



Australian Government

Inspector-General of Biosecurity

Strategy, governance and planning to strategically manage the department's biosecurity science resource

Inspector-General of Biosecurity

Review report no. 2023-24/01



© Commonwealth of Australia 2024

Ownership of intellectual property rights

Unless otherwise noted, copyright (and any other intellectual property rights) in this publication is owned by the Commonwealth of Australia (referred to as the Commonwealth).

Creative Commons licence

All material in this publication is licensed under a [Creative Commons Attribution 4.0 International Licence](https://creativecommons.org/licenses/by/4.0/) except content supplied by third parties, logos and the Commonwealth Coat of Arms.



Cataloguing data

This publication (and any material sourced from it) should be attributed as: Inspector-General of Biosecurity (2024). *Strategy, governance and planning to strategically manage the department's biosecurity science resource*. Canberra: Inspector-General of Biosecurity.

ISBN 978-0-9756234-0-4

This publication is available at www.igb.gov.au

Inspector-General of Biosecurity
c/o Department of Agriculture, Fisheries and Forestry
GPO Box 858 Canberra ACT 2601
Telephone 1800 900 090
Email InspGenBiosecurity@agriculture.gov.au

Disclaimer

The Australian Government represented by the Inspector-General of Biosecurity has exercised due care and skill in preparing and compiling the information and data in this publication. Notwithstanding, the Inspector-General of Biosecurity, its employees and advisers disclaim all liability, including liability for negligence and for any loss, damage, injury, expense or cost incurred by any person as a result of accessing, using or relying on any of the information or data in this publication to the maximum extent permitted by law.

Acknowledgements

The Inspector-General acknowledges the cooperation and advice of the Department of Agriculture, Fisheries and Forestry.
Thank you to the review team, Dr Carina Moeller, Ms Clare Hamilton and Ms Julia Darcy.

Acknowledgement of Country

We acknowledge the Traditional Custodians of Australia and their continuing connection to land and sea, waters, environment and community.
We pay our respects to the Traditional Custodians of the lands we live and work on, their culture, and their Elders past and present.

Contents

Executive summary	5
Findings and recommendations	6
1 The Inspector-General of Biosecurity	11
2 This review	12
2.1 Review objective	12
2.2 Review criteria	13
2.3 Scope	13
2.4 Definitions	14
3 Departmental context	15
3.1 Summary	15
3.2 Introduction	16
3.3 Departmental challenges	16
3.4 The department's strategic approach to science	16
4 Does the department's biosecurity group have a fully articulated strategy for the management of its biosecurity science resource?	27
4.1 Summary and recommendations	27
4.2 Introduction	28
4.3 Background	29
4.4 Assessment	34
5 Does the department's biosecurity group have an effective governance framework for the biosecurity science resource?	37
5.1 Summary and recommendations	37
5.2 Introduction	39
5.3 Background	39
5.4 Assessment	47
6 Does the department's biosecurity group have an effective planning framework for the biosecurity science resource?	52
6.1 Summary and recommendations	52
6.2 Introduction	54
6.3 Background	54
6.4 Assessment	60
Appendix A: Regulatory versus academic approach to science	64
Appendix B: Scientific independence versus integrity	66
Appendix C: Visions and plans for science	67
Science action plan for supporting innovative science 2016–2017	68
Science strategy action plan 2017–2020	68
Science strategic action plan November 2020 – April 2022	70
Science action plan of the Our future department blueprint 2021–2025	72
Science strategic action plan 2.0	72
Appendix D: Case studies	74
1. Biosecurity Innovation Program	74
2. Centre of Excellence for Biosecurity Risk Analysis	76
3. Modern Technologies and Diagnostic Tools program	79
4. National eDNA Testing Program	82
5. Plant Innovation Centre	86
6. Commonwealth Scientific and Industrial Research Organisation	89

Appendix E: Partner organisations	92
References	94
Agency Response	100

Tables

Table 1 Review criteria to assess how the biosecurity science resource is managed	13
Table 2 Enterprise-wide strategy documents and plans relevant to the department's Biosecurity and Compliance Group's management of the biosecurity science resource	18
Table 3 Governance bodies relevant for biosecurity science and research (2020–2023)	42
Table 4 Funding allocation for research, research services, and diagnostics (\$ million, rounded) to different entities published in the portfolio budget statements	56
Table 5 Typology of a regulatory and academic approach to science (after Ruggles 2004)	65
Table 6 Visions for science and research	67
Table 7 Tentative catalogue of research partner organisations of the biosecurity group	92

Figures

Figure 1 Draft governance structure for science proposed as part of formulating the <i>DAFF Science Strategy</i> (2013-2018)	26
Figure 2 Components of strategy and strategy formulation adapted to biosecurity science	29
Figure 3 Typical components of the planning cycle	54
Figure 4 Elements of a planning framework to understand available resources and plan requirements, allocation and sharing	62
Figure 5 Governance structure of the MTDT program	81

Boxes

Box 1 Biosecurity Research, Development and Extension Strategic Statement 2018–2025	32
Box 2 Considerations for a biosecurity science strategy	35
Box 3 A coordinating function to provide collaborative science leadership	50
Box 4 Biosecurity Innovation Program	74
Box 5 Centre of Excellence for Biosecurity Risk Analysis (CEBRA) Program	76
Box 6 Modern Technologies and Diagnostic Tools (MTDT) program	79
Box 7 National eDNA Testing Program	82
Box 8 Plant Innovation Centre	86
Box 9 Commonwealth Scientific and Industrial Research Organisation	89

Executive summary

Biosecurity risks are evolving and changing constantly at global scales. Therefore, Australia's world-class biosecurity system must be adaptive and innovative in devising solutions to complex biosecurity risk management problems. Australia's approach to biosecurity is science-based: science produces the evidence for the effectiveness of technological and policy solutions to managing biosecurity risks; science underpins regulatory decision-making, policymaking, and operational risk management and the advice provided to the Australian Government.

The Department of Agriculture, Fisheries and Forestry (the department) is Australia's lead agency responsible for biosecurity matters and principal regulator. It administers the *Biosecurity Act 2015* and subordinate legislation.

The department's Biosecurity and Compliance Group (biosecurity group) relies heavily on a broad and significant science resource – knowledge, people, research partners and infrastructure – to appropriately protect Australia from the risk of entry, establishment and spread of harmful pests and diseases.

The biosecurity group's science resource is a core element of the department's biosecurity system and hence the performance of functions by biosecurity officials under the Act. The science resource includes:

- biosecurity research conducted and commissioned by the department
- all forms of scientific evidence to assess and mitigate biosecurity risks that are within the remit of the department under the *Biosecurity Act 2015*
- the department's science-trained, multi-disciplinary workforce, scientific experts and research partners
- technology (e.g. IT systems, software and laboratory equipment) and infrastructure assets (e.g. diagnostic laboratories and post-entry quarantine) used to provide science-services and in research
- research infrastructure and other resources shared by collaborating organisations

Objective and approach

This review by the Inspector-General of Biosecurity (Inspector-General) assessed the biosecurity group's strategy, governance and planning for the biosecurity science resource – knowledge, people, partners and infrastructure. It is a review of the management system rather than an academic assessment or academic peer-review of the standard of scientific evidence or the quality of research used in the department's biosecurity system.

Three questions and several sub-questions guided this review:

1. Does the department's biosecurity group have a fully articulated strategy for the management of its biosecurity science resource?
 - 1.1. Does it support other strategies, enterprise-wide and in the biosecurity group?
 - 1.2. Does it outline an appropriate current and future role and function of science in the department's biosecurity group?
 - 1.3. Does the strategy's implementation reduce strategic risks and set a pathway to improving biosecurity outcomes?
2. Does the department's biosecurity group have an effective governance framework for the biosecurity science resource?
 - 2.1. Does it clarify oversight and accountability?
 - 2.2. Does it enable fit-for-purpose program and project monitoring, evaluation, and risk management?

3. Does the department's biosecurity group have an effective planning framework for the biosecurity science resource (knowledge, people, partners and infrastructure)?

3.1. Does it map out the department's current and future business needs?

3.2. Does the planning effectively align with enterprise-wide plans and *Commonwealth Biosecurity 2030*?

Departmental challenges

The Inspector-General acknowledges that the department experienced significant changes and challenges over the core period considered in this review (2020 to June 2023), including the machinery of government changes on 1 July 2022, heightened awareness of the risks of foot-and-mouth disease and lumpy skin disease, and a challenging fiscal position.

As revealed in the conduct of this review, the management of the biosecurity science resource is complex and multifaceted, with no unifying oversight. The challenges that the department faces and changes in structure, programs and budgets have added to this complexity.

In September 2023, a new Secretary and Director of Biosecurity was appointed and has prioritised the recommendations of the various independent reviews of the department undertaken recently. In response to the Australian Public Service Commission (APSC) 2023 capability review of the department, the department has commenced making changes to strategic policy and governance.

The Inspector-General considers the recent history of the management of the science resource as an important source of information for devising improvements. Implementation of the recommendations of this review should strengthen the department's science-based approach to biosecurity and support the work of the many dedicated individuals involved in protecting Australia from the many harmful pest and diseases causing damage in other parts of the world.

Findings and recommendations

1. Does the department's biosecurity group have a fully articulated strategy for the management of its biosecurity science resource?

The biosecurity group has not clearly articulated an overarching, coherent biosecurity science strategy to guide and provide direction and prioritisation to the biosecurity group's broad and significant science resource – knowledge, people, partners and infrastructure.

A biosecurity science strategy should support other relevant strategies — for example, *Commonwealth Biosecurity 2030* and the *2026 Science & Surveillance Group Strategic Roadmap*.

1.1 Does it support other strategies, enterprise-wide and in the biosecurity group?

The role and function of science is inconsistently described across strategic and planning documents. The absence of a coherent hierarchy of priorities and the failure to establish connections between these priorities across different documents hinder their effective utilisation. It is difficult to determine what is truly important and applicable.

1.2 Does it outline an appropriate current and future role and function of science in the department's biosecurity group?

A biosecurity science strategy should establish an agreed, and hence coherent, view of the current and future role and function of science in the department's biosecurity system. Strategic clarity will support resource planning and make it easier to prioritise research, the capabilities of the workforce and collaborating organisations, and infrastructure assets.

Strategy formulation should result in an agreed conceptual and strategic understanding of the role and function of science in a policy, regulatory and operational biosecurity context. The process would elicit fundamental questions such as 'Is our approach to science academic or regulatory or both?', 'What are the roles of our scientists – are they, for example, regulatory, operational or research scientists?', 'How does the biosecurity group engage with the (academic) science of its collaborators?', 'How will a future where science is (fully) embedded in policy processes look like?', among others.

The department's biosecurity group has currently not articulated an overarching science strategy to appreciate and guide the current and future role of its biosecurity science resource.

1.3 Does its implementation reduce strategic risks and set a pathway to improving biosecurity outcomes?

The identification of strategic risks should be part of formulating a science strategy, which should support the biosecurity group's new (2023) risk management framework. The department's biosecurity group has not articulated an overarching science strategy to identify and mitigate strategic risks.

Recommendation 1

That the Director of Biosecurity and the biosecurity leadership group lead the development of a biosecurity science strategy that supports a strategic approach to managing the biosecurity group's significant science resource – knowledge, people, partners and infrastructure.

Strategy development and implementation will strengthen science as a core capability and clarify whether the biosecurity group's approach to science is, for example, regulatory, academic or both. The biosecurity group's new strategic approach to science should be based on evidence-driven analyses of research and innovation priorities, scientific workforce capability, research collaborations and critical infrastructure.

Recommendation 2

That the Director of Biosecurity and the biosecurity leadership group engage proactively to clarify the strategic role of science and hence the biosecurity science resource in enterprise-level and biosecurity strategy and planning documents. This will support the biosecurity group's expressed aspiration to strengthen science capability.

Relevant documents (current, drafted or planned) include, but may not be limited to:

- *Commonwealth Biosecurity 2030*
- Science strategy and integrity statement
- Workforce strategy and plan
- Asset management policy
- ICT strategy and plan
- Data policy
- Other policies and plans, as identified by the biosecurity leadership.

2. Does the department's biosecurity group have an effective governance framework for the biosecurity science resource?

This review found that the department's biosecurity group does currently not have an effective governance framework for managing the biosecurity science resource that supports collaborative leadership and transparency at all levels of the organisation. Current arrangements are characterised by an incoherent hierarchy and insufficient connectivity.

An effective governance system should drive the strategic approach to the management of the science resources, improve line of sight to the Director of Biosecurity and the biosecurity leadership group on science matters and related resource allocation and be easily identifiable by staff at all levels of the organisation.

2.1 Does it clarify oversight and accountability?

High-level governance arrangements are ineffective in providing oversight and accountability for the biosecurity science resource. The Biosecurity and Compliance Board's governance in relation to setting cross-cutting priorities for science and research, and related resources allocation, across the biosecurity group is unclear. The board's oversight is limited to the Centre of Excellence for Biosecurity Risk Analysis (CEBRA) program and the Biosecurity Innovation Program 2018–2023.

The board should lead strategy and prioritise rather than operationalise science-based actions and activities of the roadmap *Commonwealth Biosecurity 2030*. The operationalisation of the board's strategy and the roadmap's priorities should be the role of the biosecurity divisions and their business areas.

2.2 Does it enable fit-for-purpose program and project monitoring, evaluation, and risk management?

Across the biosecurity group, there is currently no consistent and standardised approach to program and project management, monitoring and evaluation. The Biosecurity and Compliance Board's Data, Research and Innovation Sub-Committee (DRISC) has not devised processes to routinely monitor and review research outcomes, adoption and benefits realisation in line with the sub-committee's terms of reference. The status of DRISC is currently unclear.

The Inspector-General commends the biosecurity group's new (2023) risk management framework as guidance to managing specific program and project risks.

Recommendation 3

That the Director of Biosecurity and the biosecurity leadership group establish a coherent, connected and collaborative system of governance that enables prioritisation, resource allocation, performance, and accountability in the management of the biosecurity science resource.

The governance system should clarify responsibilities and reporting lines, and support decisions on resource allocation based on regular updates on the status of the biosecurity science resource, including research projects and investments, scientific workforce requirements, research partnerships and initiatives, and critical scientific biosecurity infrastructure.

Recommendation 4

That the Director of Biosecurity establish, within a connected system of governance, a coordinating function with the authority to represent the biosecurity group's research interests, the scientific credentials to engage effectively on biosecurity science matters, and the collaborative leadership and capacity to effectively coordinate science-related matters across the biosecurity group.

The function should drive overarching strategy and deliver leadership to cross-cutting science programs. It should coordinate and provide advice to the Director of Biosecurity and the biosecurity leadership group on science matters of general significance and collaborate with disciplinary experts on specific science matters. It should be a single, trusted point of contact for research collaborators and oversee the biosecurity group's collaborative arrangements.

The function may have the title of Biosecurity Chief Scientist.

3. Does the department's biosecurity group have an effective planning framework for the biosecurity science resource (knowledge, people, partners and infrastructure)?

The biosecurity group has no overarching planning framework for its biosecurity science resource to determine and prioritise the actions needed in order to achieve science-related goals set by strategy. There is currently a lack of systematic and consistent planning, coordination and prioritisation across the biosecurity group.

3.1 Does it map out and prioritise the biosecurity group's current and future business needs?

The Biosecurity and Compliance Group does not have an overarching planning framework for its biosecurity science resource underpinned by consolidated and validated planning data to prioritise resources and analyse the gap between current and future business needs.

A planning framework for the biosecurity science resource should be guided by a biosecurity science strategy and underpinned by fit-for-purpose data to map out and prioritise the biosecurity group's current and future business needs.

The biosecurity group will need to consolidate, develop and make usable the group's data and management information to support decision-making, monitoring and resources management in relation to research projects, partner organisations, the workforce in scientific roles, and critical biosecurity infrastructure assets.

3.2 Does the planning effectively align with relevant enterprise-wide plans and Commonwealth Biosecurity 2030?

It can be reasonably expected that enterprise-level plans (e.g. the department's science, workforce, asset management, ICT and data strategies and plans) should support not only the general but also specialised requirements of the biosecurity science resource. Current planning of the biosecurity science resource does not effectively align with relevant plans.

Commonwealth Biosecurity 2030 was never intended as an overarching biosecurity science strategy. Rather, it provides an inventory of what the biosecurity group does in different action areas. The consultancy *Mapping the biosecurity RD&I landscape* undertaken in 2022 by PwC (PricewaterhouseCoopers) found that biosecurity research did not strongly align with or cover 6 of the 9 actions of *Commonwealth Biosecurity 2030*.

Recommendation 5

That the Director of Biosecurity and the biosecurity leadership group ensure that the department's enterprise-level planning is fit-for-purpose for the general and specialised requirements of the biosecurity group's science resource.

The biosecurity leadership should establish a shared understanding of the requirements as part of formulating a biosecurity science strategy and related resource planning. This will include, but may not be limited to, requirements pertaining to the following:

- Research information management system: the biosecurity leadership should have access to and use consolidated data on research projects and partners for planning and prioritisation and performance monitoring. The new research information management system should consolidate the biosecurity group's dispersed research project information, and include basic project management information, partner organisations (arrangements and expertise) and investments. It should link to financial cost centres and enable routine reporting on various attributes.
- Workforce strategy and planning: the biosecurity leadership group should have access to and uses consolidated workforce data to build a fit-for-future scientific workforce and support the sustainment of critical scientific skills.
- Asset management policy: the biosecurity group's infrastructure assets, including laboratories and specialised ICT systems (e.g. the new Laboratory Information Management System) should be funded sustainably and managed using a whole-of-life approach to asset management.
- ICT strategy and plan: That the biosecurity group's specialised ICT requirements should be adequately supported to improve operational and diagnostic science-services, research and the efficiency of biosecurity risk management.
- Data policy: the biosecurity group should implement modern data governance and management arrangements for biosecurity data assets to support science-services and biosecurity research, among other important biosecurity applications.

Recommendation 6

That the Director of Biosecurity and biosecurity leadership group establish a planning framework for the biosecurity science resource that is guided by strategy and part of an integrated system of governance.

The planning framework will be supported by relevant contemporary policy (e.g. science, workforce, collaborators, infrastructure assets) and consolidated and validated planning data, as per the previous recommendation, to prioritise resources and analyse the gap between current and future business needs.

It will develop the network of external specialists, as it might not be feasible for the biosecurity group to have the full range of specialist expertise, skills and infrastructure in-house. The new planning framework will prioritise science/research-related actions of *Commonwealth Biosecurity 2030* and any other plans of the biosecurity divisions and their business areas.



Dr Lloyd Klumpp

Inspector-General of Biosecurity

25 March 2024

1 The Inspector-General of Biosecurity

The Inspector-General of Biosecurity is an independent statutory officer responsible for reviewing the performance of functions, or exercise of powers, by biosecurity officials¹ in the Department of Agriculture, Fisheries and Forestry.

The Department of Agriculture, Fisheries and Forestry is Australia's lead agency responsible for biosecurity matters. It is the principal regulator and administers the *Biosecurity Act 2015* and subordinate legislation.

The *Biosecurity Act 2015* creates the Inspector-General's mandate, sets out the relationship with the Director of Biosecurity (the Secretary of the Department of Agriculture, Fisheries and Forestry) and the Minister for Agriculture, and requires the appointment of the Inspector-General.

The Inspector-General's scope covers the elements of Australia's biosecurity system that are within the remit of the department. It does not extend to the elements of the biosecurity system that are the responsibility of state and territory governments and industry, international trade issues and market access opportunities.

The Inspector-General's reviews are systems reviews rather than assessments of only a single performance of a function or a single biosecurity official. They provide assurance over Australia's preventative biosecurity risk management systems and support their continuous improvement.

The Biosecurity Regulation 2016 prescribes details of the review, information-gathering and reporting process. The Inspector-General prepares review reports and gives these to the Director of Biosecurity and the Minister for Agriculture. The review reports and the Inspector-General's review work program are published at www.igb.gov.au.

General information on Inspector-General's role and responsibility is available on the [Inspector-General of Biosecurity website](http://www.igb.gov.au). For details, the reader is referred to the *Biosecurity Act 2015* and Biosecurity Regulation 2016.

¹ Under the Biosecurity Act 2015, a biosecurity official is a biosecurity officer, a biosecurity enforcement officer or the Director of Biosecurity.

2 This review

Biosecurity risks are evolving and changing constantly at global scales. This means Australia's world-class biosecurity system must be adaptive and innovative in devising solutions to complex problems.

Australia's approach to biosecurity is science-based. Science produces the evidence supporting the effectiveness of policy, technological and operational solutions to managing biosecurity risks. It is a core capability that underpins the Department of Agriculture, Fisheries and Forestry's regulatory decision-making, policymaking and operational risk management and the advice it provides to the Australian Government. For instance, the department cannot undertake its regulatory responsibilities under the *Biosecurity Act 2015* for biosecurity risk assessments without science.

The department's Biosecurity and Compliance Group (biosecurity group) is responsible for operational, policy and science aspects of biosecurity, as well as departmental compliance and enforcement matters and collaboration with First Nations peoples. Its work is crucial in protecting Australia from biosecurity risks. In carrying out its role, it relies heavily on a broad and significant science resource – knowledge, people, partners and infrastructure. The science resource enables biosecurity officials to perform their functions under the Act and achieve the following goal:

A risk-based biosecurity system that effectively, efficiently, and sustainably protects Australia's health, economic, environmental and national security interests against the threats of today and tomorrow, consistent with our Appropriate Level of Protection (DAWE 2021a).

This review is timely given the biosecurity group's planning over the past 3 years or more, progress in implementing major reforms, and the recent Australian Public Service Commission (APSC) capability review of the department (APSC 2023). Due to significant financial pressures, revealed in March 2023 (ABC News 2023), the department's biosecurity group has had to further consider its strategy for tackling systemic issues (APSC 2023, IGB 2021a).

2.1 Review objective

The department's science-based approach to biosecurity relies on a broad and significant science resource – knowledge, people, partners and infrastructure – that supports the performance of functions by biosecurity officials.

The overarching objective of this review was to assess the effectiveness of the biosecurity group's management system for the biosecurity science resource. Specifically, this review assessed the biosecurity group's strategy, governance and planning for the biosecurity science resource.

This review is not an academic assessment or academic peer-review of the standard of scientific evidence, or the quality of research and innovation that underpin the department's science-based approach to biosecurity.

Also, it is not a technical review like the Inspector-General's reviews of the department's management of *Xylella fastidiosa* (IGB 2022) and khapra beetle (IGB 2021b).

2.2 Review criteria

Three review criteria and several sub-criteria served as guiding questions in this review ([Table 1](#)).

Table 1 Review criteria to assess how the biosecurity science resource is managed

Criteria	Sub-criteria
1. Does the department's biosecurity group have a fully articulated strategy for the management of its biosecurity science resource?	1.1 Does it support other strategies, enterprise-wide and in the biosecurity group? 1.2 Does it outline an appropriate current and future role and function of science in the department's biosecurity group? 1.3 Does its implementation reduce strategic risks and set a pathway to improving biosecurity outcomes?
2. Does the department's biosecurity group have an effective governance framework for the biosecurity science resource?	2.1 Does it clarify oversight and accountability? 2.2 Does it enable fit-for-purpose program and project monitoring, evaluation, and risk management?
3. Does the department's biosecurity group have an effective planning framework for the biosecurity science resource?	3.1 Does it map out and prioritise the biosecurity group's current and future business needs? 3.2 Does the planning effectively align with relevant enterprise-wide plans and <i>Commonwealth Biosecurity 2030</i> ?

2.3 Scope

Reviews by the Inspector-General of Biosecurity pertain to the elements of Australia's biosecurity system that are within the remit of the Department of Agriculture, Fisheries and Forestry.

This review does not examine the elements of the biosecurity system that are within the scope of state and territory governments and industry or international trade and market access issues.

In conducting this review, the Inspector-General considered policy documents that apply to the biosecurity group as part of the wider department, and how the biosecurity group has engaged with enterprise-wide strategies and plans and implemented these in its business.

The Inspector-General assessed core information generated by the current department and its most recent predecessor:

- Department of Agriculture, Fisheries and Forestry: 1 July 2022 to present.
- Department of Agriculture, Water and the Environment: 1 February 2020 to 30 June 2022.

The Inspector-General chose to include information from before 31 January 2020 on a case-by-case basis. This is information generated by:

- Department of Agriculture: 30 May 2019 to 31 January 2020.
- Department of Agriculture and Water Resources: 21 September 2015 to 29 May 2019.
- Department of Agriculture, Fisheries and Forestry: 18 September 2013 to 20 September 2015.

2.4 Definitions

The department's documents typically use the term 'science' interchangeably with 'research'. 'Research' may encompass 'innovation' and vice versa. The following definitions apply.

Science

Commonly, science is:

[...] defined in its broadest sense as embracing all forms of knowledge, and all branches of inquiry, to the extent they are informed by an evidence base (DIISRT 2012).

[...] the pursuit of knowledge and understanding of the natural and social world following a systematic methodology based on evidence (The Science Council 2023).

This definition also applies to 'biosecurity science', except that the context of the knowledge is biosecurity. In other words, the science underpinning the measures aimed at minimising the risk of entry, establishment and spread of harmful pests and diseases in Australia.

As discussed further in this report, the approach to doing science can be described as either academic or regulatory depending on whether the science happens in an academic or regulatory context (Ruggles 2004). When referring to the approach, this review uses the terms 'academic science' and 'regulatory science'.

Science resource

Australia's leading biosecurity agency and regulator draws on a broad and significant biosecurity science resource – knowledge, people, research partners and infrastructure.

The department's biosecurity group manages a science resource that includes:

- biosecurity research conducted and commissioned by the department
- all forms of scientific evidence to assess and mitigate biosecurity risks that are within the remit of the department under the *Biosecurity Act 2015*
- the department's science-trained, multi-disciplinary workforce, scientific experts and research partners
- technology (e.g. IT systems, software and laboratory equipment) and infrastructure assets (e.g. diagnostic laboratories and post-entry quarantine) used to provide science-services and in research
- research infrastructure and other resources shared by collaborating organisations

These resources constitute the body of scientific knowledge the department uses and garners within its biosecurity business domain to devise evidence-based solutions to regulatory and operational biosecurity problems.

Research

In this review, research refers to empirical (involving the use of models, experimentation, and testing of hypotheses) and non-empirical (involving use of models, theories, and logic in reviews and analyses) studies undertaken by the department and its partners within the context of the department's biosecurity system. Research can catalyse innovation. The prioritisation and coordination of research to focus investments was recommended in the review by Craik et al. (2017).

Innovation

Unless specifically mentioned, in this review, 'research' includes 'innovation'. Innovation is about doing things differently. It is defined by novel approaches – ideas, methods and technology – that catalyse change (Slack et al. 2015). Innovation can be incremental or radical (Beck et al. 2016). The innovation process involves working with practitioners (e.g. the biosecurity group's policy and operational experts) to generate new ideas and then successfully implementing them. Innovation can be led by research but also generated by other means. The strengthening of innovation to improve the biosecurity system featured in several recommendations of the review by Craik et al. (2017).

3 Departmental context

3.1 Summary

This chapter provides important context for this review. It explores how the Department of Agriculture, Fisheries and Forestry, at an enterprise-level, has described the role and function of science in 18 strategic and planning documents and offers observations based on them.

The documents show that within the department there are varying views of science and research, which suggests there is insufficient strategic clarity at the enterprise-level. This has flow-on impacts, including to the Biosecurity and Compliance Group (biosecurity group).

The Inspector-General observes that, ideally, a science strategy would explicitly consider the context for the department's science and be based on a clear conceptual understanding of whether the department's approach to science and research is academic or regulatory or both. Regulatory and academic science pursue different strategic outcomes and are shaped by different external, organisational and behavioural drivers (Ruggles 2004).

The *Corporate Plan 2023–24* (DAFF 2023a) appears to take the view that the department's approach to science is or should be academic in that it describes world-class science and research as a departmental role and function. However, the *Workforce Strategy and Action Plan 2021–25* (in draft since 2020) describes a need to develop the role of 'regulatory scientists' (DAWE 2020a). Departmental scientists are also referred to as technical, operational and research scientists (BPSSD 2023). Some senior biosecurity officials consulted for this review mentioned that the department does regulatory science and not science. Overall, there is currently no agreed understanding of what 'regulatory science' and the role of 'regulatory scientists' might entail.

Between 2020 and 2022, the department invested significant resources in developing a strategic approach to its science. The *Future department review* identified science as one of 8 high priority improvement areas (Tongue 2020). These were formalised in *Our future department blueprint 2021–2025*, which aimed to build the future capability and culture of the department (DAWE 2021b). Under the blueprint's Science Stream, the department aimed to strengthen science literacy, the science community and career pathways for scientists; improve science translation into policies and delivery of evidence-based outcomes; and establish partnerships for science excellence (DAWE 2021c).

In 2020, the role of Science Convenor and the Office of the Science Convenor were established to provide science leadership and coordination. Under the new Science Stream, the Science Convenor produced the *Science Strategic Action Plan*, which was endorsed by the Executive Board (DAWE 2020b). However, the plan lacked maturity and has been ineffective. It is unclear what happened to this plan and the Science Stream after the machinery of government changes on 1 July 2022.

The department's 2023 submission to the Australian Public Service Commission's (APSC) capability review identifies science as key capability to be strengthened by 2027 (DAFF 2023b). The self-assessment identified a need to create a coherent and integrated approach to the scientific agenda; strong relationships with research collaborators; strengthening science capability; and science that is embedded in policy processes.

Recent plans for the department's science were preceded by the former Department of Agriculture, Fisheries and Forestry (DAFF) *DAFF Science Strategy 2013–2018* (DAFF 2013). The requirements it identified were overall similar to those set out in *Our future department blueprint 2021–2025* (DAWE 2021b). The Inspector-General suggests that the strategic work undertaken in 2013 and 2021 will be valuable in addressing the biosecurity-specific recommendations of this review.

3.2 Introduction

To set the scene, this chapter gives an overview of how the department, at an enterprise-level, has described the role and functions of science at various times. To do this, it examines 18 strategic and planning documents. The recent history of the department's management of science is essential context for this strategic review of the biosecurity group's strategy, governance and planning for the biosecurity science resource.

3.3 Departmental challenges

The Inspector-General acknowledges that the department experienced significant changes and challenges over the core period considered in this review (2020 to June 2023), including the machinery of government changes on 1 July 2022, heightened awareness of the risks of foot-and-mouth disease and lumpy skin disease and a challenging fiscal position.

In response to the APSC capability review of the department (APSC 2023), the department's leadership intends to implement significant reforms over the next 4 years. Changes to strategic policy and governance have commenced.

This review found that the management of the department's biosecurity science resource is complex and multifaceted, with no unifying oversight. Challenges faced by the department and changes in structure, programs and budgets have added to this complexity.

External and internal stakeholders consulted for this review, and the Inspector-General's review *Adequacy of department's operational model to effectively mitigate biosecurity risks in evolving risk and business environments* (IGB 2021a), described the department as a highly reactive or crisis-driven organisation that has not devoted adequate time to being strategic or strategically focused. Biosecurity crises, business restructures and changes in leadership personnel are expectable events and should be seen as demanding good governance and business continuity planning.

With the machinery of government changes on 1 July 2022, the Department of Agriculture, Water and the Environment (DAWE) was renamed the Department of Agriculture, Fisheries and Forestry. Environment and water-related functions moved to the new Department of Climate Change, Energy, the Environment and Water (DCCEEW). The biosecurity function remained in Department of Agriculture, Fisheries and Forestry. The Secretary of DAWE, who is also the Director of Biosecurity, continued as the Secretary of the Department of Agriculture, Fisheries and Forestry. In September 2023, a new Secretary and Director of Biosecurity was appointed, and has prioritised action on the findings and recommendations of the various independent reviews of the department.

In moving forward, the Inspector General believes there is value in unpacking the recent history of the management of the science resource. The findings and recommendations of this review will strengthen the performance of the department's science-based approach to biosecurity and support the work of the many dedicated individuals involved in protecting Australia from harmful pests and diseases that cause damage in many parts of the world.

3.4 The department's strategic approach to science

It can be reasonably expected that strategic decisions made at the enterprise-level guide and drive the biosecurity group's management of the biosecurity science resource. Clarity on strategic direction at the enterprise-level has positive flow-on impacts at all levels of the organisation (APSC 2023). Therefore, to understand the context for biosecurity science, the review examined enterprise-level strategic and planning documents that were made before September 2023. A list of these documents is in [Table 2](#).

Since at least 2013, the department has communicated the need to strengthen science capability ([Table 2](#), [Figure 1](#)). However, its strategic and planning documents show there are varying views on the role of department's science and research and what might be needed in the future.

As discussed further in this report, the Inspector-General notes that a strategic approach to science would ideally be rooted in a clear conceptual understanding of whether the department's approach to science and research is academic or regulatory or both. Strategic clarity and prioritisation should flow from there. Important differences arise from the context; either approach pursues different strategic outcomes ([Appendix A: Regulatory versus academic approach to science](#)).

3.4.1 Corporate Plan

The corporate plan is prepared in accordance with the requirements set by the *Public Governance, Performance and Accountability Act 2013* (PGPA Act) and the PGPA Rules 2014 and should be the department's primary planning document. It sets the department's strategic direction and must state its purpose, objectives, key activities, performance criteria and measurement of performance (DF 2023a).

The corporate plan should be strategic and align with other department plans and statements – including for science – to drive organisational performance. The department's submission to the recent APSC capability review identified this as an area for improvement (DAFF 2023b).

Subsequent versions of the corporate plan ([Table 2](#)) describe world-class science and research as a departmental role and function:

Our diverse roles and functions include biosecurity operations, trade and technical market access, world-class science and research, policy advice to government, program administration, client services to industry, and regulation (DAFF 2023a).

The Inspector-General's view is that a core role of the department's science and research is to support policy, regulation and related decision-making – noting and notwithstanding that the department's research arm, the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) conducts independent science and research of a high standing, including in biosecurity.

To support policy, regulation and operational decision-making, science and research must meet certain professional standards, be of high quality and be practical and relevant for the policy and regulatory problems at hand. It can achieve this without being necessarily internationally competitive and hence world-class (e.g. DAFF 2023a). The latter is a typical and core performance criterion for scientific research organisations and academia ([Appendix A: Regulatory versus academic approach to science](#)). The department's corporate plan should deal with professional standards and performance criteria suitable for policy and regulation, and so on. These should be further developed in the department's scientific integrity policy to support the corporate plan ([Appendix B: Scientific independence versus integrity](#)).

The *Corporate Plan 2021–22* and *Corporate Plan 2022–23* ([Table 2](#)) describe science and research among core capabilities to be strengthened while the *Corporate Plan 2023–24* omits this ([Table 2](#)). On the other hand, the department's 2023 submission to the APSC capability review aspires to strengthen science capability as a path to excellence (DAFF 2023b). Either way, any plan to strengthen science and research is currently not underpinned by data-driven analyses of what is needed. A capability gap analysis for the department's science resource has long been recommended but has not been undertaken (DAWE 2021b, DAWE 2020a, DAFF 2013).

Table 2 Enterprise-wide strategy documents and plans relevant to the department's Biosecurity and Compliance Group's management of the biosecurity science resource

Reference	Description	Date and place
Requirement under the Public Governance, Performance and Accountability Act 2013 (PGPA Act) (DF 2023b)		
<i>Corporate Plan 2021–22</i> (DAWE 2021d)	<p>The department's primary planning document prepared in accordance with the requirements set by the PGPA Act.</p> <p>Science: In line with the <i>Our future department blueprint 2021-2025</i> (DAWE 2021b), the <i>Corporate Plan 2021–22</i> identifies 'cross-cutting science, innovation and research' as a core capability to be built. It specifically refers to the department's <i>Science Strategic Action Plan</i> (DAWE 2020c, 2021e) as the tool that guides science delivery and application.</p>	August 2021; department website
<i>Corporate Plan 2022–23</i> (DAFF 2023c)	<p>Description as above.</p> <p>The first corporate plan of the new Department of Agriculture, Fisheries and Forestry following the machinery of governance change on 1 July 2022.</p> <p>Science: As with the previous corporate plan, the document identifies 'cross-cutting science, information and research activities' as a focus area to be strengthened. However, it no longer refers to the <i>Science Strategic Action Plan</i> as the tool that guides science delivery and application (DAWE 2020c, 2021e).</p>	February 2023; department website
<i>Corporate Plan 2023–24</i> (DAFF 2023a)	<p>Description as above.</p> <p>This is the department's second corporate plan following the machinery of governance change on 1 July 2022.</p> <p>Science: The plan no longer identifies the need to strengthen science as a core capability. Instead, science is viewed as an input to 'Support industry productivity and growth through science, policy and partnerships'.</p>	September 2023; department website
<i>Enterprise risk management framework and policy</i> (DAFF 2023d)	<p>Outlines the department's approach to effective risk management, including the principles, expectations, accountabilities, and responsibilities of staff. It was developed to meet the requirements of the PGPA Act 2013.</p> <p>Science: The risk appetite statement for science is: 'We value innovation in the pursuit of maintaining scientific resources and programs to deliver government priorities. We manage risks to the availability of reliable scientific evidence, which supports our decision-making and regulatory and policy outcomes'.</p> <p>There are 2 risk tolerance statements for science: 'We have a medium tolerance for challenging and adapting our processes in line with scientific developments' and 'We have a medium tolerance for reshaping our approach to ensure scientific literacy in our workforce and in our solutions to agriculture, biosecurity, climate change, fisheries and forestry'. A medium rating is defined as 'willing to take measured risks to enhance our objectives'. The Inspector-General commends the department's work on this policy but observes that the statements are rather difficult to understand.</p>	2023; department website

Reference	Description	Date and place
Documents in view of the Australian Public Sector (APS) reform plan (Australian Government n.d.)		
<i>Future department review</i> (Tongue 2020)	<p>An internal review of the department aimed at identifying opportunities for improved connection, synergies, alignment, collaboration, innovation and streamlining consistent with the APS reform plan (Australian Government n.d.). The review informed the development of the <i>Our future department blueprint 2021-2025</i> (DAWE 2021b).</p> <p>Science: The review identified science as a priority reform area. It recommended the development of an enterprise-wide science strategy and ‘strengthened governance mechanisms’ for the science capability stream that ‘support departmental objectives and strategic decision-making’.</p>	September 2020; internal document
<i>Our future department blueprint 2021–2025</i> (DAWE 2021b)	<p>A 5-year workplan informed by the <i>Future department review</i> (Tongue 2020). The blueprint was the department’s enterprise-wide strategy at the time. It was described as an ‘integrated, strategic response’ to the government’s APS reform agenda (Australian Government n.d.) and ‘unprecedented levels of investment’ made across the department’s portfolio (DAWE 2021b).</p> <p>Science: The blueprint aimed to create a future ready department by committing to build core capabilities across 8 streams. Science is one of the core capability streams.</p>	2021; department website
<i>Purpose, Objectives, Priorities, Values and Vision</i> (DAFF 2022a)	<p>The department’s ‘strategic direction on a page’. The statement sets out the department’s purpose, the government’s objectives, key strategic and cross-cutting priorities, an overarching vision and underlying values, and the connections between key areas of work. The statement is one of the department’s ‘being future-ready’ resources to support the government’s APS reform plan. It replaced the <i>2020 Purpose, Objectives and Priorities</i> statement.</p> <p>Science: The statement refers to the blueprint’s priorities (DAWE 2021b), including ‘strengthening cross-cutting science, information and research activities’.</p>	December 2022; internal website
<i>Draft Workforce Strategy and Action Plan 2021–25</i> (DAWE 2020a)	<p>A draft workforce plan described as a ‘strategic business-driven, business-owned and action-based process’. The revised delivery date to the Executive Board was March/April 2023.</p> <p>Science: The draft plan identifies the need to strengthen science capability, the role of ‘regulatory scientists’, and the use of ‘evidence-based science [sic] in policy and regulation’. An analysis of current and needed scientific capability has been an action of the department’s plans for science (Appendix C: Visions and plans for science).</p>	2020; internal document

Reference	Description	Date and place
<i>Capability review. Department of Agriculture, Fisheries and Forestry self-assessment</i> (DAFF 2023b)	<p>The department's self-assessment submitted to the capability review mandated under the Australian Public Service Commission (APSC) capability review program (APSC 2021).</p> <p>The self-assessment expresses several aspirational narratives (excellence horizons for core capabilities the department aims to develop. The capabilities are those of the <i>Our future department blueprint 2021–2025</i> (DAWE 2021b) plus the new First Nations agenda. Science is one of the core capabilities.</p> <p>Science: Under the excellence horizon for science, the department's plans include 'Strengthening cross-cutting science, information, and research activities'.</p> <p>The report includes the vision statement for science from the <i>Science Strategic Action Plan 2.0</i>, mentioned below: 'By 2027, we aim to be known – by our people, stakeholders, and top scientific talent – for using the best available science to inform and deliver leading regulatory, operational and policy outcomes.' To achieve excellence, the plan targets the governance of science, research collaborations, resource planning and embedding science in policy processes.</p>	2023; internal document
Strategy and plans for science		
<i>DAFF Science Strategy 2013–2018</i> (DAFF 2013)	<p>The department's first enterprise-wide science strategy.</p> <p>Science: In March 2012, the Secretary asked the department's Chief Scientist (the role may have ceased in 2020) to develop a strategy for the department's scientific resources.</p> <p>The 24-page document was a well-articulated strategy. It communicated the important elements of strategy, including the purpose of the department's science function, outcomes, and the first action plan for science.</p>	2013; department website
<i>Science Action Plan for supporting innovative science August 2016 – December 2017</i> (Chief Scientist 2018)	<p>The department's second action plan following the publication of the <i>DAFF Science Strategy 2013–2018</i> (DAFF 2013).</p> <p>Science: 'In response to the release of the Prime Minister's National Innovation and Science Agenda [in December 2015], the Deputy Secretary [of the Biosecurity and Compliance Group] requested the department's Chief Scientist [...] to prepare a plan to strengthen departmental scientific capability [...]' (Appendix C: Visions and plans for science).</p> <p>The 3 high-level actions of this plan were: (i) Revision of our people capability planning; (ii) Improving IT infrastructure; (iii) Information access and sharing.</p>	2016; internal document
<i>Science Strategy Action Plan 2017–2020</i> (Chief Scientist 2017)	<p>The department's third action plan following the publication of the <i>DAFF Science Strategy 2013–2018</i> (DAFF 2013).</p> <p>Science: This plan contained a detailed schedule with outputs, actions and area leading the actions. The plan was structured around 3 topics: (i) Science networking, information access and research prioritisation; (ii) Science communication and media planning; (iii) Innovative scientific workforce.</p>	February 2017; internal document

Reference	Description	Date and place
<i>Professional Scientific Independence Statement</i> (DAWR 2018a)	<p>The department's first professional scientific independence statement delivered under the third plan for science, as mentioned above, and published on the department's internal website.</p> <p>Science: The Executive Management Committee approved the Professional Scientific Independence Statement in September 2018 (EMC 2018, Appendix C: Visions and plans for science).</p>	September 2018; internal document
<i>Science Strategic Action Plan</i> (DAWE 2020c)	<p>The department's fourth action plan came out of the <i>Future department review</i> (Tongue 2020).</p> <p>Science: This plan was a '12-18 months' roadmap' to 'improve the delivery and application of science supporting evidence-based policy, regulatory and operational decision-making' (Appendix C: Visions and plans for science).</p> <p>The plan has been also referred to as the science strategy.</p>	November 2020; internal document
<i>Science roadmap of the Our future department blueprint 2021–2025</i> (DAWE 2021b, 2021c)	<p>Science: The blueprint's science roadmap was a plan informed by the <i>Science Strategic Action Plan</i> (DAWE 2020c), as mentioned above, although the alignment appears unclear.</p> <p>The 3 actions of the roadmap were: (i) Formalise Office of the Science Convenor, Science Council and 'communities of practice' and align their mandate to science priorities; (ii) Ensure the department has the science resources and programs to deliver government priorities; (iii) Ensure science is embedded into department policy processes and submissions.</p>	September 2021; internal document
<i>Science Strategic Action Plan 2.0</i> (DAWE 2021e)	<p>The department's fifth action plan and second plan following the <i>Future department review</i> (Tongue 2020).</p> <p>Science: This plan (SSAP2.0) replaced the previous plan within less than one year (Appendix C: Visions and plans for science). In the new plan, the wording of actions was 'harmonised' with the <i>Our future department blueprint 2021–2025</i> (DAWE 2021e). Actions focused on capability (e.g. capability gap analysis, science partners), enabling services (e.g. IT systems and eLibrary services) and 'building trust in science' through improved communication and engagement.</p>	May 2021; internal document
Documents guided by the regulator performance framework for Commonwealth entities (DF 2023c)		
<i>Regulatory Practice Statement</i> (DAWE 2021f)	<p>Sets out general principles for the department's regulatory practice and its approach to delivering regulation across the diverse regulatory functions the department administers. Biosecurity is one of the department's regulatory systems.</p> <p>Science: The statement mentioned the use of 'evidence-based research' [sic] to deliver outcomes for stakeholders and communities.</p>	June 2021; department website
<i>Regulator Performance Framework Report</i> (DAWE 2021g)	<p>A self-assessment of the performance of the department's 6 regulatory functions. Biosecurity is one of the regulatory systems covered in the report.</p> <p>Science: The report described the regulatory function of biosecurity as risk-based and an approach 'supported by research, science and intelligence gathering, helping us target what matters most'.</p>	2021; department website

3.4.2 Future department review

The enterprise-wide, internal *Future department review* by the department's predecessor, DAWE, identified science as one of 8 high-priority improvement areas to build the future capability and culture of the department (Tongue 2020, [Table 2](#)). The review report dedicated one chapter to science, assessed separately from the priority topics of technology and data and analytics.

The report described the department as a science-driven organisation and science – including its people employed in scientific roles and scientific partners – as being of foundational importance to the department’s purpose, objectives and priorities (Tongue 2020).

For the review, the department consulted over 150 science staff including over 60 staff from the biosecurity group.

The report summarised the views of science staff as following:

- There are specific integration issues for areas of the department, such as science.
- Staff desire more capacity to work across boundaries and share scientific knowledge.
- Scientists want to be recognised for the work they do and for their work to inform policy decisions.
- Need to enhance internal networking and sharing through forums, webinars, workshops, etc.
- There’s a lack of awareness in the department’s science community around ‘who’s doing what with whom?’
- Policymakers want clear, easy to understand scientific evidence.
- There’s no ‘voice of science’ in executive-level decision-making. (Tongue 2020)

To address the concerns, the *Future department review* recommended, amongst other things, the development of:

[...] a science strategy to manage the department’s scientific knowledge and identify the department’s future science needs and opportunities (Tongue 2020).

The review’s recommendations – except for the development of a science strategy – were subsequently formalised in the department’s *Our future department blueprint 2021–2025* (DAWE 2021b). Work on a science strategy commenced in 2020, led by an expert consultant (Garrett 2020). However, a fit-for-purpose science strategy never materialised.

3.4.3 Science Strategy and Science Strategic Action Plan

The *Future department review* (Tongue 2020) initially generated great momentum for science in the department, which was supported by the Secretary and Director of Biosecurity and the department’s leadership group.

As a result of this, the department established the Office of the Science Convenor and a cross-departmental Science Council. Also, the role of the Deputy Secretary of Science was announced on 8 December 2020 to champion and support the delivery of the department’s science. The Deputy Secretary of the Biosecurity and Compliance Group held this role. However, even before the machinery of government changes on 1 July 2022, the status of this leadership role had become unclear.

While the *Future department review* was underway, work on a science strategy commenced. The *Future department review* had a vision of a science strategy ‘shaped by those working in science’ (Tongue 2020). This approach gave science staff, such as operational and research scientists, a voice and recognised their grievances, which included insufficient recognition and visibility, lack of a voice and the absence of a fit-for-purpose library subscription system. The grievances recorded as part of the *Future department review* had been known for a while (e.g. Chief Scientist 2013) and are indicative of the well-described science–policy divide (e.g. Šucha and Dewar 2020, Sarewitz 2013, Gudmundsson and Sørensen 2013).

It is highly commendable that the department engaged purposefully with science staff as part of the *Future department review*. However, contrary to the vision of the *Future department review*, the Inspector-General believes that a science strategy would be best shaped by both scientists and policymakers. This approach would foster understanding, narrow or overcome the science–policy divide and make strategy development a success story. Unfortunately, the department’s science strategy never materialised as a cohesive document to provide strategic direction.

On 5 August 2020, the consultant Science Convenor presented a proposal to the department’s Executive Board² seeking formal approval to develop a science strategy that would ‘strengthen the department’s science capability, maintaining and improving the expertise and evidence base used to support departmental advice and decision-making’ (DAWE 2020b).

² The Executive Board comprises the Secretary (Director of Biosecurity) and the Deputy Secretaries of the department.

The 3-page proposal appeared to offer too many things, which made it appear unconcise. However, the Executive Board approved the development of a science strategy on 5 August 2020 and agreed to assign staff resources to a taskforce (later formalised as the Office of the Science Convenor).

According to the proposed timeline, strategy was to be implemented starting in January 2021. By November 2020, the development of a science strategy had been dropped. The department has not documented the reasoning and decision. Instead, on 24 November 2020, the consultant Science Convenor presented the *Science Strategic Action Plan* to the Executive Board which the board approved (OSC 2020).

Overall, the *Science Strategic Action Plan* had insufficient maturity to provide the necessary strategic direction for the department's science. There was no clear alignment with the *Our future department blueprint 2021–2025*, which was developed concurrently (DAWE 2021b). Despite the Executive Board's approval, the Inspector-General's consultations revealed that there was insufficient buy-in across the department's biosecurity group. Senior biosecurity officials said they did not see the relevance of the *Science Strategic Action Plan* and related activities for their work.

[Appendix C: Visions and plans for science](#) shows the original *Science Strategic Action Plan* and subsequent attempts to provide strategy to the department's science. In 2021, the original plan was replaced by the *Science Strategic Action Plan 2.0* to harmonise the plan with the *Our future department blueprint 2021–2025*.

Since the inception of the 2020 *Science Strategic Action Plan*, the tension between choosing a plan versus a strategy has remained unresolved. A plan is not a strategy even if it has 'strategic' in its title (Martin 2022, Jones 2020, Bradley 2018). The need for a strategy was described concisely in the Executive Board's paper endorsing the plan on 24 November 2020:

The department needs a science strategy in the same way as it needs a strategy for other major aspects of its endeavour, such as a people strategy, an IT strategy and an innovation strategy. The [department's] science strategy will ensure that the work of a significant component of [department] staff (our scientists), as well as the science that [the department] funds externally and that of our partners and collaborators, provides a high-quality, effective input to our policy, regulatory and operational decisions, and is undertaken efficiently (OSC 2020).

At the end of a resource-intensive process, with significant involvement of the biosecurity leadership group, the department has no science strategy. With the machinery of government changes on 1 July 2022, the Science Convenor and Office of the Science Convenor continued in DCCEEW and operated initially as a cross-departmental function. Following a transition period, this is no longer the case.

Key planning documents and executive decisions owned by the department's predecessor, DAWE, have not been managed appropriately and the current department can no longer access them. The machinery of government changes were disruptive, and business continuity for extensive strategic work on science was not adequately managed. The leadership may clarify whether it still has plans for a fit-for-purpose science strategy. Without a strategy, it is difficult to see how the department intends to successfully deliver the excellence horizon for science described in the 2023 self-assessment submitted to the APSC capability review (DAFF 2023b, [Table 2](#)).

3.4.4 Our future department blueprint 2021–25

The *Our future department blueprint 2021–2025* (DAWE 2021b) formalised many recommendations of the *Future department review* (Tongue 2020). The blueprint set the department's 'roadmap' to become 'future-ready' by 2025. It identified 8 priority reform areas also described as 'capability streams'. The blueprint named science as one of the capabilities to be strengthened for the future of the department's workforce and to improve performance and drive organisational change (DAWE 2021b, Tongue 2020). Science continued to be described as a capability to be strengthened in the department's self-assessment to the APSC capability review (DAFF 2023b).

The blueprint's strategic outcomes for science aimed to enhance science literacy, improve career pathways for scientists, strengthen the science community, improve science translation into policies, deliver evidence-based outcomes, establish partnerships for science excellence, and address major challenges like biosecurity or climate change adaptation. To achieve these outcomes, the department committed to initiatives like formalising science leadership roles, ensuring resources for science, and integrating more scientific evidence into policy development and decision-making. The initiatives were scheduled across the years 2021 to 2024.

The *Future department review* recommended a science strategy (Tongue 2020). However, this was not included in the blueprint. Instead, the blueprint's mix of actions to build science capability ranged from tangible things such as having a library subscription system to transformative, strategic changes such as instilling new work practices.

3.4.5 Department's self-assessment and response to the APSC capability review

The department's 2023 submission to the APSC capability review reiterates plans to strengthen science and research informed by the *Our future department blueprint 2021–2025* and the *Future department review* (DAFF 2023b, DAWE 2021b, Tongue 2020, Chief Scientist 2013).

According to the department's self-assessment, the aspirational excellence horizon for science will target the governance of science, research collaborations, resource planning, and embedding science in policy processes. The department describes it as follows:

Strengthening cross-cutting science, information, and research activities.

We will have a coherent and integrated approach to our scientific agenda and strong relationships with a range of higher education and research institutions.

Already, we have one of the largest scientific and research communities in the APS, producing, commissioning, and applying petabytes of data. Our science and research-based work are expanding to encompass previously impossible tasks on many fronts – like vacuuming dust from shipping containers to analyse and detect DNA evidence of khapra beetle.

Over the next five years, we will support efforts to ensure the department has adequate resources to underpin its cross-cutting science, information, and research programs to deliver our work across all government priorities. That means embedding science and a strong evidence base into department policy processes, better leveraging existing data, investing in people, and building their confidence to apply data in policy and decision-making (DAFF 2023b).

In response to the APSC capability review, the department is implementing a new transformation plan. The details for science and research are yet to be clarified. The transformation plan spells out how success will look like by 2027 and includes the following:

We use evidence, science, data and feedback from stakeholders and users in an integrated way to co-design practical solutions.

We have a governance system that supports our leaders to collectively set priorities, align resource allocations and promote a shared sense of purpose and direction (DAFF 2023e).

3.4.6 Workforce Strategy and Action Plan 2021–25 (in draft)

The department has long identified the importance of a workforce strategy to identify and establish required workforce capabilities, including for science (Tongue 2020, DAWE 2021a). The department's enterprise-wide *Workforce Strategy and Action Plan* (Table 2) has been in draft since 2020 (DAWE 2020a), and the new delivery date of March/April 2023 has not been met. Therefore, the Inspector-General chose to consider the draft.

Science is a priority capability of the draft workforce strategy. A capability gap analysis was an action of the *Science Strategic Action Plan* and previous plans for science (Appendix C: *Visions and plans for science*). However, it has not been undertaken. A capability gap analysis would provide essential planning data including for the *Science Strategic Action Plan's* aspiration to attract scientific talent.

The draft workforce strategy refers to other strategies including a science strategy. These strategies are yet to be developed to shape the structure and capability of the workforce:

[...] the internal development of Science, Data and ICT strategies will all have an impact on the structure and workforce capability required to deliver critical reform (DAWE 2020a).

The draft workforce strategy recommends that the department enhance its science leadership and develop the role of regulatory scientists to translate science in a regulatory context:

We need to strengthen our science capability to support the department to become a leader in science and to ensure evidence-based science [sic] is used in policy and regulation. Over the next four years the department will continue to build its specialist capability in critical roles. However, to embed science into good public policy development and implementation, we must enhance our leadership capability within our science stream and further develop the role of ‘regulatory scientists’ to translate and facilitate the application of complex science in a regulatory context (DAWE 2020a).

However, within the department there is currently no agreed understanding of what ‘the role of regulatory scientists’ – or other types of scientists – might entail. The Inspector-General suggests that roles of the department’s scientists should be clarified in a workforce strategy or policy.

Roles may be clarified for the regulatory, operational and the research scientist (e.g. BPSSD 2023, DAWE 2020a, DEE 2018). An example of how this may be approached is the former Department of Energy’s work level standards for research scientists (DEE 2018). To describe scientists’ roles for a business area such as biosecurity, the Inspector-General is of the view that the department needs a clear conceptual understanding of whether its approach to science and research is academic or regulatory or both. Attributes of academic and regulatory science differ because they pursue different strategic outcomes. The scientists’ roles vary accordingly (Šucha and Sienkiewicz 2020, Ruggles 2004, [Appendix A: Regulatory versus academic approach to science](#)).

3.4.7 Previous DAFF Science Strategy (2013–2018)

The current action plans for science (DAWE 2021e) were preceded by the *DAFF Science Strategy 2013-2018* ([Table 2](#)). The Inspector General thinks that, overall, this strategy was well-constructed and fit-for-purpose at the time.

In March 2012, the Secretary asked the department’s Chief Scientist³ to develop a science strategy. A consultation draft prepared by the project team (scientific leadership board led by the Chief Scientist) received feedback from over 50 external and internal stakeholders. The feedback was incorporated during the strategy formulation process (Chief Scientist 2013). The matters identified are relevant to date and included feedback on strengthening:

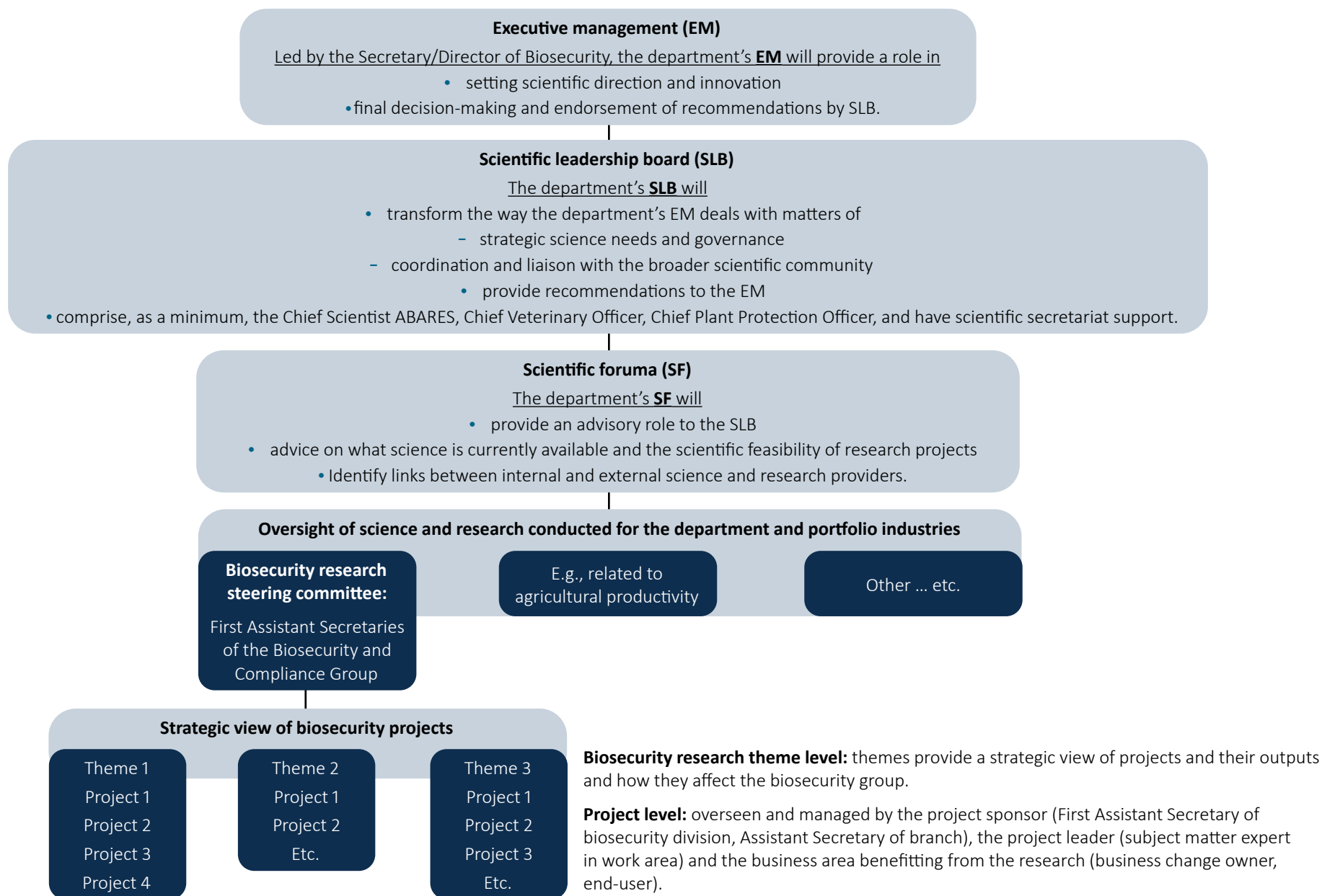
- science governance and scientific leadership ([Figure 1](#))
- engagement with the scientific community
- knowledge sharing across the department and having systems that support knowledge sharing
- research prioritisation processes
- science quality assurance by increasing opportunity to access academic peer review processes (Chief Scientist 2013).

The department published the science strategy on its website in 2013 (DAFF 2013). The strategy’s action plan was subsequently updated on 2 occasions ([Table 2](#); [Appendix C: Visions and plans for science](#)). Unlike the *Science Strategic Action Plan* (OSC 2020, Garrett 2020), the 24-page strategy covered comprehensively important elements of strategy, including a vision and desired outcomes, resources, the role and function of science, stakeholder relationships and a plan for improvements (DAFF 2013).

In developing the science strategy, the project team proposed a governance structure for science to clarify responsibilities, oversight, and accountability ([Figure 1](#)). The Inspector-General suggests that the department consult this governance structure, as it may assist in addressing recommendations of this review.

³ The role of Agricultural Chief Scientist was originally located within ABARES but moved to the Australian Chief Plant Protection Office (since 2023 the Australian Plant Protection and Environmental Biosecurity Office) when the office holder became the Australian Chief Plant Protection Officer (ACPPPO) (2014–2020). This arrangement meant that the Chief Scientist had an in-depth understanding of biosecurity. In the conduct of this review, the Inspector-General received conflicting information on whether the role of Chief Scientist has formally continued since 2020. The department informed the Inspector-General that the combined role of Chief Scientist/ACPPPO reverted back to a dedicated ACPPPO in 2021. Legacy functions relating to important international and domestic external engagements continue to be undertaken by the current ACPPPO.

Figure 1 Draft governance structure for science proposed as part of formulating the *DAFF Science Strategy* (2013-2018)



4 Does the department's biosecurity group have a fully articulated strategy for the management of its biosecurity science resource?

4.1 Summary and recommendations

The review criteria chosen for this chapter were:

- Does the Department of Agriculture, Fisheries and Forestry's Biosecurity and Compliance Group (biosecurity group) have a fully articulated science strategy for biosecurity?
 - Does it support other strategies, enterprise-wide and in the biosecurity group?
 - Does it outline an appropriate current and future role and function of science in the department's biosecurity group?
 - Does the strategy's implementation reduce strategic risks and set a pathway to improving biosecurity outcomes?

This review found that the department's biosecurity group has not articulated a science strategy to guide and provide coherent direction and prioritisation to the biosecurity group's broad and significant science resource – knowledge, people, partners and infrastructure.

A biosecurity science strategy will support aspirations to strengthen science capability more broadly (e.g. DAFF 2023b). The process of formulating a strategy will elicit an agreed understanding of the role and purpose of science in the department's science-based biosecurity risk management system. Varying notions of the approach to science as regulatory and/or academic have added to ambiguity about the role of the biosecurity group's science for both policy and science staff.

The biosecurity group stresses the vital role of science-based decision-making; yet science is not conceptualised as an enabler of, or core function for, the department's biosecurity system in *Commonwealth Biosecurity 2030*; a roadmap to direct and guide projects, initiatives and investments associated with the Australian Government's biosecurity remit.

Commonwealth Biosecurity 2030 (2021) plans to increase research, research collaborations and scientific capability to prepare for the future. The annual action plans developed under *Commonwealth Biosecurity 2030* are currently not, or insufficiently, underpinned by data-driven analyses of strengths and weaknesses to understand research and innovation priorities and what science capabilities and resources are needed (see [Chapter 5](#)). This weakens their strategic relevance.

When formulating a strategy, it will be important to identify strategic risks that may arise from the absence of strategy. For example, some internal and external stakeholders told the Inspector-General that there were perceptions of policy-based evidence-seeking rather than evidence-based decision-making. Doubt, whether founded or unfounded, is a precursor of scepticism in science. However, this can be proactively managed through a biosecurity science strategy that aligns with the enterprise and biosecurity risk management frameworks.

Biosecurity officials expressed different opinions on whether a biosecurity science strategy was needed. Some were uncertain about how a science strategy would assist them with their tasks. Efforts to put in place an enterprise-wide science strategy (2020-2022) had been ineffective, and a level of strategy fatigue was evident in consultations with the Inspector-General.

To future proof the department's science-based approach to biosecurity, the management of the biosecurity science resource needs to be strategically focused. The biosecurity leadership group should therefore articulate strategic directions and resource prioritisation and drive strategy implementation. Clear linkages with other biosecurity and departmental strategies (e.g. departmental science, workforce, ICT and infrastructure assets) should be established for staff to easily discern which strategies are up-to-date and pertinent to their work.

In light of the findings, the Inspector-General makes the following recommendations.

Recommendation 1

That the Director of Biosecurity and the biosecurity leadership group lead the development of a biosecurity science strategy that supports a strategic approach to managing the biosecurity group's significant science resource – knowledge, people, partners and infrastructure.

Strategy development and implementation will strengthen science as a core capability and clarify whether the biosecurity group's approach to science is, for example, regulatory, academic or both. The biosecurity group's new strategic approach to science should be based on evidence-driven analyses of research and innovation priorities, scientific workforce capability, research collaborations and critical infrastructure.

Recommendation 2

That the Director of Biosecurity and the biosecurity leadership group engage proactively to clarify the strategic role of science and hence the biosecurity science resource in enterprise-level and biosecurity strategy and planning documents. This will support the biosecurity group's expressed aspiration to strengthen science capability.

Relevant documents (current, drafted or planned) include, but may not be limited to:

- *Commonwealth Biosecurity 2030*
- Science strategy and integrity statement
- Workforce strategy and plan
- Asset management policy
- ICT strategy and plan
- Data policy
- other policies and plans, as identified by the biosecurity leadership.

4.2 Introduction

This chapter assessed whether the department's biosecurity group has a fully articulated biosecurity science strategy to strategically manage its significant biosecurity science resource – knowledge, people, partners and infrastructure.

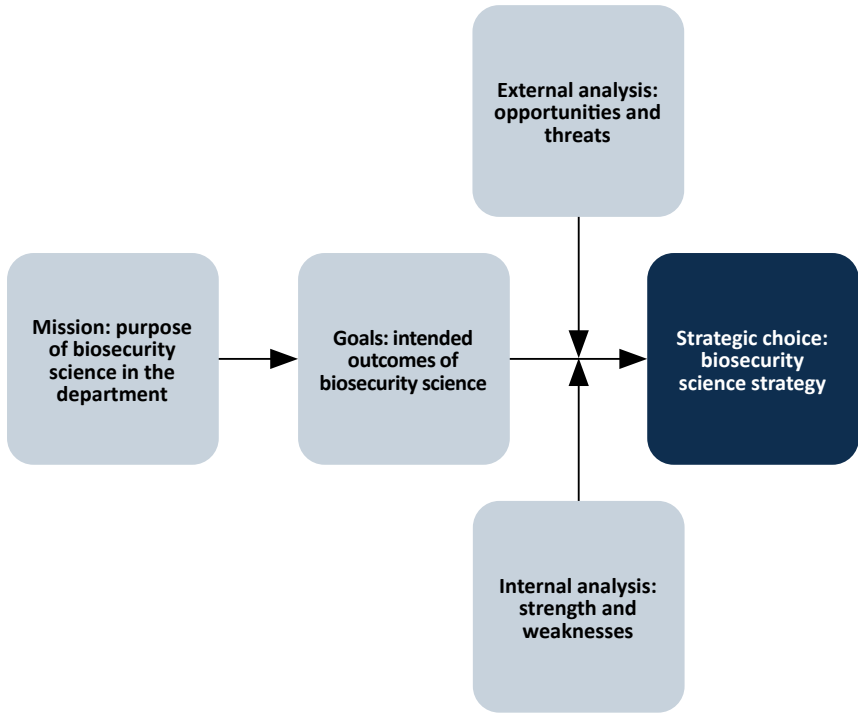
Government organisations that have science as a core capability usually formulate science strategies. For example:

- the research strategy of the Australian Fisheries Management Authority (AFMA 2023)
- the regulatory science strategy by Food Standards Australia New Zealand (FSANZ 2019)
- New Zealand's biosecurity science strategy (MAF Biosecurity New Zealand 2007).

In line with common definitions of strategy (e.g. DF 2021, Noe et al. 2015), a (science) strategy drives and describes the ways, rather than the actions or activities, an entity or an entity’s (science) function aims to reach its goals and hence fulfil its mission. It informs the governance arrangements and activities needed to achieve the entity’s strategic outcomes.

Figure 2 shows typical components of an entity’s strategy and the strategy formulation process. It has been adapted for this review from those required in a Commonwealth entity’s corporate plan (DF 2021).

Figure 2 Components of strategy and strategy formulation adapted to biosecurity science



4.3 Background

This section gives an overview of several high-level strategic documents and how these describe the role and function of science, research and innovation, as applicable, in biosecurity.

4.3.1 Priorities for Australia’s biosecurity system (Craig et al. 2017)

The landmark review *Priorities for Australia’s biosecurity system* identified biosecurity as a critical function of Australia’s research infrastructure serving the national interest. The review stated that ‘innovation driven by [Research, Development, and Extension is] vital to Australia’s scientific, risk-based approach to biosecurity’ (Craig et al. 2017, Australia’s Chief Scientist 2016).

Research and innovation (R&I) were a focus area of the Craig review. To future proof the biosecurity system, the Craig review made recommendations to better coordinate, target and prioritise R&I at the national level. In response to the recommendations, in 2018 the Biosecurity and Compliance Group developed a *Biosecurity Research, Development and Extension (RD&E) Strategic Statement 2018–2025*, as discussed below, and established the Biosecurity Innovation Program in 2018. This program ended in 2023. The biosecurity leadership group is yet to devise future plans for investments into research-led innovation.

4.3.2 National Biosecurity Strategy 2022–2032

Representing the Commonwealth, the department’s biosecurity group was a major contributor to Australia’s first *National Biosecurity Strategy 2022–2032* (NBS) published in 2022 (DAFF 2022b). All Australian governments are signatories to the NBS; its development was overseen by the National Biosecurity Committee.

The NBS describes a collective vision for Australia's future biosecurity system and is underpinned by the 2019 *Intergovernmental Agreement on Biosecurity* (IGAB) (COAG 2019). It defines the biosecurity system as:

A risk-based system underpinned by science that protects Australia's people, our environment, economy and lifestyle from the biosecurity threats of today and tomorrow (DAFF 2022b).

By characterising the biosecurity system as risk-based and underpinned by science, the NBS communicates science as being of foundational importance to the biosecurity system.

To achieve the biosecurity system's purpose, Australian governments agreed to 6 priority reform areas. Science is specifically covered in the following priority area:

Integration supported by technology, research, and data.

We will create a more connected, efficient and science-based system to facilitate more timely, informed and risk-based decisions (DAFF 2022b).

4.3.3 Strategic documents of the department's biosecurity group

Commonwealth Biosecurity 2030

Commonwealth Biosecurity 2030 is the department's externally facing strategic document released in 2021. It aims to provide 'a clear and practical roadmap to direct and guide projects, initiatives and investments' (DAWE 2021a). The document was not intended as a science strategy; rather, it targets other capabilities and components critical to the department's biosecurity system. It is in large parts an inventory of biosecurity activities the biosecurity group undertakes along with some strategic elements. It is accompanied by several annual action plans (DAFF 2023f, DAFF 2022c).

Commonwealth Biosecurity 2030 describes 5 enablers of the department's biosecurity system:

- Governance
- People
- Technology
- Regulation
- Funding

It is somewhat surprising that technology, but not science, is an 'enabler' of the department's biosecurity system in *Commonwealth Biosecurity 2030*. In contrast, the *National Biosecurity Strategy 2022–2032* describes science as enabling (underpinning) the biosecurity system (DAFF 2022b). The notion of an enabler elevates a capability or function to one of foundational importance.

In *Commonwealth Biosecurity 2030*, research is an input to the biosecurity system. Several of the roadmap's 9 high-level actions specify the need to increase research, research collaborations and scientific capability. Each high-level action is further specified by 5 to 8 activities (DAWE 2021a).

Action 1 is about accelerating efforts and collaboration with the department's key partners to strengthen the biosecurity system. It states:

We will work across the Commonwealth and with governments, industry, research institutions and community groups to implement improvements across the system to efficiently and effectively manage biosecurity risk (DAWE 2021a).

Research institutions are key stakeholders (partners) in the roadmap:

Organisations such as the CSIRO, Research and Development Corporations and tertiary institutions progress research and provide intelligence to better understand pests and diseases, new tools and approaches that can improve operations and the impacts of the broader environment on the biosecurity system (DAWE 2021a).

Action 4 is about investing in a skilled and responsive workforce, and regulatory tools and information systems. It states:

Build our technical, scientific, strategic intelligence and analytics capability, including establishing a pipeline for future needs (DAWE 2021a).

Action 5 commits to advancing detection technologies and innovations to business practices. It states:

Increase our research, validation and adoption of new diagnostic techniques, supporting faster and more accurate border clearance, incursion response efforts and building the diagnostics capability of system partners (DAWE 2021a).

Action 7 is to:

Increase offshore intelligence, research and data sourcing to support risk-based interventions, preparedness and response (DAWE 2021a).

Action 8 is to lift our national preparedness, response and resilience to exotic pest and disease incursions. It states:

Develop and maintain preparedness plans for priority exotic pests and diseases, supported by enhanced simulation modelling capability to support surveillance and response planning.

Increase diagnostic capability and capacity for priority environmental pests and diseases at departmental and other critical partner laboratories (DAWE 2021a).

The Inspector-General notes that the biosecurity group's plans to increase research, research collaborations and scientific capability are not underpinned by data-driven gap analyses of current and future needs. An enterprise-level science capability gap analysis was planned but not undertaken (DAWE 2021b, DAWE 2020c). A capability gap analysis should provide essential data for the biosecurity group's planning and prioritisation of science capability and resources.

Biosecurity RD&E Strategic Statement 2018–2025

In March 2018, the Deputy Secretary Biosecurity launched the *Biosecurity research development and extension (RD&E) strategic statement 2018–2025* (RD&E strategic statement) (DAWR 2018b). The statement was a carefully planned one-page biosecurity strategy ([Box 1](#)) developed to progress recommendations of the review by Craik et al. (2017).

The Craik review assessed that there was little research coordination and prioritisation among government, research organisations and industry participants in the biosecurity system, and that the department should provide national leadership. Another catalyst was the government's *Agriculture white paper 2015–2020* (Commonwealth of Australia 2015). The RD&E strategic statement was not intended as an overarching biosecurity science strategy; it was developed so that the biosecurity group could better understand, coordinate as well as influence national RD&E.

The work undertaken by the department's former Biosecurity Policy and Implementation Division (BPID) (now the Biosecurity Strategy and Reform Division) was comprehensive, and the RD&E strategic statement was accompanied by national RD&E priorities, a benefits analysis and mapping of Australia's national biosecurity RD&E governance.

The Biosecurity Research Steering Committee (BRSC) and, from early 2018, the Biosecurity Research and Innovation Steering Committee (BRISC) oversaw the work (BRSC 2018, 2017). In developing the statement, BPID consulted stakeholders across the biosecurity group, the National Biosecurity Committee and industry (DAWR 2017). On 28 March 2018, the new RD&E strategic statement ([Box 1](#)) was published on the department's internal website (Deputy Secretary Biosecurity 2018).

In consultations with the Inspector-General, biosecurity officials said that, as a result of changes in leadership personnel and business restructures, the *Biosecurity RD&E strategic statement 2018–2025* fell into disuse in 2019 – that is, soon after its launch. The date range suggests that the document is still current.

The Inspector-General found no evidence that the RD&E strategic statement was fully implemented or of a decision to discontinue the statement. This indicates a weakness in the biosecurity group's governance, business continuity and accountable leadership.

Most senior biosecurity officials consulted for this review had no awareness of the RD&E strategic statement. Some officials told the review they believed that the statement was intended as ‘guidance only’. This seems unlikely given that the Deputy Secretary of the biosecurity group oversaw and launched the statement ([Appendix C: Visions and plans for science](#)), that the BPID was involved in significant development work for over 2 years, and that the RD&E strategic statement was intended to address recommendations of the review by Craik et al. (2017).

The biosecurity group should evaluate the progress made against the Craik review’s RD&E recommendations and the *Biosecurity RD&E strategic statement 2018–2025* ([Box 1](#)).

Box 1 Biosecurity Research, Development and Extension Strategic Statement 2018–2025

Vision

Biosecurity research, development and extension supports the national biosecurity system through delivery of evidence-based solutions that strengthen our risk-based approach to managing biosecurity.

Prioritise

Establish, promote and review biosecurity RD&E priorities to guide investment decisions.

- Research priorities are focused and address biosecurity challenges.
- Leaders communicate our priorities to staff and stakeholders.
- Research activities align with the departmental priorities.

Plan and conduct

Plan and conduct activities and projects collaboratively to maximise return on investment.

- Planned activities have clearly defined outcomes and benefits for the biosecurity system.
- Linkages to other research activities are identified.
- Opportunities to collaborate are identified and promoted.

Evaluate

Ensure research projects provide scientifically-sound evidence to inform policy decisions.

- Research projects are subject to quality assurance and review.
- Research projects are scientifically and technically sound.
- Research-driven policy changes improve biosecurity outcomes.

Adopt

Implement and communicate opportunities and new approaches to biosecurity operations.

- Adoption of research and its beneficial impact is planned at the start of any RD&E activity.
- Research outcomes are adopted by the department and lead to operational improvements.
- Research outcomes, their uptake and beneficial impact are promoted across the department and shared with other parties where appropriate.

(DAWR 2018b)

2026 Science & Surveillance Group Strategic Roadmap

In 2021, the Science and Surveillance Group (SSG) in the Biosecurity Plant & Science Services Division (BPSSD) developed the strategy *2026 Science & Surveillance Group Strategic Roadmap* (SSG 2021) to elevate core capabilities of its business and communicate these and the SSG's critical services role to the biosecurity group.

SSG's strategy is an excellent example of strategy formulation. The document was not intended as a science strategy but covers important scientific activities and infrastructure that are core components of the department's biosecurity system.

The SSG delivers scientific analysis and technical advice, diagnostics and surveillance and response at first ports of entry and approved arrangements. It is also responsible for building capacity in Northern Australia and for biosecurity regulation in Torres Strait (DAFF 2023a, SSG 2021). SSG employs a large scientific workforce and manages and maintains significant surveillance and diagnostics capability and scientific infrastructure, including 8 diagnostic laboratories. The group's business as usual function is to identify pests and diseases accurately and rapidly.

The strategy's vision for 2026 states:

SSG will be data and technology driven biosecurity experts, innovation and capability builders delivering national [departmental] outcomes (SSG 2021).

The strategy focusses on 4 areas underpinned by 'horizon' projects:

Diagnostics: deliver high quality diagnostic expertise, advice and data intelligence.

Surveillance & response: use data and technology to support targeted, risk-based surveillance, response, inspections and regulation.

Sustainable investment: strategically align activities to sustainable investment. Build a strong data curation culture to drive realistic, compelling science communications.

Network capability: drive stakeholder and community stewardship as capability building, response experts and third-party outsourcing advisors / managers (SSG 2021).

The strategy identifies 6 capabilities to build by 2026. Their maturity was scored on a scale of 1 to 3 in 2021 to obtain a baseline guiding strategic improvements:

Technology & innovation. Maturity level 1/3.

Regulation. Maturity level 1/3.

Diagnostics. Maturity level 2/3.

Surveillance & response. Maturity level 2/3.

Data management. Maturity level 1/3.

Biosecurity network. Maturity level 2/3 (SSG 2021).

Reforms are implemented under 12 major projects targeted at building capacity, capability, policy, and regulation. The projects are aligned with SSG's strategic plan and other initiatives that BPSSD undertakes.

The Inspector-General commends SSG's strategy document, including the clear leadership focus and emphasis on expected behaviours, performance, and accountability, and the ongoing reform program underpinned by relevant projects.

4.4 Assessment

4.4.1 Criterion 1: Does the department's biosecurity group have a fully articulated strategy for the management of its biosecurity science resource?

The biosecurity group has not articulated an overarching science strategy that will provide coherent direction to the group's science capability and research-related activities, prioritise resources, and guide performance and accountability in the department's science-based biosecurity system. For example, *Commonwealth Biosecurity 2030* (DAWE 2021a) and the *Science & Surveillance Group Strategic Roadmap* (SSG 2021) should link to, and be driven by, the strategic directions set for science and research at the group level.

There is no cohesive and deliberate view on the role and function of science in the biosecurity group. The group does not conceive science as one of its enabling, core capabilities or functions despite relying heavily on science, employing a large scientific workforce, and managing significant scientific infrastructure (e.g. DAWE 2021a and subsequent action plans, SSG 2021, DAWR 2018b).

The absence of a fully articulated biosecurity science strategy is symptomatic of the biosecurity executive's unclear strategic direction for science, with implications for the effectiveness of science/research-related governance arrangements ([Chapter 5](#) and [Appendix D: Case studies](#)), resource planning and prioritisation and the quality of stakeholder engagement ([Chapter 6](#)). It is difficult to see how the group intends to successfully deliver the excellence horizon for science described in the *Capability review, Department of Agriculture, Fisheries and Forestry self-assessment* (DAFF 2023b) without a biosecurity science strategy.

The department has identified the need for a strategic approach towards its science on multiple occasions, although it has struggled with strategy formulation and implementation ([Appendix C: Visions and plans for science](#)). This is also evident in the biosecurity group (e.g. DAWR 2018b). The most recent work on a science strategy undertaken at the enterprise-level ([Table 2](#)) – championed by the Secretary/Director of Biosecurity and Deputy Secretary of the Biosecurity and Compliance Group – has had little, if any, impact on the biosecurity group's strategic approach towards its significant science resource ([Chapter 3](#)).

The Inspector-General found that staff across the biosecurity group had differing views on the need for a science strategy. The well-described science-policy divide (e.g. Šucha and Dewar 2020, Sarewitz 2013, Gudmundsson and Sørensen 2013) was evident in the consultations undertaken for this review: policymakers who hold science qualifications said that it was important for the biosecurity group to have a science strategy, while many others were unsure about its relevance or felt that a science strategy was not needed for their work.

The Inspector-General believes the biosecurity leadership group needs to articulate its strategic approach for its significant science resource. Elements of a science strategy are suggested in [Box 2](#).

4.4.2 Criterion 1.1: Does the strategy support other strategies, enterprise-wide and in the biosecurity group?

The department's biosecurity group has currently not articulated its overarching science strategy. A biosecurity science strategy should align with other strategies of the biosecurity group and the wider department to support the department's major reforms and the transformational changes currently underway (APSC 2023, DAFF 2023b).

Utilisation of the different strategic and planning documents is hindered by the absence of a coherent hierarchy of priorities and the failure to establish connections between priorities across different documents. It is difficult to determine what is truly important and applicable. Inconsistencies indicate ineffective governance and oversight.

4.4.3 Criterion 1.2: Does the strategy outline an appropriate current and future role and function of science in the department's biosecurity group?

The department's biosecurity group has not articulated its overarching science strategy to appreciate and guide the current and future role of its science resource. Strategic clarity will support resource planning and make it easier to prioritise research, the capabilities of the workforce and collaborating organisations and infrastructure assets.

Formulation of a biosecurity science strategy should result in an agreed conceptual and strategic understanding of the role and function of science. The process would elicit fundamental questions such as ‘is our approach to science academic, regulatory or both?’, ‘what are the roles of our scientists; are they, for example, regulatory, operational, or research scientist?’, ‘how does the biosecurity group engage with the (academic) science of its collaborators?’, ‘how will a future where science is (fully) embedded in policy processes look like?’, amongst others.

Commonwealth Biosecurity 2023 describes the need to increase research, research collaborations and scientific capability to prepare for the future (DAFF 2023f, 2022c). However, research on decision-making has long recognised that there is no straight forward connection between doing more research – generating more information – and making better decisions (Sarewitz and Pielke 2007).

A formal analysis of strengths and weaknesses to understand what science capabilities and resources are needed should underpin the strategic relevance of the roadmap’s action plans (DAWE 2021a, DAFF 2023f, 2022c). This analysis should be part of formulating a biosecurity science strategy.

4.4.4 Criterion 1.3: Does the strategy’s implementation reduce strategic risks and set a pathway to improving biosecurity outcomes?

The department’s biosecurity group has not articulated an overarching science strategy to identify and mitigate strategic risks. [Box 2](#) gives some examples of risks that may arise from the absence of a science strategy. Related risk mitigation should be guided by and link to the department’s enterprise and biosecurity risk management frameworks (DAFF 2023d, 2023e, 2023g).

Box 2 Considerations for a biosecurity science strategy

A biosecurity science strategy should consider the following questions.

Why a science strategy?

Australia’s approach to biosecurity is science-based. Science is a core capability in the department’s world-class biosecurity system. It therefore needs a strategy in the same way as other core capabilities and functions that support the work of the biosecurity group — for example a workforce/people strategy, an ICT strategy and a data strategy.

A science strategy will assist in establishing a strong science-culture where science is embedded in processes and ways of working.

What is the purpose of science?

Science ensures that the department’s science-based approach to biosecurity risk management is adaptive and innovative in devising solutions to complex biosecurity problems. Science does this by providing the evidence that underpins regulatory decision-making, policymaking, operational risk management and the advice provided to the Australian Government.

What is the approach to science?

The biosecurity group is not a scientific research organisation but relies heavily on science, research, and innovation.

A science strategy should therefore clarify:

- whether the biosecurity group’s approach to science is regulatory or academic or both given that each of these approaches pursue different strategic outcomes ([Appendix A: Regulatory versus academic approach to science](#)).
- how the biosecurity group engages with the science of its academic collaborators (e.g. CEBRA, CSIRO) and how academic science operates within a regulatory environment.

This clarification will provide the required guidance and scope for the biosecurity group's scientific workforce (e.g. regulatory, operational and research scientists) and engagement with its scientific collaborators.

What is scientific integrity?

A shared understanding of scientific integrity should be based on an agreed understanding of the biosecurity group's approach to science, as mentioned above. The statement should describe the science culture that is expected and that must be modelled at all levels of the organisation. It should spell out how policy engages with science and the professional behaviours of the biosecurity group's scientific workforce (e.g. regulatory, operational and research scientists), including expectations when engaging with the biosecurity group's scientific collaborators and other external stakeholders (see also [Appendix B: Scientific independence versus integrity](#)).

What is the biosecurity group's science capability?

The biosecurity group needs to fully understand its current science capability and scientific resources to establish the priorities that will future proof the biosecurity system. The group should consolidate relevant data held within corporate functions and in different biosecurity business areas, including data on scientific resources, workforce capability, research projects, and research partners. A review of science capability, including a workforce capability gap analysis, had been planned but not undertaken (DAWE 2021b, 2020c, DAFF 2013).

What are some of the risks to be managed with a science strategy?

Some of the risks to be managed are:

- inefficiencies, values confusion, and potential conflicts of interest among science staff due to ambiguity regarding regulatory and/or academic expectations on science ([Appendix A: Regulatory versus academic approach to science](#)).
- immature strategic and collaborative engagement with academic partner organisations.
- misconceptions about the role and function of science in a regulatory context that may result in inconsistent approaches to biosecurity risk management.
- inefficient resource allocation.
- reputational or legal risks due to stakeholder perceptions of policy-based evidence making rather than evidence-based decision-making in policy.
- weak science-culture, which will be evident in insufficient or no coordinated strategy and immature governance, planning and prioritisation.
- ineffective change management – for example, the aspiration to embed a science–culture at all levels of the organisation, which will be evident where science is embedded in policy processes and submissions through new ways of working (DAWE 2021b).

5 Does the department's biosecurity group have an effective governance framework for the biosecurity science resource?

5.1 Summary and recommendations

The review criteria chosen for this chapter were:

- Does the department's Department of Agriculture, Fisheries and Forestry's Biosecurity and Compliance Group (biosecurity group) have an effective governance framework for the biosecurity science resource?
 - Does it clarify oversight and accountability?
 - Does it enable fit-for-purpose program and project monitoring, evaluation, and risk management?

This review found that the department's biosecurity group does not have an effective governance framework for the biosecurity science resource that supports collaborative leadership and transparency at all levels of the organisation. Current arrangements are characterised by incoherent hierarchy and insufficient connectivity. This limits their effectiveness in providing line of sight to the Director of Biosecurity (the Secretary) and the biosecurity leadership group.

The biosecurity leadership group does not receive regular updates on the biosecurity science resource, including research investments, scientific workforce requirements, research partnerships and initiatives (strategic and short-term), and the status of critical biosecurity infrastructure.

The biosecurity group's capability to deliver effective, cross-cutting science leadership through the Biosecurity and Compliance Board is limited. The oversight role of the board's Data, Research, and Intelligence Sub-Committee (DRISC) has been partial. The DRISC's research governance role is defined only in relation to the Centre of Excellence for Biosecurity Risk Analysis (CEBRA) and Biosecurity Innovation Program 2018–2022. The DRISC is currently suspended pending a governance review. The biosecurity group was unable to provide details of this review.

At present, the governance of science-based programs and activities sits mostly within the biosecurity divisions and their individual business areas. Governance arrangements vary in levels of maturity and depend on the:

- responsible area
- benefiting area
- funding source
- collaborating organisation/s, as applicable.

The biosecurity group has evaluated major programs such as the CEBRA program. However, it did not provide evidence that would demonstrate that the implementation status and benefits realisation of research projects are routinely evaluated. This should be important information for the biosecurity leadership group / Biosecurity and Compliance Board for performance reporting and decision making.

The Inspector-General found the governance arrangements to be most advanced in the Biosecurity Plant and Science Services Division (BPSSD) and the Plant Protection and Environmental Biosecurity Division (PPEBD) (previously the Australian Chief Plant Protection Office). Both divisions collaborate closely. They provide oversight and accountability on research, diagnostic services and reform, research infrastructure, among other things, through the Plant Biosecurity Portfolio Board.

The Biosecurity Animal Division's Project Board, created in February 2023, is improving oversight. Collaborative leadership with the Australian Chief Veterinary Officer (ACVO) as a member will strengthen the board's governance role.

As a cross-cutting policy division, the Biosecurity Strategy and Reform Division (BSRD) should clarify its role in the governance of science and research in collaboration with the biosecurity leadership group. BSRD should reassess how it engages with the research commissioned by other biosecurity divisions. For example, the BSRD's role might be primarily to provide cross-cutting coordination and research administration because scientific experts with specialised subject matter expertise are largely affiliated with the BPSSD and the Biosecurity Animal Division. Some research programs managed by the BSRD were overseen by the DRISC; others lack oversight. DRISC was suspended in March 2022 pending a governance review. The quality of BSRD's management and administration of research programs varies widely depending on the responsible area.

The biosecurity group has stakeholder relationships with many academic, public, and commercial research organisations and research-services providers; yet there is no easily identifiable point of contact for external stakeholders. Stakeholder experiences are positive where the departmental contact is a counterpart who has the authority to represent the biosecurity group's research interests, scientific credentials to engage effectively on science matters and capacity to effectively coordinate science-related issues across the biosecurity group.

The Secretary's – who is the Director of Biosecurity – recent commitment to governance reform should significantly improve the biosecurity group's governance arrangements for science. In response to the 2023 Australian Public Service Commission (APSC) capability review of the department, the Secretary announced a system of governance that supports leaders at all levels of the organisation to collectively set priorities, align resource allocations and promote a shared sense of purpose and direction.

In light of the findings, the Inspector-General makes the following recommendations:

Recommendation 3

That the Director of Biosecurity and the biosecurity leadership group establish a coherent, connected and collaborative system of governance that enables prioritisation, resource allocation, performance, and accountability in the management of the biosecurity science resource.

The governance system should clarify responsibilities and reporting lines, and support decisions on resource allocation based on regular updates on the status of the biosecurity science resource, including research projects and investments, scientific workforce requirements, research partnerships and initiatives, and critical scientific biosecurity infrastructure.

Recommendation 4

That the Director of Biosecurity establish, within a connected system of governance, a coordinating function with the authority to represent the biosecurity group's research interests, the scientific credentials to engage effectively on biosecurity science matters, and the collaborative leadership and capacity to effectively coordinate science-related matters across the biosecurity group.

The function should drive overarching strategy and deliver leadership to cross-cutting science programs. It should coordinate and provide advice to the Director of Biosecurity and the biosecurity leadership group on science matters of general significance and collaborate with disciplinary experts on specific science matters. It should be a single, trusted point of contact for research collaborators and oversee the biosecurity group's collaborative arrangements.

The function may have the title of Biosecurity Chief Scientist.

5.2 Introduction

This chapter assesses whether the department's biosecurity group has an effective governance framework for its biosecurity science resource.

For a public entity such as the department and its business areas:

[governance refers to] the arrangements and practices which enable a public sector entity to set its direction and manage its operations to achieve expected outcomes and discharge its accountability obligations (ANAO 2014)

[and] the set of responsibilities and practices, policies, and procedures, exercised by an agency's executive, to provide strategic direction, ensure objectives are achieved, manage risks and use resources responsibly and with accountability (ANAO and PMC 2006).

Good governance focuses on performance and accountability and is evident in:

- developing strong leadership at all levels of the entity, with a focus on ethical behaviour and continuous improvement [...]
- maintaining governance systems and processes that are fit-for-purpose [...]
- optimising performance through planning, engaging with risk, innovation, and performance monitoring, evaluation, and review [...]
- focusing on openness, transparency, and integrity, engaging constructively with stakeholders and promoting accountability through clear reporting on performance and operations [...]
- where appropriate, participating in collaborative partnerships to more effectively deliver programs and services, including partnerships outside government [...] (ANAO 2014).

An effective governance framework embodies the directions set by strategy ([Chapter 4](#)). It achieves cohesion and accountability and fosters a culture where decisions on priorities and resource allocation are clearly communicated and underpinned by consolidated and validated data and management information ([Chapter 6](#)). The effectiveness of governance arrangements depends on leadership behaviours ('soft governance') and appropriately structured arrangements and processes ('hard governance') (ANAO 2014).

5.3 Background

The need to strengthen the governance of science was highlighted in the 2020 *Future department review* (Tongue 2020) and by the Chief Scientist in 2013 ([Figure 1](#), [Appendix C: Visions and plans for science](#)).

Following the machinery of government changes on 1 July 2022, the department reviewed its organisation structure to improve 'Our ability to deliver in accordance with the POPVV [the new Purpose, Objectives, Priorities, Vision, and Values statement], shaped by the government's priorities [...]' (DAFF 2023h).

A taskforce was established to design the new structure and advance improvements to governance, among other priority topics (DAFF 2023i). The relationship between changes to the organisation structure and governance was not clearly outlined at the time.

With increasing finance problems (ABC News 2023), followed by the Australian Government's announcement of the new biosecurity funding package in May 2023 (DAFF 2023j), senior biosecurity officials expressed their commitment to strengthening governance, transparency and accountability for the new funding measures, as directed by the Australian Government.

The recent APSC capability review of the department recommended taking urgent action to 'Establish a new system of governance with the senior leadership team collectively responsible for setting and clearly communicating enterprise-wide priorities, managing resource allocation, and supporting effective decision-making' (APSC 2023). In October 2023, the department's new Deputy Secretary Transformation (now the Chief Operating Officer) commenced to consolidate previous work and review and implement governance systems that will support more effective decision-making in the department (DAFF 2023e).

The Inspector-General's view is that this work should have a positive impact on the biosecurity group's governance of its science resource – a necessity identified in the *Future department review* (Tongue 2020).

Overall, the Inspector-General observed that the biosecurity group's governance of science and research has varying levels of maturity ([Appendix D: Case studies](#)). The biosecurity group's peak governance body, the Biosecurity and Compliance Board, does not provide clear oversight and accountable leadership. Details are discussed in this chapter.

5.3.1 Governance bodies

[Table 3](#) gives an overview of departmental and biosecurity governance bodies relevant to biosecurity science and research between 2020 and 2023. The department is currently working through improvements to organisational governance (DAFF 2023e). The Inspector-General anticipates improvements to the arrangements summarised in [Table 3](#) in terms of coherence, connectivity, and collaborative leadership.

Biosecurity and Compliance Board and sub-committees

The Biosecurity and Compliance Board is the biosecurity group's peak governance body. It has responsibility for regulation, risk management and governance according to the terms of reference of the board (BCB 2022a). The board is supported by the 3 sub-committees described in [Table 3](#).

The board's terms of reference lists the focus areas of:

1. Better regulatory practice.
2. Anticipating and acting on emerging biosecurity threats.
3. Implementation of government policy changes and announcements and associated funding (BCB 2022a).

Focus area 2 lists responsibilities of the 3 sub-committees:

- Annually endorsing priorities for biosecurity data analytics, research, and intelligence.
- Annually endorsing risk-based priorities for the compliance and assurance program.
- Annually endorsing priorities for biosecurity investment (BCB 2022a).

The board's oversight of the biosecurity group's research is implicit as the board should endorse research priorities set by the Data, Research and Intelligence Sub-Committee (DRISC). In consultations with the Inspector-General, biosecurity officials said that, because DRISC did not function as intended, it was suspended in March 2022 and a governance review is pending.

The Director of Biosecurity's Scientific Advisory Panel

In October 2021, the Director of Biosecurity established a Scientific Advisory Panel.

[The Scientific Advisory Panel will] ensure the Director of Biosecurity has direct access to high level scientific advice, information and assessments on:

- the status of existing and emerging animal, plant, and environmental biosecurity threats
- science-based strategies for preventing and managing existing and emerging animal, plant and environmental biosecurity threats
- global scientific developments, technologies and science-based strategies that have potential to strengthen Australian biosecurity outcomes (BCG 2021a).

The panel's chair is the Director of Biosecurity, who determines ex-officio appointments to the panel. The panel has been composed of senior biosecurity executives and senior scientists from CEBRA and CSIRO ([Table 3](#)).

The biosecurity group's peak governance body, the Biosecurity and Compliance Board, receives updates and feedback from the Scientific Advisory Panel. For example, in July 2022, the Deputy Secretary of the Biosecurity and Compliance Group 'updated members [of the board] with feedback from the Director of Biosecurity's Science Advisory Panel meeting [...]' (BCB 2022b).

In establishing the Scientific Advisory Panel, not enough consideration was given to the biosecurity group's system of governance for science and the overall effectiveness of arrangements. The disconnect in governance arrangements, and arguably collaborative leadership, is evident in the Biosecurity and Compliance Board's discussion of its relationship with the Scientific Advisory Panel:

[In July 2022, the board discussed and agreed] to establish a connection from the [Biosecurity and Compliance Board] back to the [Director of Biosecurity's Scientific Advisory Panel] (to help have consistency in the way risk is being managed)

[and] to provide their thoughts (through the Secretariat) on changing the format of the [Scientific Advisory] Panel structure, what the panel considers, and how outcomes and actions are agreed (BCB 2022b).

The Inspector-General observes that a cohesive, transparent and collaborative system of governance will enable the provision of timely scientific analysis and advice to the biosecurity leadership group and hence line of sight to the Director of Biosecurity.

The Inspector-General is of the view that the Director of Biosecurity's (the Secretary) recent commitment to governance reform should significantly improve the biosecurity group's governance arrangements for science and related resources in terms of coherence, connectivity and collaborative leadership. In response to the recent APSC capability review of the department (APSC 2023), the Secretary announced a system of governance that supports leaders at all levels of the organisation to collectively set priorities, align resource allocations and promote a shared sense of purpose and direction (DAFF 2023e).

Other governance bodies

The boards of the BPSSD, PPEBD and Biosecurity Animal Division ([Table 3](#)) have an oversight role for their own programs and projects. At the time this review was conducted, there was no clear governance linkage to the Biosecurity and Compliance Board and its sub-committees.

There is no high-level oversight by a board in BSRD. The quality of BSRD's management and administration of research programs varies widely depending on the responsible area ([Appendix D: Case studies](#)). In consultations with the Inspector-General, biosecurity officials of the BSRD said that the division had been allocated some science-related work where 'the biosecurity group didn't know where else to put it'.

As a cross-cutting policy division, the BSRD should clarify its role in the governance of science and research in collaboration with the biosecurity leadership group and the other biosecurity divisions; the majority of scientific experts with specialised subject matter expertise are affiliated with the BPSSD and Biosecurity Animal Division – these divisions commission most of the research – and the offices of the Australian Chief Plant Protection Officer (ACPPPO), Chief Veterinary Officer (ACVO), and Chief Environmental Biosecurity Officer (ACEBO).

In the Inspector-General's view, the BSRD is an appropriate area to provide an overarching coordination function in the management of the biosecurity research and innovation. A prerequisite for the provision of effective coordination to the wider biosecurity group will be a governance system equipped with the capability to deliver credible science leadership in the BSRD.

Table 3 Governance bodies relevant for biosecurity science and research (2020–2023)

Name	Overview of stated role and recent events
Director of Biosecurity	<p>The Director of Biosecurity is a statutory office holder under the <i>Biosecurity Act 2015</i>. The director and has communicated the importance of science as one of the department's core capabilities for public policy development and decision-making (DAWE 2021b, DAFF 2013). The role of Director of Biosecurity is held by the department's Secretary.</p> <p>In 2020, the incumbent established the role of the Science Convenor, the Office of the Science Convenor (OSC), and the Science Council and the Director of Biosecurity's Scientific Advisory Panel.</p>
Director of Biosecurity's Scientific Advisory Panel	<p>The Scientific Advisory Panel was established in October 2021 by the Director of Biosecurity/Secretary. Members are biosecurity executives (including the Australian Chief Plant Protection Officer, Chief Veterinary Officer, and Chief Environmental Biosecurity Officer) and senior scientists from Centre of Excellence for Biosecurity Risk Analysis (CEBRA) and CSIRO (CEO of CEBRA, and the Director of CSIRO's Australian Centre for Disease Preparedness and Head of CSIRO Health and Biosecurity).</p> <p>According to the terms of reference, the panel provides scientific advice on contemporary biosecurity issues, including in reports or reviews. Meeting minutes or verbal updates are provided to the Biosecurity and Compliance Board for information. The Director of Biosecurity and the board consider the panel's scientific advice in decision-making (BCG 2021a).</p>
Deputy Secretary Science/Co-chair of Science Council	<p>The Deputy Secretary Biosecurity held the position of Deputy Secretary Science, which was created in December 2020 under the <i>Future department review</i> (Tongue 2020) and <i>Our future department blueprint 2021–2025</i> (DAWE 2021b). The purpose of the role is to champion science and drive the department's science agenda through leadership. Following the machinery of government and personnel changes in 2022 (Chapter 3.2), it is unclear if the role of Deputy Secretary Science is still active.</p> <p>Since January 2023, the Deputy Secretary Biosecurity has been the department's co-chair of the cross-departmental Science Council to champion science and drive the department's science agenda. It is unclear if this arrangement is still active.</p> <p>The department and the Department of Climate Change, Energy, the Environment and Water (DCCEEW) co-chairs of the Science Council were supported by the Science Convenor and OSC. It is unclear if this arrangement is still current.</p>
Science Convenor, Office of the Science Convenor (OSC)	<p>The role of the Science Convenor and the OSC were created in 2020 to strengthen science and lead the development and implementation of the department's enterprise-wide science agenda, including a science strategy.</p> <p>The first Science Convenor and former CEO of CSIRO facilitated the establishment of a memorandum of understanding with CSIRO (2021) and developed the <i>Science Strategic Action Plan</i> (2020) (Appendix C: Visions and plans for science). The role reported directly to the Secretary / Director of Biosecurity and the Executive Board. Biosecurity projects under the joint CSIRO and department mission '<i>Catalysing Australia's Biosecurity</i>' will be managed under the memorandum of understanding (CSIRO n.d.).</p> <p>Following the machinery of government changes in 2022, the Science Convenor and OSC transferred to the DCCEEW and operated as a 'shared service' for DCCEEW and the department during a transition period. The department has no resources dedicated to continuing the endeavour. Planning and decision documents were transferred to the DCCEEW with the machinery of government changes and the department can no longer access them through its IT system.</p>

Name	Overview of stated role and recent events
Science Council	<p>According to its vision statement, the Science Council aims ‘to embed science as a core value across DCCEEW and DAFF, to ensure that use of best-available scientific information is an integral element of departmental decision-making, and to promote the role of science in development and delivery of effective regulatory, operational and policy outcomes’ (DCCEEW and DAFF 2023).</p> <p>The council is co-chaired by the Deputy Secretary Biosecurity and a Deputy Secretary of DCCEEW. The membership is from both departments.</p> <p>The Science Council advocates and works through influence. The governance arrangements for translating Science Council’s ideas and initiatives into decisions that may improve ways of working in biosecurity business areas are not clear.</p>
Agricultural Chief Scientist/Chief Scientist	<p>The role of Agricultural Chief Scientist was established in the 1990s as an independent scientific advisory role. It provided scientific leadership across the department’s agriculture portfolio and represented the Australian Government internationally (DAWE 2021h). The role of Chief Scientist was performed by the Australian Chief Plant Protection Officer (ACPPO) from 2014 when the office holder became ACPPO (2014–2020).</p> <p>In the conduct of this review, the Inspector-General was informed that the combined role of Agricultural Chief Scientist / ACPPO reverted back to a dedicated ACPPO in 2021. The current APPO continues to undertake legacy functions relating to important international and domestic external engagements.</p> <p>Overall, the Inspector-General received conflicting information on whether the department has had a dedicated Agricultural Chief Scientist since 2020. Policy documents of the biosecurity group continued to mention the Chief Scientist. Based on the information provided, the Inspector-General was unable to establish whether the Agricultural Chief Scientist and the Chief Scientist are the same and who might be holding these roles at present.</p>
Australian Chief Plant Protection Officer (ACPPO)	<p>The ACPPO is a policymaker and scientist and the primary representative of, and an advisor to, the Australian Government on all matters relating to Australia’s plant health status and its supporting systems. The role works closely with the ACEBO (this table). The ACPPO is the First Assistant Secretary of the Plant Protection and Environmental Biosecurity Division in which the ACEBO is situated.</p> <p>The role’s focus is primarily on external stakeholder relationships and domestic and international responsibilities. The ACPPO represents the Australian Government internationally – for example, as Australia’s official contact point for the International Plant Protection Convention and others. The ACPPO leads on domestic biosecurity matters – for example, by working with governments in Australia’s national Plant Health Committee.</p> <p>The ACPPO is also a member of the Director of Biosecurity’s Scientific Advisory Panel and the Plant Biosecurity Portfolio Board.</p>
Australian Chief Veterinary Officer (ACVO)	<p>The ACVO is a policymaker and scientist and the primary representative of, and advisor to, the Australian Government on all matters relating to the maintenance and improvement of Australia’s animal health status and its supporting systems.</p> <p>The role’s focus is primarily on external stakeholder relationships and domestic and international responsibilities. The ACVO represents the Australian Government internationally – for example, as the Australian delegate to the World Organisation of Animal Health and others. The ACEBO leads on domestic biosecurity matters – for example, by working with governments and industry to build capacity around prevention, preparedness, detection and response to emergency animal disease threats.</p> <p>The ACVO is also a member of the Director of Biosecurity’s Scientific Advisory Panel and the Biosecurity Animal Division Project Board.</p>

Name	Overview of stated role and recent events
Australian Chief Environmental Biosecurity Officer (ACEBO)	<p>The ACEBO is a policymaker and scientist and the primary representative of, and adviser to, the Australian Government on all matters relating to environmental biosecurity risks and the interconnection of biosecurity with biodiversity and ecosystem services. The ACEBO raises awareness and builds Australia's capacity to manage national environmental biosecurity issues and ensures Australia's environment, rich culture and social amenity is safeguarded from the impacts of exotic pests, diseases and weeds. The role works closely with the ACPPO and the ACVO.</p> <p>The role's focus is primarily on external stakeholder relationships and responsibilities. The ACEBO leads on domestic biosecurity matters, for example, as the Chair of the National Biosecurity Management Consultative Committee and the Consultative Committee on Introduced Marine Pests Emergencies, among others, and has a close working relationship with DCCEEW.</p> <p>The ACEBO is also a member of the Director of Biosecurity's Scientific Advisory Panel.</p>
Biosecurity and Compliance Board	<p>The Biosecurity and Compliance Board is the biosecurity group's peak governance body. The board provides strategic oversight of the group and business reforms and reports directly to the Director of Biosecurity (BCB 2022a). It was established in May 2021.</p> <p>The terms of reference define the board's role in establishing outcome-based priorities, articulating the risk appetite and tolerance for the biosecurity group and managing and delivering investment across the biosecurity business. The board operationalises the <i>Commonwealth Biosecurity 2030</i> roadmap. It does this through a '4-year transformation program guided by the 9 strategic actions of the roadmap'.</p> <p>The Biosecurity and Compliance Board endorses annually the biosecurity research priorities developed by the Data, Research and Intelligence Sub-Committee (DRISC). DRISC last updated the biosecurity research priorities in November 2021.</p> <p>The board's chair is the Deputy Secretary Biosecurity, and members are first assistant secretaries of the biosecurity group, the ACPPO, ACVO and ACEBO. There are 3 sub-committees reporting to the board, of which 2 have been suspended since 2 March 2023 pending a governance review.</p>

Name	Overview of stated role and recent events
Data, Research and Intelligence Sub-Committee (DRISC)	<p>DRISC is a sub-committee under the Biosecurity and Compliance Board. Established in May 2021, the DRISC replaced the Biosecurity Research and Innovation Steering Committee (BRISC). The DRISC has been paused since 2 March 2023 pending a governance review.</p> <p>According to its terms of reference, the DRISC provides governance, prioritisation and reporting of biosecurity data, research, and intelligence activities. DRISC is authorised to make decisions within its scope. It reports directly to the Biosecurity and Compliance Board and advises the Director of Biosecurity on complex, high-risk matters (BCG 2022a).</p> <p>DRISC's Chair has been a first assistant secretary of the biosecurity group (previously, the ACEBO). Members are selected assistant secretaries and principal directors of the biosecurity group. DRISC external advisors are ABARES and CEBRA.</p> <p>Science: DRISC has the following roles:</p> <ul style="list-style-type: none"> • a governance role for research conducted under the Innovation Program (see case study: Biosecurity Innovation Program) and the CEBRA program (see case study: Centre of Excellence for Biosecurity Risk Analysis) but not for other research arrangements • ensures an appropriate suite of research projects commence and are implemented • sets research priorities that align with the delivery of <i>Commonwealth Biosecurity 2030</i> (DAWE 2021a) and the <i>Our future department blueprint 2021–2025</i> (DAWE 2021b) • monitors and reviews research outcomes and oversees the implementation and benefits realisation of research outcomes • establishes and maintains relationships with the board's other 2 sub-committees (IPSC and RCASC) and external advisors, ABARES and CEBRA. <p>In November 2021, DRISC endorsed the biosecurity research priorities agreed to by the former BRISC. However, DRISC has not updated the biosecurity research priorities that were to be endorsed annually by the Biosecurity and Compliance Board in line with the terms of reference of the board and DRISC.</p>
Investment Prioritisation Sub-Committee (IPSC)	<p>IPSC is a subcommittee under the Biosecurity and Compliance Board. According to its terms of reference, the IPSC provides a strategic approach to investment and optimising return on investment. The IPSC establishes and reviews the biosecurity investment priorities that implement the <i>Commonwealth Biosecurity 2030</i> roadmap. IPSC is authorised to make decisions within its scope. It reports directly to the Biosecurity and Compliance Board and advises the Director of Biosecurity on complex, high-risk matters (BCG 2022b).</p> <p>IPSC was established in May 2021. It has been paused since 2 March 2023 pending a governance review.</p> <p>The IPSC chair has been a first assistant secretary of the biosecurity group (previously, the first assistant secretary of the Biosecurity Digital Reform Division) and members are selected assistant secretaries and principal directors of the biosecurity group.</p> <p>The IPSC:</p> <ul style="list-style-type: none"> • develops the biosecurity investment profile and the Biosecurity and Compliance Group's investment prioritisation framework to establish and guide investment priorities, including research investments • collaborates with DRISC to align investment priorities with the research priorities. <p>Since 2021, IPSC has not finalised the investment prioritisation framework for endorsement by the Biosecurity and Compliance Board in line with its terms of reference. Without this framework, it is unclear how IPSC and DRISC prioritise research investments.</p>

Name	Overview of stated role and recent events
Risk, Compliance and Assurance Sub-Committee (RCASC)	<p>RCASC is a sub-committee under the Biosecurity and Compliance Board. According to its terms of reference, RCASC coordinates, prioritises and recommends improvements to the biosecurity system. It oversees the development and implementation of the biosecurity risk management and the assurance frameworks. RCASC is authorised to make decisions within its scope. It reports directly to the Biosecurity and Compliance Board and advises the Director of Biosecurity on complex, high-risk matters (BCG 2022c).</p> <p>RCASC was established in May 2021. The Chair is a first assistant secretary of the biosecurity group (previously, the first assistant secretary of the Biosecurity Strategy and Reform Division), and members are selected first assistant secretaries, assistant secretaries and principal directors of the biosecurity group.</p> <p>Science: RCASC has no defined responsibility for biosecurity science and research, according to its terms of reference. It is unclear how RCASC collaborates with DRISC and IPSC to support performance and accountability in research investments.</p>
Plant Biosecurity Portfolio Board	<p>The Plant Biosecurity Portfolio Board was originally established by the Biosecurity Plant Division (now Biosecurity Plant and Science Services Division) in March 2016 to provide governance of programs and projects under the <i>Agricultural competitiveness white paper</i> (2015–2020) (BPSSD and PPEBD 2023).</p> <p>Today, the board's role is to govern and oversee the Biosecurity Plant and Science Services Division (BPSSD) and Plant Protection and Environmental Biosecurity Division (PPEBD) and their programs and projects in priority areas relating to plant biosecurity (BPSSD and PPEBD 2023).</p> <p>The portfolio board:</p> <ul style="list-style-type: none"> • leads the delivery, oversight, and control of projects, including research projects, where the division contributes financial and/or human resources • endorses project documentation and plans • ensures resources are available to deliver projects • aligns the division's activities with the department's priorities • undertakes quality assurance for programs and associated projects.
Biosecurity Animal Division Project Board	<p>Established in February 2023, the Biosecurity Animal Division Project Board provides strategic leadership on matters including strategic direction, business improvement, project management and performance reporting, budget measures, departmental initiatives, risk analyses, and market access (BAD 2023).</p> <p>Its Chair is the assistant secretary of the Animal Strategy & Coordination Branch and members are the first assistant secretary, assistant secretaries and selected directors, and the Deputy Chief Veterinary Officer.</p> <p>The terms 'science' and 'research' are not specifically mentioned in the board's terms of reference. At the inaugural board meeting, members noted that the board has been established as an ongoing forum to manage prioritisation of the division's objectives, the implementation of projects and large or key bodies of work within the division, which may or may not be science and/or research based (BADPB 2023).</p>

Name	Overview of stated role and recent events
Biosecurity Operations Division Executive (BODEx) board	<p>The BODEx board provides leadership and ensures the Biosecurity Operations Division's delivery of outcomes consistent with the department's purpose, objectives, and priorities. BODEx governs and oversees the division's business including delivery biosecurity assessment, inspection, and response activities, maintain the import system, and delivery of biosecurity regulatory services (BOD 2023). BODEx was established in February 2021.</p> <p>The Biosecurity Operations Division is a beneficiary of research and responsible for implementing research outcomes in their operations. The BODEx does not have oversight of biosecurity research projects, and it is unclear if BODEx make decisions on research projects that have major implications for biosecurity operations.</p>

5.4 Assessment

5.4.1 Criterion 2: Does the department's biosecurity group have an effective governance framework for the biosecurity science resource?

The department's biosecurity group does not have an effective governance framework for the biosecurity science resource that support collaborative leadership and transparency at all levels of the organisation. Current arrangements are characterised by incoherent hierarchy and insufficient connectivity and are ineffective in providing line of sight to the Director of Biosecurity and the biosecurity leadership group.

At present, the governance of science-based programs, projects and activities sits with the biosecurity divisions and their individual business areas. The oversight role of the Biosecurity and Compliance Board is unclear and limited. Governance arrangements for science-based programs, research projects and activities vary and depend on the:

- responsible area
- benefiting area
- funding source
- collaborating organisation/s, as applicable.

In October 2021, a Scientific Advisory Panel, including external scientific experts, was established to advise the Director of Biosecurity. The new panel was in addition to, and separate from, the Biosecurity and Compliance Board. This led to confusion about the Biosecurity and Compliance Board's governance role (BCB 2022b). The Biosecurity and Compliance Board should operate in tandem with the Director of Biosecurity's role to discuss and decide on science-based strategies and plans for managing existing and emerging biosecurity threats. When establishing the Scientific Advisory Panel, the Director of Biosecurity did not clearly communicate its role and the type of scientific (or other) advice sought from external experts on existing threats, including lumpy skin disease, African swine fever and Japanese encephalitis managed by biosecurity divisions at the time. The Scientific Advisory Panel's and the Biosecurity and Compliance Board's relationship and roles in the biosecurity group's governance system should be clarified. This should cover their distinct responsibilities in the provision of scientific advice to the Director of Biosecurity.

Going by the title, the role/s of Chief Scientist and/or Agricultural Chief Scientist appear to be relevant in the governance of science. However, based on the information that the biosecurity group provided, it is unclear whether there is currently a dedicated Chief Scientist/Agricultural Chief Scientist and what the role/s and function/s might be in the biosecurity group or the wider department ([Table 3](#)).

The Biosecurity and Compliance Board has limited visibility of the biosecurity group's research programs and activities other than the CEBRA program and the Biosecurity Innovation Program (2018–2023), which is managed by the BSRD and overseen by the board's DRISC. Thus, any high-level prioritisation of research by the board is partial at best.

In consultations with the Inspector-General, biosecurity officials questioned the effectiveness of the board's DRISC as a governance body. The biosecurity group was unable to provide evidence to show that DRISC or the board's Investment Prioritisation Sub-Committee (IPSC) have updated the research priorities for the board's endorsement since November 2021. It is unclear how DRISC and IPSC collaborate to prioritise investments, including into critical infrastructure (e.g. PBPMO 2022, SSG 2021).

The DRISC's terms of reference establish that the sub-committee is to monitor and review research outcomes and oversee implementation and benefits realisation (BCG 2022a, DRISC 2021b). In consultation meetings with the Inspector-General, biosecurity officials described an implementation gap between the completion of research and the operationalising of the outcomes. The department did not provide evidence to show that the DRISC did 'systematically monitor and review research project outcomes, adoption, and benefits realisation to inform the prioritisation of projects and advice to the [Biosecurity and Compliance Board]' (DRISC 2021b).

In March 2023, the board paused DRISC and IPSC pending a governance review. The biosecurity group was unable to provide the Inspector-General with the terms of reference for a review of the DRISC and IPSC. The Inspector-General notes that the governance review should clarify the Biosecurity and Compliance Board's focus and scope in relation to the biosecurity group's science and research and improve coordination, oversight and accountable leadership.

The biosecurity group has also no overarching framework for engaging and participating in collaborative research partnerships (e.g. ANAO 2014). While the governance of the CEBRA program is very well documented ([Appendix D: Case studies](#)), this is not the case for all collaborative arrangements. Research collaborations (projects and student engagements) are managed by multiple areas with no cohesion and strategic oversight. In consultation meetings with the Inspector-General, research stakeholders quietly expressed concerns that the quality of the department's engagement with its research partners varies. Important factors were transparent and well-designed governance processes, and the scientific understanding and decision-making authority of the department's counterpart.

The Inspector-General found the governance arrangements for science and research to be most advanced in the PBSSD and PPEBD (previously the Australian Chief Plant Protection Office). Both divisions collaborate closely in the Modern Technologies and Diagnostics Tools (MTDT) program ([Appendix D: Case studies](#)), among others, and provide oversight and accountability through the Plant Biosecurity Portfolio Board ([Table 3](#)). In consultation meetings and through the information provided ([Appendix D: Case studies](#)), the Inspector-General found the divisions' reporting lines to the Plant Biosecurity Portfolio Board to be well established.

It is commendable that the Biosecurity Animal Division has set up a similar function in the Biosecurity Animal Division Project Board in 2023. This board also includes representation from the Australian Chief Veterinary Officer (ACVO) and/or Deputy Chief Veterinary Officer.

The Biosecurity Strategy and Reform Division (BSRD) does not have a board to oversee the performance of its research programs. In some cases, DRISC provided oversight, as mentioned above. The quality of BSRD's management and administration of research programs varies widely depending on the responsible area. In consultations with the Inspector-General, biosecurity officials of the BSRD said that the division had been allocated some research-related work where 'the biosecurity group didn't know where else to put it'. As a cross-cutting policy division, the BSRD should clarify its role in research governance and establish a system of governance equipped with the capability to deliver effective science leadership to its programs and the wider biosecurity group.

This review found examples of good as well as poor governance in individual business areas ([Appendix D: Case studies](#)). For example, the BPSSD's Plant Innovation Centre has well-developed governance mechanisms to prioritise and undertake research funded through different sources. The Plant Innovation Centre is overseen by the Plant Biosecurity Portfolio Board. On the other hand, the BSRD's National eDNA Testing Program seemingly operates in isolation with no clear oversight ([Appendix D: Case studies](#)).

To improve the governance of science, the Inspector-General proposes a coordinating function with the authority and delegation to provide centralised science leadership to the biosecurity group and advise the Biosecurity and Compliance Board and the Director of Biosecurity. The function may be supported by a committee such as DRISC and could have the title of Biosecurity Chief Scientist ([Box 3](#)).

5.4.2 Criterion 2.1: Do governance arrangements for science clarify oversight and accountability?

Current governance arrangements for the biosecurity science resource are characterised by incoherent hierarchy and insufficient connectivity. This is limiting oversight and accountability.

The Biosecurity and Compliance Board's overall governance role in setting of cross-cutting priorities for science and research and resources allocation across the biosecurity group is unclear, although defined for projects funded under the CEBRA program and Biosecurity Innovation Program 2018–2023 ([Appendix D: Case studies](#)).

Oversight should be supported by fit-for-purpose planning data, as discussed further in [Chapter 6](#). For example, the establishment of a research project database was discussed at the Biosecurity and Compliance Board's DRISC in June 2022 but was not followed through. The biosecurity group does not maintain fit-for-purpose information management systems to enable reporting and support oversight and accountability by the board.

Divisional governance arrangements for science-related activities vary in level of maturity ([Appendix D: Case studies](#)). The Inspector-General found the governance arrangements to be most advanced in the BPSSD and PPEBD. In consultations with the Inspector-General, business areas explained their documented processes for engaging with the divisions' Plant Biosecurity Portfolio Board ([Table 3](#)). This indicates that, overall, there is a connected system of governance with clear oversight and accountable leadership at the divisional level.

5.4.3 Criterion 2.2: Do governance arrangements for science enable fit-for-purpose program and project monitoring, evaluation and risk management?

There is currently no consistent and standardised approach to program and project monitoring and evaluation across the biosecurity group. This should include 'monitoring through the systematic review of research outcomes, adoption and benefits realisation that takes account of whole-of-group needs to achieve a future ready biosecurity system' (BCG 2022a).

The department did not provide evidence that implementation and benefits realisation of research and science-based activities are routinely evaluated. There is no requirement to do so. Benefit assessments should be important information that assists the biosecurity leadership group / Biosecurity and Compliance Board to monitor performance and prioritise future work.

Depending on the business area, the level of maturity of processes ranges from well-developed to poorly designed ([Appendix D: Case studies](#)). A positive example is the routine milestone reporting, tracking of progress and risk assessments undertaken in the MTDT program. The MTDT program directly engages the operational beneficiaries of projects, thereby ensuring the work is relevant and can be implemented.

The documented evaluations of the CEBRA program and Biosecurity Innovation Program 2018–2023 (BCG 2021b, ACIL Allen Consulting 2020) are also commendable ([Appendix D: Case studies](#)). However, project monitoring, implementation and benefits realisation are not managed at the divisional or program level but are the responsibility of project owners.

The Inspector-General commends the biosecurity group's new (2023) risk management framework as guidance to managing specific program and project risks (DAFF 2023g).

Box 3 A coordinating function to provide collaborative science leadership

Government entities that rely heavily on science typically engage a Chief Scientist to provide science leadership. Examples are Geoscience Australia (GA 2023) and the Department of Defence (DD 2023). The role of Agricultural Chief Scientist is described on the department's website (DAWE 2021h), but since 2020 it may not have been a formal and dedicated role.

The Inspector-General recommends that the biosecurity group establish a coordinating function with the:

- authority to represent the biosecurity group's research interests
- scientific credentials to engage effectively on science matters internally and externally with research collaborators
- delegation to provide coordinated, collaborative science leadership, governance, and advice to the biosecurity leadership group and the Director of Biosecurity.

This function could have the title of Biosecurity Chief Scientist. It would be supported by an office. The role would work closely with biosecurity divisions and the biosecurity leadership. It would deliver, including but not be limited to the following matters.

Leadership

- Provide collaborative leadership that facilitates policy-science exchange and fosters a science-culture at all levels of the organisation.
- Coordinate and provide authoritative and independent advice and decision-making on general science matters to the Director of Biosecurity and the biosecurity leadership group.
- Fully implement the recommendations by Craik et al. (2017) related to biosecurity research and innovation made in their review report *Priorities for Australia's biosecurity system*.
- Represent departmental biosecurity matters related to science, research and innovation nationally and internationally.

Strategy

- Engage widely to co-design a biosecurity science strategy and scientific integrity policy relevant for policy and science. Oversee and review their implementation.
- Coordinate to ensure alignment between enterprise-wide and biosecurity strategy and planning documents in respect to science and research.
- Establish clarity of intent internally and externally, including an agreed understanding of the biosecurity group's approach to science (e.g. academic and/or regulatory).

Governance

- Lead the co-design of a coherent, connected governance system for the biosecurity science resource that supports collaborative leadership and transparency at all levels of the organisation.
- Provide collaborative leadership to strategically prioritise research program and project selection, workforce requirements and critical national biosecurity infrastructure.
- Design and implement a peer-review system for programs and projects (see also [Figure 1](#) and DAWR 2018b), and oversee scientific and performance reviews of programs and projects.
- Develop cross-cutting policies and standardise procedures and project management to ensure accountability and the proper use and management of resources in science-based activities.

- Oversee and coordinate the intersection between the science-based capacity and capability of the workforce, partner organisations and internal/external infrastructure to optimise usage of these science resources.
- Chair relevant committees and sub-committees.

Stakeholders

- Be a visible and trusted coordinating point of contact for science-related issues and research collaborators.
- Coordinate and manage research partnerships, including Memorandums of Understanding, partnering agreements, academic appointments of biosecurity officials, and student secondments of partner organisations to the department.
- Engage nationally – for example, with Australia’s Chief Scientist – on science matters.
- Support the Australian Chief Plant Protection Officer, Chief Veterinary Officer and Chief Environmental Biosecurity Officer in relation to general and specific science matters, as appropriate.

Capability

- Coordinate and conduct a science capability gap analysis of the biosecurity group.
- Enhance scientific literacy at all levels of the biosecurity group.
- To improve planning and decision-making, coordinate and collaborate to establish information management tools, such as a research project management system and data base, research infrastructure/asset database and staff capability database.

6 Does the department's biosecurity group have an effective planning framework for the biosecurity science resource?

6.1 Summary and recommendations

The review criteria chosen for this chapter were:

- Does the Department of Agriculture, Fisheries and Forestry's Biosecurity and Compliance Group (biosecurity group) have an effective planning framework for the biosecurity science resource (knowledge, people, partners and infrastructure)?
 - Does it map out the department's current and future business needs?
 - Does the planning effectively align with enterprise-wide plans and *Commonwealth Biosecurity 2030*?

The review found that the biosecurity group has no overarching planning framework for the biosecurity science resource to prioritise the actions needed to achieve science-related goals in the department's biosecurity system. Planning is undertaken by individual business areas. There is limited oversight and prioritisation by the biosecurity leadership group / Biosecurity and Compliance Board.

An investment prioritisation framework was planned but not completed by the board's Investment Prioritisation Sub-Committee. Access to and use of fit-for-purpose planning data has long been a limitation in the biosecurity leadership group's planning decisions and prioritisation of business needs. Effective information management systems should enable routine access to consolidated and validated planning data, including on research projects, the scientific workforce, research partner organisations and infrastructure assets.

Divisional planning approaches vary in levels of maturity and executive oversight and cross-cutting collaboration. An example of a well-planned and strategic program is the Modern Technologies and Diagnostic Tools (MTDT) program to reform the plant diagnostic system. Some of the work undertaken in the MTDT program should be delivered through a fit-for-purpose shared services model. For example, digital services and a sustainable, whole-of-life approach to managing the operational life of the biosecurity group's laboratory assets.

This review identified a disconnect between the biosecurity leadership group's decision-making and the strategy and planning decisions undertaken at the enterprise-level under the department's enabling services model. Shared services are frequently not fit-for-purpose for planning of the biosecurity science resource. Examples of ineffective planning are the *Science Strategic Action Plan* and *Science Health Check*, the *Workforce Strategy and Action Plan 2021–25* that has been in draft for 3 years, an *Asset Management Policy* that should devise a sustainable funding model for critical biosecurity science-services infrastructure, and the unclear progress on a long-planned policy for data assets.

In 2022, biosecurity research projects did not strongly align with or cover 6 of the 9 actions of *Commonwealth Biosecurity 2030* (PwC 2022a, 2022b, 2022c). Biosecurity officials attributed inconsistencies in alignment to incoherent project prioritisation and coordination processes across the biosecurity group when projects are assessed for approval and funding. To improve project planning and prioritisation, in 2021 the Biosecurity and Compliance Board's Data, Research, and Intelligence Sub-Committee (DRISC) had agreed to consider a research project stocktake. Work commenced in a spreadsheet but was not completed.

In light of the findings, the Inspector-General makes the following recommendations:

Recommendation 5

That the Director of Biosecurity and the biosecurity leadership group ensure that the department's enterprise-level planning is fit-for-purpose for the general and specialised requirements of the biosecurity group's science resource.

The biosecurity leadership should establish a shared understanding of the requirements as part of formulating a biosecurity science strategy and related resource planning. This will include, but may not be limited to, requirements pertaining to the following:

- Research information management system: the biosecurity leadership should have access to and use consolidated data on research projects and partners for planning and prioritisation and performance monitoring. The new research information management system should consolidate the biosecurity group's dispersed research project information, and include basic project management information, partner organisations (arrangements and expertise) and investments. It should link to financial cost centres and enable routine reporting on various attributes.
- Workforce strategy and planning: the biosecurity leadership group should have access to and uses consolidated workforce data to build a fit-for-future scientific workforce and support the sustainment of critical scientific skills.
- Asset management policy: the biosecurity group's infrastructure assets, including laboratories and specialised ICT systems (e.g. the new Laboratory Information Management System) should be funded sustainably and managed using a whole-of-life approach to asset management.
- ICT strategy and plan: That the biosecurity group's specialised ICT requirements should be adequately supported to improve operational and diagnostic science-services, research and the efficiency of biosecurity risk management.
- Data policy: the biosecurity group should implement modern data governance and management arrangements for biosecurity data assets to support science-services and biosecurity research, among other important biosecurity applications.

Recommendation 6

That the Director of Biosecurity and biosecurity leadership group establish a planning framework for the biosecurity science resource that is guided by strategy and part of an integrated system of governance.

The planning framework will be supported by relevant contemporary policy (e.g. science, workforce, collaborators, infrastructure assets) and consolidated and validated planning data, as per the previous recommendation, to prioritise resources and analyse the gap between current and future business needs.

It will develop the network of external specialists, as it might not be feasible for the biosecurity group to have the full range of specialist expertise, skills and infrastructure in-house. The new planning framework will prioritise science/research-related actions of *Commonwealth Biosecurity 2030* and any other plans of the biosecurity divisions and their business areas.

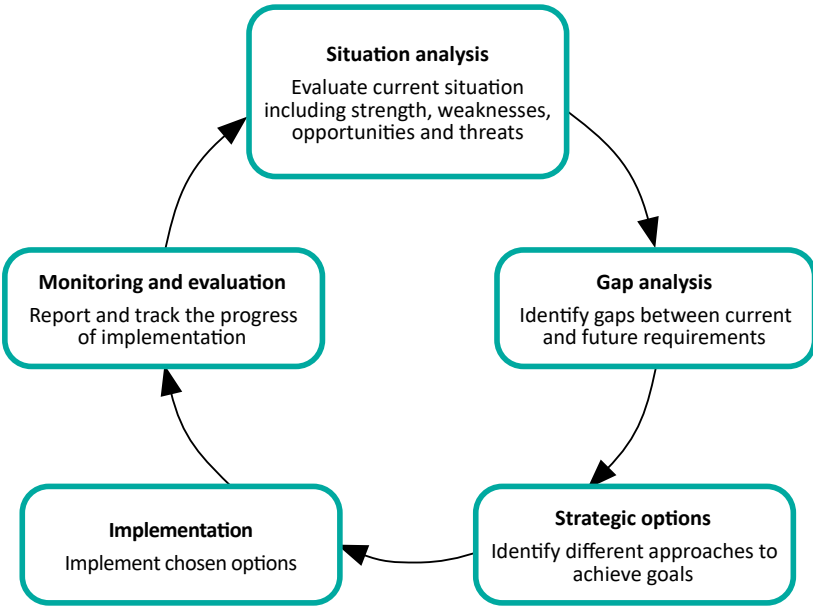
6.2 Introduction

This chapter assesses whether the department’s biosecurity group has an effective planning framework to ensure that it has the science resource (knowledge, people, partners and infrastructure) it requires now and into the future.

A planning framework guides the process of identifying, estimating, and allocating the resources needed to successfully deliver organisational capability and outcomes, realise benefits, and identify and mitigate risks. Planning frameworks are implemented in a cyclic process to respond to ongoing changes in the operating environment and support continuous improvement (Figure 3).

This chapter focuses on the biosecurity group’s planning approaches to ensure the group has the required scientific knowledge (programs, projects), people (workforce capability), partners (research collaborators) and infrastructure (laboratories and ICT) to fulfil its biosecurity regulatory and operational functions.

Figure 3 Typical components of the planning cycle



6.3 Background

In 2017, the review by Craik et al. *Priorities for Australia’s biosecurity system* made several recommendations relating to the need for clear research and innovation priorities, improved coordination of biosecurity research and innovation, and research that addresses identified gaps:

Research to address gaps: Gaps identified in managing national priority pests and diseases will receive significant focus above other competing areas of the national biosecurity system. Further, there will be a clear national system priority focus on research and opportunities for technological innovation to address and improve national system gaps and priorities [...] (Craik et al. 2017).

The biosecurity group is yet to fully implement the recommendations of the Craik review. The Biosecurity Innovation Program, established in response to the Craik review, ended in 2023. Future plans for research and innovation are yet to be devised by the biosecurity leadership group.

In 2020, the department took steps to better understand its science resource and assess the gap between current and future requirements (Tongue 2020, DAWE 2020a, 2020b). To support planning, in August 2021 the Executive Board agreed on an enterprise-wide Science Health Check by an independent panel (OSC 2021). According to the panel's terms of reference (OSC 2021), the Science Health Check would have considered:

- whether the department's science is 'fit-for-purpose', and effective in providing an evidence base for policy, regulatory and operational decision-making
- how science is resourced
- how business areas in the department partner and collaborate with other organisations.

However, the enterprise-wide Science Health Check never progressed beyond agreement on the idea.

There is general consensus across the department on a need to further develop the scientific capability of the department's science-trained workforce, improve succession planning and build specialist capability in critical roles (DAWE 2021b, 2020a, 2020c, Tongue, 2020). This should be supported by a consistent and validated workforce dataset and plan (APSC 2023). However, the department has not progressed a workforce plan beyond the drafting state (DAWE 2020a).

The recent Australian Public Service Commission (APSC) capability review recommended:

[The department should] Commence the development of a strategic workforce plan, to build a fit-for-future workforce and support the sustainment of critical skills (APSC 2023).

The APSC capability review highlighted deficits in strategy, governance and planning at the enterprise-level (APSC 2023). The strategic directions set for science and research at the enterprise-level should be fit-for-purpose to guide the biosecurity group's planning. This has arguably not been the case despite the time and resources spent on a science strategy and plans ([3.4 The department's strategic approach to science](#)). The following sections give an overview of the biosecurity group's planning approaches.

6.3.1 Knowledge

The biosecurity group acquires scientific knowledge through biosecurity programs and projects undertaken in-house (e.g. Plant Innovation Centre), by research partners and in collaborative arrangements. Examples are given in [Appendix D: Case studies](#).

Typically, individual biosecurity business areas identify research topics in a bottom-up approach ([Appendix D: Case studies](#)). As discussed above ([Criterion 2: Does the department's biosecurity group have an effective governance framework for the biosecurity science resource?](#)), prioritisation and decision-making on which projects go ahead and receive funding varies depending on the responsible area, benefiting area and funding source. At the division level, the Inspector-General found well-designed planning processes in the Biosecurity Plant & Science Services (BPSSD) and Plant Protection and Environmental Biosecurity (PPEBD) divisions, jointly governed by the Plant Biosecurity Portfolio Board ([Table 3](#)). The Biosecurity and Compliance Board's role in research prioritisation is insufficiently defined.

The biosecurity group has long recognised the need for a comprehensive understanding of types of research, research projects and associated spendings. To address recommendations of the review by Craik et al. (2017), a stocktake of national biosecurity research was undertaken as part of developing the *Biosecurity RD&E strategic statement 2018-2025* (DAWR 2018b), as discussed in [Chapter 4](#). However, the stocktake information was lost.

In 2021, the Biosecurity Strategy and Reform Division (BSRD) commenced another research stocktake to identify research gaps and inform planning of the CSIRO mission *Catalysing Australia's Biosecurity* ([Appendix D: Case studies](#)). The idea of a stocktake resonated with the Biosecurity and Compliance Board's Data, Research, and Intelligence Sub-Committee (DRISC):

[In November 2021, the DRISC agreed to consider] the [Biosecurity Strategy and Reform Division's] stocktake of research and development activities to understand the status of activities and to identify gaps in what is needed to deliver a future ready biosecurity system (DRISC 2021a, 2021b).

As discussed above, the DRISC was suspended in March 2022. Overseen by the Australian Chief Plant Protection Office (now PPEBD), the stocktake continued in the PricewaterhouseCoopers (PwC) consultancy *Mapping the biosecurity RD&I landscape* (PwC 2022a, 2022b, 2022c):

[The consultancy] examined the current RD&I projects being undertaken by DAFF which align with *Commonwealth Biosecurity 2030* and the Future Biosecurity Operating Model [discontinued draft] and worked with DAFF stakeholders to ascertain the funding sources currently utilised for these projects, and to identify current problem areas for securing project funding (PwC 2022c).

However, the PwC consultants found it impossible to collate the biosecurity group's research projects, as the information is dispersed among groups, systems, and spreadsheets. The consultants recommended the establishment of a national research, development and innovation (RD&I) project database to support prioritisation and planning of biosecurity research (PwC 2022c). This would be a prerequisite for the full implementation of the Craik review's recommendations on research and innovation (Craik et al. 2017, [chapter 6](#)).

Total investment amounts are documented where the funding allocation is from a single source, such as in the case of administered funding for research services listed in the portfolio budget statements (DAFF 2023k) and the department's annual funding mechanism for specific programs ([Table 4](#)). However, departmental funding has been reallocated usually as budgets tightened.

Table 4 Funding allocation for research, research services, and diagnostics (\$ million, rounded) to different entities published in the portfolio budget statements

Entity	2021–22	2022–23	2023–24	Funding type	Use
Centre of Excellence for Biosecurity Risk Analysis	\$1.854	\$1.890	\$1.977	Administered	Research projects
CSIRO's Australian Centre for Disease Preparedness	\$8.619	\$8.783	\$9.186	Administered	Diagnostic services
Biosecurity Innovation Program 2018-2023	\$4.659	\$5.409	–	Departmental	Research and innovation projects
Modern Technologies and Diagnostic Tools Program	\$5.590	\$7.180	\$5.510	Departmental	Reform of the plant diagnostic system

6.3.2 People

According to anecdotal evidence and the *DAFF Science Strategy 2013-2018* (DAFF 2013), the biosecurity group's science-trained workforce includes staff with tertiary science qualifications in entomology, plant pathology, botany, molecular biology, zoology, agricultural, environmental, and veterinary science, and other disciplines.

Science staff work in jobs that could be described in a workforce strategy as, for example, technician, operational and research scientist. Work levels standards should be used to further clarify roles. For example, the standard could be similar to the work level standards for research scientists developed by the former Department of Energy and the Environment (DEE 2018).

The biosecurity group will need a contemporary workforce dataset to identify gaps between current and future scientific capacity and capability and develop a workforce plan (see also APSC 2023).

Biosecurity divisions have recognised the need for developing their workforce. An action of *Commonwealth Biosecurity 2030* is to 'Invest in a skilled and responsive workforce supported by improved regulatory tools and information' (DAWE 2021a).

A review into the BPSSD and PPEBD diagnostic system identified:

Building the workforce capacity and capability can be addressed through developing workforce plans to address both short term and longer terms requirements [from financial year 2022-23]. [Consider review of] the current skill set, identify gaps and future skillset requirements and risks (Healy 2021).

The *Biosecurity Animal Division Strategy 2022-2025* aims to build a skilled and resilient workforce (BAD 2022). To achieve this, the division will:

- a. Develop a current skills matrix by end 22/23 to enable the division to identify the required skills for the right positions, and to identify gaps and limitations of our workforce to support future workforce planning [...].
- b. Develop a future workforce plan by end 24/25 [...].
- c. Attract and retain a diverse workforce based on a clear understanding of roles and responsibilities, recognition of effort and to support development [...] (BAD 2022).

Although these plans and actions do not specifically mention science and research, their implementation promises to improve the planning and management of each division's scientific workforce.

6.3.3 Partners

The biosecurity group's research partners increase research capacity and capability by offering applied biosecurity research, science-based services and, to a lesser extent, professional development opportunities.

Research partners are key stakeholders in *Commonwealth Biosecurity 2030* (DAWE 2021a), which includes research-related actions such as:

Partner with governments, research organisations and industry groups to grow and better align biosecurity research and supporting delivery of the new Agriculture Innovation Agenda biosecurity priority and an investment prospectus [...].

Increase our research, validation, and adoption of new diagnostic techniques, supporting faster and more accurate border clearance, incursion response efforts and building the diagnostics capability of system partners (DAWE 2021a).

The review of the plant diagnostics system (Healy 2021) identified the need for strong collaborative partnerships with external experts. A mature system would fulfil 3 criteria:

Established hybrid model for service delivery, including third-party services that meet requirements for cost, quality, and timeliness and are fit-for-purpose.

Strong, collaborative, and productive partnerships delivering expert input, identified through structured planning, and managed with established policies and procedures.

Collaborative partnerships with external experts and institutions for building capability through co supervised projects (Healy 2021).

Based on the information provided by the biosecurity group, this review identified over 30 partner organisations, mostly involved in collaborative research initiatives, programs, and projects ([Appendix E: Partner organisations](#)). The list of partner organisations identified here is likely to be incomplete, as there is no single administrative contact or process for the biosecurity group's collaborative arrangements.

Of the over 10 academic partners in [Appendix E: Partner organisations](#), 3 are considered strategic partners – CSIRO, University of Canberra, and Charles Sturt University (DAWE 2022). Charles Sturt University hosts the department's biosecurity training centre. The centre develops and delivers professional training and specialised programs tailored to respond, adapt, and improve capability of frontline biosecurity officers.

The department describes strategic partnerships as following:

[Strategic partners] have agreed to collaborate and share resources with us – they are a win-win for both parties. The arrangements are based on the principles of trust, transparency, and shared objectives, and provide a framework to drive collaboration between our organisations (DAWE 2022).

Strategic partnerships are managed under a memorandum of understanding (CSIRO, Charles Sturt University) or a partnering agreement (University of Canberra).

The biosecurity group's research collaboration with the Centre of Excellence for Biosecurity Risk Analysis (CEBRA), hosted by the University of Melbourne, is longstanding and subject to a grant agreement. Further details of this collaborative arrangement are in [Appendix D: Case studies](#).

The biosecurity group collaborates with several public sector entities, including the department's Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) and state governments. State governments are involved in collaborative research and may provide ad-hoc plant diagnostic services. In addition, some also collaborate with the biosecurity group via the University of Canberra's National eDNA Reference Centre (Agriculture Victoria, South Australian Research and Development Institute, Department of Primary Industries and Regional Development Western Australia; [Appendix D: Case studies](#)).

Commercial partners listed in [Appendix E: Partner organisations](#) have been involved in projects funded under the Biosecurity Innovation Program 2018–2023. The business area administering the program has also managed reporting to the executive and contracts ([Appendix D: Case studies](#)). Other commercial partners are involved in University of Canberra's National eDNA Reference Centre.

The biosecurity leadership has asked some partner organisations to provide advice on biosecurity matters. For example, senior scientists/executives from CEBRA and CSIRO are advisors on the Director of Biosecurity's Scientific Advisor Panel, and scientists from CEBRA are observers on the Biosecurity and Compliance Board's DRISC, which is currently suspended, as discussed above ([Table 3](#)).

6.3.4 Infrastructure

The biosecurity group's research and research services infrastructure are a critical component of Australia's national biosecurity system. The 2016 *National Research Infrastructure Roadmap*, developed by Australia's Chief Scientist, identifies biosecurity research infrastructure as a national asset serving the national interest, underpinning decision-making, and supporting industry growth (Australia's Chief Scientist 2016).

According to the recent APSC capability review:

[assets in several regional offices] require significant building upgrades or replacement within the next 5 years. The regional office network houses the department's laboratories, which [the department] advises are also at end of life and require upgrading.

[The department] recognises the importance of updating its overall capital plan (ICT and property) as part of a multi-year approach to its internal budget (APSC 2023).

In January 2022, the department released its first *Asset Management Policy* (DAFF 2022d). The Inspector-General did not assess how the department, at the enterprise-level, manages biosecurity infrastructure but observed that the *Asset Management Policy* does not specifically outline how science-services infrastructure are managed. Improvements recommended in the APSC capability review (APSC 2023) should consider the specific requirements of the biosecurity group's science-services infrastructure as, for example, assessed in the MTDT program (PBPMO 2022).

Animal laboratory

The biosecurity group does not operate an animal laboratory but collaborates with CSIRO's Australian Centre for Disease Preparedness (ACDP) ([Appendix D: Case studies](#)). The ACDP is a service provider to the department, supporting the diagnostics of, and research in, emergency animal diseases and high-risk zoonotic diseases. The facility is critical national biosecurity infrastructure managed by the CSIRO under their policies. It is an approved arrangement class 5.3 biosecurity containment level 3 (BC3) facility and subject to regular audits by the department that ensure compliance with the provisions of the *Biosecurity Act 2015* (IGB 2022). In the 2023–24 financial year, the department has provided \$9.186 million to the operating cost of the ACDP in line with the department's portfolio budget statements appropriation.

Plant laboratories

The review *Plant 2030 – DAWE diagnostics system end-state and roadmap* (Healy 2021) provides a detailed plan for the biosecurity group's plant diagnostics system, including laboratory infrastructure and related policy. The plan is currently being implemented under the MTDT program ([Appendix D: Case studies](#)).

The MTDT program is a comprehensive and well-thought-out reform program for the plant diagnostic system. It covers the biosecurity group's 8 diagnostic laboratories for plant pests and diseases located in Melbourne, Adelaide, Perth, Darwin, Cairns, Brisbane and Sydney, and Melbourne's Post-Entry Quarantine facility and Plant Innovation Centre. The program has determined the adequacy of the infrastructure, including equipment, and includes planning for regular maintenance and upgrades to keep pace with changing technologies and to maintain currency.

Under the department's *Asset Management Policy* (DAFF 2022d), plant diagnostic laboratories are not treated as assets with associated capital expenses and accounting to maintain fixed assets in operating condition over their useful life. Instead, the biosecurity group undertakes an annual budget bid process managed by the Department of Finance. The MTDT program plans to deliver a *Commonwealth Diagnostic Laboratories Property Management Plan* to develop a whole-of-life management approach to laboratory infrastructure (PBPMO 2022).

The MTDT program is also developing policy and a quality assurance system for the operation of plant diagnostic laboratories with the view to obtain NATA (National Association of Testing Authorities) accreditation for selected methods. NATA accreditation is widely recognised as Australia's leading mechanism to prove an organisation's laboratories are qualified, competent and comply with international standards.

Information and data management

Modern and fit-for-purpose information and communications technology (ICT) and data strategies are essential for any science-services, research and research-based activities.

The Inspector-General previously commented on the importance of modern ICT systems and the need to manage data as assets (IGB 2022, IGB 2021a). The department continues to improve digital services and has made progress against its *ICT Strategy 2020 to 2024* (DAWE 2021i). The need for significant investment to modernise ICT legacy systems was highlighted in the recent APSC capability review (APSC 2023).

A new enterprise-wide data policy, including a data governance framework and management guide, announced in 2021, has not been finalised (DAWE 2021b, 2021j).

Staff consulted for the recent APSC capability review 'consistently told the review team that systems and technology make it challenging to do their work' (APSC 2023).

The APSC review recommended:

[That the department] needs to modernise legacy ICT assets to reach a contemporary operating capability. It has an opportunity to prepare a 10-year ICT investment plan to address its key risks (APSC 2023).

The biosecurity group should ensure that enterprise-wide ICT planning addresses the specific ICT and data strategy requirements enabling the biosecurity group's science-services, research and research-based activities that support biosecurity risk management.

In consultation meetings with the Inspector-General, biosecurity officials highlighted the specialist ICT needs of laboratories that are different from those in office environments. The MTDT program covers specific ICT plans (PBPMO 2022). For example, the MTDT program is currently implementing a LIMS (Laboratory Information Management System), which addresses a recommendation made by the Inspector-General in 2022 (IGB 2022).

6.4 Assessment

6.4.1 Criterion 3: Does the department have an effective planning framework for its biosecurity science resource?

The biosecurity group has no overarching planning framework for its biosecurity science resource to determine and prioritise the actions needed in order to achieve the science- and research-related goals set by strategy. An effective planning framework should holistically consider resources, and resource allocation and sharing with partner organisations ([Figure 4](#)).

A planning framework for the biosecurity science resource should be underpinned by fit-for-purpose data. The biosecurity group should consolidate, develop, and make usable the group's data and management information to support decision-making, monitoring, and resources management for research projects, partner organisations, workforce in scientific roles and infrastructure assets.

Research projects

To plan and prioritise research investments, a fit-for-purpose research information management system is needed to routinely run and easily retrieve reports on the types of research undertaken and spendings.

The information management system should include basic project management information, including project title, objectives, strategic relevance, deliverables, project owner, partner organisation, budget and budget allocation to partner organisation/s, funding source/s, updates on project status, implementation, and benefits realisation. The database should link to cost centres in the department's financial management system.

Partner organisations

The biosecurity group should consolidate its efforts to develop, and adequately govern, the network of partnerships.

A research information management system should include a register of partner organisations to provide an overview of the research areas, topics and the services partners provide. The register should enable oversight of joint projects, initiatives, and contractual arrangements. This will provide transparency, avoid duplication of effort, and assist with the selection of the best partner for a problem at hand. The information management system should document existing formal arrangements.

A planning framework should consider the capabilities of external specialists as it is not feasible, nor necessary, for the biosecurity group to have the full range of specialist expertise, skills and infrastructure in-house (e.g. Healy 2021).

The governance of the relationship with partner organisations should include a visible, single and authoritative point of contact for research collaborators (see also [Box 3](#)) and a stakeholder engagement plan. In consultations with the Inspector-General, research stakeholders said that it can be difficult for them to identify who to contact if there wasn't already an established relationship. The quality of the engagement and planning was seen as good where the departmental contact understood science and the academic needs of the research collaborator. Some collaborators mentioned the need for clearer science leadership by the department to plan their own biosecurity research programs more effectively.

Workforce in scientific roles

The APSC capability review identified workforce planning as an urgent priority for the department (APSC 2023). Workforce planning at the enterprise-level should consider the specific requirements of the biosecurity group's science-trained workforce. Roles and responsibilities should be adequately described for different cohorts – for example, for technicians, regulatory, operational, and research sciences, as applicable.

In consultations with the Inspector-General, biosecurity officials expressed their concerns about shortages in specialist scientific skills – for example in plant diagnostics. This was not necessarily about more science roles; it was about maintaining current knowledge and expertise. Succession planning was identified as an area requiring urgent action and should be addressed in an enterprise-level workforce plan that effectively supports the requirements of the biosecurity group.

To build a pipeline for potential future employees and address skill shortages, the Plant Innovation Centre has established collaborative arrangements with several universities to host and supervise students in its laboratories ([Appendix D: Case studies](#)). The Inspector-General commends this initiative, which should be part of an overarching workforce plan.

When planning of the biosecurity group's science-trained workforce, the department should also consider and leverage the network of current and potential partnerships with external specialist experts, as discussed above ([Figure 4](#)).

The department's scientific workforce operates at the science–policy interface. The Inspector-General notes that this is unique and differs from academia ([Appendix A: Regulatory versus academic approach to science](#)). In consultations, some science staff said that they would rather not have their tertiary qualification recorded in a workforce management system to avoid disadvantage – perceived or real – when working in policy or applying for policy positions. Science staff described a culture and 'mindset that scientists can only do science'. A workforce strategy should allow for the cultural shift needed to bridge the policy–science divide, as discussed in previous chapters, to fully appreciate and use the unique skills and capabilities the science-trained workforce brings to the biosecurity business.

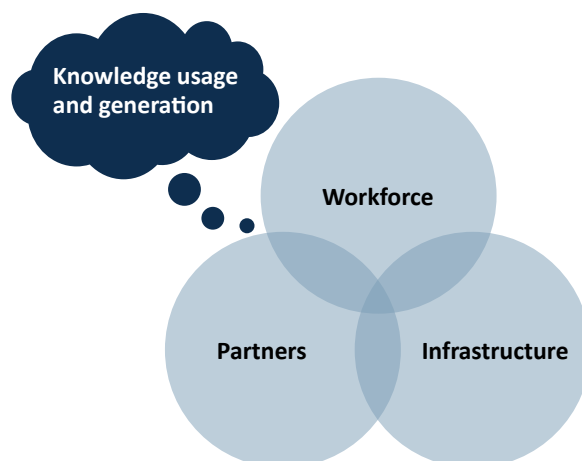
Infrastructure

Investment into critical biosecurity infrastructure assets, such as the network of diagnostic laboratories, is essential to manage biosecurity risks at the frontline and keep pace with changing technologies.

The Biosecurity and Compliance Board, through its sub-committees (IPSC and DRISC), should ensure that requirements for the biosecurity group's scientific infrastructure are represented in the enterprise-level *Asset Management Policy* (DAFF 2022d) and coordinate and drive the development of fit-for-purpose policies and a whole-of-life approach to managing biosecurity infrastructure assets.

To support planning and investment decisions, the department should develop a research asset register under its *Asset Management Policy* (DAFF 2022d).

Figure 4 Elements of a planning framework to understand available resources and plan requirements, allocation and sharing



An overarching planning framework will strengthen the commendable improvements to planning processes evident in biosecurity divisions. For example, the Plant Biosecurity Portfolio Board ([Table 3](#)) oversees planning of programs and projects of shared interest to BPSSD and the PPEBD divisions. The MTDT program managed by PPEBD and the Plant Innovation Centre in BPSSD both have well-developed planning and implementation processes in place ([Appendix D: Case studies](#)).

The Biosecurity Animal Division’s Project Board, established in February 2023, is improving oversight. Oversight can be strengthened through collaboration with the Australian Chief Veterinary Officer (ACVO). According to its recent business plan, the board intends to develop a prioritisation framework for the division’s work, and monitor progress and performance, so it can (re)prioritise funding and investment as required (BAD 2023, 2022). The Inspector-General observes that the Biosecurity Animal Division is yet to develop and implement the prioritisation framework and notes the division should be guided by an overarching planning framework.

6.4.2 Criterion 3.1: Does it map out and prioritise the biosecurity group’s current and future business needs?

As discussed above, the Biosecurity and Compliance Group should develop an overarching planning framework for its biosecurity science resource. This planning framework should be underpinned by consolidated and validated planning data to prioritise resources and analyse the gap between current and future business needs.

To prioritise the biosecurity group’s current and future business needs, the Biosecurity Investment Prioritisation Sub-Committee (IPSC) had planned to develop an investment prioritisation framework by 2021 (BCG 2022b). The framework is incomplete and on hold and has not been considered by the Biosecurity and Compliance Board. Without this framework, it is unclear how the Biosecurity and Compliance Board’s DRISC and IPSC prioritise investments into research, scientific capability and infrastructure assets.

In consultations with the Inspector-General, biosecurity officials said that the department’s enabling services model is adequate for office infrastructure but frequently inadequate for funding and maintaining highly specialised (laboratory) infrastructure.

The biosecurity group should actively engage at the enterprise-level to ensure that enterprise-wide ICT planning addresses the specific ICT and data strategy requirements enabling the biosecurity group’s research and research services. In consultation meetings with the Inspector-General, biosecurity officials highlighted the specialist ICT needs of laboratories, which are different from those in office environments. The MTDT program covers specific ICT plans (PBPMO 2022). For example, the MTDT program is currently implementing a Laboratory Information Management System that addresses a recommendation the Inspector-General made in 2022 (IGB 2022).

The Inspector-General commends the MTDT program's progress on delivering a *Commonwealth Diagnostic Laboratories Property Management Plan* (PBPMO 2022). The plan flags the need for a whole-of-life management approach to diagnostics infrastructure and should be used to inform and uplift the department's enterprise-level *Asset Management Policy* (DAFF 2022d).

The department's *Asset Management Policy* (DAFF 2022d) should treat the biosecurity group's plant diagnostic laboratories as assets with associated capital expenses and accounting to maintain fixed assets in operating condition over their useful life. It is inadequate and high-risk to fund critical biosecurity infrastructure through an annual budget bid process.

It is worth noting that arrangements are different for animal diagnostic services, which are delivered by CSIRO's ACDP (ACDP n.d., [Appendix D: Case studies](#)). The department contributes to the ACDP's operational cost under a service agreement (BSRD 2023). In the 2023–24 financial year, the department has provided \$9.186 million to the operating cost of the ACDP in line with the department's portfolio budget statement appropriation. An effective planning framework should adequately consider changes in cost for animal diagnostic services as well as future business needs.

6.4.3 Criterion 3.2: Does planning effectively align with relevant enterprise-wide plans and Commonwealth Biosecurity 2030?

Enterprise-level strategy and plans should be an input to the biosecurity group's planning of its biosecurity science resource. The Inspector-General observed that strategy and planning work undertaken at the enterprise-level was frequently not fit-for-purpose for the biosecurity divisions.

Some of the reasons for this are given in the recent APSC capability review (APSC 2023) and other reviews (ANAO 2023, IGB 2021a). Examples of ineffective strategy and planning are the *Science Strategic Action Plan* (DAWE 2020c, Garrett 2020); the *Workforce Strategy and Action Plan 2021-25* that has been in draft for 3 years (DAWE 2020a); an *Asset Management Policy* that should incorporate the specific requirements for biosecurity research / laboratory infrastructure (DAFF 2022d); and the unclear progress on a long-planned policy for the department's data assets, including a data governance framework and management guide (DAWE 2021b, 2021j).

The biosecurity group's planning of research is frequently not well aligned with actions of the roadmap *Commonwealth Biosecurity 2030* (DAWE 2021a). According to an analysis undertaken by the department's former strategic consulting services partner PwC, existing biosecurity research did not strongly align with, or cover, 6 of the 9 actions of *Commonwealth Biosecurity 2030* (PwC 2022c). The PwC report found:

a number of stakeholders were of the view that a key reason for inconsistencies in project alignment with *Commonwealth Biosecurity 2030* [...] relates to a lack of a consistent and systematic project prioritisation and coordination process across the department when RD&I projects are being assessed for approval and funding (PwC 2022c).

This is consistent with the Inspector-General's observations and should be addressed through strategy, effective governance arrangements and planning.

Appendix A: Regulatory versus academic approach to science

It is widely accepted that best-practice approaches to policy development are evidence-based. That is, informed by systematic analyses of available information. Australia's science-based approach to biosecurity is modelling best practice.

However, it is also widely accepted that the relationship between science and policy is rarely simple with challenges to be negotiated among science and policy participants in a system (e.g. Funtowicz and Ravetz 2020, Šucha and Sienkiewicz 2020, McNie et al. 2016, Leith et al. 2014, Sarewitz 2013, DIISRT 2012). Typical challenges relate to cultural differences; information access and data policy; different turn-over times for science and policy, among other things (DIISRT 2012). As mentioned above, the *Future department review* described challenges for the department's scientists regarding recognition and having a voice. The Australian Government's APS200 project on *APS200: the place of science in policy development in the public service* (DIISRT 2012) aimed to identify practical solutions to overcome or narrow the science–policy challenges and ensure that scientific advice and research is more effectively incorporated in the development of evidence-based policy. This aspiration is shared by the department (e.g. DAFF 2023e, Tongue 2020).

A challenge identified in the conduct of this review is for the Biosecurity and Compliance Group (biosecurity group) to establish a shared understanding of its approach to science, which may be described as regulatory, academic or both. A typology developed by Ruggles (2004) may assist with this ([Table 5](#)).

Ruggles (2004) typology is based on the understanding that regulatory and academic science are shaped by different external, organisational and behavioural drivers and pursue different strategic outcomes. The purpose, values and behaviours of scientists in a regulatory or academic context vary. A contemporary statement of scientific integrity ([Appendix B: Scientific independence versus integrity](#)) and workforce strategy would reflect this.

The strategy of Food Standard Australia New Zealand states:

Regulatory science is [...] grounded in a fundamental knowledge of science and regulation. It consists of the application of science to support policy, notably regulatory objectives. It requires integration of a large variety of scientific fields, the development of new methods, and the ability to synthesise information from many sources to quantify risk and support regulatory and other policy objectives (FSANZ 2019).

The Inspector-General suggests that the biosecurity group use Ruggles' typology as a starting point for discussions. This should assist with formulating a biosecurity science strategy relevant for policymakers, scientists and external research collaborators.

Table 5 Typology of a regulatory and academic approach to science (after Ruggles 2004)

	Regulatory science	Academic science
INSTITUTIONS	Government/industry	Universities/research organisations
GOALS	<p>Information is needed to meet regulatory requirements and to provide reliable information for decision makers.</p> <p>Research questions are framed by legislators and regulators and have immediate social and economic implications.</p> <p>The ultimate goal is conflict resolution through public debate over competing interests and values.</p>	<p>Original research is framed by scientists and driven by rational analysis and expert judgment.</p> <p>The aim is to expand the understanding and knowledge of the natural world through an ongoing process of questioning, hypothesising, validation and refutation.</p>
ROLE OF UNCERTAINTY	<p>Predictive certainty is required by the political process and the legal system.</p> <p>Knowledge is frequently and necessarily generalised to situations very different from those in which the original data was collected.</p> <p>Uncertainty is not welcomed by the public, legislators and the courts.</p>	Uncertainty is expected and embraced.
COMPLETENESS OF INFORMATION	Action is frequently required before all the necessary information has been developed.	Results are published when a body of information has been developed, tested and validated.
STATISTICAL ERROR	Work is often done with a mandate to minimise Type II error because of frequently incomplete information, with the result that Type I error is increased.	Scientists in academia strive to minimise Type I error.
ROLE OF VALUES	Regulatory scientists are required to consider and work with the values of many including the public, politicians, the scientific community, and the regulatory community.	Academic scientists work primarily with their own and their collaborators' values. They seldom must incorporate public or political values.
PRODUCTS	Products are grey literature, baseline data, monitoring data, regulatory/policy documents.	Results are published in peer-reviewed journal articles and books; presentations are made at professional meetings.
TIMEFRAME	<p>Time frames are determined and driven by statute, regulation, and the political process. They are finite and often quite short (90 days to 2–4 years).</p> <p>Resolution of problems being reacted to is often driven by crisis or mandated timelines or the election cycle.</p>	Time frames are open-ended; usually carried out relatively free of an urgent need for the information generated.
POLITICAL INFLUENCE	Politics is a direct influence. Upper-level administrators are appointed by the government. Funding is at the will of government. Ultimate oversight is by the courts.	The researcher's own political philosophy is and their perception of the preferences of grant and tenure review committees are indirect influences.
ACCOUNTABILITY	Accountability is to legislatures, courts and the public.	Accountability is to professional peers.
INCENTIVES	Incentives are compliance with legal requirements and working for the public good.	Incentives are professional recognition, advancement in tenure system or university administration.

Appendix B: Scientific independence versus integrity

There is limited awareness of the department's current statement of scientific professional independence, which was approved by the Executive Management Committee in September 2018 (EMC 2018). The statement was published on the department's internal website and last reviewed in August 2021 (DAWE 2021k).

Statement of Scientific Professional Independence:

Stakeholders can be confident that the [department] produces high quality scientific advice, based on the latest available information from staff and external partners with relevant expertise and professional standing. Scientific activities are undertaken to provide:

- the best available outputs for deciding how to effectively safeguard Australia's agricultural, fisheries, food, forestry and water resource industries so that they remain competitive, profitable and sustainable
- the most up-to-date, relevant, and accurate information to make evidence-based decisions and inform policy development on Australia's agricultural, fisheries, food, forestry and water resources.

Departmental scientists are public servants who are obligated to work within the Australian Public Service Values, Employment Principles and Code of Conduct. Staff are aware of these terms of employment and advised that any public comment on departmental work will represent the views of the department, unless it is clearly stated that the views expressed are provided based on personal opinion.

This statement of independence is built on scientific work being conducted to meet the strategic mandate of the department, rather than the mandate of individuals within it.

Research and analysis need to be scientifically robust and independent from the Government's views and policy positions but should be focussed within the strategic mandates of the department. One critical role of research and analysis is to inform future policy changes. The department recognises the need for a supportive permissive culture to foster innovation. Scientists are encouraged to ask questions, develop new ideas and methodologies and engage in effective collaboration, to ensure the delivery of high-quality scientific advice. The department encourages peer-reviewed publication of scientific research outputs and, where appropriate, recognises individual staff authorship following a process of rigorous review and clearance.

Scientific professional independence is maintained at all times such that research and analysis consistent with departmental priorities is conducted without prejudice or bias (DAWE 2021k).

In the context of regulatory science ([Table 5](#)), it seems appropriate to replace the statement of scientific independence with a statement of scientific integrity. The statement of scientific integrity should be reflected in the workforce strategy (e.g. DAWE 2020c).

A statement of scientific integrity should:

- place strong emphasis on the science-culture expected among policy and science staff at all levels of the biosecurity group's leadership
- clarify what it means to be a regulatory rather than an academic scientist ([Table 5](#)) to reduce role confusion and clarify the expected behaviours and conduct of the department's scientists
- make clear the rules on perceived or actual conflict of interest, including the department's policy related to external honorary appointments (e.g. Adjunct Professor and Visiting Research Fellow)
- clarify the behaviours and conduct expected of policymakers who engage with scientific evidence and advice.

In consultation meetings with the Inspector-General, some biosecurity officials expressed that they had encountered confirmation bias whereby science users looked for results to confirm prior beliefs and policy positions.

Policy must engage with results that challenge prior beliefs and positions. What constitutes ‘evidence-based decision-making’, and its importance should be supported by a strong science culture led by a science-strategy and statement of scientific integrity.

Appendix C: Visions and plans for science

Over the years, the department has developed various visions (Table 6) and plans for science and research summarised here. The enterprise-wide plans are the context to better understand the Biosecurity and Compliance Group’s (biosecurity group) management of its science resource. The implementation status of these plans was out of scope in this review.

The Inspector-General observed that agreed enterprise-level plans of immediate relevance for the biosecurity group were not necessarily seen through and implemented. For example, policy documents may have been finalised (e.g. guidelines for scientific publications devised and published by the department), but their contents have not been consistently used and therefore not implemented (e.g. usage of the guidelines for scientific publications).

Table 6 Visions for science and research

Source	Vision
<i>DAFF Science Strategy 2013–2018</i> (DAFF 2013)	A connected DAFF science community that underpins the work of the department and is held in high esteem both within DAFF and by all the department’s stakeholders.
<i>Statement of scientific professional independence</i> (DAWR 2018a)	
<i>Biosecurity Research, Development and Extension Strategic Statement 2018–2025</i> (DAWR 2018b)	<i>Biosecurity research, development and extension</i> supports the national biosecurity system through delivery of evidence-based solutions that strengthen our risk-based approach to managing biosecurity.
<i>Science Strategic Action Plan</i> (DAWE 2020c)	<p>The department is a leader in solving problems through science. We produce, commission and apply world class science to inform regulatory and policy decisions and find innovative solutions to enhance Australia’s agriculture, unique environment, heritage, and water resources.</p> <p>We do this by building the scientific capability of our staff, collaborating with research institutions, innovators and Indigenous Australians, and sharing our expertise and findings with our stakeholders, partners and the community.</p>
<i>Science Strategic Action Plan 2.0</i> (DAWE 2021e)	We will be known amongst our people, stakeholders and scientific talent for using the best available science to inform and deliver leading regulatory, operational and policy outcomes.
DCCEEW/DAFF Science Council; Terms of reference and ways of working (DCCEEW and DAFF 2023)	We work to embed science as a core value across DCCEEW and DAFF, to ensure that use of best available scientific information is an integral element of departmental decision-making, and to promote the role of science in development and delivery of effective regulatory, operational and policy outcomes.

Science action plan for supporting innovative science 2016–2017

A catalyst for the plan was the Prime Minister's National Innovation and Science Agenda announced in December 2015 (ANAO 2017). In response to the announcement, the Deputy Secretary Biosecurity requested that the department's Chief Scientist prepare a plan to strengthen the department's scientific capability. The plan had the following actions:

The Chief Scientist will lead the progression and implementation of the following actions through collaboration with relevant Divisions in 2016–2017:

1. Revision of our people and capability planning to include:

- Improved collection of metrics for measurement of current scientific workforce and future state needs.
- Managerial support for study leave, secondments, development and learning opportunities.
- Support mechanisms for scientific staff to dedicate time to innovate.
- Support for scientific staff to showcase the departmental science capacity.
- Simplifying recruitment procedures to attract high-calibre scientists.
- Recognition schemes for the vital role of science and scientific excellence in the department.

2. Improving IT infrastructure:

- Development of a scientific equipment asset register and a departmental-wide plan for modernising/upgrade of equipment.
- Improvements to internet-based diagnostic tools and communication.
- Improving file sharing capability with a focus on large geospatial files.
- Development of a departmental staff skills register.
- Development of or utilisation of an existing peer to peer intradepartmental networking tool.
- Development of a platform (secure, if needed) for online discussion of ideas and wicked problems (i.e., departmental science blogs, TED talks, etc.).

3. Information access and sharing:

- Development of a departmental policy for publication in scholarly journals.
- Improvements to access and sharing of scientific literature.
- Continuation of the annual departmental science conference.

Science strategy action plan 2017–2020

The Chief Scientist presented a paper on the plan to the Executive Management Committee in February 2017 (Chief Scientist 2017). Attached to the plan was a detailed schedule of outputs, specific actions and the area responsible for the action. The plan was described as following:

Science programs within the Department of Agriculture and Water Resources (the department) support our mission to sustain the way of life and prosperity of all Australians through thriving agriculture, fisheries, forestry and water resources sectors.

To achieve the vision of the Science Strategy 2013-18, respond to the National Innovation and Science Agenda and strengthen support for the department's mission, the Science Strategy Action Plan identifies specific initiatives focussed on:

- strengthening the department's scientific capability, credibility and integrity
- recognising the integration of science (scientists, method, data, knowledge and systems) in the department's business when communicating to stakeholders and the broader community

- raising the awareness and profile of the department's scientific resources in strategic planning, funding and priority-setting
- establishing quality assurance procedures for science
- improving community, stakeholder and executive confidence in scientific integrity and capability the department
- ensuring the public, the department's stakeholders and the scientific community see us as a focus for and showing leadership to advance innovation
- providing direction to national research efforts consistent with portfolio priorities
- increasing the provision of accessible and authoritative public information to industry, media and the public
- facilitating a culture of a one-department science, together with portfolio agencies, to optimise the sustainability and performance of its scientific resources and investment
- becoming an employer of choice for scientists
- attracting, developing and retaining staff with science qualifications who understand, communicate and meet the department's scientific competency needs
- ensuring evidence-based decision-making
- identifying and accessing the best available science, tools and knowledge systems to ensure policy processes and outcomes are underpinned by rigorous and credible evidence
- creating synergistic science partnerships that build on the department's relationships with other key organisations in scientific research and development (R&D) to maximise outcomes from collaboration
- adding value to the Australian Public Service (APS) and the Australian Government.

(Chief Scientist 2017)

The 2017 plan focused on 3 areas:

1. Science networking, information access and research prioritisation

- Improved IT infrastructure and support relevant to scientific business needs.
- Improved access to scholarly journals.
- Guidelines for departmental scientists to collaborate externally and publish in scientific journals.
- Research priorities defined.

2. Science communication and media planning

- A strong science-based departmental employment brand and market driven talent sourcing strategy.
- Commitment to department scientists more actively engaging in scientific workshops, forums, conferences and with the community.
- A science communications plan.

3. Innovative scientific workforce

- Dedicated science leadership and management that supports mechanisms for scientists to be innovative.
- Improved metrics for measurement of the current scientific workforce and future needs.
- Simplified and targeted recruitment procedures to attract high calibre scientists.
- Managerial support for scientific learning and development opportunities, including secondments.
- Scientific mentoring program and career mapping tools.

(Chief Scientist 2017)

Science strategic action plan November 2020 – April 2022

The *Future department review* recommended that a science strategy be developed (Tongue 2020). Under the leadership of the department's Band 2 consultant Science Convenor, a *Science Strategic Action Plan* was developed instead and approved by the Executive Board on 24 November 2020 (OSC 2020):

Objectives

SUPPORT POLICY DEVELOPMENT AND REGULATION

To support the department's policy and regulatory efforts through evidence, based on the best available science.

NEEDS DRIVEN SCIENCE, BASED ON RELATIONSHIPS

To build effective stakeholder relationships to properly understand stakeholder needs, problems and opportunities.

QUALITY PARTNERING

To build goal-oriented networks collaborating with research institutions and innovators both internally and externally.

DELIVERY OF IMPACT

Through quality and timely communication with end users, deliver impact through translation and take up of scientific findings.

CAPABILITY AND CAREER DEVELOPMENT

To support science capability; and ensure the department's scientific cohort are motivated, well-resourced and connected.

INDIGENOUS ENGAGEMENT

Partnering with Indigenous communities to actively incorporate Indigenous knowledge.

Actions

STAFF MOBILITY AND COLLABORATION/PARTNERSHIPS

- Enable and incentivise short and longer term staff transfers/exchanges.
- Increase cross fertilization and collaboration with the external research sector through strategic partnership arrangements.
- Scope the feasibility of a departmental science capability search tool.
- Ensure early and genuine Indigenous engagement is incorporated into departmental practices for science development and application.

STAKEHOLDER ENGAGEMENT (NEEDS DRIVEN SCIENCE) AND TRANSLATION

- Increase targeted stakeholder relationship building.
- Scope potential for better utilizing relevant steering committee boards.

ENHANCED COMMUNICATION

- Increase communication training for departmental scientists.
- Better (and more) communication around the science we do, and its impact, across a range of platforms and opportunities.

CAPABILITY: CAREER DEVELOPMENT + RESOURCING

- Create a policy that specifically recruits and retains high performing talent, and provides tailored scientific career progression provisions.
- Enhance tools, systems and technologies to support science practitioners.

GOVERNANCE

- Establish robust and sustainable departmental science governance and increase executive level science representation.

Metrics

STAKEHOLDER SATISFACTION, INTERNALLY AND EXTERNALLY

‘How readily applicable, and valuable in impact, are our science outputs and commissioned science to both internal and external end users and science partners?’ (Annual survey).

INTERNAL STAFF SATISFACTION

‘How well are our scientific staff supported to produce high quality and impactful science outputs and commissioned science?’ (Annual survey).

RETURN ON OUR INVESTMENT IN SCIENCE

‘Do we get good value for money from the science developed in the department as well as procured by the department? (End of project assessments).

SCIENCE QUALITY ASSESSMENT

‘How do our departmental science outputs and commissioned science rate, relative to appropriate research sector standards/benchmarks, and can be improved? (Bi-annual independent reviews).

Implementation

‘Vision without execution is hallucination’, Thomas Edison, Inventor & Business Leader (1847 – 1931).

Our plan ...

- Executive Board sign off for SSAP (by mid-November).
- Put in place Science Council meetings (mid-November, mid-December).
- Communicate SSAP appropriately, inc. initiate related external stakeholder discussions.
- Initiate implementation of three cross divisional projects in the next three months (including developing a resource budget); conclude ‘new look’ CSIRO contractual arrangements; etc.

Resources

- ‘A strategy isn’t a strategy unless resources shift’, GG Garrett & GJ Davies, ‘Herding Cats’, Triarchy Press, UK (2010).
- Resources = \$ + people’s time, i.e., importantly, how we might expect people to operate differently.
- We recognise departmental fiscal resources are very tight.
- At this point in time the only likely financial requirement is to provide project leaders with backfilling capacity when we are utilising their key staff members for focused, cross boundary projects (as per implementation action 4 above).

(OSC 2020, Garrett 2020)

The *Science Strategic Action Plan* informed the science roadmap in *Our future department blueprint 2021–2025* (DAWE 2021b). However, the science roadmap does not name the same actions. Thus, it is unclear if the *Science Strategic Action Plan* was implemented.

Science action plan of the Our future department blueprint 2021–2025

According to the department's documents, the *Science Strategic Action Plan* informed the 'science roadmap' of the *Our future department blueprint 2021–2025* (DAWE 2021c). However, the actions of the blueprint's science roadmap are different to those of the action plan (DAWE 2021e).

The blueprint's science roadmap names 3 actions called 'initiatives' and 1 to 3 sub-actions:

Formalise Office of the Science Convenor (OSC), Science Council and 'communities of practice' and align their mandate to science priorities.

- Establish single view of science 'communities of practice' (2021-22).
- Embed role of OSC in priority projects (soft start or continuation) (2022-23).
- Ensure the department has the science resources and programs to deliver government priorities.
- Deliver academic journal library with single subscription management across the department (2022-23).
- Feed outcomes from capability gap analysis into workforce planning and technology for delivery (2022-23).
- Secure scientific talent pipeline (recruitment, development programs, career pathways) (2023-24).
- Ensure science is embedded into departmental policy processes and submissions.
- Instil work practices to routinely integrate science evidence base into decision-making including the Indigenous Science Pathway.

(DAWE 2021c)

While this review did not assess the implementation of the blueprint, the Inspector-General has nevertheless observed that none of these actions have been completed by the time specified. Some actions were already mentioned in the *Science Strategy Action Plan 2017-2020* (Chief Scientist 2017) – for example, a library subscription system, knowledge of the science workforce for future planning, and the adequacy of IT and data systems and tools.

Science strategic action plan 2.0

The 2020 *Science Strategic Action Plan* (SSAP) was soon replaced by the *Science Strategic Action Plan 2.0* (DAWE 2021e). The latter refers specifically to the blueprint:

OFFICE OF THE SCIENCE CONVENOR (OSC)

The OSC helps to connect and enable DAWE scientists and technologists to develop, deploy and communicate the best available knowledge, partnerships, tools and systems to underpin our departmental purpose, objectives and priorities.

OSC/Sub-group actions (outside the Blueprint)

Science publications and principles policy

Science Health Check panel

Internal and external science satisfaction surveys

Consciously fostering the next generation of science leaders (in accordance with Science Council Terms of Reference)

Managing existing science partnerships and input into future partnerships

Specific Blueprint actions

- 1.1 Establishing ongoing science coordination functions for OSC and Science Council
- 1.2 Aligning on science strategic priorities
- 1.3 Ensuring visibility of the OSC and deputy secretary of science on DAWE org chart
- 1.5 Collating and reporting on performance of the Blueprint initiatives

- 2.5 Establish platform for academic journal access Collaborative Blueprint action
- 3.1 Embedding science rationale into regular business reporting (science key in relevant policy proposals)

SCIENCE MAPPING, PRIORITISATION AND GAPS

Sub-group actions > Specific Blueprint actions

- 2.1 Capability gap analysis and future investment guidance
- 2.3 Reviewing existing scientific workforce (part of capability gap analysis)

Collaborative Blueprint action

- 4.6 Reviewing existing and prospective science collaborations (part of capability gap analysis)
- 4.7 Procurement panel of trusted partners

RECRUITING, DEVELOPING AND RETAINING SCIENCE TALENT

Sub-group actions (outside the Blueprint)

Strategic advice and knowledge sharing on how best to foster scientific identity, talent recruitment and careers

Specific Blueprint actions

- 2.6 Building learning, development and mentoring programs for our science community
- 2.7 Recruitment plan to enable acquisition of scientific talent to fill capability gaps

Collaborative Blueprint action

- 6.3 Science workforce plan to align to capability gap analysis
- 6.4 Designing a general Science classification stream of employment
- 6.5 Alternative working arrangements for workforce mobility

EMBEDDING FIT FOR PURPOSE TOOLS, DATA AND TECHNOLOGY

Sub-group actions (outside the Blueprint)

Supporting, connecting and promulgating Communities of Practice

Specific Blueprint actions

- 2.2 Formalising science and technology 'Hubs of Excellence'
- 2.4 Reviewing existing and prospective science tools and tech

Collaborative Blueprint action

- 5.1 Science capability search tool platform development
- 5.2 ISD partnership formation [initially, via the DXC SSB Discovery project]

BUILDING TRUST IN SCIENCE THROUGH ENHANCED COMMUNICATION AND ENGAGEMENT

Sub-group actions (outside the Blueprint)

Science 101 modules for all DAWE staff

Strategic engagement with Indigenous champions and programs of work

Specific Blueprint actions

- 1.4 Internal science engagement plan

Collaborative Blueprint action

- 3.2 Developing an Indigenous science pathway (Our Knowledge Our Way)
- 4.1 Evaluation of current science communications
- 4.2 External science engagement plan

- 4.3 Spokesperson framework
- 4.4 Indigenous science partnerships co design
- 4.5 Indigenous science engagement plan.

(DAWE 2021e)

Appendix D: Case studies

The following case studies (**Boxes 4 to 9**) give an overview of some of the Biosecurity and Compliance Group's programs, research intensive business areas and research partnerships, and their purpose in the department's biosecurity system.

The case studies make observations on areas for improvement and helped in answering the review criteria ([Table 1](#)).

1. Biosecurity Innovation Program

Box 4 Biosecurity Innovation Program

The biosecurity group established the Biosecurity Innovation Program (BIP; 2018-2023) in response to recommendations by Craik et al. (2017) in their landmark review *Priorities for Australia's biosecurity system*.

The program ended in 2023. The biosecurity leadership group is yet to devise future plans for biosecurity research and innovation and their integration into business as usual. When it does so, it would benefit the biosecurity group to evaluate the Biosecurity Innovation Program's success against the recommendations of the Craik review.

The Biosecurity Innovation Program's objectives were to:

- deliver innovative technologies and approaches to address emerging biosecurity challenges and assist with biosecurity screening of goods and travellers at international ports
- deliver emerging technologies with potential to improve early detection beyond ports, for the purpose of managing biosecurity risk to improve and maintain export market access for Australia's agriculture sector
- avoid high costs associated with eradication and management by testing new technologies and approaches for the prevention or early detection of new and emerging diseases (DAWE 2022).

The appropriation bill signed on 29 May 2018 provided \$25.2 million for the financial years 2018–19 to 2022–23. Going forward, the innovation program has been provided \$2.1 million for the financial year 2023–24 to fund existing projects that were moved from 2022–23 to the current financial year. Since its establishment, the program has funded over 120 projects.

Governance

The biosecurity group's peak governance body for the innovation program was the Data, Research, and Intelligence Sub-Committee (DRISC) from mid-2021 to March 2023 ([Table 5](#)). Before this, the now dissolved Biosecurity Research and Innovation Steering Committee (BRISC) provided governance and oversight.

A business area in the Biosecurity Strategy and Reform Division (BSRD) supported oversight and administered the program. The Inspector-General found the business area's governance and project management processes to be well-designed and mature. The business area managed an annual, publicly run expression of interest process; shortlisting of priority proposals; engaged with the Biosecurity and Compliance Board's

DRISC and other senior biosecurity officials on project selection, prioritisation and approval; the review of progress reports; and finalised and closed projects. It was the responsibility of the biosecurity group's project leads to inform project sponsors (senior executive level) on project progress and any issues.

The Biosecurity Innovation Program's Innovation Ideas Committee assessed project ideas. It shared information, resources and networks to increase collaboration and reduce duplication (DAWE n.d.). Committee members were experts from across the biosecurity group and department.

Evaluations

Department evaluations were part the Biosecurity Innovation Program's governance arrangements to identify areas for improvement. The first evaluation was completed in July 2021 and covered the period from 1 July 2018 to 30 June 2020 (DAWE 2021a). The findings highlighted the maturity and strength of the program's governance and project management processes. Areas for improvement included strengthening the strategic focus in project selection and building collaborations across divisions to provide more targeted and cross-cutting outcomes. The Inspector-General notes that these findings align with the wider observations made in this review, indicating that the issues identified are not specific to the Biosecurity Innovation Program.

Another evaluation covering the period from 1 July 2018 to current was planned to be completed in the financial year 2023–24.

Project prioritisation

The Biosecurity Innovation Program ran a public expression of interest process to seek innovation project ideas (DAWE 2022). The ideas had to align with one of the innovation program's 5 priorities:

- automation
- data and intelligence
- communication and collaboration
- risk analysis
- surveillance, diagnostics, and screening (DAWE 2021b).

Once a project idea met certain eligibility criteria, it was assessed and ranked against other project ideas by the Innovation Ideas Committee. In prioritising ideas, the business area administering the Biosecurity Innovation Program ensured that project ideas were evenly spread across biosecurity divisions. Only successful ideas proceeded to the full proposal stage.

The departmental project lead developed the idea into a full proposal in collaboration with the external project partner. Proposals also described how a project would deliver benefits to the biosecurity system and how it aligned with the department's corporate plan and the program's priorities and objectives. The proposals were approved by the project sponsor – the responsible first assistant secretary.

Full proposals were again prioritised using a ranking system by the administering team and other department staff. The funding available to the program determined the cut-off in the ranked list of projects. All projects within the funding envelope went to biosecurity group's first assistant secretaries for final review and approval. The final list was submitted to DRISC for approval.

Project management

The administering business area supported the project lead by managing tasks such as procurement of contracts and the budget. In consultations with the Inspector-General, biosecurity officials expressed their appreciation for such tasks to be centrally administered via the Biosecurity Innovation Program.

The project lead was responsible for engaging with the third party and monitoring and reporting on the project progress (DAWE 2022). The program used the information for reporting on project status and outcomes.

Implementation

The Biosecurity Innovation Program had a mature evaluation process with ongoing project monitoring and reporting. However, while the program had developed a benefits management plan (DA 2019) – hence a process to receive feedback on the benefits realised from a project – it was up to the project lead and beneficiaries to implement project outcomes.

In consultations with the Inspector-General, biosecurity officials mentioned the difficulty to attain funding to implement and operationalising project outcomes after the research phase. This is a problem not just for projects funded through the Biosecurity Innovation Program.

Now that the program has ended, it would be beneficial for the biosecurity leadership to evaluate the Biosecurity Innovation Program's outcomes against the recommendations of the review by Craik et al. (2017) and use this information for future planning.

References

- DA (Department of Agriculture) 2019. Benefits management plan: Biosecurity Innovation Program. Internal document: Department of Agriculture.
- DAWE (Department of Agriculture, Water and the Environment) 2022. Program plan: Biosecurity Innovation Program. Internal document: Department of Agriculture, Water and the Environment.
- DAWE (Department of Agriculture, Water and the Environment) 2021a. Biosecurity Innovation Program: mid-term evaluation (2018-2020). Internal document: Department of Agriculture, Water and the Environment.
- DAWE (Department of Agriculture, Water and the Environment) 2021b. Biosecurity Innovation Program. Department website, Department of Agriculture, Water and the Environment.
- DAWE (Department of Agriculture, Water and the Environment) n.d. Innovation ideas committee terms of reference. Internal document: Department of Agriculture, Water and the Environment.
- CRAIK, W., PALMER, D. and SHELDRAKE, R. 2017. Priorities for Australia's biosecurity system: an independent review of the capacity of the national biosecurity system and its underpinning Intergovernmental Agreement. Canberra: Department of Agriculture and Water Resources.

2. Centre of Excellence for Biosecurity Risk Analysis

Box 5 Centre of Excellence for Biosecurity Risk Analysis (CEBRA) Program

The Centre of Excellence for Biosecurity Risk Analysis (CEBRA) is a long-standing biosecurity research program of the Australian Government. It is an important part of the department's suit of approaches to managing biosecurity risk. The program is hosted by the University of Melbourne (CEBRA 2022a). Between 2006 and 2013, the program operated as the Australian Centre of Excellence for Risk Analysis (ACERA). In May 2013, ACERA became CEBRA when the New Zealand Government, represented by the NZ Ministry of Primary Industries, signed on as a funding partner.

The program's mission is to 'provide strategic thinking and practical solutions across the biosecurity continuum', with the strategic objective to assist the Australian and New Zealand governments by delivering 'practical, rigorous solutions and strategic advice related to biosecurity risk analysis, encompassing the assessment, management, and communication of biosecurity risk' (CEBRA 2021).

The program has received ongoing funding since 2006. The current CEBRA grant agreement totals \$7.579 million for 4 years from July 2021 to June 2025. The program will be up for open tender before the end of this period.

Governance

The CEBRA program is delivered in accordance with the terms and conditions of the 2021–25 grant agreement (DAWE and UM 2021) and the grant opportunity guidelines (DAWE 2020). A program plan specifies the requirements and processes for managing the grant program, including the objectives, outcomes, outputs, performance measures, milestones, and roles and responsibilities (DAWE 2021).

There are 2 pillars in the governance of the program: CEBRA's and the department's governance. The CEBRA grant agreement directs the governance structure to be implemented for the program by the University of Melbourne and their relationship with the department. Accordingly, CEBRA is governed by a board that monitors and provides advice on topics including research policy, work plans, performance, and professional standards. The board has an independent chairperson and representatives from the University of Melbourne and the Australian and New Zealand governments. A chief executive officer (CEO) supports, and is accountable to, the board and is responsible for the operational management of the program. The board may be assisted by third-party advisors from across industry, academia and government, as required and agreed. The role of a scientific review panel is to review and approve draft project proposals and assess final reports produced by CEBRA (CEBRA 2022a).

The biosecurity group's peak governance body for CEBRA had been the Biosecurity and Compliance Board's Data, Research and Intelligence Sub-Committee (DRISC) from mid-2021 to March 2023 (Table 3). Before this, the now dissolved Biosecurity Research and Innovation Steering Committee (BRISC) provided oversight. CEBRA's CEO is an advisor to DRISC. The DRISC was suspended in March 2023 pending a governance review. This has disrupted governance arrangements and CEBRA's engagement 'with the department's [senior biosecurity officials], primarily through the Biosecurity and Compliance Board and its Data, Research and Intelligence Sub-committee [DRISC] and/or directly research project sponsors, and between CEBRA project leads [...]' (DAWE 2021).

A business area in the Biosecurity Strategy and Reform Division (BSRD) supports oversight and administers the CEBRA program. The Inspector-General found the area's governance and project management processes for the CEBRA program to be well designed and mature. The area engages with DRISC and other senior biosecurity officials on matters including project selection and approval, the review of progress reports and project finalisation and closure. It is the responsibility of the biosecurity group's project leads to inform project sponsors (senior executive level) on project progress and any issues.

Independent review

The department's partnership with CEBRA has grown and matured over time. Independent reviews have been undertaken after each funding cycle. The most recent review was in 2020 (ACIL Allen Consulting 2020). It was positive overall, concluding that the calibre and quality of CEBRA's research is high and impactful and that the program is performing against its objectives. Areas for improvement included the effectiveness of identifying suitable projects, strengthening of project management and the facilitation of collaborations that maximise value.

The 2020 review led to changes in CEBRA's governance, improved project management practices and the introduction of strategic, multi-year projects. In a consultative process, the department and CEBRA overhauled performance indicators for the CEBRA program to devise a fit-for-purpose performance framework covering the areas of stakeholder engagement; research, development, and extension; collaboration; excellence; governance; monitoring and evaluation (CEBRA 2022a, 2022b).

The review's recommendations were progressed under the current round of funding (CEBRA 2022a). Their implementation is overseen by the BSRD. The Inspector-General commends the process and the improvements made.

Projects

Research topics are identified by individual biosecurity business areas and/or CEBRA. Biosecurity officials consulted in the last CEBRA review (ACIL Allen Consulting 2020) found the project selection process was reactive and lacking strategy, and the biosecurity group's business areas competed for their own priorities lessening the overall impact of limited research funding.

Proposals are developed in response to a call for proposal or, alternatively, when identified as priority topics. CEBRA collaborates with the business area in developing a concept proposal providing sufficient detail and a rationale for why the research is relevant and should be funded. The scientific review panel reviews and approves concept proposals. DRISC provides in principle agreement to projects, which then progress to the Biosecurity and Compliance Board for review and endorsement. This provides transparency across the first assistant secretaries' level of the biosecurity group (DRISC 2022). Since DRISC was suspended, projects are approved by first assistant secretaries.

Approved concept proposals progress to the full proposal stage. Development of a mature proposal 'involves considerable engagement with all stakeholders, including data custodians and end users, to ensure all project requirements (including data, budgets and sensitivities) are appropriately canvassed, understood and agreed [...]' (DAFF 2022). Full proposals are endorsed by the project sponsor and, in the absence of DRISC approved by the delegate (currently first assistant secretary, Biosecurity Strategy and Reform Division) for subsequent inclusion in CEBRA's work plan.

During the project delivery phase, there is the expectation of active engagement between CEBRA and the department project leads. Changes to project milestones must be mutually agreed and the proposal updated accordingly. Major changes require sign-off by the project sponsor. Final project reports are reviewed by the biosecurity group (project leads coordinate the process) and the CEBRA scientific review panel. CEBRA must address any feedback before project closure.

The CEBRA project life cycle does not include the adoption and implementation of research findings, which lie with the biosecurity group. The biosecurity group's involvement at the project planning stage and a science and research strategy, which is yet to be developed, should ensure that the projects are relevant and deliver 'practical solutions' (CEBRA 2021). It is commendable that the business area administering the CEBRA program has a well-designed feedback process in place to understand how project findings and outputs are being implemented. However, the biosecurity group does not currently have a framework to fully understand the long-term benefits realised across the group.

CEBRA's commitment to communicating, disseminating and promoting research findings is underpinned by a stakeholder engagement framework and respective performance indicators. The recently updated [ACERA/CEBRA project database](#) is an example of clear and informative communication. It lists past and current projects and reports under 9 research themes according to their funding period (CEBRA n.d.).

References

- ACIL ALLEN CONSULTING 2020. Report to Department of Agriculture, Water and the Environment, 25 March 2020, Centre of Excellence for Biosecurity Risk Analysis review. Internal document: ACIL Allen Consulting.
- CEBRA (Centre of Excellence for Biosecurity Risk Analysis) 2022a. Annual report 2021-2022. Melbourne: University of Melbourne, Centre of Excellence for Biosecurity Risk Analysis.
- CEBRA (Centre of Excellence for Biosecurity Risk Analysis) 2022b. Annual report 2021-2022, Appendices. Melbourne: University of Melbourne, Centre of Excellence for Biosecurity Risk Analysis.
- CEBRA (Centre of Excellence for Biosecurity Risk Analysis) 2021. CEBRA strategic vision 2021-2025. Melbourne: University of Melbourne, Centre of Excellence for Biosecurity Risk Analysis.
- CEBRA (Centre of Excellence for Biosecurity Risk Analysis) n.d. [Overview of ACERA/CEBRA projects](#) a summary of project outputs and outcomes. Melbourne: University of Melbourne, Centre of Excellence for Biosecurity Risk Analysis. [Accessed 10 June 2023]
- DAFF (Department of Agriculture, Fisheries and Forestry) 2022. Centre of Excellence for Biosecurity Risk Analysis (CEBRA)- program overview. Internal document: Department of Agriculture, Fisheries and Forestry.
- DAWE (Department of Agriculture, Water and the Environment) 2021. Program plan, Centre of Excellence for Biosecurity Risk Analysis (CEBRA) grant program 2021-25. Internal document: Department of Agriculture, Water and the Environment.

DAWE (Department of Agriculture, Water and the Environment) 2020. Centre of Excellence for Biosecurity Risk Analysis (CEBRA) grant program- grant opportunity guidelines 2021–25. Canberra: Department of Agriculture, Water and the Environment), Community Grants Hub.

DAWE (Department of Agriculture, Water and the Environment) and UM (University of Melbourne) 2021. Grant agreement in relation to the Centre of Excellence for Biosecurity Risk Analysis (CEBRA) grant program. Agreement ID: 4-G7Z8GK7. Internal document: Department of Agriculture, Water and the Environment.

DRISC (Data, Research and Intelligence Sub-committee) 2022. Minutes; meeting 8, Monday, 27 June 2022. Internal document: Department of Agriculture, Water and the Environment.

3. Modern Technologies and Diagnostic Tools program

Box 6 Modern Technologies and Diagnostic Tools (MTDT) program

The Modern Technologies and Diagnostic Tools (MTDT) program is a \$22.77 million, 4-year investment (2021–2025) by the Australian Government to modernise the biosecurity diagnostics system and improve the speed and accuracy of pest and disease identification at the border. Of the total department appropriation, 97.81% was allocated to the Plant Protection and Environmental Biosecurity Division (PPEBD) (previously the Australian Plant Protection Office) and 2.19% (\$0.5 million) was allocated to the Biosecurity Animal Division (BPBM 2022, 2021).

Allocations are managed by their respective divisions with no overlap in governance or project management arrangements. The PPEBD has committed to major reforms of the plant diagnostics system. The Biosecurity Animal Division's allocation has been split over 2 projects on biologicals undertaken by CSIRO's Australian Centre for Disease Preparedness (ACDP) ([Box 9](#)).

The following refers to the plant component of the MTDT program, which aims to 'achieve an agile and effective National Plant Biosecurity Diagnostics System underpinned by robust governance and technical capacity' (BPBM 2022, 2021).

The program is extensive and covers 7 major reform areas:

- Strategic policy and business design: providing strategic direction to 2030 and guiding new investments.
- Laboratory assurance program: implementing a laboratory assurance and quality management in plant diagnostics laboratories with the view to obtain National Association of Testing Authorities (NATA) accreditation for selected methods.
- Diagnostics capacity: expanding diagnostics capacity and capability by building the skills of the departmental workforce and onboarding new staff.
- Property, equipment, and tools: ensuring the future diagnostics system is supported by the right facilities, equipment and tools.
- Systems and infrastructure: ensuring diagnostics data and information needs are supported by appropriate infrastructure and information systems.
- Research and innovation: building in-house capability to conduct research and innovation and adopting modern diagnostic technologies to improve operational service delivery.
- Program governance and administration.

The Inspector-General regards the reforms underway in the MTDT program as essential and urgent. The program plan describes the following benefits (BPBM 2021a):

- improved timeframes for diagnosis of samples which will help with border clearance of plants and plant products

- upgraded and modern laboratory practices to provide a long-lasting legacy
- established laboratory assurance program to give confidence in diagnostic processes
- improved workforce planning to ensure a skilled and responsive workforce
- greater technical capacity to perform diagnostics, both internally and externally with key partners
- new equipment and tools to perform diagnostics
- targeted research and innovation program to improve in-house capability to investigate, develop and validate faster and more accurate diagnostic assays thereby improving service delivery outcomes
- better understanding of pests reaching the border to inform biosecurity risk management
- improved departmental reputation and confidence of external stakeholders.

Governance

The MTDT program is formally owned by PPEBD managed out by Plant Health Policy Branch. The program's governance structure is transparent and well developed ([Figure 5](#)).

The Plant Biosecurity Portfolio Board ([Table 3](#)) provides oversight of the division's objectives, portfolio, and associated activities on behalf of the plant division's first assistant secretary (PBPMO 2021).

The governance of the plant component of the MTDT program is well-developed. Some of the reform areas concern shared services – for example, IT system for capture, storage and analysis of diagnostics data, and diagnostic reference libraries. Thus, it would be important to set up arrangements that oversee and clarify shared requirements of biosecurity divisions and connect to the shared-services work undertaken at the enterprise-level (see [Chapter 6](#)).

Linkages

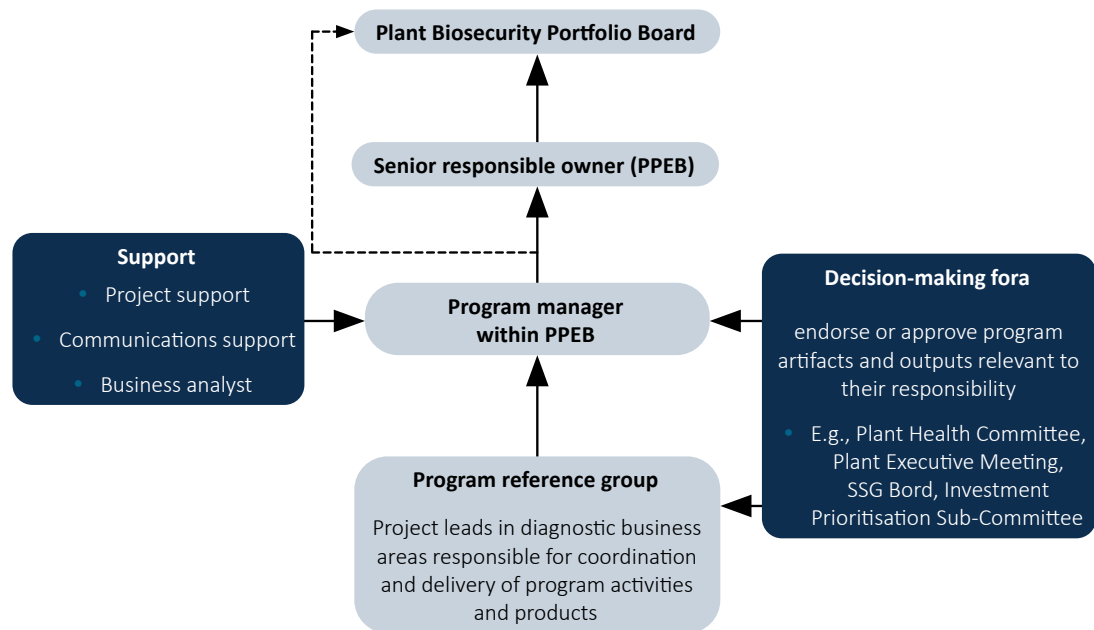
The MTDT program seeks to link to and integrate with other budget measures that include diagnostic components, including measures focussing on national (rather than departmental) preparedness, surveillance and diagnostics.

Linkages are sought to department programs and projects relevant to diagnostics. For example, the Biosecurity Innovation Program has funded eDNA projects owned by the BSRD ([Box 4](#)) and a project on a molecular diagnostics database of pathogens of terrestrial animals owned by the Biosecurity Animal Division.

Close linkages exist with the Plant Innovation Centre ([Box 8](#)) and the Science & Surveillance Group as both are major beneficiaries of the MTDT program. Dependencies also exist in relation to the readiness of the department's ICT infrastructure and systems to support diagnostic processes (e.g. rolling out a Laboratory Information Management System; capacity for capture, storage and analysis of diagnostics data; and diagnostic reference libraries).

Cross-divisional collaborations could be strengthened to work towards the common goal of modernising the biosecurity diagnostics system and improve the speed and accuracy of pest and disease identification at the border. This should be led by the biosecurity group's executive via the Biosecurity and Compliance Board. Examples include addressing the specific infrastructure and ICT requirements in enterprise-level shared services arrangements and the Biosecurity Strategy and Reform Division's eDNA initiative ([Box 7](#)).

Figure 5 Governance structure of the MTDT program



Source: modified after PBPMO (2021)

The strategic importance or potential of eDNA technology for surveillance and diagnostics has been communicated by senior biosecurity officials on multiple occasions (e.g. DAFF 2023, DAWE 2022) but the policy required to support its use and adoption in biosecurity risk management is lacking. The National eDNA Testing Program managed by the BSRD appears to operate in isolation from the significant reforms currently underway in the MTDT program. Collaborations between the PPEBD and the BSRD should cover policy development for eDNA, laboratory accreditation and policy development for the wider laboratory network supporting the department's biosecurity system. Progression of the reforms in a cross-cutting manner will enhance the effectiveness and efficiency of the department's surveillance and diagnostics system.

References

- DAFF (Department of Agriculture, Fisheries and Forestry) 2023. Capability review. Department of Agriculture, Fisheries and Forestry self-assessment. Internal document: Department of Agriculture, Fisheries and Forestry.
- DAWE (Department of Agriculture, Water and the Environment) 2022. Newsletter from the Secretary, volume 94. Partnering with the University of Canberra. Internal document: Department of Agriculture, Water and the Environment.
- PBPMO (Plant Biosecurity Program Management Office) 2022. Modern Technologies and Diagnostic Tools FY2022–2025, project plan v2.0. Internal document: Department of Agriculture, Fisheries and Forestry.
- PBPMO (Plant Biosecurity Program Management Office) 2021. Modern Technologies and Diagnostic Tools, tranche 1 program plan v1.0. Internal document: Department of Agriculture, Fisheries and Forestry.

4. National eDNA Testing Program

Box 7 National eDNA Testing Program

Environmental DNA (eDNA⁴) monitoring is a technology with the potential to revolutionise surveillance, diagnostics and early detection of invasive, alien species among other applications (e.g. Berry et al. 2021, Trujillo-González et al. 2021). Plans to develop and deploy DNA-based monitoring such as eDNA were announced by the Director of Biosecurity in June 2021 (DAWE 2021a). Subsequently in October 2021, the Australian Government announced that it was ‘rolling out [a] National eDNA Testing Program’ and ‘investing \$7 million in a new national program’ (Minister for Agriculture and Northern Australia 2021). The program is not a budget measure underpinned by longer term funding.

The funding announced in 2021 covered project-based funding for the years 2018 to 2025, which at the time was estimated at approximately \$1 million per year (DAWE 2021b). The projects have been funded through multiple pre-existing programs and arrangements, including the department’s Khapra Beetle Surge Program, the Hitchhiker Program, and Biosecurity Innovation Program (Box 4) (DAWE 2021a).

The National eDNA Testing Program is managed by the Biosecurity Strategy and Reform Division (BSRD). It has no apparent strategic linkages to the Modern Technologies and Diagnostics Tools (MTDT) program (2021–2025), which is a major strategic budget measure to reform the diagnostic system (Box 6). The research into eDNA is largely commissioned by other biosecurity divisions. The BSRD should clarify how it engages with the research programs and projects of other business areas.

National eDNA Reference Centre hosted by the University of Canberra

The National eDNA Reference Centre is hosted by the University of Canberra and is part of UC’s EcoDNA group (EcoDNA 2023). The aim of the centre is to ‘support the department in establishing and sustaining national eDNA testing capability, capacity and competency [...]’ (DAWE and UC 2022a). It was established in January 2022 when the department and the university signed a 3-year partnering arrangement. The University of Canberra is among the department’s strategic partners that ‘have agreed to collaborate and share resources’ (DAFF n.d.).

The National eDNA Reference Centre receives project-based funding from the department and is largely funded by the university. In consultations with the Inspector-General, the centre expressed the need for funding certainty to maintain and grow the EcoDNA group’s unique capability. Developments in eDNA technology move quickly. The centre has argued for a more strategic rather than reactionary funding approach to the future operationalising of eDNA technology in the department’s biosecurity system.

Under the partnering arrangement, the University of Canberra is leading and administering the delivery of multiple research, diagnostic and other services of benefit to the department. For example, the National eDNA Reference Centre has developed eDNA test validation guidelines and test protocols (De Brauwier et al. 2022a, 2022b); coordinates, conducts and administers eDNA research on relevant target species on behalf of the department; and supports operational biosecurity areas in surveillance and detection of target species from environmental samples (DAWE and UC 2022a). The centre has also established a network of state and territory-based collaboration centres to develop Australia’s national eDNA capacity.

4 Environmental DNA (eDNA) is DNA collected from the environment including soil, sediment, water, and air. Traces of DNA in the environment originate from faeces, mucous, skin, eggs, pollen, etc. The analyses of eDNA offers rapid, universal and cost-effective ways to measure and detect pests and diseases, among others. The ongoing development of eDNA technology is fast-moving. There is increasing interest by government agencies and industry to use eDNA to solve biosecurity and environmental problems (Southern eDNA Society n.d.).

The BSRD's role in the governance of the collaborative network is unclear. The Inspector-General observes that the department's leading diagnostics and research laboratory, the Plant Innovation Centre at the Post-Entry Quarantine facility in Mickleham, Victoria, is not featuring in the network. There is no formal connection between the laboratory network and the Biosecurity Plant and Science Services Division's (BPSSD) strategic plan to 'Lead plant biosecurity diagnostics laboratory network and partner with private laboratories in biosecurity risk management to meet expected growth in demand for diagnostics' and 'Utilise new and emerging diagnostic technologies' (DAWE 2021c). These omissions indicate a lack of strategic oversight and coordination by the biosecurity group and can limit the National eDNA Testing Program's relevance for future eDNA technology in the department's preventative biosecurity system.

The BSRD advised that the National eDNA Reference Centre has been seeking accreditation by the National Association of Testing Authorities (NATA) and supports the accreditation process of collaborating centres. To progress this, the BSRD worked with NATA to amend a memorandum of understanding with the department. A new schedule 5, signed on 20 September 2021, specifies that NATA is the department's accreditation authority for analytical laboratories and testing service providers conducting sampling and/or testing of eDNA and eRNA (DAWE 2021d).

In regard to a potential future role of eDNA in the department's preventative biosecurity system, it appears advisable to implement a single assurance framework for all laboratories operating in the department's biosecurity system. Alignment could be sought with the MTDT program's laboratory assurance framework ([Box 6](#)).

Other partnering arrangements

The department and the University of Canberra also agreed to engage university students and staff in collaborative projects (DAWE and UC, 2022b). According to this arrangement, the department will host and supervise students enrolled at the university. It has been modelled on agreements set up by the Plant Innovation Centre with other universities ([Box 8](#)). There is opportunity to include the Plant Innovation Centre in the arrangement with the University of Canberra and build on the centre's existing initiative to co-supervise post-graduate students in its molecular research facilities. The exchange would be of mutual benefit.

Since about 2021, the biosecurity group's National eDNA Testing Program sought a collaborative arrangement with CSIRO's [National Biodiversity DNA Library](#) (NBDL). The NBDL aims to create a DNA library for all named Australian plants and animals supported by world-leading data infrastructure for analysis and biomonitoring in Australian ecosystems (CSIRO n.d.). Exotic pests and diseases absent from the Australian continent are currently not within the scope of the NBDL. Thus, it will be important for the biosecurity leadership to clarify the benefits of the NBDL to the department's preventative biosecurity system as part of future planning and investment prioritisation.

Governance

Overall, it is unclear how the BSRD's governance of the National eDNA Testing Program supports executive oversight and decision-making in relation to eDNA research and technology. A program plan has not been finalised and approved by the BSRD's executive and endorsed by the biosecurity leadership group / Biosecurity and Compliance Board.

The business area administering the National eDNA Testing Program has a role in reviewing the 3-year partnering arrangement with the University of Canberra (DAWE and UC 2022a). Under the arrangement, the parties meet annually to review and consider the operation of the agreement. The first annual review meeting was in February 2023 to assess the university's National eDNA Reference Centre against the criteria of the agreement's schedule.⁵ The department's review report has been in draft since then. The Inspector-General notes that the University of Canberra partnering agreement – which is unfunded; the centre is funded only on a project basis – is reviewed far more frequently than the CEBRA program ([Box 5](#)).

⁵ Review criteria: Establishment of National eDNA Reference Centre and eDNA Collaboration Centres; Accreditation; Capability and Preparedness; National eDNA Guideline; Research & Development; Test Validation; Environmental DNA Test Protocols; Biological Reference Material; Reporting & Data Analysis; Operational Support; Proficiency Testing.

It appears inefficient to conduct a full review annually given this arrangement. Regular discussion and documentation of operational issues, including financial and human resources, and updates against the schedule in formal meetings appear to be more appropriate. Meeting outcomes should be documented as part of good public governance, and the minutes used to provide timely advice to the department's beneficiaries of University of Canberra's research and the biosecurity leadership.

An eDNA expert reference group appears to have been intended to have a governance role in the National eDNA Testing Program. According to its terms of reference, the 'DAFF [Department of Agriculture, Fisheries and Forestry]-DCCEEW [Department of Climate Change, Energy, the Environment and Water] eDNA Expert Reference Group is [...] responsible for policy and technical decision-making relating to eDNA RD&E' and 'has been established as a technical/policy decision-making entity to support the on-going operations of the National eDNA Testing Program' (DAFF-DCCEEW eDNA Expert Reference Group 2022). The Inspector-General found that the terms of reference were in draft with no evidence of endorsement and hence delegation of decision-making. In the absence of a membership list and meeting minutes, it is unclear if an eDNA expert reference group exists as intended. In consultations with the Inspector-General, biosecurity officials partaking in the department's scientific communities of practice clarified that these have no decision-making authority but work through influence. The case of the eDNA expert reference group highlights broader governance issues with unclear roles and responsibilities, delegation of authority, and ultimately performance and accountability.

This review found the governance and administration of the National eDNA Testing Program to be immature: key planning documents have remained in draft, minutes were not taken or finalised, and there is poor or no documentation of decisions and approvals.

Projects

The biosecurity group does not maintain a fit-for-purpose database of past, current and planned eDNA projects – for example, similar to the database maintained by the Plant Innovation Centre ([Box 8](#)). Such a database would be important for strategic planning and decisions on the future direction and implementation of eDNA technology in the department's biosecurity system. In March 2023, the BSRD's answered to a question on notice that the 'majority of the funding [for eDNA projects] is provided via the department's Hitchhiker measures program [\$2,413,571 over 2022–23] and the Biosecurity Innovation Program [\$1,691,696 over 2019–23]'. The information received by the Inspector-General for this review illustrates a largely nominal role of the BSRD's National eDNA Testing Program in these projects, as project leads are primarily in other biosecurity divisions and project administration has been largely undertaken by the Biosecurity Innovation Program ([Box 4](#)).

Capability for the future

The department recently featured its work on eDNA as an example of a capability aspiration and path to excellence in the *Capability review, Department of Agriculture, Fisheries and Forestry self-assessment* undertaken for the APSC capability review (APSC 2023, DAFF 2023). However, the biosecurity leadership has not articulated a clear path for eDNA to enhance the biosecurity group's surveillance and diagnostics capability, or the department's preventative biosecurity system more broadly. Questions on the use of eDNA in preventative biosecurity and regulation should be more clearly addressed as, for example, a detection of eDNA is not indicative of the presence of a live organism of biosecurity concern.

In 2020, the *Australia's biosecurity future report* assessed the technology readiness level (TRL) of eDNA technology as ranging from 'concept validation in lab environment' (TRL4) to 'deployment in an operational environment' (TRL9) (CSIRO 2020). Prerequisites for implementing eDNA technology in the department's biosecurity system include policy and regulatory compliance readiness, and the availability of accredited laboratories with specialised equipment and workflows, testing standards and reliable eDNA assays for operationally relevant target organisms (e.g. De Brauwer et al. 2022a, 2022b, SSG 2021, Trujillo-González et al. 2021).

Project-based funding, such as the funding provided to the University of Canberra's National eDNA Testing Centre, does not typically accommodate the implementation of research outcomes. After the research, further work is necessary to embed new technology in policy and regulation. In consultation meetings with the Inspector-General, biosecurity officials identified this as a challenge. In contrast, the MTDT budget measure could address the operational role of eDNA in surveillance as part of its reform program (e.g. the 'eDNA and eRNA use cases' under the MTDT's 'Strategic policy and business design' topic) ([Box 6](#)).

In conclusion, the strategic oversight by the biosecurity leadership and the governance of the biosecurity group's eDNA projects and initiatives should be strengthened. More broadly, the BSRD should clarify its role in the governance of science and research and reassess how it engages with the research that is largely commissioned by other biosecurity divisions.

References

- APSC (Australian Public Service Commission) 2023. Capability review – Department of Agriculture, Fisheries and Forestry. Canberra: Australian Public Service Commission.
- BERRY, O., JARMAN, S., BISSETT, A., HOPE, M., PAEPER, C., BESSEY, C., SCHWARTZ, M. K., HALE, J. and BUNCE, M. 2021. Making environmental DNA (eDNA) biodiversity records globally accessible. *Environmental DNA*, 3, 699-705.
- CSIRO 2020. [Australia's biosecurity future](#). Unlocking the next decade of resilience (2020–2030). Canberra: Commonwealth Scientific and Industrial Research Organisation.
- CSIRO n.d. [National Biodiversity DNA Library](#). Canberra: Commonwealth Scientific and Industrial Research Organisation. [Accessed 22 June 2023]
- DAFF (Department of Agriculture, Fisheries and Forestry). 2023. Capability review, Department of Agriculture, Fisheries and Forestry self-assessment. Internal document: Department of Agriculture, Fisheries and Forestry.
- DAFF (Department of Agriculture, Fisheries and Forestry) n.d. Strategic partners, University of Canberra. Internal website: Department of Agriculture, Fisheries and Forestry. [Accessed 22 February 2023]
- DAFF–DCCEEW eDNA EXPERT REFERENCE GROUP 2022. Terms of reference updated 01/07/2022. Internal document: Department of Agriculture, Fisheries and Forestry, Department of Climate Change, Energy, the Environment and Water.
- DAWE (Department of Agriculture, Water and the Environment) 2021a. National eDNA Testing Program: project plan summary (draft version 14, March 2022). Implementing national eDNA testing capability for environmental and biosecurity purposes. Internal document: Department of Agriculture, Water and the Environment.
- DAWE (Department of Agriculture, Water and the Environment) 2021b. Media talking points, draft 27 September 2021. eDNA framework launched for ground-breaking biosecurity technology. Internal document: Department of Agriculture, Water and the Environment.
- DAWE (Department of Agriculture, Water and the Environment) 2021c. Plant 2030 - strategic plan to strengthen trade through national biosecurity. Internal document: Department of Agriculture, Water and the Environment).
- DAWE (Department of Agriculture, Water and the Environment) 2021d. Schedule 5: Laboratories conducting sampling and/or testing of DNA/RNA from environmental samples (eDNA/eRNA). Addition to memorandum of understanding between the Commonwealth Department of Agriculture, Water and the Environment and the National Association of Testing Authorities, Australia. Internal document: Department of Agriculture, Water and the Environment.
- DAWE (Department of Agriculture, Water and the Environment) and UC (University of Canberra) 2022a. Partnering arrangement. The Commonwealth of Australia as represented by the Department of Agriculture, Water and the Environment and the University of Canberra. Internal document: Department of Agriculture, Water and the Environment, University of Canberra.
- DAWE (Department of Agriculture, Water and the Environment) and UC (University of Canberra) 2022b. Partnering arrangement to engage university students and staff on collaborative projects between the Department of Agriculture, Water and the Environment and University of Canberra. Internal document: Department of Agriculture, Water and the Environment, University of Canberra.
- DE BRAUWER M., CHARITON A., CLARKE L. J., COOPER M. K., DIBATTISTA J., FURLAN E., GIBLOT-DUCRAY D., GLEESON D., HARFORD A., HERBERT S., MACDONALD A. J., MILLER A., MONTGOMERY K., MOONEY T., NOBLE L. M., ROURKE M., SHERMAN C. D. H., STAT M., SUTER L., WEST K. M., WHITE N., VILLACORTA-RATH C., ZAIKO A. and TRUJILLO-GONZÁLEZ A. 2022a. [Environmental DNA test validation guidelines](#). Canberra: National eDNA Reference Centre, University of Canberra.
- DE BRAUWER M., CHARITON A., CLARKE L. J., COOPER M. K., DIBATTISTA J., FURLAN E., GIBLOT-DUCRAY D., GLEESON D., HARFORD A., HERBERT S., MACDONALD A. J., MILLER A., MONTGOMERY K., MOONEY T., NOBLE L. M., ROURKE M., SHERMAN C. D. H., STAT M., SUTER L., WEST K. M., WHITE N., VILLACORTA-RATH C., ZAIKO A. and TRUJILLO-GONZÁLEZ A. 2022b. [Environmental DNA protocol development guide for biomonitoring](#). Canberra: National eDNA Reference Centre, University of Canberra.
- EcoDNA 2023. [National eDNA Reference Centre \(NRC\)](#). Canberra: University of Canberra. [Accessed 22 June 2023]
- HEALY, M. 2021. Plant 2030- DAWE diagnostics system end-state and roadmap. Internal document: Department of Agriculture, Water and the Environment.
- MINISTER FOR AGRICULTURE AND NORTHERN AUSTRALIA 2021. Media release, Tuesday 12 October 2021: eDNA set to revolutionise biosecurity detections. Canberra: Minister for Agriculture and Northern Australia.

PwC (PricewaterhouseCoopers) 2022a. Mapping the biosecurity R&D landscape – funding profile, July 2022. Internal document: prepared by PricewaterhouseCoopers for the Department of Agriculture, Fisheries and Forestry.

PwC (PricewaterhouseCoopers) 2022b. Mapping the biosecurity RD&I landscape – gap analysis, August 2022. Internal document: prepared by PricewaterhouseCoopers for the Department of Agriculture, Fisheries and Forestry.

SOUTHERN eDNA SOCIETY n.d. [Southern eDNA Society - advancing best practice eDNA methods and uptake across sectors](#). Southern eDNA Society. [Accessed 22 June 2023]

SSG (Science and Surveillance Group) 2021. Science and surveillance group molecular review. Internal document: Department of Agriculture, Water and the Environment.

TRUJILLO-GONZÁLEZ, A., VILLACORTA-RATH, C., WHITE, N. E., FURLAN, E. M., SYKES, M., GROSSEL, G., DIVI, U. K. and GLEESON, D. 2021. Considerations for future environmental DNA accreditation and proficiency testing schemes. *Environmental DNA*, 3, 1049-1058.

5. Plant Innovation Centre

Box 8 Plant Innovation Centre

The Plant Innovation Centre is a science-based biosecurity business area located at the department's Post-Entry Quarantine facility in Mickleham, Victoria. It was launched in November 2017. The centre uses in-house laboratory facilities for research. It is part of the Plant Import Operations Branch in the Biosecurity Plant and Science Services Division (BPSSD).

The centre's mission is to collaborate '[...] with cross divisional programs, build in-house R&D [research and development] capability to conduct projects focused on improving [the department's] operational capacity and capability to detect, diagnose and manage exotic plant pests and further engage with the education sector' (DAWE 2020a).

The Plant Innovation Centre's core objectives are to:

- conduct in-house research that addresses operational issues
- partner with scientific research communities and industry leaders
- collaborate with the education sector (DAWE 2020c).

The centre's research is funded through multiple sources, including by the BPSSD, the Plant Innovation Centre operational budget, the former Biosecurity Innovation Program (2018–2023), the Hitchhiker Program, and the Modern Technologies and Diagnostic Tools (MTDT) program ([Box 6](#)) (DAFF 2022a).

Governance

The Plant Innovation Centre's senior responsible officer is the assistant secretary of the division's Plant Import Operations Branch. The role endorses and oversees the centre's annual work plan, including all research projects identified and prioritised by the centre's panel.

The Plant Biosecurity Portfolio Board ([Table 3](#)) provides high-level governance for all projects that the centre manages and undertakes. The board also endorses the centre's annual work plan and makes funding decisions on research projects identified and prioritised by the centre's panel.

The Plant Innovation Centre's panel assesses and prioritises project proposals developed by business areas on their technical, operational and strategic alignment. Priority projects are included in the PIC's annual work plan for endorsement by the senior responsible officer and the board. The panel is composed of the PIC's Director/Assistant Director, Principal Science Analyst, and other relevant stakeholders, including project sponsors, end users, external partners, and subject matter experts.

Project sponsors are generally directors who champion and manage the development of proposals and projects undertaken by their business areas. They serve on the centre's panel to discuss proposals submitted for funding. The sponsor may not work in the division that benefits from expected project outcomes.

Where the Plant Innovation Centre seeks divisional funding, the board is the sole high-level governance body endorsing the funding of projects. For projects with other funding sources, there are additional governance bodies involved in decision-making and oversight. For example, the Biosecurity and Compliance Board and its Data, Research and Innovation Sub-Committee (DRISC) in case of the Biosecurity Innovation Program ([Box 4](#)). Thus, a project endorsed by the Plant Biosecurity Portfolio Board may be rejected at a later stage in the decision-making process by another governance body.

The Plant Innovation Centre's governance and project management is supported by a comprehensive and well organised database of proposed (future), current and past projects (DAFF, 2022a). The centre's project database captures project details, including budget, project sponsor, dates, funding source, the panel's ranking and the project implementation status. The database tracks progress against milestones and implementation outcomes. Overall, the centre has a clear project coordination funding that adds value to the division that benefits from the project outcomes. The centre uses mature and transparent end-to-end project management processes, including milestone and budget reporting to the senior responsible officer and the area administering the funding.

Collaborative research projects between the Plant Innovation Centre and external partners such as universities, state agencies, and industry are administered using standard Commonwealth contracts, except where special collaborative arrangements are in place (e.g. [Box 9](#)).

Project prioritisation

Research ideas are formed by either Plant Innovation Centre or other department staff and require a project sponsor (director level) to be developed into a proposal. It is a requirement that research ideas must be in the field of either diagnostics to 'enhance detection and diagnostics of pests and diseases' or treatment to 'prevent entry of pests or diseases through novel treatments' (DAFF 2022b).

The Plant Innovation Centre generally develops all project ideas supported by a project sponsor into full proposals. These describe the scope of the problem, objectives, milestones, expected outputs and benefits, budget, funding source, stakeholders and partners, and the adoption process. The proposal also identifies the division that is the main benefactor of expected project outcomes. Thus, the centre maintains a pool of fully developed, ready-to-go project proposals as funding opportunities arise. Proposals are included in the centre's project database, as described above.

To prioritise proposals, the panel has adapted the process that was being developed by the Biosecurity and Compliance Board's Investment Prioritisation Sub-committee (IPSC) ([Table 3](#)), by which proposals are assessed against 5 criteria:

- Strategic, operational and/or policy alignment.
- Capability to deliver milestones.
- Likelihood of achieving milestones.
- Biosecurity impact/benefits (cost/time savings, efficacy, etc.).
- Ability to implement into service delivery.

Project implementation

Completed Plant Innovation Centre projects are evaluated to find areas for improvement and to make recommendations on benefits and next steps. As part of the evaluation, centre staff consult with stakeholders, including end users of the research, project partners and subject matter experts. Alternative decisions on next steps are to implement the project findings, conduct further research, or to discontinue the project activities.

The implementation of project outcomes is the project sponsor's responsibility. An implementation and change management plan may be developed to support implementation into the business.

The Plant Innovation Centre communicates and disseminates its research outcomes in multiple ways to demonstrate return-on-investment and the centre's value as an in-house research capability. Research communication happens through final project reports, internal and external publications, an annual science exchange workshop, and the publication of centre's research in international peer-reviewed journals.

Collaborations

The Plant Innovation Centre undertakes collaborative research projects with a range of organisations, including universities, state governments and industry. Many priority projects are on molecular diagnostics as the centre has extensive expertise in this field (DAFF 2022a). Some examples are:

- RMIT University project 'Lab-on-a-chip assay for the rapid detection of multiple plant viruses', 2022–2023.
- University of Southern Queensland project 'Rapid detection of plant disease by microneedle patch array', 2022–2023.
- CSIRO project 'Single rapid and sensitive molecular test to detect honeybee pests', 2022–2024.

Since 2020, the Plant Innovation Centre has established collaborative arrangements with several universities to host and supervise students conducting laboratory-based research at the PIC (DAWE 2022). The benefits of the agreements are strengthened partnerships with universities and building a pipeline for potential future employees.

References

- DAFF (Department of Agriculture, Fisheries and Forestry) 2022a. Plant Innovation Centre project status registry. Internal document: Department of Agriculture, Fisheries and Forestry.
- DAFF (Department of Agriculture, Fisheries and Forestry) 2022b. Plant Innovation Centre research and initiative 'end to end framework'. Internal document: Department of Agriculture, Fisheries and Forestry.
- DAWE (Department of Agriculture, Water and the Environment) 2020a. Plant Innovation Centre diagnostics drivers priorities. Internal document: Department of Agriculture, Water and the Environment.
- DAWE (Department of Agriculture, Water and the Environment) 2020b. Plant Innovation Centre overview. Internal document: Department of Agriculture, Water and the Environment.
- DAWE (Department of Agriculture, Water and the Environment) 2022. Plant Innovation Centre developing closer partnerships with the education sector. Internal document: Department of Agriculture, Water and the Environment.

6. Commonwealth Scientific and Industrial Research Organisation

Box 9 Commonwealth Scientific and Industrial Research Organisation

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is among the department's 'strategic partners that have agreed to collaborate and share resources with [the department]' (DAFF n.d.). The department lists trust, transparency, and shared objectives as the principles underpinning strategic partnerships. The arrangements with CSIRO are intended to drive collaboration, provide leadership, and take the department's 'work to the next level to achieve better outcomes' (DAFF n.d.).

Memorandum of understanding

The department's strategic partnership with CSIRO is formalised in a memorandum of understanding (MoU) to encourage collaborative research, exchange of information and knowledge sharing, make transactional interactions administratively easier and facilitate funding arrangements. The partnership builds on previous collaborations and intends to 'link major CSIRO programs and missions to the [department's] objectives and science priorities, and vice versa' (DAFF 2023).

The MoU commenced in March 2021 (DAWE 2021). The Department of Agriculture, Fisheries and Forestry and CSIRO signed a variation to the MoU on 13 January 2023 (DAFF 2023), following the machinery of governance changes on 1 July 2022. The MoU will be in effect for 5 years.

The MoU defines the operating principles of the partnership. These cover values, planning activities, and project management principles. Other arrangements associated with the MoU include a standard project agreement and staff mobility agreement to strengthen scientific cooperation (DAFF n.d.). The MoU does not include funding for the CSIRO's Australian Centre for Disease Preparedness (ACDP).

Governance

The MoU provides a mechanism to 'establish and maintain a mutually supportive governance framework' including shared executive oversight and co-design of research (OSC n.d.). A Strategic Relationship Oversight Committee (SROC) oversees the implementation of the MoU. Members of the SROC are the Deputy Secretary and first assistant secretaries of the Biosecurity and Compliance Group and their CSIRO counterparts.

Under the MoU, the department leads the planning activities. Projects are co-designed with CSIRO to 'create policy initiatives or deliver policy outcomes [and] a range of potential research projects'. The SROC discuss and endorse an annual workplan (DAFF and CSIRO 2023, OSC n.d.). The SROC has not met since the machinery of governance changes and formation of the new Department of Agriculture, Fisheries and Forestry on 1 July 2022, and an updated or new workplan has not been developed.

The role of the Operations Management Committee (OMC) is to manage operational matters and disputes between the department and CSIRO (OSC n.d.). According to its terms of reference, the OMC is the first point of contact between the department and CSIRO. The committee is responsible for facilitating collaborations under the MoU and maintaining a register of projects for reporting to the SROC, the department and CSIRO (OSC n.d.). However, it appears that such a project register does not exist.

Currently, the OMC membership comprises staff of the Office of the Science Convenor (OSC) and CSIRO. Following the machinery of government changes on 1 July 2022, the OSC was moved to the Department of Climate Change, Energy, the Environment and Water (DCCEEW). The new governance arrangements for OMC are unclear, and it appears that the OMC has had no role in the department since the changes.

Catalysing Australia's Biosecurity

Catalysing Australia's Biosecurity (CAB) is a mission-oriented program and a joint initiative between CSIRO and the department (CSIRO n.d.). Mission-oriented research and innovation is an approach to coordinating public and private sector actions to develop solutions for complex societal challenges (e.g. GRC 2020,

Mazzucato 2018). Applying the approach to biosecurity, the mission is characterised by actors in the Australian biosecurity landscape (research organisations, government, academia, industry) working in the same direction through coordination of strategies, policies, investment, and the development of technologies to address shared, well-specified and timebound objectives.

The CAB's goal is to 'improve long-term national biosecurity outcomes by delivering innovative technologies, digital systems and capabilities that transform performance' (CSIRO n.d.). The CAB will focus on:

- detection and diagnostic technologies and platforms
- intelligence gathering platforms
- intervention technologies
- decision support systems and modelling platforms
- social-economic support
- performance assurance mechanisms.

The SROC/CSIRO–DAFF CAB Steering Committee agreed in June 2021 to develop the mission and set up the CAB operating model and governance (DAFF and CSIRO 2023). Planning is to be completed by the end of 2023. Currently, the planning team seeks to establish a co-funding model and partnerships with government, industry and community. The department and CSIRO intend to seek launch approval for CAB in quarter 4 of 2023. Once launched, CSIRO will commission initial joint investments, formalise foundational partnerships with research organisations and industry, and co-develop additional investments with industry (DAFF and CSIRO 2023).

In consultations undertaken for this review, the Inspector-General learnt that the department has found it challenging to allocate sufficient resources (staff and time) to planning and setting up CAB. As discussed above, the biosecurity leadership should establish a coordinating function to provide centralised science coordination and leadership for science-related issues and research collaborators ([Box 3](#)). The function should provide leadership to the biosecurity group to clarify and make decisions on the biosecurity group's strategic role within CAB and devise appropriate governance and resourcing.

Australian Centre for Disease Preparedness

CSIRO's ACDP is a high-containment diagnostics and research facility working on dangerous pathogens affecting animals and humans (ACDP n.d.). The ACDP is an approved arrangement class 5.3 biosecurity containment level 3 (BC3) facility and subject to regular audits by the department that ensure compliance with the provisions of the *Biosecurity Act 2015* (IGB 2022).

The animal diagnostic and scientific services that the ACDP provides are a core element in the department's biosecurity system 'with appropriately strong focus on excellence in infectious disease science, infectious agent security and contributions to improving Australia's biosecurity status' (IGB 2022). The department provides funding to the ACDP to maintain its facilities and expertise in endemic and exotic diseases. In the 2023–24 financial year, the department has provided \$9.186 million to the operating cost of the ACDP as per the department's portfolio budget statements appropriation. The department is also funding biosecurity research undertaken at the ACDP: \$830,256 in 2021–22 and \$1.6 million in 2022–23 (BSRD 2023).

Projects

The department does not maintain a single and easily accessible register for projects with CSIRO. This hinders strategic oversight, prioritisation, and planning. The OMC would be responsible for maintaining a register of projects covered by the MoU (OSC n.d.). CSIRO's ACDP is not covered by the MoU but conducts research that should be included in a register.

Projects with CSIRO are funded in multiple ways. The respective research governance arrangements vary depending on the funding source, responsible area, and benefiting area. For example, the Plant Innovation Centre in the Biosecurity Plant & Science Services Division collaborates with CSIRO in the eDNA project 'Single rapid and sensitive molecular test to detect honeybee pests' (2022–24) funded through the Hitchhiker Program. The Biosecurity Strategy and Reform Division is the owner of the CSIRO project 'Biosecurity molecular screening using eDNA technology (eDNA invasive bees and parasitic bee mites)' (2022–23) funded through the Biosecurity Innovation Program ([Box 4](#)), and the Biosecurity Animal Division works with CSIRO on 'Surveillance of viruses in wildlife using Australia's vast collection of museum-archived specimens', also funded through the Biosecurity Innovation Program. Respective governance arrangements apply ([Table 3](#)).

Future research

Using a mission-oriented approach, CSIRO sets a pathway to strategically investing time and resources in big, transformative initiatives that address great societal challenges (e.g. ending plastic waste, building a clean hydrogen industry) rather than multiple, small projects. In contrast, the department's approach to research is rather conventional as demonstrated by the many investments into small projects aimed at solving specific, applied problems. The department will need to clarify its strategic approach (i.e. big and transformative versus incremental improvements) to science and research to lead effectively within the biosecurity mission and 'drive innovation and transformation across Australia's biosecurity system' (CSIRO n.d.).

References

- ACDP n.d. [Australian Centre for Disease Preparedness](#). Commonwealth Scientific and Industrial Research Organisation (CSIRO). [Accessed 13 July 2023]
- BSRD (Biosecurity Strategy and Reform Division) 2023. Investment in biosecurity research, development and extension. Supplementary budget estimates, Rural and Regional Affairs and Transport; Agriculture, Fisheries and Forestry Portfolio, outcome 2; Biosecurity Strategy and Reform Division; answers to questions on notice: SQ23-000314, 3 March 2023. Canberra: Parliament of Australia, Rural and Regional Affairs and Transport Legislation Committee.
- CSIRO (Commonwealth Scientific and Industrial Research Organisation) n.d. [Catalysing Australia's biosecurity](#). Commonwealth Scientific and Industrial Research Organisation. [Accessed 10 July 2023]
- COAG (Council of Australian Governments) 2019. [Intergovernmental Agreement on Biosecurity](#). Canberra: Council of Australian Governments.
- DAFF (Department of Agriculture, Fisheries and Forestry) 2023. Variation to memorandum of understanding between the Commonwealth Department of Agriculture, Fisheries and Forestry and the Commonwealth Scientific and Industrial Research Organisation. Internal document: Department of Agriculture, Fisheries and Forestry.
- DAFF (Department of Agriculture, Fisheries and Forestry) n.d. Strategic partners. CSIRO. Internal document: Department of Agriculture, Fisheries and Forestry.
- DAFF (Department of Agriculture, Fisheries and Forestry) and CSIRO (Commonwealth Scientific and Industrial Research Organisation) 2023. Catalysing Australia's biosecurity. Working together to transform Australia's biosecurity. Internal document: Department of Agriculture, Fisheries and Forestry, Commonwealth Scientific and Industrial Research Organisation.
- DAWE (Department of Agriculture, Water and the Environment) 2021. Memorandum of understanding between the Commonwealth Department of Agriculture, Water and the Environment and the Commonwealth Scientific and Industrial Research Organisation. Internal document: Department of Agriculture, Water and the Environment.
- GRC (Global Research Council) 2020. [Statement of principles. Mission-oriented research](#). Global Research Council. [Accessed 10 July 2023]
- IGB (Inspector-General of Biosecurity) 2022. Assurance review for arrangements to import live lumpy skin disease virus to CSIRO's Australian Centre for Disease Preparedness. 2022–23/02. Internal document: Inspector-General of Biosecurity.
- MAZZUCATO, M. 2018. Mission-oriented research & innovation in the European Union: a problem-solving approach to fuel innovation-led growth. Brussels: European Commission, Directorate-General for Research and Innovation.
- OSC (Office of the Science Convenor) n.d. Governance structures for partnerships. Internal document: Department of Climate Change, Energy, the Environment and Water; Department of Agriculture, Fisheries and Forestry.

Appendix E: Partner organisations

[Table 7](#) summarises the research partners of the Biosecurity and Compliance Group, based on information available to the Inspector-General at the time. It is not comprehensive; there is currently no single administrative contact and overarching process and coordination for collaborative research arrangements, including a research information management system to manage collaborators and collaborative projects.

Table 7 Tentative catalogue of research partner organisations of the biosecurity group

Partner	Research initiative, program, and field (examples)	Funding type or source, where available
Academic partners		
Centre of Excellence for Risk Analysis (CEBRA) hosted by University of Melbourne	<ul style="list-style-type: none"> Biosecurity risk modelling Risk pathway analysis Surveillance 	Administered funding
RMIT University	Disease detection	Biosecurity Innovation Program
University of Southern Queensland	Disease detection	Biosecurity Innovation Program
James Cook University	eDNA	Biosecurity Innovation Program
Macquarie University	Pest management	Biosecurity Innovation Program
Queensland University of Technology	<ul style="list-style-type: none"> DNA sequencing Treatments 	Biosecurity Innovation Program
Deakin University	Disease modelling	Biosecurity Innovation Program
University of New England	Behavioural research	Biosecurity Innovation Program
Strategic partners		
CSIRO	<ul style="list-style-type: none"> Catalysing Australia's Biosecurity (CAB) eDNA 	Various
CSIRO Australian Centre for Disease Preparedness	<ul style="list-style-type: none"> Diagnostic services Diagnostic tools 	Administered funding
Charles Sturt University	<ul style="list-style-type: none"> Biosecurity training Virtual reality 	Departmental; Biosecurity Innovation Program
University of Canberra	eDNA and eRNA	Biosecurity Innovation Program; Khapra Beetle Surge Program; Hitchhiker Program
Public sector		
ABARES	<ul style="list-style-type: none"> Economic modelling of impact and consequences Pest and disease risk assessment Surveillance system methods 	Departmental; various

Partner	Research initiative, program, and field (examples)	Funding type or source, where available
Agriculture Victoria	<ul style="list-style-type: none"> • Pest identification • Diagnostic tools • Ad hoc diagnostic services 	Biosecurity Innovation Program; various
Queensland Department of Agriculture and Fisheries	<ul style="list-style-type: none"> • Pest diagnostics • Disinfestation strategies • Ad hoc diagnostic services 	Biosecurity Innovation Program; various
Victoria Department of Jobs, Precincts and Regions	<ul style="list-style-type: none"> • Surveillance tools • Ad hoc diagnostic services 	Biosecurity Innovation Program; various
New South Wales Department of Primary Industries	<ul style="list-style-type: none"> • eDNA • Pest identification • Ad hoc diagnostic services 	Biosecurity Innovation Program; various
Plant Health Australia	Diagnostic techniques	Biosecurity Innovation Program
Commercial		
Steritech	Treatment techniques	Biosecurity Innovation Program
Rapiscan Systems	X-rays	Biosecurity Innovation Program
Biofouling Solutions	Biofouling	Biosecurity Innovation Program
The Gulanga Group Pty Ltd	Automated document assessment	Biosecurity Innovation Program
Instinct and Reason	Digitalising document	Biosecurity Innovation Program
Scalzo Foods Pty Ltd	Treatment techniques	Biosecurity Innovation Program
Freight and Trade Alliance	Digitalising documents	Biosecurity Innovation Program
ThinkPlace Australia	Behavioural research	Biosecurity Innovation Program
DHI Water and Environment	Risk pathway tool	Biosecurity Innovation Program
RingIR Pty Ltd	Treatment techniques	Biosecurity Innovation Program
Virtual Guard Ltd	Inspection tool	Biosecurity Innovation Program
VSICA Research Pty Ltd (and University of Melbourne)	Disinfestation strategies	Biosecurity Innovation Program
Multiple Suppliers of Tech	Virtual reality	Biosecurity Innovation Program
Centre for Inclusive Design	Decision-making capability	Biosecurity Innovation Program

References

ABC NEWS 2023. [Agriculture department in dire straits as ‘festering’ finance problem reaches a head](#). ABC News, 8 March 2023. [Accessed 9 March 2023]

ACDP (Australian Centre for Disease Preparedness) n.d. [Australian Centre for Disease Preparedness](#). Commonwealth Scientific and Industrial Research Organisation (CSIRO). [Accessed 13 July 2023]

ACIL Allen Consulting 2020. Report to Department of Agriculture, Water and the Environment, 25 March 2020, Centre of Excellence for Biosecurity Risk Analysis review. Internal document: ACIL Allen Consulting.

AFMA (Australian Fisheries Management Authority) 2023. [AFMA Strategic research plan 2023–2028](#). Canberra: Australian Fisheries Management Authority.

ANAO (Australian National Audit Office) 2023. [Department of Agriculture, Fisheries and Forestry’s cultural reform](#). Canberra: Australian National Audit Office. [Accessed 11 November 2023]

ANAO (Australian National Audit Office) 2017. [Design and monitoring of the National Innovation and Science Agenda](#). Canberra: Australian National Audit Office. [Accessed 11 November 2023]

ANAO (Australian National Audit Office) 2014. Public sector governance, strengthening performance through good governance. Canberra: Australian National Audit Office.

ANAO (Australian National Audit Office) and PMC (Department of Prime Minister and Cabinet) 2006. Implementation of programme and policy initiatives: making implementation matter, better practice guide. Canberra: Commonwealth of Australia.

APSC (Australian Public Service Commission) 2023. Capability review – Department of Agriculture, Fisheries and Forestry. Canberra: Australian Public Service Commission.

APSC (Australian Public Service Commission) 2021. [Capability Review Program](#). Last updated 25 November 2022. Canberra: Australian Public Service Commission. [Accessed 1 December 2023]

AUSTRALIAN GOVERNMENT n.d. [About APS reform](#). Canberra: Australian Government. [Accessed 24 January 2023]

AUSTRALIA’S CHIEF SCIENTIST 2016. National research infrastructure roadmap. Canberra: Australian Government.

BAD (Biosecurity Animal Division) 2023. Biosecurity Animal Division project board terms of reference. Internal document: Department of Agriculture, Fisheries and Forestry.

BAD (Biosecurity Animal Division) 2022. Biosecurity Animal Division strategy 2022–2025. Internal document: Department of Agriculture, Fisheries and Forestry.

BADPB (Biosecurity Animal Division Project Board) 2023. Meeting of 22 February 2023: final outcomes and actions. Internal document: Department of Agriculture, Fisheries and Forestry.

BCB (Biosecurity and Compliance Board) 2022a. Terms of reference Biosecurity and Compliance Board. Internal document: Department of Agriculture, Fisheries and Forestry.

BCB (Biosecurity and Compliance Board) 2022b. Minutes; meeting no. 16, Thursday, 28 July 2022; Biosecurity and Compliance Board. Internal document: Department of Agriculture, Fisheries and Forestry.

BCG (Biosecurity and Compliance Group) 2022a. Terms of reference data, research and intelligence sub-committee. Internal document: Department of Agriculture, Fisheries and Forestry.

BCG (Biosecurity and Compliance Group) 2022b. Terms of reference investment prioritisation sub-committee. Internal document: Department of Agriculture, Fisheries and Forestry.

BCG (Biosecurity and Compliance Group) 2022c. Terms of reference risk, compliance and assurance sub-committee. Internal document: Department of Agriculture, Fisheries and Forestry.

BCG (Biosecurity and Compliance Group) 2021a. Director of Biosecurity's science advisory panel terms of reference. Internal document: Department of Agriculture, Fisheries and Forestry.

BCG (Biosecurity and Compliance Group) 2021b. Biosecurity Innovation Program: mid-term evaluation (2018–2020). Internal document: Department of Agriculture, Water and the Environment.

BECK, M., LOPES-BENTO, C. and SCHENKER-WICKI, A. 2016. Radical or incremental: where does R&D policy hit? *Research Policy*, 45, 869–883.

BOD (Biosecurity Operations Division) 2023. Terms of reference, Biosecurity Operations Division executive. Internal document: Department of Agriculture, Fisheries and Forestry.

BPSSD (Biosecurity Plant and Science Services Division) 2023. Business plan 2023–24. Internal document: Department of Agriculture, Fisheries and Forestry.

BPSSD (Biosecurity Plant and Science Services Division) and PPEBD (Plant Protection and Environmental Biosecurity Division) 2023. Plant biosecurity portfolio board terms of reference. Internal document: Department of Agriculture, Fisheries and Forestry.

BRADLEY, C. 2018. [Simply labeling a plan 'strategic' doesn't make it so](#). McKinsey & Company. [Accessed 26 January 2023]

BRSC (Biosecurity Research Steering Committee) 2018. Meeting of 29 March 2018: minutes. Internal document: Department of Agriculture and Water Resources.

BRSC (Biosecurity Research Steering Committee) 2017. Meeting of 24 March 2017: minutes. Internal document: Department of Agriculture and Water Resources.

BSRD (Biosecurity Strategy and Reform Division) 2023. Investment in biosecurity research, development and extension. Supplementary budget estimates, Rural and Regional Affairs and Transport; Agriculture, Fisheries and Forestry Portfolio, outcome 2; Biosecurity Strategy and Reform Division; answers to questions on notice: SQ23-000314, 3 March 2023. Canberra: Parliament of Australia, Rural and Regional Affairs and Transport Legislation Committee.

CHIEF SCIENTIST 2018. Science Strategy Action Plan 2017–2020 implementation update; Executive management committee; agenda item 5; 4 September 2018. Internal document: Department of Agriculture and Water Resources.

CHIEF SCIENTIST 2017. Science Strategy Action Plan 2017–2020; executive management committee; agenda item 8; 14 February 2017. Internal document: Department of Agriculture and Water Resources.

CHIEF SCIENTIST 2013. DAFF Science Strategy – reviewing feedback; minute – for information to Secretary, Department of Agriculture, Fisheries and Forestry. Internal document: Department of Agriculture, Fisheries and Forestry.

COAG (Council of Australian Governments) 2019. Intergovernmental Agreement on Biosecurity. Canberra: Commonwealth of Australia.

COMMONWEALTH OF AUSTRALIA 2015. Agricultural competitiveness white paper. Canberra: Commonwealth of Australia.

CRAIK, W., PALMER, D. and SHELDRAKE, R. 2017. Priorities for Australia's biosecurity system: an independent review of the capacity of the national biosecurity system and its underpinning Intergovernmental Agreement. Canberra: Department of Agriculture and Water Resources.

CSIRO (Commonwealth Scientific and Industrial Research Organisation) n.d. [Catalysing Australia's biosecurity](#). Commonwealth Scientific and Industrial Research Organisation. [Accessed 10 July 2023]

DAFF (Department of Agriculture, Fisheries and Forestry) 2023a. Corporate Plan 2023–24. Canberra, Department of Agriculture, Fisheries and Forestry.

DAFF (Department of Agriculture, Fisheries and Forestry) 2023b. Capability review – Department of Agriculture, Fisheries and Forestry self-assessment. Internal document: Department of Agriculture, Fisheries and Forestry.

DAFF (Department of Agriculture, Fisheries and Forestry) 2023c. Corporate Plan 2022–23. Canberra: Department of Agriculture, Fisheries and Forestry.

DAFF (Department of Agriculture, Fisheries and Forestry) 2023d. Enterprise risk management framework and policy. Internal document: Department of Agriculture, Fisheries and Forestry.

DAFF (Department of Agriculture, Fisheries and Forestry) 2023e. Transformation action plan. Internal website: Department of Agriculture, Fisheries and Forestry. [Accessed 8 June 2023]

DAFF (Department of Agriculture, Fisheries and Forestry) 2023f. Commonwealth Biosecurity 2030, action plan 2023. Update on progress and 2023 priority actions. Canberra: Department of Agriculture, Fisheries and Forestry.

DAFF (Department of Agriculture, Fisheries and Forestry) 2023g. Biosecurity risk management framework: a guide for Biosecurity and Compliance Group. Internal document: Department of Agriculture, Fisheries and Forestry.

DAFF (Department of Agriculture, Fisheries and Forestry) 2023h. Organisation structure. Internal website: Department of Agriculture, Fisheries and Forestry. [Accessed 8 February 2023]

DAFF (Department of Agriculture, Fisheries and Forestry) 2023i. Designing DAFF. Internal website: Department of Agriculture, Fisheries and Forestry. [Accessed October 2023]

DAFF (Department of Agriculture, Fisheries and Forestry) 2023j. [Sustainable biosecurity funding – strengthening our biosecurity system](#). Canberra: Department of Agriculture, Fisheries and Forestry. [Accessed 22 February 2024]

DAFF (Department of Agriculture, Fisheries and Forestry) 2023k. [2023–24 Portfolio budget statements](#). Canberra: Department of Agriculture, Fisheries and Forestry. [Accessed 7 February 2023]

DAFF (Department of Agriculture, Fisheries and Forestry) 2022a. Our purpose, objectives, priorities and values. Internal website: Department of Agriculture, Fisheries and Forestry. [Accessed 22 February 2023]

DAFF (Department of Agriculture, Fisheries and Forestry) 2022b. National biosecurity strategy. Canberra: Department of Agriculture, Fisheries and Forestry.

DAFF (Department of Agriculture, Fisheries and Forestry) 2022c. Commonwealth Biosecurity 2030, action plan 2022. Update on progress to date and 2022 actions. Canberra: Department of Agriculture, Water and the Environment.

DAFF (Department of Agriculture, Fisheries and Forestry) 2022d. Asset management policy. Internal document: Department of Agriculture, Fisheries and Forestry.

DAFF (Department of Agriculture, Fisheries and Forestry) 2013. DAFF Science Strategy 2013–2018. Canberra: Department of Agriculture, Fisheries and Forestry.

DAWE (Department of Agriculture, Water and the Environment) 2022. Strategic partners. Internal website: Department of Agriculture, Fisheries and Forestry. [Accessed 22 February 2023]

DAWE (Department of Agriculture, Water and the Environment) 2021a. Commonwealth Biosecurity 2030. A strategic roadmap for protecting Australia's environment, economy and way of life. Canberra: Department of Agriculture, Water and the Environment.

DAWE (Department of Agriculture, Water and the Environment) 2021b. Our future department blueprint 2022–2025. Canberra: Department of Agriculture, Water and the Environment.

DAWE (Department of Agriculture, Water and the Environment) 2021c. Science snapshot, 14 September 2021. Internal document: Department of Agriculture, Water and the Environment.

DAWE (Department of Agriculture, Water and the Environment) 2021d. Corporate Plan 2021–22. Canberra: Department of Agriculture, Water and the Environment.

DAWE (Department of Agriculture, Water and the Environment) 2021e. Science Strategic Action Plan. Internal document: Department of Agriculture, Water and the Environment.

DAWE (Department of Agriculture, Water and the Environment) 2021f. Regulatory practice statement. Canberra: Department of Agriculture, Water and the Environment.

DAWE (Department of Agriculture, Water and the Environment) 2021g. Regulator performance framework: self-assessment report 2020–21. Canberra: Department of Agriculture, Water and the Environment.

DAWE (Department of Agriculture, Water and the Environment) 2021h. [Agricultural Chief Scientist](#). Canberra: Department of Agriculture, Water and the Environment. [Accessed 10 July 2023]

DAWE (Department of Agriculture, Water and the Environment) 2021i. ICT strategy 2020 to 2024. Internal document: Department of Agriculture, Water and Environment.

DAWE (Department of Agriculture, Water and the Environment) 2021j. Data policies and guidance. Internal website: Department of Agriculture, Water and Environment. [Accessed 22 February 2023]

DAWE (Department of Agriculture, Water and the Environment) 2021k. Scientific professional independence. Internal website: Department of Agriculture, Water and the Environment. [Accessed 22 February 2023]

DAWE (Department of Agriculture, Water and the Environment) 2020a. Draft: Workforce strategy and action plan 2021 to 2025. Internal document: Department of Agriculture, Water and the Environment.

DAWE (Department of Agriculture, Water and the Environment) 2020b. Science strategy; paper to the executive board; agenda item 5; 5 August 2020. Internal document: Department of Agriculture, Water and the Environment.

DAWE (Department of Agriculture, Water and the Environment) 2020c. Science Strategic Action Plan SSAP: a 12–18 months roadmap. Internal document: Department of Agriculture, Water and the Environment.

DAWR (Department of Agriculture and Water Resources) 2018a. Department of Agriculture and Water Resources statement of scientific professional independence. Internal document: Department of Agriculture and Water Resources.

DAWR (Department of Agriculture and Water Resources) 2018b. Biosecurity research development and extension (RD&E) strategic statement 2018 – 2025. Internal document: Department of Agriculture and Water Resources.

DAWR (Department of Agriculture and Water Resources) 2017. Biosecurity research, development and extension strategic statement; biosecurity research steering committee; out of session; December 2017. Internal document: Department of Agriculture and Water Resources.

DCCEEW (Department of Climate Change, Energy, the Environment and Water) and DAFF (Department of Agriculture, Fisheries and Forestry) 2023. DCCEEW/DAFF Science Council: terms of reference and ways of working. Internal document: Department of Climate Change, Energy, the Environment and Water; Department of Agriculture, Fisheries and Forestry.

DD (Department of Defence) 2023. [Our leadership](#). Canberra: Department of Defence. [Accessed 1 August 2023]

DEE (Department of the Environment and Energy) 2018. Research scientist merit advancement policy. Canberra: Department of the Environment and Energy.

DEPUTY SECRETARY BIOSECURITY 2018. What's new: Biosecurity RD&E Strategic Statement. Internal document: Department of Agriculture and Water Resources.

- DF (Department of Finance) 2023a. [What to include in a corporate plan](#). Canberra: Department of Finance. [Accessed 1 September 2023]
- DF (Department of Finance) 2023b. [Corporate plans for Commonwealth companies \(RMG 133\)](#). Canberra: Department of Finance. [Accessed 21 March 2023]
- DF (Department of Finance) 2023c. [Regulator performance \(RMG 128\)](#). Canberra: Department of Finance. [Accessed 4 April 2023]
- DF (Department of Finance) 2021. Corporate plans for Commonwealth companies (RMG 133). Canberra: Department of Finance. [Accessed 21 March 2023]
- DIISRT (Department of Industry, Innovation, Science, Research and Tertiary Education) 2012. [APS200 project: the place of science in policy development in the public service](#). Canberra: Department of Industry, Innovation, Science, Research and Tertiary Education. [Accessed 13 July 2023]
- DRISC (Data, Research and Intelligence Sub-Committee) 2021a. Minutes. Meeting 2, 2 November 2021. Internal document: Department of Agriculture, Water and the Environment.
- DRISC (Data, Research and Intelligence Sub-Committee) 2021b. Minutes. Meeting 3, 30 November 2021. Internal document: Department of Agriculture, Water and the Environment.
- EMC (Executive Management Committee) 2018. EMC response to out-of-session paper 2 of 10 September 2018: Revised Department of Agriculture and Water Resource's statement of scientific professional independence. Internal document: Department of Agriculture and Water Resources.
- FSANZ (Food Standards Australia New Zealand) 2019. [Regulatory science strategy 2019-23](#). Kingston, Wellington: Food Standards Australia New Zealand.
- FUNTOWICZ, S. O. and RAVETZ, J. R. 2020. Post-normal science: how does it resonate with the world of today? [Science for policy handbook](#). [13 July 2023]
- GA (Geoscience Australia) 2023. [About organisational structure](#). Canberra: Geoscience Australia. [Accessed 1 August 2023]
- GARRETT, G. 2020. Staying at the forefront of science: Geoff Garrett, our science convenor releasing the SSAP (video transcript). Internal website: Department of Agriculture, Water and the Environment. [Accessed 22 February 2023]
- GUDMUNDSSON, H. and SØRENSEN, C. H. 2013. Some use – little influence? On the roles of indicators in European sustainable transport policy. *Ecological Indicators*, 35, 43–51.
- HEALY, M. 2021. Plant 2030 – DAWE diagnostics system end-state and roadmap. Internal document: Department of Agriculture, Water and the Environment.
- IGB (Inspector-General of Biosecurity) 2022. Effectiveness of preventative biosecurity arrangements to mitigate the risk of entry into Australia of the serious plant pest *Xylella fastidiosa*. Canberra: Inspector-General of Biosecurity.
- IGB (Inspector-General of Biosecurity) 2021a. Adequacy of department's operational model to effectively mitigate biosecurity risks in evolving risk and business environments. Canberra: Inspector-General of Biosecurity.
- IGB (Inspector-General of Biosecurity) 2021b. Robustness of biosecurity measures to prevent entry of khapra beetle into Australia. Canberra: Inspector-General of Biosecurity.
- JONES, P. 2020. [A strategy document is different to a strategic plan](#). Excitant. [Accessed 26 January 2023]
- LEITH, P., O'TOOLE, K., HAWARD, M., COFFEY, B., REES, C. and OGIER, E. 2014. Analysis of operating environments: a diagnostic model for linking science, society and policy for sustainability. *Environmental Science & Policy*, 39, 162–171.

MAF (Ministry of Agriculture and Forestry) Biosecurity New Zealand 2007. [A biosecurity science strategy for New Zealand – Mahere rautaki putaiao whakamaru](#). Wellington: Ministry of Agriculture and Forestry. [Accessed 13 July 2023]

MARTIN, R. 2022. [A plan is not a strategy](#). Schooley Mitchell. [Accessed 26 January 2023]

MCNIE, E. C., PARRIS, A. and SAREWITZ, D. 2016. Improving the public value of science: a typology to inform discussion, design and implementation of research. *Research Policy*, 45, 884–895.

NOE, R. A., HOLLENBECK, J. R., GERHART, B. and WRIGHT, P. M. 2015. *Human resources management: gaining a competitive advantage*. New York: McGraw-Hill Education.

OSC (Office of the Science Convenor) 2021. Independent scientific review: DAWE science ‘health check’; Executive board, agenda item 7. Internal document: Department of Agriculture, Water and the Environment.

OSC (Office of the Science Convenor) 2020. Science Strategic Action Plan (SSAP); Executive board, agenda item 7. Internal document: Department of Agriculture, Water and the Environment.

PBPMO (Plant Biosecurity Program Management Office) 2022. Modern technologies and diagnostic tools FY2022–2025, project plan v2.0. Internal document: Department of Agriculture, Fisheries and Forestry.

PwC (PricewaterhouseCoopers) 2022a. Mapping the biosecurity R&D landscape – funding profile, July 2022. Internal document: prepared by PricewaterhouseCoopers for the Department of Agriculture, Fisheries and Forestry.

PwC (PricewaterhouseCoopers) 2022b. Mapping the biosecurity RD&I landscape – gap analysis, August 2022. Internal document: prepared by PricewaterhouseCoopers for the Department of Agriculture, Fisheries and Forestry.

PwC (PricewaterhouseCoopers) 2022c. Mapping the biosecurity RD&I landscape – opportunities report, August 2022. Internal document: prepared by PricewaterhouseCoopers for the Department of Agriculture, Fisheries and Forestry.

RUGGLES, A. 2004. [Research highlight: regulatory vs. academic science](#). Ogmios Newsletter of the Center for Science and Technology Policy Research, 9, 3–5. [Accessed 13 July 2023]

SAREWITZ, D. 2013. Science’s rightful place is in service of society. *Nature*, 502, 595–595.

SAREWITZ, D. and PIELKE, R. A. 2007. The neglected heart of science policy: reconciling supply of and demand for science. *Environmental Science & Policy*, 10, 5–16.

SLACK, N., BRANDON-JONES, A., JOHNSTON, R. and BETTS, A. 2015. *Designing the innovation process. Operations and process management – principles and practice for strategic impact*. Harlow: Pearson.

SSG (Science and Surveillance Group) 2021. Science & Surveillance Group: strategic roadmap. Internal document: Department of Agriculture, Water and the Environment.

ŠUCHA, V. and DEWAR, M. 2020. *Institutional Framework for the Science–Policy Interaction*. Science for Policy Handbook. Elsevier.

ŠUCHA, V. and SIENKIEWICZ, M. (eds) 2020. [Science for policy handbook](#). Brussels: Elsevier. [13 July 2023]

THE SCIENCE COUNCIL 2023. [Our definition of science](#). London: The Science Council. [Accessed 24 January 2023].

TONGUE, A. 2020. Future department review – revitalising the organisation to deliver for the government and Australians. Internal document: Department of Agriculture, Water and the Environment.



25 March 2024

Dr Lloyd Klumpp
Inspector-General of Biosecurity
c/o Department of Agriculture, Fisheries and Forestry
GPO Box 858
CANBERRA ACT 2601

Dear Lloyd

Thank you for your report, *Strategy, governance and planning to strategically manage the department's biosecurity science resource* which you provided to me on 26 February 2024.

I appreciate the observations and insights provided by this comprehensive review, including recognition of the critical role science has as a resource in the biosecurity system. I support the importance of ensuring there is an appropriate planning and prioritisation framework for biosecurity science resources including research commissioned by the department, to ensure greater alignment with broader departmental objectives.

I agree with all six recommendations contained within your report. As you have noted, many of your recommendations are closely aligned to the findings and recommendations of the 2023 Australian Public Service Commission capability review of the department. I consider that issues around appropriate governance, effective prioritisation, planning, and project management are fundamental to the success of the whole department, including the ongoing effective management and strengthening of the biosecurity system.

Where appropriate the biosecurity leadership group's response to your recommendations will be incorporated into the broader departmental response to the APSC capability review as outlined in our Transformation Action Plan. Significant elements of the reform work under the Transformation Action Plan are well underway.

The department's response to each recommendation is at Attachment A.

The department assessed your report in relation to whether information contained within it could be considered as prejudicial to the public interest. No content was identified that should be excluded from public disclosure.

Yours sincerely,

Adam Fennessy PSM

Attachment A: Department of Agriculture, Fisheries and Forestry – Agency response to the IGB report: *Strategy, governance and planning to strategically manage the department’s biosecurity science resource.*

Recommendation 1 - agreed

That the Director of Biosecurity and the biosecurity leadership group lead the development of a biosecurity science strategy that supports a strategic approach to managing the biosecurity group’s significant science resource – knowledge, people, partners, and infrastructure.

The department will develop a Biosecurity Science Strategy that articulates its approach to managing science resources, within the context of the department’s Transformation Action Plan and consistent with the Commonwealth Biosecurity 2030 roadmap and the Biosecurity Risk Management Framework. The strategy will address the role and function of science as a biosecurity resource and how knowledge, people, partners, and infrastructure are managed.

The department notes the importance of updating its approach to science strategy following the Machinery of Government changes that saw scientists, the Office of the Science Convenor and scientific functions shift to the Department Climate Change, Energy, the Environment and Water.

Recommendation 2 - agreed

That the Director of Biosecurity and the biosecurity leadership group engage proactively to clarify the strategic role of science, and hence the biosecurity science resource, in enterprise-level and biosecurity strategy and planning documents. This will support the department’s expressed aspiration to strengthen science capability.

As part of the broader response to the department’s Transformation Action Plan, the department will engage with reform activities and work to ensure that the Biosecurity Science Strategy and management of the department’s biosecurity science resource are aligned to, and reflected in, enterprise level planning documents that are produced in response to the Transformation Action Plan.

Recommendation 3 - agreed

That the Director of Biosecurity and the biosecurity leadership group establish a coherent, connected, and collaborative system of governance that enables prioritisation, resource allocation, performance, and accountability in the management of the biosecurity science resource.

The department recognises the importance of, and is committed to, developing a coherent system of governance to provide the most effective management of the biosecurity science resource. The department will review and identify improvements to the current governance system to reflect and contribute to priority action 1.1 of the Transformation Action Plan. Priority action 1.1 is to enhance the department’s governance system to ensure an effective support system to achieve enterprise-wide priorities which include the biosecurity science resource. A key element of the

Transformation Action Plan is success through accountability, ensuring that we monitor progress against this action through group and divisional oversight, and delivery through business plans.

Recommendation 4 - agreed

That the Director of Biosecurity establish, within a connected system of governance, a coordinating function with the authority to represent the biosecurity group's research interests, scientific credentials to engage effectively on biosecurity science matters, and the collaborative leadership and capacity to effectively coordinate science-related matters across the biosecurity group.

As part of the department's response to recommendation 3, the department will consider the best model for a "coordinating function", including whether this role could be performed through enhancement of current governance arrangements which bring together the Chief Veterinary Officer and the Chief Plant Protection Officer and the broader biosecurity executive team. The department will consider what settings are required to ensure that the model adequately delivers leadership to cross-cutting science programs, acknowledging the broad range of science in the group's work program, and the need to prioritise competing demands.

Recommendation 5 - agreed

That the Director of Biosecurity and the biosecurity leadership group ensure that the department's enterprise-level planning is fit for purpose for the general and specialised requirements of the biosecurity group's science resource.

The department, including the group's technical scientific leaders the Chief Veterinary Officer, the Chief Plant Protection Officer, and the Chief Environmental Biosecurity Officer, will have a key responsibility to advocate for and articulate the department's biosecurity scientific requirements to ensure they are adequately reflected under relevant priority actions of the Transformation Action Plan. The scientific cohort of the group will have responsibility to ensure these representations reflect the breadth of the role of the science resource for the department. This will include representations against priority actions, including: 3.3 Improving regulatory service delivery, 4.1 Workforce planning and development, and 5.3 Information and data maturity roadmap, which specifically address the need to establish effective enterprise-wide planning.

Recommendation 6 – agreed

That the Director of Biosecurity and biosecurity leadership group establish a planning framework for the biosecurity science resource that is guided by strategy and part of an integrated system of governance.

As noted in the response to Recommendation 5, the Transformation Action Plan will address enterprise-wide business planning. In this context, the department will work to ensure that divisional business plans and the Biosecurity Science Strategy (see Recommendation 1) adequately address planning needs including, where appropriate, engagement with external entities and specialists on science and research related activities.

