activity</p>

Reform areas	Outcomes	NBC work program and outputs
2. National priority pests and diseases	Identification of national priority pests and diseases (animal, plant, environmental)	Implementation of a systematic national priority (exotic) pest and disease approach, including for environmental biosecurity risks
	Identification of prevention, emergency preparedness and response requirements and responsibilities	Risk assessments for national priority pests and diseases
	Early detection and accurate, timely diagnosis of national priority pests and diseases	Activity plans for managing national priority pests and diseases, agreed by all relevant participants, outlining risk mitigation measures, surveillance, diagnostics, response, as well as the relevant participants (including their roles and responsibilities and cost-sharing arrangements)
	Demonstration of Australia's pest and disease status for market access	Alignment of biosecurity surveillance activities with major export market risks
	Identification of responsibilities for established pests and diseases	Emergency response deeds for aquatic animals and exotic production weeds
		Greater landowner-led resourcing and management of nationally significant established pests and diseases
3. Knowledge management and system performance	Improved decision-making and operational efficiency and effectiveness	National collaboration on data and intelligence sharing
	Increased capacity to measure and demonstrate the performance of the national biosecurity system	Agreement on minimum standards and specifications for data sets
	Improved accountability of jurisdictions for commitments under the IGAB	An agreed national biosecurity information system accessible to all jurisdictions
	Greater public understanding of the performance of the system	A performance framework and measurable performance indicators for the national system
		An independent IGAB Evaluation Program of jurisdictional commitments

TABLE 12 Proposed revisions of the IGAB

Issue/Section	Proposed changes
Structure	Structure needs to reflect a logical flow of issues and group sections concerned with the national system together, and sections concerned with the IGAB together.
Language	Language could be simplified, sharper and purposeful. Jurisdictions should look to make clear (versus heavily caveated) commitments in the agreement, reflective of the consensus progressively being reached on issues.
Front page of the Agreement	Should list all jurisdictions who are signatories to the agreement. Should state the following revised objective for the agreement: <i>The objective of this Agreement the national collaboration between Australian governments to strengthen Australia's biosecurity system.</i>
1. Preamble	Should be redrafted to provide a more refined and succinct precis of the national biosecurity system and its challenges. It should include reference to Australia and its external territories. 1.4(iii) should reflect invertebrate transmitted diseases as well as animal – see below.
2. Purpose [and scope] of the Agreement	Should reflect the objective for the agreement (see front page above) in 2.1. Should include a statement on the scope of the agreement, identify the IGAB as a major element of the national biosecurity architecture; acknowledge other major parties (industry and community). 2.2(ii) should focus on key components; refer to diseases transmitted between vertebrate and invertebrate animals and humans rather than zoonotic diseases. Should include the roles and responsibilities of the Australian, state and territory governments (including for domestic and international market access) within Strengthening the Working Partnership (currently Section 7) as the basis for 2.2(iii) remaining.

Issue/Section	Proposed changes
3. Principles underpinning the National Biosecurity System	<p>Principles should be articulated before goal/objectives.</p> <p>Should include the principle of ecologically sustainable development.</p>
4. Goals and Objectives of the National Biosecurity System	<p>Include the following simplified goal: <i>The goal of the national biosecurity system is to minimise the impact of pests and diseases on Australia's economy, environment and the community, while facilitating trade and the movement of plants, animals, people and products.</i></p> <p>In old 3.2 add 'involving governments, industry and community' after frameworks.</p> <p>In old 3.2(ii) add 'to minimise impact'.</p> <p>Include the following simplified objective for old 3.2(iii): <i>ensure that, where appropriate, national significant pests and diseases already in Australia are contained, suppressed or otherwise managed by relevant landowners.</i></p> <p>Include the following new objective at 4.2(iv): <i>enables market access, both domestic and international, and tourism appeal.</i></p>
5. System components	<p>Limit 5.1 to a short description of the components of the national biosecurity system, (currently a mix of components, features, principles, activities and outcomes). Include any key principles in 3. above.</p> <p>Include the following new component in 5.2: <i>Nationally agreed list of exotic priority pests and diseases (animal, plant and environmental).</i></p>
6. Strengthening System components	<p>Should simply read: <i>The Parties agree to further develop and continuously improve the national biosecurity system in accordance with the priority reform areas described in Schedule 1 of this Agreement, recognising that the rate of progress will be contingent on available resources.</i></p>

Issue/Section	Proposed changes
7. Strengthening the working partnership	<p>7.2 should read: <i>The foundation of institutional relationships and arrangements between governments and the agricultural sector is already well developed. This Agreement and activities under the priority reform areas will build on these and strengthen arrangements with the broader community.</i></p> <p>7.3–7.5 concerning national appointments are now redundant.</p> <p>International responsibilities should include Australia’s commitment to the Convention on Biological Diversity.</p> <p>7.13 should refer to the PITMATD as the vehicle for state/territory consultation.</p> <p>7.18–7.19 should be replaced with the dispute resolution mechanism approved by agriculture ministers in 2010.</p> <p>Should include a section on ‘Core Commitments’ articulating:</p> <ul style="list-style-type: none"> • the roles and responsibilities of jurisdictions, including implementation of the IGAB, for which they undertake to be accountable • a commitment to support financially, decisions agreed to under animal, plant, and environment emergency response deeds • a commitment to data and knowledge sharing between jurisdictions • a commitment to ongoing stakeholder engagement and communication, with activities scrutinised as part of jurisdictional evaluations under the IGAB.
8. Implementing the Agreement	<p>Should succinctly outline governance arrangements and responsibilities for implementation and administration by AGMIN, AGSOC and the NBC.</p> <p>Should formally create the NBC and include its terms of reference as a Schedule.</p> <p>8.1–8.2 should identify ‘lead’ and ‘supporting’ biosecurity ministers and agencies and require formal mechanisms between agencies to define the relationship, roles and responsibilities, information flows, deliverables and resources.</p> <p>8.3 Should state: <i>This agreement will commence operation on the date it is signed.</i></p> <p>Should succinctly outline the procedure for including new and amending existing IGAB clauses.</p>

Issue/Section	Proposed changes
9. (new) Performance and Reporting	<p>Should include and authorise the following:</p> <ol style="list-style-type: none"> 1. Annual reporting to ministers on implementation of the IGAB priority reform areas, to be made public upon ministerial consideration. 2. Establishment of a program of evaluations to assess and report on implementation of jurisdictions' commitments under the IGAB, to be made public following ministerial consideration. 3. A periodic, independent assessment of the effectiveness of IGAB (drawing on 1 and 2 above), to be made public.
Schedules	<p>Should include four schedules only:</p> <ol style="list-style-type: none"> 1. The IGAB Priority Reform Areas. 2. The NBC's terms of reference. 3. Simplified glossary, inclusive of 'shared responsibility' and 'national commitments'. 4. A list of the agreed national biosecurity frameworks/policies/procedures being used by the parties.

APPENDIX A

Terms of reference and links to the report

Purpose of the review

The review will assess the capacity of the national biosecurity system to manage increased biosecurity risk associated with an increasingly complex global environment; and, identify where adjustments are needed to ensure the system is effective, efficient and flexible and continues to support market access for Australian produce, to minimise primary production costs and to support a healthy economy, environment and community.

The review will also assess the implementation and effectiveness of the IGAB and its schedules, and report to Commonwealth, state and territory ministers responsible for biosecurity matters on findings and recommendations for amendments. The review will recommend if the purpose, goals and objectives, coverage, principles, key components and features of the IGAB are still relevant.

Scope of the review

The IGAB review will consider and provide recommendations on the following terms of reference:

1. The implementation and effectiveness of each section of the current agreement, progress against the priority reform areas outlined in schedules 2–8 and any requirements for revision of the schedules.
2. The suitability of the agreement to underpin the national biosecurity system into the future.
3. Current and likely future biosecurity risks and priorities, including the optimal allocation of resources and availability of required capability and capacity to address those risks and priorities, with particular consideration of risks that may impact Australia's market access arrangements for agricultural products, and the use of innovation in the system.
4. The development of a national statement of intent for the biosecurity system, encompassing the entire biosecurity continuum, including economic and market access, environmental and social considerations for governments, industry and the community.
5. Defining roles and responsibilities of all parties in the national biosecurity system. This should include advice on how the concept of a shared biosecurity responsibility can be better understood and implemented across government, industry, environmental and community groups and individuals.

6. The review of existing cost-sharing arrangements and the potential for implementation of new funding arrangements for all biosecurity activities. Consideration should be given to relevant National Biosecurity Committee projects including:
 - a. the National Framework for Cost Sharing Biosecurity Activities
 - b. the national portfolio investment optimisation model, and
 - c. the national stocktake of biosecurity investment.
7. The development of measurable indicators to assess whether the national system is achieving its objectives, and to identify where adjustments are needed. Consideration should be given to the availability of appropriate and consistent data.

TABLE 13 Where this review's terms of reference are addressed in the Draft Report

Term of reference	Where addressed
1.	The 2012 IGAB: 1.3 A future IGAB: 10.2
2.	Suitability of the IGAB: 10.2
3.	Future risks: 1.2 Determining priorities: 5.1 Resource allocation: 8.1; 8.3 Market access: 3.1 Innovation: 6.1
4.	National Statement of Intent: 2.3
5.	Roles and responsibilities: 2.1 Shared responsibility: 2.1
6.	Funding arrangements: 8.3 Relevant NBC projects: 8.2–3 Sustainable funding opportunities: 8.4
7.	Performance and reporting: 9.2 Knowledge and data: 9.3

Note: As outlined in the Discussion Paper, some aspects of the national biosecurity system are not being considered as part of this Review, including:

- biosecurity arrangements specific to human health
- biosecurity Import Risk Analyses (BIRAs)
- comprehensive reviews of emergency responses deeds
- response plans, such as the Australian Veterinary Emergency Plan (AUSVETPLAN)
- matters to do with specific biosecurity legislation, and
- matters to do with Australia's international obligations relating to biosecurity.

APPENDIX B

Review panel biographies

Dr Wendy Craik AM (Chair)

Dr Craik has more than 25 years' experience in senior roles in public policy, particularly on issues related to natural resource management. She is currently Chair of the Climate Change Authority, Deputy Chancellor for the University of South Australia (2010–2018), Chair of the NSW Marine Estate Management Authority, Board Member of the Australian Farm Institute and Member Advisory Board for the Centre for Strategy and Governance.

She has an extensive record of executive level appointments in both public and private sectors, most recently as a Commissioner of the Productivity Commission (2009–2014). Prior to this, Wendy was CEO of the Murray Darling Basin Commission (2004–2008) and Executive Director of the National Farmers' Federation (1995–2000). Other previous roles include President of the National Competition Council, board member for Dairy Australia, Chair of the Australian Rural Leadership Foundation, Chair of the Australian Fisheries Management Authority and Chair of the National Rural Advisory Council.

Mr David Palmer

Mr Palmer is currently the Chair of the NSW Biosecurity Advisory Committee and the Board of the NSW Rural Assistance Authority. Mr Palmer is also an independent director on the Board of Animal Health Australia, the Invasive Animals CRC and the Greater Sydney Local Land Services.

He is the former Managing Director of Meat and Livestock Australia and spent six years as the Executive Director of the Cattle Council of Australia. Other previous work includes the chairmanship of the Australia-Korea Foundation, and employment with the NSW Meat Industry Authority, the NSW Farmer's Association, and the Australian Meat & Livestock Corporation.

Dr Richard Sheldrake AM

Dr Sheldrake is the Former Director General of the New South Wales Department of Primary Industries. Prior to this appointment Dr Sheldrake had been Director-General of the NSW Departments of Industry and Investment, Natural Resources and Agriculture. He has led the various departments in service delivery, policy development, compliance and regulation, research and development and technology transfer across a broad range of fields.

Dr Sheldrake has played a role in developing and guiding state and national policy in areas such as carbon offsets; plant and animal biosecurity; agricultural research and development; drought policy; rural and regional service delivery, native forest management; native vegetation; fisheries resource management; efficient water use; sustainable land use; and, export market development.

He has previously held the offices of Commissioner of the Murray Darling Basin Commission, NSW Commissioner for Soil Conservation and NSW Commissioner of Forests. Dr Sheldrake was previously a Director of the Pig Research and Development Corporation and Animal Health Australia Limited and Chair of the Primary Industries Health Committee.

APPENDIX C

Public consultation

Consultation process

Over 65 submissions were received in response to the Review Panel's Discussion Paper released in May 2016 (Table 14). Non-confidential submissions can be found at [IGAB Review](#) on the Australian Government Department of Agriculture and Water Resources website.

TABLE 14 Submissions received

Organisation/individual	Organisation/individual
Australian Capital Territory Government (Environment, Planning and Sustainable Development Directorate)	Queensland Tourism Industry Council Limited
Adelaide and Mt Lofty Ranges Natural Resources Management Board	Quinn, Nelson
AgForce Queensland	Ridley, Wayne
Animal Health Australia Limited	RSPCA Australia
Australian Barramundi Farmers Association	Sheepmeat Council of Australia and WoolProducers Australia Limited
Australian Forest Products Association	Slowgrove, Gary
Australian Forest Products Association's subcommittee on Forest Health and Biosecurity	South Australian Government
Australian Government (Department of Agriculture and Water Resources; Department of the Environment and Energy)	Southern Cross Cargo Proprietary Limited
Australian Lot Feeders' Association	Southern Gulf NRM Limited
Australian Pork Limited	Strawberry Growers Association of Western Australia Incorporated
Australian Seed Federation Limited	Sydney Airport Limited
Australian Walnut Industry Association Incorporated, Chestnuts Australia Inc., Hazelnut Growers of Australia Inc., and Pistachio Growers' Association Inc.	Teys Australia Proprietary Limited
Blue Ribbon Group	The Australian Veterinary Association Limited
Biosecurity Council of Western Australia	The Tasmanian Salmonid Growers Association Limited

Organisation/individual	Organisation/individual
Cattle Council of Australia	The Tourism and Transport Forum Australia Limited
Dairy Australia Limited and Australian Dairy Farmers	The University of Sydney
Dreamtime Wholesale Nursery	The Western Australian Farmers Federation Incorporated
Export Council of Australia	Victorian Government (Agriculture Victoria, Department of Economic Development, Jobs, Transport and Resources)
Flower Association of Queensland Incorporated	Voice of Horticulture Limited
Greatrex, Chris	West Australian Pork Producers' Association Incorporated
Hills Orchard Improvement Group Incorporated	Western Australian Government
Invasive Species Council Incorporated	Western Australian Agricultural Produce Commission Stonefruit Committee
National Farmers' Federation Limited	Western Australian Local Government Association
Nature Conservation Society of South Australia Incorporated	Wildlife Health Australia Incorporated
Northern Territory Farmers Association Incorporated	Wildlife Preservation Society of Queensland Incorporated
New South Wales Government Department of Primary Industries	Wine Tasmania
Nursery and Garden Industry Association Australia Limited	Confidential submissions (7)
Plant Biosecurity Cooperative Research Centre	
Plant Health Australia Limited	
Ports Australia	
Pratley, James	
Queensland Government Department of Agriculture and Fisheries	

The Review Panel has consulted a range of stakeholders in the preparation of the Draft Report (Table 15):

TABLE 15 Stakeholders consulted

Organisation/individual	Organisation/individual
AgForce Queensland	PrimeSafe (Victoria)
Agility Logistics Pty Ltd	Queensland Dairyfarmers' Organisation Ltd
Animal Health Australia Ltd	Queensland Murray-Darling Committee Inc.
Apple and Pear Australia Ltd	Queensland Tourism Industry Council Ltd
Australian Chicken Growers Council	Reid Fruits
Australian Egg Corporation Ltd	Sheepmeat Council of Australia
Australian Farm Institute	Shipping Australia Ltd
Australian Federation of International Forwarders Ltd	South Australian Freight Council Inc.
Australian Fodder Industry Association Ltd	South Australia Oyster Growers Association Inc.
Australian Forest Products Association	South Australia Rock Lobster Advisory Council Inc.
Australian Grain Exporters Association	Strawberry Growers Association of Western Australia Inc.
Australian Horse Industry Council	Sugar Australia Pty Ltd
Australian Horticulture Exporters Association Ltd	Tasmanian Seafood Industry Council
Australian Local Government Association Ltd	The Australian Veterinary Association Ltd
Australian Mango Industry Association Ltd	The Australian Veterinary Association, Western Australian Division
Australian Meat Industry Council	The Commercial Egg Producers' Association of Western Australia Inc.
Australian Nurserymen's Fruit Improvement Company Ltd	The Northern Territory Livestock Exporters Association Inc.
Australian Prawn Farmers Association Inc.	The Tasmanian Salmonid Growers Association Ltd
Australian Wool Innovation Ltd	The University of Melbourne, Centre of Excellence for Biosecurity Risk Analysis
AUSVEG	The Western Australian Farmers Federation Inc.
Avocados Australia Ltd	The Western Australian Fishing Industry Council Inc.

Organisation/individual	Organisation/individual
Balco Australia Pty Ltd	Vegetables WA
Barossa Grape and Wine Association Inc.	Vinehealth Australia (formerly the Phylloxera and Grape Industry Board of South Australia)
Beechworth Honey Pty Ltd	Viterra Pty Ltd
Blue Ribbon Group	Weed Society of Queensland Inc.
Brisbane City Council	WA Citrus
Canegrowers	Western Australia Local Government Association
Cattle Council of Australia	Wildcatch Fisheries SA Inc.
Charles Sturt University	Wildlife Preservation Society of Queensland Inc.
Coles Supermarkets Australia Pty Ltd	Woolworths Ltd
CSIRO	Government agencies
Curtin University	<i>Australian Government</i>
Customs Brokers and Forwarders Council of Australia Inc.	Department of Agriculture and Water Resources
Dairy Australia Limited and Australian Dairy Farmers	Department of Foreign Affairs and Trade
Dairy NSW Ltd	Department of Health
Darwin Port	Department of Immigration and Border Protection
Export Council of Australia	Department of the Environment and Energy
Farm Pride Foods Ltd	<i>New South Wales Government</i>
Ferguson Australia Pty Ltd.	Department of Premier and Cabinet
Fruit Growers Tasmania Inc.	Department of Primary Industries
Fruit West Co-operative Ltd	Office of Environment and Heritage
Grain Growers Limited	Natural Resources Commission*
Grain Industry Association of Western Australia Inc.	<i>Victorian Government</i>
Grains Research and Development Corporation	Department of Economic Development, Jobs, Transport and Resources
Grains Industry Market Access Forum Ltd	Department of Environment, Land, Water and Planning
Growcom Australia	Department of Premier and Cabinet
Hills Orchard Improvement Group Inc.	Department of Treasury and Finance

Organisation/individual	Organisation/individual
HortEx	<i>Queensland Government</i>
Humpty Doo Barramundi Pty Ltd	Department of Agriculture and Fisheries
HVP Plantations	Department of the Premier and Cabinet
Ingham's Pty Ltd	Queensland Treasury
Invasive Animals Cooperative Research Centre	<i>South Australian Government</i>
Invasive Species Council (also representing the Nature Conservation Council of NSW)	Department of Environment, Water and Natural Resources
Livestock Biosecurity Network Pty Ltd	Department of the Premier and Cabinet
Manbullo Mangoes	Department of Primary Industry and Regions
McCain Foods (Aust.) Pty Ltd	Department of Treasury and Finance
McLaren Vale Grape, Wine and Tourism Industry Association Inc.	<i>Western Australian Government</i>
Meat and Livestock Australia Ltd	Department of Agriculture and Food
Murray Goulburn Co-operative Co. Ltd	Department of Environment Regulation
National Farmers' Federation Ltd	Department of Fisheries
Natural Resource Management Regions Australia	Department of Parks and Wildlife
North Queensland Bulk Ports Corporation Ltd	Department of State Development
Northern Territory Beekeepers Association Inc.	Department of the Premier and Cabinet
Northern Territory Cattlemen's Association Inc.	Department of Treasury
Northern Territory Farmers Association Inc.	Forest Products Commission
Northern Territory Pastoral Land Board	Biosecurity Council of WA*
Nursery and Garden Industry Victoria	<i>Tasmanian Government</i>
Nursery and Garden Industry Western Australia	Department of Primary Industries, Parks, Water and Environment
OneFortyOne Plantations Pty Ltd	<i>Northern Territory Government</i>
Oysters Tasmania	Department of Primary Industry and Fisheries
Parmalat Australia Pty Ltd	Department of Land Resource Management
Consolidated Pastoral Company Pty Ltd	Northern Australia Development Office
Pearl Producers Association Inc.	<i>Australian Capital Territory Government</i>

Organisation/individual	Organisation/individual
Plant Biosecurity Cooperative Research Centre	Territory and Municipal Services Directorate (from 1 July 2016, Environment, Planning and Sustainable Development Directorate)
Plant Health Australia Ltd.	
Pork South Australia Inc.	
Ports Australia	

* Other government entity.

APPENDIX D

Risk Return Resource Allocation model

The Risk Return Resource Allocation (RRRA) model was developed to provide advice to the Australian Government Department of Agriculture and Water Resources on the return, in terms of reduced risk, for its investment in controls to manage biosecurity risk and improved confidence that resources are allocated to achieve the greatest risk reduction.

The RRRA model is composed of a collection of interacting sub-models. A model for each entry pathway is used to describe the means by which an organism can enter Australia and the effect of biosecurity controls in modifying entry likelihood. Post-entry models determine the probability that establishment and spread will occur, and the consequences for agriculture and other sectors. The model combines the frequency of entry, establishment and spread of each organism with the consequence to determine risk.

The model considers four types of departmental investment in biosecurity controls:

- policy development, intelligence and communication: including import risk analyses, policy reviews, and intelligence monitoring and stakeholder engagement
- pre-border processes: those activities required to meet import conditions prior to arrival in Australia
- clearance activities: at border activities to manage biosecurity risk including document assessment, inspection, treatment, destruction, export and post-entry quarantine
- post-border activities: including surveillance, preparedness and response functions.

In the RRRA model, an organism of biosecurity concern (organism) can represent groups of species, such as 'broadacre beetles' or 'livestock bacteria'. It can also represent special case species that warrant direct consideration, such as foot-and-mouth disease or khapra beetle. Every organism that could enter or emerge in Australia via one or more pathways and have some probability of establishing, spreading and generating consequences is represented in the model.

All possible consequences are considered within the RRRA model, including for agricultural industries, domesticated and companion animals, environment, infrastructure and produced goods, human health and social impacts.

APPENDIX E

Biosecurity performance frameworks: national government examples

1. Australian Government (Department of Agriculture and Water Resources)

Strategic objectives (biosecurity related)	Managing biosecurity and imported food risk Expanding agricultural, fisheries and forestry exports (Note: certification only elements details below)
Outcomes expectations	Use evidence-based risk management to ensure the safe movement into and out of Australia of people, animals, plants, food and cargo Coordinate emergency responses to exotic pest and disease incursions Provide certification of exports to meet importing country requirements
Performance measures: Australia maintains a favourable pest and disease status (a) Export certification meets importing country requirements (a)	Targets Qualitative assessment that the nature and impact of animal and plant biosecurity incursions has not significantly harmed Australia's favourable pest and disease status (b) Pest and disease eradication is funded throughout the year based on national priorities The Intergovernmental Agreement on Biosecurity is found to be effective in managing the national biosecurity system Less than 1% of consignments are rejected as a result of export certification failure No markets are lost as a consequence of failed departmental certification services Less than 5% of quota allocations are rejected because of quota certification failures

The effectiveness and efficiency of biosecurity and food interventions on import pathways improves (c)	<p>The post-intervention compliance rate for passengers and mail is maintained or improved</p> <p>Interventions on low-risk pathways are reduced (d)</p> <p>The compliance rate for all food inspected is maintained or improved</p>
Responses to biosecurity and imported food incidents improves	The department assesses that responses to biosecurity and imported food incidents have improved
Risk assessments for imported goods use science-based risk analysis, drawing on the best available scientific information and advice	100% of import risk assessments are conducted in accordance with regulations and the best available science and advice
The ability of governments, industry and the community to quickly and effectively respond to exotic pest and disease incursions improves	<p>Responses to pest and disease incursions and outbreaks are managed according to relevant frameworks</p> <p>Requests for rapid response in the event of a significant exotic pest or disease outbreak are responded to immediately</p> <p>100% of priority emergency plans (AUSVETPLAN, AQUAVETPLAN, EMPPLAN and PLANTPLAN) reflect contemporary science of emergency responses to plant and animal pests and diseases</p>
Public awareness of biosecurity risks improves	The number of followers on and the total reach of the Australian Biosecurity Facebook page is maintained or increased

(a) Performance measure and targets published in the Portfolio Budget Statements 2016–17

(b) Assessment based on information including OIE (World Organisation for Animal Health) notifications, plant incursions and market access issues directly related to biosecurity

(c) Performance measures for post-compliance rates for cargo will be developed

(d) For imported plant products only

Source: DAWR 2016; DAWR 2016b.

2. New Zealand Government (Ministry for Primary Industries)

Long term outcome	Protect from biological risk
Intermediate outcomes:	The primary sector is protected from biological risks through the effective operation of the biosecurity and food safety systems.
Impacts:	Protecting New Zealand's competitive advantage of a pest-free environment Better preparing New Zealand to respond to pest and disease incursions Increasing voluntary and assisted compliance
Progress indicators:	Market access is maintained and opportunities enhanced, with trading partners having confidence in New Zealand's biosecurity system Health of the biosecurity system is improving Number of response plans completed or reviewed Completion of exercise testing readiness for an incursion Adoption of previous recommendations that lead to faster, more effective responses Compliance rates with biosecurity requirements increasing
Appropriation:	Service performance measure
Biosecurity incursion response and long-term pest management	Number of Industry sign-up for Government–Industry Agreement deeds Percentage of key stakeholders are satisfied with major biosecurity responses
Border biosecurity monitoring and clearance	Percentage of international air passengers that comply with biosecurity requirements by the time they leave the airport Percentage of international mail that complies with biosecurity requirements by the time it leaves the International Mail Centre Percentage of import clearance processes completed within agreed timeframes Number of identified and mitigated biosecurity risks resulting from targeted evaluations of imported goods Percentage of costs-recovered external stakeholders rate overall service as 4 out of 5 or higher

Border biosecurity systems development and maintenance	<p>Percentage of OIE(1) and IPPC(2) standards that are accepted by New Zealand</p> <p>Percentage of certificates issued that meet biosecurity technical requirements of importing countries are specified by overseas competent authorities</p> <p>Percentage of milestones met for the Sanitary and Phytosanitary Standards Market Access Programme, as agreed with key meat, dairy, seafood and horticulture sector stakeholders</p>
Domestic biosecurity surveillance	<p>ISO 17025 accreditation maintained for all laboratory processing, testing and reporting</p> <p>Percentage of incursion investigations reach an outcome decision within specified timeframes</p> <p>With any suspected high risk or serious pest or disease notification, the investigation commences within 24 hours of notification</p> <p>No export markets are closed due to the standard of MPI's active surveillance programs</p> <p>Specifically targeted pests or diseases are detected early enough to enable effective risk management interventions</p>

(1) OIE—World Organisation for Animal Health

(2) IPPC—International Plant Protection Convention

Source: NZ MPI 2015; NZ MPI 2016.

APPENDIX F

National biosecurity system at a glance

Chapter 7 identified the limited nature of publicly available information on the status of the national biosecurity system and proposed that national system data and information could be presented in the form of a 'National biosecurity system at a glance' summary. It is suggested that the following system metrics and information could form the basis of such a summary report.

Trade, tourism and transactions

- volume and value of imports (goods/merchandise)
- gross value of agricultural production
- volume and value of agricultural exports
- inbound passenger numbers (air and sea) and inbound and domestic tourism numbers and expenditure
- number of cargo consignments (air and sea)
- number of international mail

Shared responsibility (descriptive)

- roles and responsibilities of system participants
- jurisdictional core commitments under the IGAB
- industry and jurisdictions core commitments under emergency response deeds
- compliance rate for exporters, passengers and mail
- public awareness of biosecurity risks and obligations

Market access

- market access (value) enabled by Australia's pest and disease status
- market access (value) enabled by accepted proof of freedom demonstrations
- number of markets gained, maintained and lost due on biosecurity grounds
- value of markets gained, maintained, and lost due on biosecurity grounds

Funding and investment

- total investment in biosecurity (all governments; industries, community)
- cost recovery levels for government biosecurity services in each jurisdiction
- annual cost of emergency responses (total for all system participants, total government)
- examples of risk return assessments
- value and proportion of R&D spend on national biosecurity R&I priorities

National Priority pests and diseases

- number of national priority pests and diseases – animal, plant, environment
- number of national priority pests and diseases with known surveillance, monitoring (including pre-border) and diagnostics programs
- number of national priority pests and diseases with cost-sharing arrangements
- number of exotic species detected
- number (and examples) of exotic species detections resolved
- examples of time elapsed between suspected detection and diagnosis and decision on action
- number of incursions of national priority pests or diseases
- number (and examples) of incursions eradicated/contained/not managed

Glossary

Appropriate Level of Protection (ALOP)	the level of protection deemed appropriate by a country establishing a sanitary or phytosanitary measure to protect human, animal or plant life or health within its territory (Source: IGAB). The ALOP for Australia is a high level of sanitary and phytosanitary protection aimed at managing and reducing biosecurity risks to a very low level, but not to zero.
Biosecurity	the management of risks to the economy, the environment, and the broader community, of pests and diseases entering, emerging, establishing or spreading (Source: IGAB).
Biosecurity risks	the potential of a disease or pest entering, emerging, establishing or spreading in Australia; and, the disease or pest causing harm to the environment, or economic or community activities (Source: IGAB).
Disease	the presence of a pathogenic agent in a host and/or the clinical manifestation of infection that has had an impact (that is, significant negative consequences) or poses a likely threat of an impact. It includes microorganisms, disease agents, infectious agents and parasites (Source: IGAB).
Established pest or disease	a pest or disease that is perpetuated, for the foreseeable future, within any area and where it is not feasible (economically and/or technically) to eradicate the pest or disease (Source: IGAB).
Exotic pest and disease	pests and diseases affecting plants or animals (potentially human beings) that do not normally occur in a particular country (Source: adapted from the IGAB).
Incursion	an isolated population of a pest or disease recently detected in an area, not known to be established, but expected to survive for the immediate future (Source: adapted from the International Standards on Phytosanitary Measures 5—Glossary of terms).
Intergovernmental Agreement on Biosecurity (IGAB)	an agreement between the Commonwealth and state and territory governments, except Tasmania. The agreement aims to strengthen the working partnerships between governments, improve the national biosecurity system and minimise the impact of pests and diseases on Australia's economy, environment and the community.
National biosecurity system	Australia's biosecurity system encompasses and fully integrates import and export activities, services and functions—into, within, and from Australia—and covers the spectrum of pest and disease threats to Australia's environment, production and people.
Participants	stakeholders that in some way, and to varying degrees, interact with Australia's biosecurity system; including individuals, businesses, sectors and industries, other organisations and governments.

Pest

any species, strain or biotype of the Kingdoms Animalia (excluding human beings), Plantae, Fungi, Monera or Protista that has had an impact (that is, a significant negative consequences), or poses a likely threat to having an impact (Source: IGAB).

Shared responsibility

a core concept underpinning the national biosecurity system whereby all stakeholders—including Australian governments, industry and the broader community—have important roles and responsibilities in the management of biosecurity risks in Australia. Definition proposed by this Review:

Shared responsibility means everyone takes responsibility for biosecurity matters under their control. Everyone has an obligation to take action to protect Australia from pests and diseases.

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