GOVERNMENT OF
WESTERN AUSTRALIA

Western Australian Biosecurity Strategy

2016-2025

The development of the Western Australian Biosecurity Strategy ('the Strategy') led by government and informed by industry and community, sets the strategic direction for partnership arrangements to manage biosecurity issues affecting agriculture, fisheries, forests and biodiversity in our terrestrial and aquatic environments.

GOVERNMENT OF WESTERN AUSTRALIA

Department of **Agriculture and Food**
Department of **Parks and Wildlife**
Department of **Fisheries**
Forest Products Commission

Important disclaimer

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A shorter version of this document can be found by visiting agric.wa.gov.au and searching under "biosecurity strategy"

Western Australian
Biosecurity Strategy
2016-2025

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Foreword

Western Australia's Biosecurity Strategy ('the Strategy') sets the strategic direction for the management of emerging and ongoing biosecurity issues that affect agriculture, fisheries, forests and biodiversity in our terrestrial and aquatic environments.

Biosecurity incursions have the capacity to increase costs and disrupt export and domestic trade of agriculture, forest products, aquaculture and commercial fishing as well as affecting our unique environment, biodiversity and social amenity.

Western Australia is fortunate to be free of many of the major animal and plant pests and diseases that occur elsewhere. Effective biosecurity management underpins the state's reputation as a supplier of clean, safe, high quality food, which enables access to valuable markets and trade arrangements. Of equal importance is keeping our marine areas, conservation areas and unique natural ecosystems free from damaging pests.

The financial consequences of temporary or prolonged market closures due to pest or disease outbreaks can be very significant. For example, modelling predicts revenue losses from a small outbreak of foot-and-mouth disease of around $6 billion over 10 years, while for a large multi-state outbreak, revenue losses are estimated at $51 billion (ABARES, 2013). Similarly, in the event of a high impact environmental pest, the consequences to the environment and tourism could be extensive.

The strategy is aligned with national directions and has been informed by Biosecurity Council stakeholder engagement, the Biosecurity Senior Officer's Group and feedback from Industry, government and community members over a five month period of consultation. The Strategy covers the period 2016 to 2025.

The tactics outlined in Table 1 form the basis for the implementation of the Strategy. Progress against the tactics will be reported annually. A formal review of the overall Strategy will be conducted within three years.

On behalf of all Ministers who have a responsibility for biosecurity I am delighted to support the release of this Strategy, which through its implementation will support the protection, future growth and economic development of Western Australia.

Hon Mark Lewis MLC

Minister for Agriculture and Food

Vision

The vision of WA's Biosecurity Strategy is 'working together to minimise the risks to the state's economic development, environmental assets and social amenity from terrestrial and aquatic pests and diseases'.

Purpose

The purpose of the Strategy is to set the overall direction for the management of emerging and ongoing biosecurity issues within WA from 2016 to 2025.

Scope

The Strategy covers animal and plant pests, diseases and weeds, and zoonotic diseases that can be transmitted between animals and humans. These have the potential to negatively affect WA's economy, terrestrial and aquatic environments, biodiversity, agricultural resources, human health and social amenity.

Chemical issues (including contamination or residue issues), animal welfare, food safety, human health (except issues associated with zoonoses), and GMO fall outside the scope of this Strategy. These are dealt with under other arrangements or processes.

Introduction

Biosecurity[1] is the management of risks to the economy, the environment and the community, of pests and diseases entering, emerging, establishing or spreading.

While WA's geographic isolation provides a natural advantage for biosecurity protection biosecurity risks need to be managed over a large land mass (one-third of the Australian continent) and 12 500km of mainland coastline (almost 21 000km counting offshore islands). The extensive coastline and numerous points of entry increase the risk of animal, plant and aquatic pests and diseases being introduced.

Importance of biosecurity to Western Australia

Economy

WA agricultural products are renowned as safe, high-quality products and our biosecurity systems ensure our reputation and status is maintained. Our biosecurity status confers significant competitive advantage and value proposition in overseas markets. Protecting this value proposition ensures we maintain and enhance our market share in premium markets.

About 80% of our agricultural production is exported to international markets. WA's exports of agricultural, fisheries and forest products were valued at A$7.8 billion in 2014/15 (Australian Bureau of Statistics and DAFWA, 2015), all of which is protected by maintaining our biosecurity status.

Commercial fishing, including pearling and aquaculture, contributes around $1 billion to the state's economy each year, providing direct employment for 5000 people with many more in associated service industries. Recreational fishing (an estimated 600 000 fishers) injects over $570 million in economic activities each year to the state's economy and supports 7000 jobs (Department of Fisheries, 2010).

WA is free from a large number of pests, diseases and weeds that are present in many other parts of the world. Geographical isolation and a robust biosecurity system (including border quarantine checkpoints, intrastate regulatory controls, industry and public awareness campaigns and surveillance programs) help maintain this status.

[1] As defined in Australia's Intergovernmental Agreement on Biosecurity (IGAB)

WA is seeking to further grow its exports of agrifood products to meet the demands of expanding markets in Asia, the Middle East and elsewhere. Maintaining freedom from major pests and diseases will be critical to achieving this.

Introduced organisms have the capacity to disrupt export and domestic trade of agricultural, forestry, aquaculture and fish products, as well as affect local demand or supply for these products. Such disruptions could have serious effects on the short- or longer-term viability of our food and fibre producers and access to overseas markets as well as our way of life. Incursions of pests and diseases may also affect other areas of the economy, including transport, tourism and mining, by disrupting movement of people, vehicles and products.

Environment

Effective management of biosecurity risks helps to protect our biodiversity and our distinctive ecosystems and natural environment.

WA's natural environment contributes to the value of tourism in WA, which generated $9.33 billion in spending and supported 94 000 jobs in 2013/14. About $3.8 billion of this amount goes to regional WA, injecting much-needed economic activity in outlying cities and towns.

WA is home to eight of the 15 National Biodiversity Hotspots in Australia[2] and the only International Biodiversity Hotspot in Australia — the South West Botanical Province of WA[3]. Global Biodiversity Hotspots are the richest and most threatened reservoirs of plant and animal life on Earth.

Aquatic pests and diseases are also a significant threat to WA's oceans and rivers and can devastate aquatic ecosystems, damage local economies and environments and adversely affect community lifestyles. WA's unique ecosystems present many challenges to biosecurity management, including understanding and managing risks associated with changing land use.

Social amenity

Biosecurity risks, if not adequately managed, can directly affect both human health and people's ability to enjoy their surroundings. For example, incursions of pests, diseases and weeds may negatively affect the use and enjoyment of the environment by families and pets (i.e. home gardens, public parks and gardens, streetscapes, swimming, boating and bushwalking) that are often taken for granted.

Managing biosecurity risks directly benefits the community.

Human health

Up to 75% of emerging animal diseases may be transferred between animals and humans (such diseases are known as zoonoses). They include bird flu, Ebola, SARS (severe acute respiratory syndrome), rabies, Hendra virus and Australian bat Lyssavirus.

Biosecurity management aims to reduce the spread of zoonoses. Engagement of all stakeholders — government, industry and crucially, the people of WA — is imperative to maintain WA's freedom from exotic pests and diseases.

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[2] http://www.environment.gov.au/biodiversity/conservation/hotspots/national-biodiversity-hotspots

[3] http://www.environment.gov.au/biodiversityconservation/hotspots/international-biodiversity

Future challenges

WA is particularly vulnerable to invasion from organisms beyond our borders: we have an extensive, sparsely populated coastline that is exposed to sea lanes, and a variety of environments that can support vigorous plant growth and harbour many animals. Biosecurity management is a complex task and WA's biosecurity system will need to respond to increasing challenges including:

- globalisation and the expansion of overseas travel and trade
- climate change
- changes in land use
- population spread
- risks to human health from zoonotic diseases.

Globalisation (see Figure 1) increases the volume and range of products traded internationally, the number of aircraft, ship and passenger movements, and therefore the increased risk of pests and diseases entering and establishing in Australia.

The growing volume and speed of online trading presents new challenges for biosecurity because imported plant material and animal products may not encounter established biosecurity checks, with potential adverse effects on crops and native habitats. This is an emerging issue for biosecurity regulators worldwide.

In addition, unauthorised land incursions from overseas increases the risk of pests and diseases being imported into the state.

Climate change may cause shifts in the potential range, habitat, spread and effects of pests and diseases. For example, the potential for severe weather events may assist the spread and establishment of some pests and diseases (e.g. via land degradation).

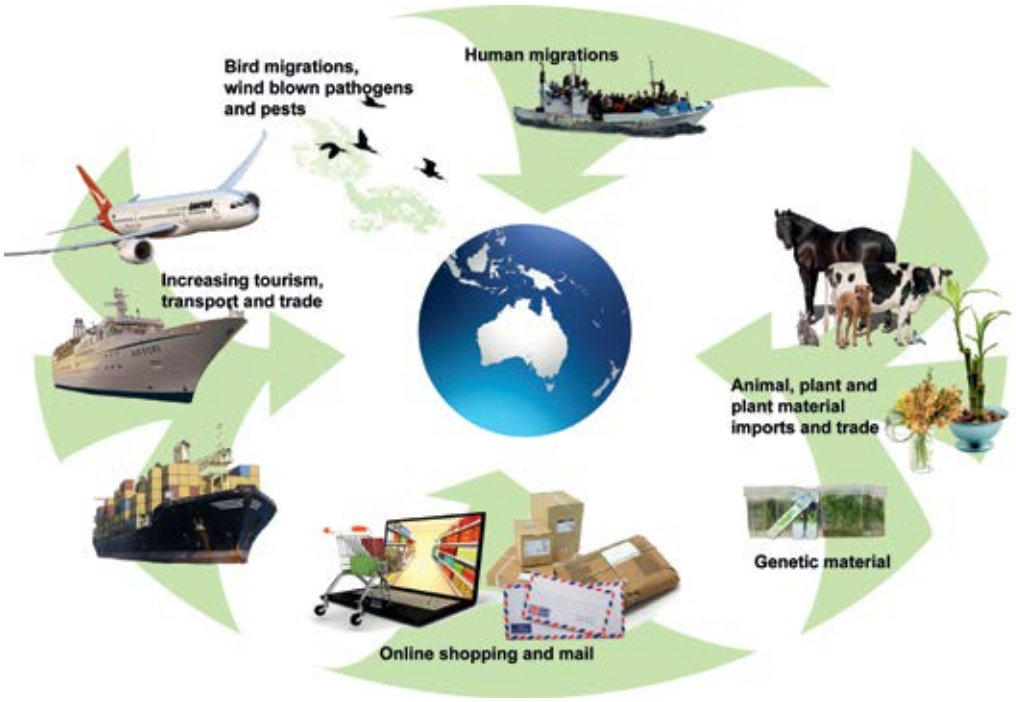

Figure 1 **Examples of pathways that present biosecurity risks**

Changes in land use increases the interface between urban and rural areas and the natural environment, and make pest and disease management more complex. Population spread into new habitats, the urbanisation of rural regions, and increasingly intensive agriculture all complicate the ability to contain a pest or disease incursion and the risk of zoonoses.

People in close contact with animals, such as farmers, livestock contractors, hunters, wildlife carers and veterinarians are at a higher risk of contracting a zoonotic disease that could then be transferred to the general population. Managing the threat of such diseases requires continuous engagement and systematic assessment.

Key risks to WA's biosecurity system

A number of key risks to the status of Western Australia's biosecurity system have emerged from recent reviews. These include the risks of regulatory failure, response failure, and innovation failure. These risks are addressed specifically in goals 4, 5 and 7 in the Strategy. Additionally there is a risk that changes to national biosecurity legislation (the *Biosecurity Act 2015*) will impact on the ability of WA to retain its high biosecurity status and market advantage.

The biosecurity continuum

An effective biosecurity system needs to manage risks across the entire biosecurity continuum; pre-border, at the border, and onshore activities designed to work together to mitigate risks.

Pre-border and border activities include risk assessment, quality assurance, establishing conditions of entry, pre-clearance checks, inspection and compliance activities. Post-border activities include surveillance, monitoring, risk assessment, emergency preparedness and response planning.

Managing risks across the biosecurity continuum is fundamental to WA's trade and economic development. The continuum is consistent with the approach being adopted nationally following the Beale Review[4] into Australia's quarantine and biosecurity services, which recommended a change in emphasis from the narrow concept of 'quarantine' to the broader one of 'biosecurity'.

The biosecurity continuum also supports Australia's overseas trade obligations, including this country's Appropriate Level of Protection (ALOP) Policy. WA complies with Australia's ALOP described as 'a high or very conservative level of protection aimed at reducing risk to very low levels, while not based on a zero-risk approach'.

Partnerships

Controlling pests and diseases requires effective collaboration between international, national and local stakeholders. WA honours international protocol obligations in developing and delivering its biosecurity system. We take into account national agreements and Australian government policy.

The Strategy is based on the principle of shared responsibility and recognises that land managers, government agencies, industry and the community are jointly responsible for pest and disease management. Government supports land managers, industry and the community to manage high-risk pests and diseases in accordance with risk management principles.

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[4] Beale, R., Fairbrother, J., Inglis, A.M., and Trebeck, D. (2008) One Biosecurity: A Working Partnership.
Commonwealth of Australia. ISBN 9780980371451.

International and national

Australia has responsibilities under the International Sanitary and Phytosanitary Agreement (SPS Agreement) to ensure that domestic quarantine measures are consistent with those applied to international imports.

WA is signatory to the Intergovernmental Agreement on Biosecurity (IGAB), which aims to 'enhance Australia's biosecurity system and strengthen the collaborative approach between the Commonwealth of Australia and state and territory governments to address Australia's broad range of biosecurity issues'.

IGAB's work focuses on developing national systems to support decision making and investment; use of biosecurity information, surveillance and diagnostics; managing established pests and diseases; engagement and communication; preparedness and response arrangements; and biosecurity research and development.

The state is also a signatory to the following national cost-sharing agreements for the management of incursions of exotic pests and diseases:

- Emergency Animal Disease Response Agreement (EADRA) — an agreement between government and industry on how to manage cost and responsibility for an emergency response to an animal disease outbreak (effective March 2002).
- Emergency Plant Pest Response Deed (EPPRD) — an agreement between government and industry for the management and funding of responses to emergency plant pest Incidents (effective October 2005).
- National Environmental Biosecurity Response Agreement (NEBRA) — sets out emergency response arrangements, including cost-sharing arrangements, for responding to biosecurity incidents that primarily affect the environment and social amenity and where the response is for the public good (2012).

State

At the state level, biosecurity is managed through a legislative framework that includes a number of key pieces of legislation:

- *Biosecurity and Agriculture Management Act 2007 (BAM Act)*
- *Emergency Management Act 2005*
- *Exotic Diseases of Animals Act 1993*
- *Agricultural Produce Commission Act 1988*
- *Fish Resources Management Act 1994*
- *Conservation and Land Management Act 1984*
- *Health Act 1911* (to be largely superseded by new public health legislation).

The WA government works with industry and the people of WA to identify and manage biosecurity risks and is responsible for:

- policies and systems that relate to specific pests and diseases
- legislation, including import and movement controls
- inspection and certification services for interstate border and post-border movements, and at international borders (in collaboration with the federal government)
- control of the impact of invasive plants and animal pests on land and waters for which it has management responsibility.

The Strategy emphasises the importance of shared responsibility (government, industry and the community) for the management of biosecurity in WA, which is underpinned by a framework for collaboration and advice (see Figure 2).

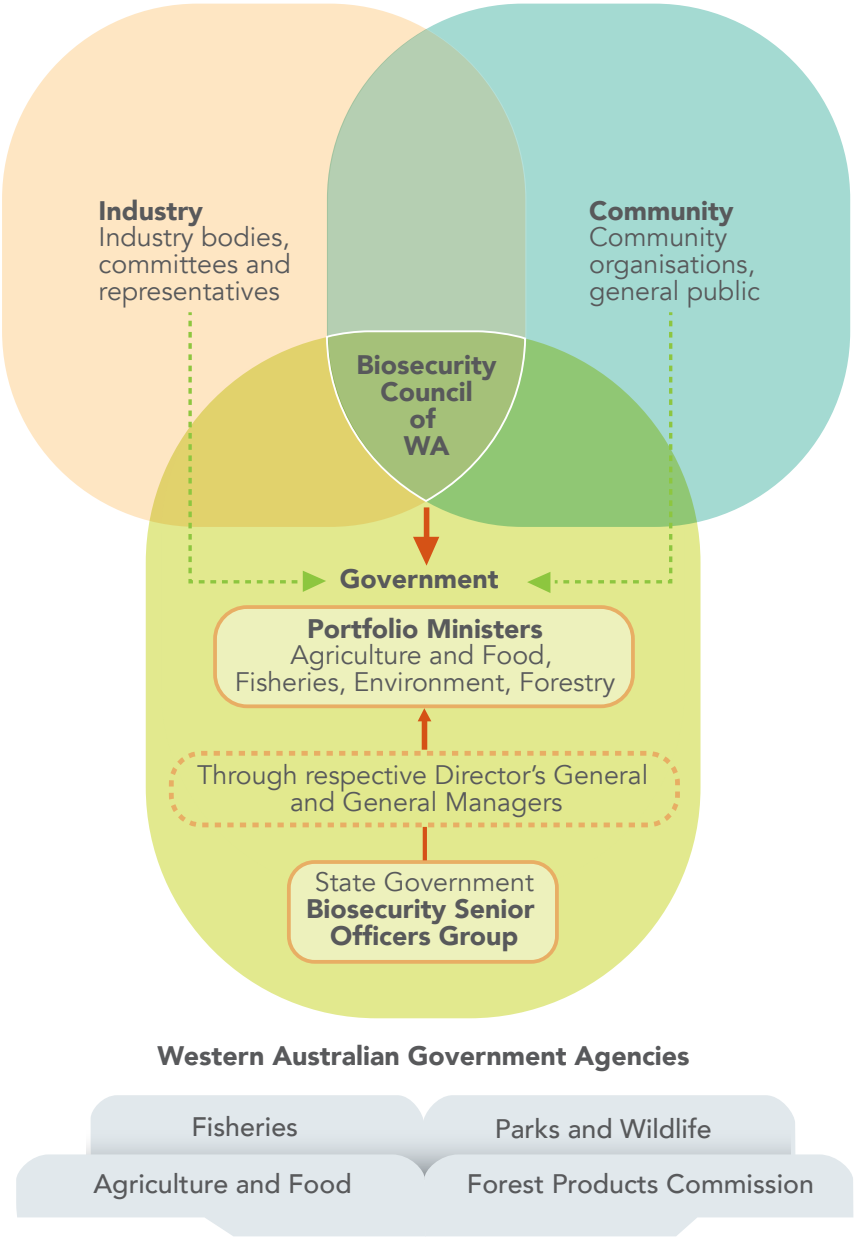

Figure 2 **WA biosecurity framework for collaboration and advice**

The Biosecurity Council of Western Australia provides strategic advice to the Minister for Agriculture and Food, the Director General of DAFWA and other ministers, when required, on matters related to biosecurity. They actively engage with industry, community and government to ensure informed and robust advice is given.

The Biosecurity Senior Officers Group (BSOG) is comprised of senior executives from each of the state government agencies with biosecurity responsibilities. BSOG develops and recommends cross-government and state-wide strategies for biosecurity management.

Local governments raise awareness and undertake surveillance activities within the community, particularly in relation to invasive plant and animal pests. They also have a role in managing biosecurity incursions that impact upon the community, and have biosecurity responsibilities as land managers.

Industry and land managers play a key role in biosecurity planning and decision making through both national and state committee structures. The Strategy sets the expectation of industry becoming increasingly involved in investment and decision making for management of biosecurity, supported by funding mechanisms available under the BAM Act and Agricultural Produce Commission (APC) legislation.

Not-for-profit, research and community organisations are also seen to play an important role through funding and providing human resources for the delivery of biosecurity-related research and on-ground programs, fundraising, communications and awareness-raising activities.

All Western Australians and visitors to WA have a role to play in protecting the biosecurity status of WA (abiding by biosecurity legislation, maintaining good farm practices, reporting anything unusual in animals, crops and the environment) to ensure the community continues to benefit from our healthy environment and economy.

Detailed descriptions of the roles and responsibilities of government, industry and the community can be found on the Biosecurity Council web page.

Biosecurity principles

Biosecurity management in WA is underpinned by three principles:

- Biosecurity is a shared responsibility.
- Effective risk management underpins decision making.
- Policies and programs are transparent, consistent and evidence based.

Biosecurity goals

The Strategy identifies seven goals that are considered essential to underpin and reform WA's biosecurity system. The outcomes and tactics that underpin the achievement of the goals are described in Table 1.

1. Enhanced partnerships and collaboration

Controlling pests and diseases is not a task that government agencies can manage on their own. The scale of the task requires cooperation and collaboration among all stakeholders.

Improved cooperation and communication between organisations and community members who have a stake in biosecurity management are needed to build stronger partnerships and networks and to deliver efficiencies. This sharing should lead to a broader base of knowledge and expertise, and reduced duplication. Existing relationships between industry, government and the community provide a strong foundation for sharing responsibility.

- Outcome 1.1 Industry, government and the community are partners who understand and respect each other's roles and responsibilities.
- Outcome 1.2 Industry and the community play a greater role in decision making and biosecurity management.

2. Enhanced engagement

Engagement refers to how people involved in biosecurity interact to achieve intended outcomes — how goals are set, processes are agreed upon, decisions are taken, and how individuals and groups participate in biosecurity management.

Many people do not know what biosecurity is or what role they have to play in protecting WA from pests and diseases. Some businesses and industries do not pay close attention to good biosecurity practices until something happens that directly affects them. These attitudes must change if new pests and diseases are going to be quickly detected, if those that are already established are to be controlled or the inadvertent introduction of a new serious biosecurity risk is to be prevented.

The National Biosecurity Engagement and Communication Framework[5] is based on the work of the International Association of Public Participation (IAP2) that describes a 'spectrum for public participation'. Spectrum elements are to inform, consult, involve, collaborate and empower. By applying the evidence-based approach of the spectrum consistently, people can better plan, coordinate and evaluate engagement activities in a more meaningful way.

[5] http://www.agriculture.gov.au/SiteCollectionDocuments/animal-plant/pihc/bepwg/national-engagement-communication-framework.pdf

A proactive biosecurity system based on shared responsibilities relies on active participation from people across WA. Those on the ground are best placed to detect and respond to a biosecurity threat. They must, however, know what to look for, what to do, who to report it to and what might happen after they report the threat. Various roles include:

- government — preparedness, coordination and communication
- industry — research and development; surveillance and response activities
- community — spot and report pests, diseases and weeds; wash down camping, hiking and boating vehicles and equipment.

Government, industry and community groups can all play a role in increasing the awareness and participation of citizens in biosecurity activities.

- Outcome 2.1 Increased industry and community awareness of biosecurity risks and participation in biosecurity.

3. Increasing use of evidence and agreed principles to inform decision making and investment

IGAB investment principles

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

Evidence-based protection of the biosecurity status of WA ensures that there is a consistent approach to decision making and prioritising investment. The IGAB investment principles outlined above have been accepted by federal, state and territory governments.

WA will align its investment with IGAB investment principles to support a stronger biosecurity system.

Invasion Curve

The Invasion Curve is a conceptual framework used nationally to illustrate the value of interventions across the invasion pathways. It shows that the greatest return on investment is achieved through investing in prevention and early intervention, compared to asset-based protection once pests are widespread and established (Figure 3).

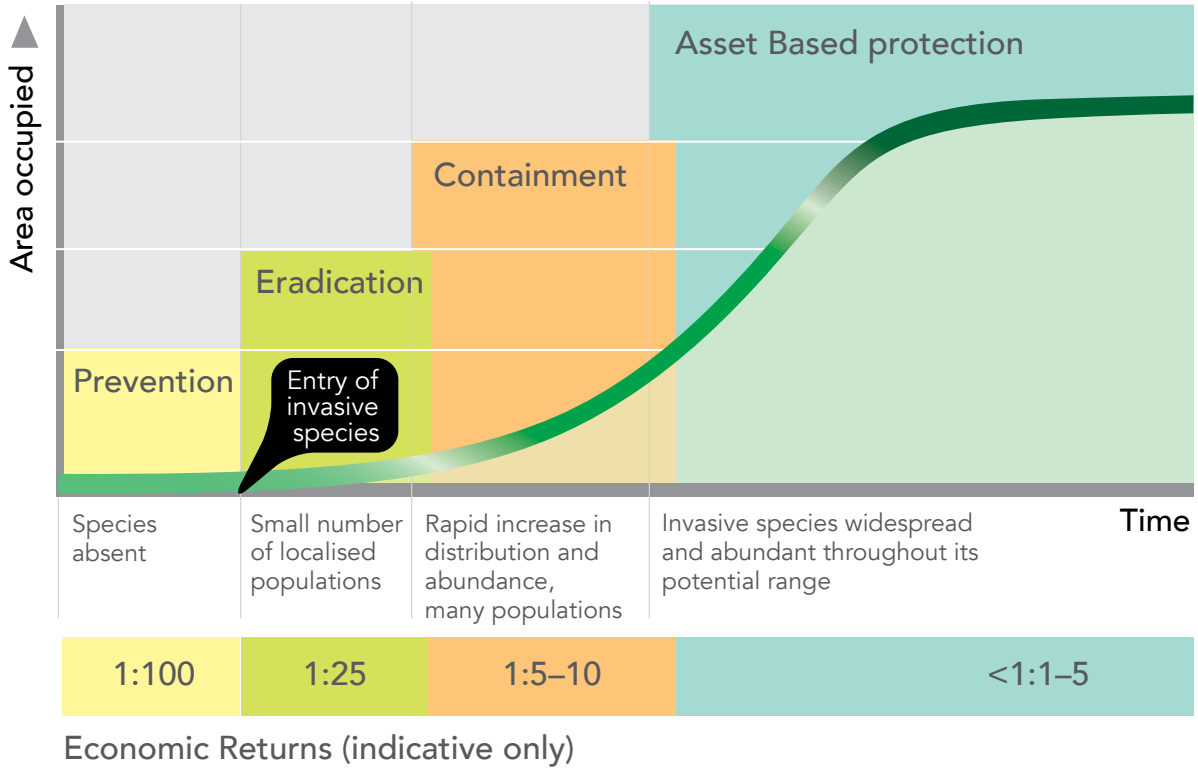

Figure 3 **The Invasion Curve indicates greater economic return on investment for actions on the left side compared with asset-based protection on the right.** (Adapted from Department of Primary Industries Victoria 2009)

In order to protect market access for agriculture and commercial forestry and fisheries products, our prevention and eradication efforts focus on exotic pests and diseases.

In the case of protecting valuable environmental or high-value assets such as biodiversity hotspots, prevention and eradication may focus on exotic threats or containment and asset based protection on established pests that are a threat to the high-value asset.

The state needs agreed strategies of how we prevent and manage pests and diseases at each of the four stages of this framework. Biosecurity decision making and resource allocation must be transparent, objective and efficient. An evidence-based approach ensures there is consistency in decision making and investment prioritisation.

- Outcome 3.1 Government, industry and the community understand and apply the investment principles outlined by IGAB.
- Outcome 3.2 State government resources are targeted to provide the greatest public benefit, and for agriculture, this is prevention and eradication of priority pests and diseases.

4. Effective legislation, regulation and policy

It is essential all stakeholders have a clear understanding of the what, why and how of the biosecurity system.

A number of pieces of legislation support the delivery of an effective biosecurity system (for key WA legislation, see under 'Partnerships'). The legislation articulates the roles and responsibilities of landholders, business owners, transporters and certain individuals.

Government policies also highlight the public land management responsibilities for applicable agencies and the need to protect high-value biodiversity assets. Government retains responsibility for management of pests and diseases on public land. This includes national parks and other conservation reserves, state forests, marine parks and other state waters, unallocated Crown Land and unmanaged reserves.

A compliance framework is in place to ensure biosecurity responsibilities are adhered to. Education and raising awareness of biosecurity responsibilities is a fundamental element of achieving voluntary compliance.

Recognition and acceptance by all stakeholders (government, industry, the broader community and users of the environment) of their responsibilities is a key goal of the Strategy.

- Outcome 4.1 Effective and appropriate state biosecurity legislation exists and is understood by stakeholders.
- Outcome 4.2 A compliance framework is well understood, effective and efficient.
- Outcome 4.3 Effective control of established priority pests and diseases on land and water assets managed by government agencies.

5. More effective preparedness and capacity to detect, respond and recover from new incursions

Due to the strong reliance of our agricultural, fishing and fibre industries on export markets, strengthening the surveillance and diagnostic systems supports the continued economic development of WA. Reporting and assurance of WA's pest and disease status under national and international agreements is pivotal to access a number of domestic and international markets.

Similarly, early detection and action is necessary to protect WA's valued environmental assets from pests and diseases.

The earlier that we detect and accurately identify unwanted pests and diseases, and the more we know about them, the more likely we will be able to effectively manage them. Having effective, coordinated emergency management systems and capacity for biosecurity response and recovery is critical. 'Capacity' includes adequately trained staff, equipment and facilities, diagnostic capability, financial resources, systems and processes.

- Outcome 5.1 The introduction and establishment of pests and diseases is prevented by effectively regulating risk pathways (the 'prevention' stage of the Invasion Curve).
- Outcome 5.2 Industry and the community understand the importance of prevention and early eradication and increasingly support surveillance for pests and diseases.
- Outcome 5.3 Emergency preparedness, response and recovery are effective (the 'eradication' stage of the Invasion Curve).

6. Community and industry understand and increasingly use available mechanisms for managing priority pests and diseases

A number of invasive pests and diseases are established in WA, or in particular areas of WA, and have the potential to cause damaging impacts to agriculture, forests, the environment or social amenity.

The BAM Act provides mechanisms (including Industry Funding Schemes and Recognised Biosecurity Groups) to support industry and local or regional community groups to lead eradication, containment or management of pests and diseases where industry or community are motivated to do so.

- Outcome 6.1 Industry and community increasingly lead management of established pests and diseases where they consider them a priority ('containment' and 'asset-based protection' stages of the Invasion Curve).

7. Biosecurity management is underpinned by science and technology-based innovative solutions

Research and development activities, innovation and continuous improvement are critical to the development of a flexible biosecurity system that can adjust to changing circumstances. This includes the systems and processes for surveillance and reporting capabilities, increasing efficiencies and reducing duplication.

A collaborative approach to develop new knowledge and adapt existing knowledge and technologies to WA conditions (including with CSIRO, federal and other state governments, universities, cooperative research centres, and other national and international research agencies and industries) is recognised as good practice.

In particular, the involvement of end-users in identifying knowledge gaps and developing research priorities is crucial to ensure the research is well directed, and to maximise uptake of new knowledge and systems.

WA has endorsed three national strategies developed for animal, plant and environment biosecurity research and development under the IGAB framework.

- Outcome 7.1 Western Australia has access to effective identification, diagnostic, surveillance, reporting and tracing systems.
- Outcome 7.2 Research, development and innovation is applied to fill important knowledge gaps.

Table 1: **Summary of the Western Australian Biosecurity Strategy Goals, Outcomes and Tactics**

Goal	Outcome	Tactics
1. Enhanced partnerships and collaboration	1.1 Industry, government and community are partners who also understand and respect each other's roles and responsibilities	1.1.1 Define and communicate roles and responsibilities of all stakeholders (government, industry and community) in existing biosecurity legislation according to public and private benefits
		1.1.2 Government biosecurity agencies collaborate effectively to enable coordinated policy and cross-portfolio administrative arrangements to effectively manage risk
	1.2 Industry and community play a greater role in decision-making and biosecurity management	1.2.1 Government will work with industry and the community to develop partnerships which complement and strengthen statutory responsibilities
2. Enhanced engagement	2.1 Increased industry and community awareness of biosecurity risks and participation in biosecurity	2.1.1 Identify the most effective partners in industry and the community for engaging in biosecurity related activities/messages
		2.1.2 Develop and deliver engagement strategies and communication mechanisms directed at increasing community awareness of biosecurity issues and their potential roles
		2.1.3 Develop and deliver engagement and communication strategies directed at increasing government, industry and community awareness of biosecurity science, its applications and benefits
3. Increasing use of evidence to inform decision making and investment, and support market access	3.1 Government, industry and community understand and apply the investment principles outlined by IGAB	3.1.1 Improve knowledge of the costs, benefits and lessons learned from current and previous intervention for pests and diseases
		3.1.2 Ensure impacts of pests and diseases on access to priority trade markets are clearly understood and data is available to support area freedom declarations to maintain Western Australia's competitive advantage.
		3.1.3 Increase awareness and application of the IGAB investment principles to investment decision-making
	3.2 State government resources targeted to provide the greatest public benefit, and for agriculture this is prevention and eradication of priority pests and diseases	3.2.1 Use risk assessment and cost benefit analyses to prioritise biosecurity prevention, eradication, containment and asset based protection measures with resourcing targeted towards threats across terrestrial and aquatic environments
4. Effective legislation and regulation	4.1 Effective and appropriate state biosecurity legislation exists and is understood by stakeholders	4.1.1 Ensure legislation supports the roles of government, industry and the community to deliver effective biosecurity activities
		4.1.2 Conduct periodic reviews of biosecurity legislation at a state and national level
		4.1.3 Effectively negotiate arrangements with the Commonwealth that ensure Western Australia's area freedoms and market access is recognised and leveraged
	4.2 A compliance framework that is well understood, effective and efficient	4.2.1 Ensure the compliance continuum from education to prosecution is implemented in an appropriate and consistent manner
	4.3 Effective control of established priority pests and diseases on land and water assets managed by government agencies	4.3.1 State government to review and develop programs to manage established priority pests and diseases so as to minimise harm to people, the environment and assets, on land and water for which it has management responsibility

Table 1: **Summary of the Western Australian Biosecurity Strategy Goals, Outcomes and Tactics (cont.)**

Goal	Outcome	Tactics
5. More effective preparedness and capacity to detect, respond and recover from new incursions	5.1 The introduction and establishment of pests and diseases is prevented by effectively regulating risk pathways (Prevention stage of the invasion curve)	5.1.1 Maintain effective and efficient risk-based quarantine operations (surveillance, tracking and reporting) to minimise the introduction of new pests and diseases and limit the risks to market access, environment and social amenity
		5.1.2 Enhance skills, knowledge and capacity within industry, government and community for the delivery of biosecurity prevention activities
	5.2 Industry and community understand the importance of prevention and early eradication and increasingly support surveillance for pests and diseases	5.2.1 Industry and community contribute to surveillance and response
	5.3 Effective biosecurity emergency preparedness, response and recovery (Eradication stage of the invasion curve)	5.3.1 Develop skills, knowledge and capacity within industry, government and community for the delivery of biosecurity eradication activities
		5.3.2 Develop and deliver effective information, training, logistics and administrative systems to underpin emergency response and recovery and regularly practise using these systems
		5.3.3 Commonwealth and other states and territories work together to improve national arrangements for managing exotic pests and diseases
6. Community and industry understand and increasingly utilise available mechanisms for managing their priority pests and diseases	6.1 Community and industry increasingly lead management of established pests and diseases where they consider them a priority (Containment and asset based protection stages of the invasion curve)	6.1.1 Review and develop programs with industry and community to manage established priority pests and diseases so as minimise harm to people, the environment and assets
		6.1.2 Develop skills, knowledge and capacity within industry, government and community for the delivery of biosecurity containment and asset based protection activities
7. Biosecurity management is underpinned by science and technology-based innovative solutions	7.1 Western Australia has access to effective identification, diagnostic, surveillance, reporting and tracing systems	7.1.1 Maintain and improve diagnostic capability, surveillance, reporting and tracking systems using effective technologies, and information management systems
	7.2 Research and development is applied to fill important knowledge gaps	7.2.1 Strengthen research and development partnerships and encourage research and development to address priority knowledge gaps in biosecurity that impact on the management of agriculture, fisheries, forests and environment within the State

Case studies

Case studies in the Strategy demonstrate each stage on the generalised Invasion Curve and one or more of the goals that apply.

For example, the foot-and-mouth disease (FMD) case study demonstrates the 'prevention' stage of the Invasion Curve, and highlights the importance of goals 2 (engagement) and 5 (more effective preparedness and capacity to detect, respond and recover from new incursions).

Table 2 **Case studies**

	Case study	Invasion Curve stage	Underpinned by (goal)
1	Foot and mouth disease	Prevention	Engagement (2) More effective preparedness and capacity to detect, respond and recover from new incursions (5)
2	Asian paddle crab	Eradication	Enhanced partnerships and collaboration (1) Engagement (2) More effective preparedness and capacity to respond and manage new and emerging pests and diseases (5)
3	Cane toad	Containment	Enhanced partnerships and collaboration (1) Engagement (2) Community and industry understand and increasingly use available mechanisms for managing priority pests and diseases (6) Biosecurity management is underpinned by science and technology-based innovative solutions (7)
4	Wild dogs	Asset-based protection (management)	Enhanced partnerships and collaboration (1) Community and industry understand and increasingly use available mechanisms for managing priority pests and diseases (6)

1. Foot and mouth disease prevention

Foot and mouth disease (FMD) is the most important biosecurity threat to Australia's livestock industries because it is highly contagious, trade sensitive and has a high potential cost. It affects cloven-hoofed animals including cattle, sheep, goats and pigs.

Disease surveillance to demonstrate freedom from FMD is critical to maintain access to our international markets as well as to ensure that FMD is detected as early as possible.

To manage the risk, government and industry engage in significant prevention, planning and preparedness activities.

Biosecurity measures include careful management of the conditions of entry of live animals, animal products and any potentially infectious material; early detection; and exercises to determine our capacity to contain and control an incursion as quickly as possible.

In 2014 more than 60 livestock industry and government representatives joined forces in Perth to work through their preparedness to implement a livestock standstill in case FMD occurred in Australia.

The discussion exercise, which followed four regional workshops held in Katanning, Muchea, Mt Barker and Bunbury, formed part of the national year-long FMD program called Exercise Odysseus.

Early detection, which includes investigating any animal that shows signs consistent with FMD, such as blisters in the mouth, drooling and lameness, will ensure the disease has the least chance of spread prior to the instigation of eradication measures. Government is working with industry to increase awareness of signs of exotic disease, to minimise the time to first detection.

A well-equipped and trained response team is also critical to the efficiency and ultimate success of eradication efforts. This in turn decreases the impacts of disease and ensures the fastest recovery and return to usual business.

The roles of government, industry and the community are critical in maintaining vigilance for signs of FMD, and ensuring all biosecurity measures designed to minimise the risk of an incursion and enhance emergency response capacity and capability are in place.

2. Asian paddle crab eradication

In October 2012 a crab caught in WA's Swan River near Mosman Bay by a recreational fisher was identified and confirmed as being the international high-risk marine pest species, Asian paddle crab (*Charybdis japonica*).

This marine pest is listed by the federal government as one of the 10 most likely invaders and potentially the most damaging marine pest species.

This species presents a serious biological threat to WA's marine environment due to its highly aggressive nature and its potential to out-compete native crabs for food and habitat.

In response to the discovery of the paddle crab, the Department of Fisheries assembled an incident management team, with input from the Swan River Trust and other stakeholders.

The team focused on extensive trapping in the surrounding areas, and a comprehensive public awareness campaign, with materials distributed at boat ramps, dive and tackle shops and via radio interviews. Members of the public were asked to look out for suspect crabs and report them to the FishWatch 1800 815 507 hotline. Fisheries officers then followed up every report received.

These efforts resulted in over 200 public reports, including confirmation of two more Asian paddle crabs being found in the following two months, caught at the same location and also by recreational fishers. While it is unknown how the pest crabs entered the Swan River, it is likely they came either via ballast water (as larvae or swimming adults) or in the hull of a vessel.

Since December 2012, over 400 public reports have been received and followed up by the Department of Fisheries, but no further pest crabs were found from those reports.

3. Cane toad containment

The cane toad (*Bufo marinus*) is a highly invasive species that is believed to have entered WA from the Northern Territory in 2009, occupying the habitats of many native species.

Since then, they have spread west across the Kimberley at a rate of about 50km a year, reaching Halls Creek and Wyndham by 2014.

Cane toads attain high population densities during colonisation and their immediate impact can be dramatic, particularly affecting reptile species (goannas and snakes), as well as other native fauna such as northern quolls. Some highly susceptible native animals have become locally extinct as a result of cane toad impacts.

The people of Kununurra have been active in trying to slow the spread of cane toads in the area and the Department of Parks and Wildlife has established a number of toad 'drop-off points' in the east Kimberley for travellers. A dog trained in cane toad detection is also used as a proactive quarantine measure, inspecting high priority freight for 'hitchhiker' toads to help prevent the spread of cane toads to other parts of the state.

These actions are part of a range of government initiatives being implemented under the Cane Toad Strategy for Western Australia 2014–19, as well as the Kimberley Science and Conservation Strategy. Associated funding has enabled investment in scientific research in cooperation with a range of partners.

While a number of possible cane toad control and management projects have been thoroughly investigated, some have proven not to be useful. Work continues on investigating options for effective landscape-scale methods to mitigate the impact of cane toads on native species in WA.

4. Wild dog management

Wild dogs can be a significant pest to livestock and native animals. In 2012 wild dogs killed an estimated 42 200 stock (mostly sheep) with a value of $6.3 million in the rangelands of WA.

To mitigate wild dog impacts, sustained and cooperative management programs are required.

The Recognised Biosecurity Group (RBG) framework provides WA communities with a legislated opportunity (through the BAM Act) to work in partnership with the state government to address 'declared pest' issues over large areas.

While land managers are responsible for wild dog control on their own properties, broader management programs allow managers to use their resources more effectively, significantly improve livestock production and profits, and contribute to the protection of vulnerable wildlife.

In 2008 the Meekatharra Rangelands Biosecurity Association formed an RBG to mitigate wild dog impacts on the sheep and goat industries. The association's prescribed area covers 13 million hectares, comprising 93 pastoral leases with diverse landowners and management systems, including pastoralists, mining companies, the Department of Parks and Wildlife, and Indigenous groups.

Measures to control wild dogs in the region include a coordinated baiting program. By 2014 the program deployed 500 000 dried meat baits each year, of which 30 000 were dropped by air. In addition, seven doggers were employed to control the most troublesome wild dogs in the area.

The BAM Act offers a mechanism to raise funds from landowners, which are matched dollar-for-dollar by the state government, in order to control declared pests.

Acronyms

ALOP	Appropriate level of protection
BAM Act	*Biosecurity and Agriculture Management Act 2007*
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAFWA	Department of Agriculture and Food, Western Australia
EADRA	Emergency Animal Disease Response Agreement
EPPRD	Emergency Plant Pest Response Deed
IGAB	Intergovernmental Agreement on Biosecurity
NEBRA	National Environmental Biosecurity Response Agreement
RBG	Recognised Biosecurity Group

Glossary

Term	Meaning
Aquatic	Relates to water, including freshwater, estuarine and marine
Appropriate level of protection	The level of protection deemed appropriate by a country establishing a sanitary or phytosanitary measure to protect human, animal or plant life or health within its territory. The Australian ALOP is probably the single most important policy statement in relation to implementing a biosecurity system because all biosecurity activities must be consistent with the ALOP
Asset-based protection	Managing the effects of pests and diseases that have become established. Once an invasive plant or animal becomes so widespread that containment or eradication is not possible, the focus of management effort should change to protecting the area's priority assets
Ballast water	Water taken up by ships to assist with vessel stability and balance
Biosecurity	The management of risks to the economy, the environment, and the community, of pests and diseases entering, emerging, establishing or spreading
Biosecurity Council	The Biosecurity Council of Western Australia was established under s. 48 of the BAM Act
Biosecurity activities	Activities undertaken to manage biosecurity risks
Biosecurity continuum	Describes the range of locations where biosecurity risks may arise and where biosecurity activities take place — pre-border, at the border, and onshore activities
Biosecurity emergency	Circumstances in which a pest or disease poses a significant and immediate threat to part or parts of Australia's economy, environment or community
Biosecurity incident	Event that increases the likelihood of biosecurity risk being realised
Biosecurity measures	Activities undertaken to manage biosecurity risks
Biosecurity risks	The potential of a disease or pest entering, emerging, establishing or spreading in Australia with the likelihood to cause harm to the environment, economy or community
Compliance	Status whereby all aspects of product, facilities, people, programs, and systems meet regulatory requirements and, where applicable, importing jurisdiction's official requirements
Declared pest	A prohibited organism or an organism for which a declaration under s. 22(2) of the BAM Act is in force
Disease	The presence of a pathogenic agent in a host or the clinical manifestation of infection that has had an impact (i.e. significant negative consequences) or poses a likely threat of an impact. Includes microorganisms, disease agents, infectious agents and parasites
Emergency preparedness	The ability to respond to an emergency allowing for the efficient mobilisation and deployment of resources and services needed to address the outbreak
Established pests and diseases	A pest or disease that is already present in Australia or parts of Australia

Term	Meaning
Exotic pests and diseases	Pests and diseases affecting plants or animals (possibly including humans) that do not normally occur in a particular country
Industry	Agriculture, forestry or fishing sectors involved in the growing, harvesting, extracting and sometimes processing of natural resources that form the basis of the products we use in our everyday lives
Inspection	Examination of an animal, plant, food and human health product, vectors or systems to verify that they conform to biosecurity requirements
Public good	Occurs when the community receives significant benefit regardless of whether that benefit is in the form of an economic benefit, a non-economic benefit, an environmental benefit or an intangible benefit
Risk assessment	The evaluation of the likelihood and the biological, social and economic consequences of entry, establishment or spread of a pest or disease within an importing country
Risk management	The process of identifying, selecting and implementing measures that can be applied to reduce the level of risk
SPS Agreement	The Agreement on the Application of Sanitary and Phytosanitary Measures of the World Trade Organisation, to which all WTO member countries are bound
Surveillance	Activities to investigate the presence or prevalence of a pest or disease in a given plant or animal population and its environment
Terrestrial	Relates to the earth, or dry land, as separate from the water
Vector	Anything capable of carrying or transmitting pests, diseases or infections
Zoonotic diseases (zoonoses)	Diseases of animals that can be transmitted to humans (e.g. bird flu, Ebola, rabies, Hendra virus)

All Western Australians and visitors to WA have a role to play in protecting the biosecurity status of WA (abiding by biosecurity legislation, maintaining good farm practices, reporting anything unusual in animals, crops and the environment) to ensure the community continues to benefit from our healthy environment and economy.

Detailed descriptions of the roles and responsibilities of government, industry and the community can be found on the Biosecurity Council web page.

www.agric.wa.gov.au/biosecurity-roles-and-responsibilities

Development and refinement of the Strategy was part of the Boosting Biosecurity Defences project, led by the Department of Agriculture and Food, WA and made possible by the State Government's Royalties for Regions program.

ROYALTIES FOR REGIONS