

BIOSECURITY COUNCIL OF WESTERN AUSTRALIA

ANNUAL REPORT 2008

Comments or feedback on the Biosecurity Council Annual Report and its content should be addressed to:

Kirsty van Hennekeler

Executive Officer to Biosecurity Council
Department of Agriculture and Food, WA
Locked Bag 4
Bentley Delivery Centre WA 6983
T: +61 8 9368 3187
F: +61 8 9474 5974
Email: kvanhennekeler@agric.wa.gov.au

Web: www.agric.wa.gov.au

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Hon. Terry Redman MLA

Minister for Agriculture and Food; Forestry;
Minister assisting the Minister for Education
Parliament House
PERTH WA 6000

Dear Minister

It gives me great pleasure to deliver the inaugural Report of the State's new Biosecurity Council (The Council), for your information and presentation to Parliament, and in satisfaction of our obligation under s51 of the *Biosecurity and Agriculture Management Act 2007*.

Council Members have met on three separate occasions since their appointments in March 2008, to consider their new role and to map out an intended *modus operandi*, and priority focus areas. One face-to-face meeting occurred during the formal reporting period for this annual report, ending on 30th June 2008, and the other two meetings (including an all day strategic planning workshop) occurred subsequent to that date. The consensus to date is that the following are key responsibilities of the Biosecurity Council:

- the provision of leadership and a shared vision for biosecurity throughout WA
- the encouragement of greater industry and community awareness of, ownership of, and collaboration in, biosecurity within WA
- benchmarking or comparative measurement of WA's biosecurity system against those of other States and of other countries around the world, for the purposes of ensuring a continuing focus within WA on the achievement of accepted "best practice" in biosecurity
- use and further development of strategic networking that expand on existing partnerships and engage new 'players' in the State's collective biosecurity effort
- monitoring and general oversight of the biosecurity business in WA, and provision of strategic advice, policy and direction – to key decision makers
- confirmation of future investment directions in biosecurity and support for additional resources where needed/justified
- support for training and community capacity building throughout all aspects of the biosecurity business.

The Council's intended foci over the remainder of this financial year are outlined in section five of this Report (Activity Plan). However, Members felt it especially important and somewhat urgent to develop a formal Biosecurity Strategy for Western Australia, to:

- articulate a vision and outcomes for a modern, integrated biosecurity system
- set some broad policy principles to underpin subsequent actions
- identify areas for immediate and longer-term action
- confirm the roles and responsibilities of key stakeholder groups– government, non-government, industry and community
- confirm some suitable principles for an appropriate sharing of costs between stakeholders and beneficiaries
- define how success will be evaluated and reported on
- provide a basis for more detailed consultations with key stakeholder groups.

I am happy to report that a preliminary draft of such a Strategy is under development and will be progressively refined with the benefit of broader stakeholder input during the second half of the 2008/09 financial year.

The Council is also particularly keen to recognise, and to maximise, the value of the work recently completed (April 2007) under the direction of Emeritus Professor Mal Nairn, which culminated in the detailed review of the overall health and standing of the State's existing biosecurity system (the WA Biosecurity Review¹). The Members intend to examine this body of work closely over the coming

¹ "Biosecurity Risk Management in Western Australia", April 2007, WA Departments of Agriculture and Food, Environment and Conservation, Fisheries, and Forest Products Commission of WA.

months, to ensure that key messages within serve to inform their future deliberations and are not lost with the passage of time. As well as helping to guide the State's future investment in biosecurity, it is expected that the WA Biosecurity Review findings will provide a vital form of benchmark against which subsequent progress in certain areas can be measured.


Western Australia can be justifiably proud of its efforts thus far, as the Council believes that the foundations of a world-class biosecurity system are already in place. However, the essential finding of the WA Biosecurity Review - that across all sectors (agriculture, fisheries, plantation forestry, the environment, and society), only 12% of the State's current biosecurity arrangements are satisfactory and without immediate need of improvement, and that fully 56% of them are in need of improvement, with a further 32% either non-existent or in need of substantial improvement/development - bears testimony to the significant challenges that still lie ahead.

Examples of significant issues which have already come to Council's attention include:

- the need to complete the full implementation of the new regulatory framework (Biosecurity and Agriculture Management Act 2007)
- the importance of the new Industry Funding Schemes (currently under development for the grains/seeds/hay, cattle and sheep industries) to empower producers to take control of their own destinies, in terms of the eradication/management of serious new pest and diseases affecting their production
- the effectiveness (or in certain cases, the lack thereof) of the current arrangements for biosecurity across the State's vast areas of Rangelands
- the widespread public dissatisfaction with current levels of pest management on the Crown Estate and on Unallocated Crown Lands in particular (with consequent perceptions of inequity/unfair treatment)
- the (silently) growing weed problem in more remote areas of the State
- the emergence of serious pest issues in the State's marine environment (eg. water ballast and bio-fouling issues)
- the need for ongoing attention to serious pests of the environment such as the Cane toad and the Starling
- the emergence of serious pests of the plantation timber industry and the built environment (eg. the European House Borer and the Chinese Auger Beetle)
- the continuing threat to public & social amenity posed by invaders such as the European wasp and the Red Imported Fire Ant
- throughout the South West Land Division of WA, the need to progress arrangements at a regional/landscape scale, for the coordinated management of invasive pests with impact on both private and public property (via the so-called "Recognised Biosecurity Group" model).

Appropriate responses to these and a range of other pressing biosecurity issues will no doubt require a sustained and collaborative effort on the part of all stakeholders, including governments, industries, the community at large, and individuals within it. On the basis of the expert work comprising the WA Biosecurity Review, it is also clear that both private and public beneficiaries alike will need to seriously consider a significant increase in resourcing across all areas of the State's biosecurity continuum.

The Council looks forward to the opportunity to play its part, through the provision of sound advice, and a constructive working relationship with all key stakeholders.



Chris Richardson
Chairman
Biosecurity Council of Western Australia
November 2008

1. BIOSECURITY COUNCIL MEMBERS



Chris Richardson (Biosecurity Council Chairperson) has been an Agriculture Protection Board member since 1998 and Chairman since 2002.

Chris' background is in mixed farming and agricultural contracting and he also served as a Local Government councillor for ten years.

Chris is Chairman of the WA Footrot Management Committee and the WA Ovine Johnes Disease Advisory Committee and is also an independent director of National Plant Biosecurity CRC Ltd that is based in Canberra. In recent times he has also been closely involved with the development of the WA Rangelands Wild Dog Management Policy.



Michelle Allen is a member of the Agriculture Protection Board and Chairs the State Wild Dog Management Advisory Committee. Michelle is experienced with policy and service delivery in the northern agricultural region and with natural resource management through the Sustainable Rural Development Program.

Michelle, together with her husband and son, has a property in Northampton producing grain and livestock. Michelle is actively involved with the marketing and transport of grain, livestock and wool and works closely with numerous local organisations in a governance capacity and is currently working with local grower groups building awareness of issues that affect regional economies.



David Anderson is Chairman of VegetablesWA (from 2004) WA and was Vice Chairman of the Potato Growers Association of WA. He is a Board member of Chemcert WA and a Member of the Agricultural Produce Commission (vegetable producers committee).

David is a vegetable grower with more than 20 years experience in fresh produce industry; growing produce for both the domestic and international markets.



Lisa Christy has spent many years working with Department of Conservation and Land Management (now Department of Environment and Conservation); Forest Products Commission; and Department of Agriculture and Food WA in roles relating to biosecurity and emergency response, including leading the emergency response to the European House Borer incursion from 2004 to 2006. She has experience as both a member and Chair of a number of related industry bodies, stakeholder groups and associations and maintains links with the forestry and furniture industries. She has strong ties to the equine industry and is currently Vice Chair of the WA Horse Council and the Equine Industry Liaison Officer for Emergency Animal Disease Response. Lisa is currently based in private industry (mining and resources), in an appointment in Supply Chain Management for an international gold mining company.



Ron Creagh has been a member of the Agriculture Protection Board of Western Australia since 1995 and is Chairman of the GrainGuard Steering Committee. Ron has played a lead role in guiding the development of industry biosecurity plans for the grains sector.

Ron owns and operates an 8000 ha broadacre cropping and livestock enterprise in the Shires of Nungarin and Trayning, is a member of the WA Wheat Growers Association and foundation member of the Ningham Focus Group and Vice Chairman of the Nungarin Land Conservation District Committee.

Ron was recently appointed Chairman of Plant Health Australia's Biosecurity Committee for the Western Region.



John Edwards is the Dean of the School of Veterinary and Biomedical Sciences at Murdoch University in Perth. Previous roles included Veterinary Epidemiologist with the WA Department of Agriculture and two years as Lecturer in Veterinary Epidemiology at Murdoch University he was appointed Chief Veterinary Officer for Western Australia from 1993-2001. This was followed by three years as Regional Coordinator for the World Organisation for Animal Health (OIE) Southeast Asia Foot and Mouth Disease Campaign. Professor Edwards is well known in national and international circles and has relevant policy and management experience in the fields of animal health, aquatic animal health, public health, plant health and invasive species. Areas of particular expertise include risk analysis, risk communication, border security, surveillance and emergency response. He is also actively involved in research on trans-boundary animal diseases in Australian and Southeast Asia. He is also Chair of the Australian Biosecurity CRC's Biosecurity Risk Intelligence Scanning Committee.



Rob Gillam is a member of the Agriculture Protection Board and is President of the Pastoralist and Graziers Association. Rob has a wealth of experience in both agricultural and pastoral enterprises. Rob's family business operates from two localities: Dongara (cropping, wool and sheep and cattle for domestic and live export markets) as well as a pastoral sheep station at Yalgoo involving wool production and live export markets.

Rob is actively involved in Local Government and biosecurity.



Maggie Lilith is the Sustainable Agriculture Officer at the Conservation Council of WA. Her role includes researching the impacts of agriculture on the environment and addressing issues such as salinity and decreasing biodiversity arising from agriculture.

Maggie also represents community interest on the Aquaculture Development Council and acts as deputy to the Director of Conservation Council on the GMO industry reference committee.

Her interest in biosecurity stems from an extensive research experience and knowledge of environmental issues such as introduced plant diseases and introduced predators and, their effects on biodiversity and plant/fauna communities. Her research on ecological impacts of the domestic cat, which was based on the precautionary principles, was part of a broader study to assess the requirements of local by-laws (cat legislation).



Dan Machin has 22 years experience in aquaculture and seafood industry development. He has worked along the continuum of strategic roles from Public Company Director, Ministerial Advisory Committees and in senior and middle management positions both in businesses (Ireland & Greece) and in government. Dan has a BSc. (zoology and botany), Diploma in Business, and a MSc. in Aquaculture.

Dan has solid general knowledge of biosecurity arrangements within WA, developed through a long standing involvement with Biosecurity Agriculture Management Bill Overarching Reference Group and the Biosecurity Review, and his operational experience in biosecurity breaches in the seafood industry in WA and nationally.



Lesley Maher has held the position of Managing Director of Era Farming for 10 years. Era Farming works with the University of Western Australia taking agricultural research into agricultural practice and has programs for farmers who wish to be chemical free, use the productive soil as a carbon sink, and ensure that their crops are contaminant free and farming style sustainable. Era Farming also has research relationships with Newcastle University (UK) and Cornell (USA). She was a member of the Minister's Sustainable Agricultural Committee for two years. Era Farming is a current recipient of an ARC grant to look at how soil biota can influence farming practice. Lesley was previously a Member of the Senate of the University of Western Australia and a Member of the Strategic Planning Committee for the NHMRC.



Phil O'Brien has a background in microbial biochemistry and molecular biology. His previous experience includes postdoctoral research at The University of California Berkeley and CSIRO Division of Plant Industry in Canberra. He has been a Biotechnology staff member at Murdoch University since 1988. His interests are in the area of plant pathogenic fungi and oomycetes. His current research focus at Murdoch is *Phytophthora cinnamomi*, the agent of eucalypt dieback disease. His specific interests are in the population genetics and the development of methods for detection of fungal phytopathogens in plant material, soil and water as this is the basis for any successful disease management and quarantine exclusion. In collaboration with colleagues at Murdoch he has established the Centre for Phytophthora Science and Management.



Bob Pearce is the Executive Director of the Forest Industries Federation of WA and President of the National Association of Forest Industries. He was previously Minister for the Environment, Education, Transport, Planning, Parliamentary and Electoral Reform and Leader of the House in the Government of Western Australia.

Bob is Deputy Chairman of the Fremantle Port Authority Board, Chairman of the WA Forest Heritage Centre, Board Member of the CRC Forestry and the Forest Training Centre and member of two forest industry Ministerial Advisory Councils.



Maxinne Sclanders has been a member of the Agriculture Protection Board since 1995 and currently is chair of the Board's Rainbow Lorikeet Working Party. With her family she operates a vineyard in the Perth Hills. Maxinne is a former senior public servant who is now working as a consultant. She is a member of the Mental Health Review Board, Edith Cowan University's Quality and Audit Committee and Fremantle Hospital Human Research Ethics Committee. She has a particular interest in ways to encourage urban populations to participate in the management of environmental/agricultural pests and diseases.



Johann van der Merwe is currently developing a Quarantine Management System for Chevron for the Gorgon Project that has set new benchmarks in the management of biosecurity risks, in particular those associated with large resource projects in sensitive locations. He was previously the Parks Director for South African National Parks. He managed biosecurity threats to the biodiversity of national parks including management of highly contagious diseases (e.g. anthrax, bovine tuberculosis, foot and mouth) and a massive invasive species management program. He is considered an international authority on conservation planning and development, protected area management, and associated sustainable regional development.

2. BUSINESS OF COUNCIL AND ITS INTERACTION WITH GOVERNMENT AGENCIES

A Whole-of-Government Approach to Biosecurity

The four key government agencies with responsibility for delivery of biosecurity management in Western Australia (WA) are:

- the Department of Agriculture and Food (DAFWA);
- the Department of Environment and Conservation (DEC);
- the Department of Fisheries (DoF) and
- the Forest Products Commission (FPC).

These agencies are in the process of establishing a whole-of-government framework to develop and implement a comprehensive and integrated approach to manage biosecurity threats across the environment, the community and all primary industries within WA. Legislation that underpins this objective, the *Biosecurity and Agriculture Management Act 2007* (BAM Act) has been enacted and the Biosecurity Council has been formed under its auspices (Division 6, Section 48). The section of the BAM Act that deals with the Biosecurity Council is one of the few sections that is currently fully operational.

Biosecurity Council

The 14 member Biosecurity Council (the Council) was appointed on 27 February 2008 and endorsed by Cabinet on 10 March 2008. The main business of the Council is to advise the Minister for Agriculture and Food or the Director General of the Department of Agriculture and Food Western Australia, as the case requires, on any matter related to biosecurity. The Council has four ordinary meetings per year. The inaugural meeting occurred on 2 May 2008. Meetings for the remainder of the calendar year were planned for 23 July, 17 October and 12 December 2008.

The Council is a specialist advisory group, comprised of members who are experienced or actively involved in agricultural, fishing, aquaculture, pearling or related commercial activities, natural resource management, environmental protection or regional communities. The members of the Council were chosen with the aim of including a broad cross-section of these biosecurity-related areas, and who have a general or specific interest and expertise in the management of biosecurity in the State, and to include members of community and producer organisations.

Five Agriculture Protection Board (APB) members are also Council members. The appointment of the APB members was necessary to retain a level of 'corporate knowledge' on biosecurity policy and related initiatives and programs, particularly those matters that relate to the protection of agricultural industries, during the transition from the old legislation to new. The APB will continue to operate until the APB legislation is repealed (expected in July 2009). The APB's enabling and administered legislation (*Agriculture Protection Board Act 1950* and the *Agriculture and Related Resources Protection Act 1976*) will be repealed following proclamation of Divisions 6 & 7 of Part 2, of the *Biosecurity and Agriculture Management (Repeal and Consequential Provisions Act) 2007*.

Executive and administrative support for the Biosecurity Council is provided by Dr Kirsty van Hennekeler (Policy Officer, DAFWA; Executive Officer to Biosecurity Council and biosecurity Senior Officer's Group) and Ms Caroline Horsfield (Administration Officer, DAFWA).

The *Biosecurity and Agriculture Management Act 2007*

The main purposes of the *Biosecurity and Agriculture Management Act 2007* (BAM Act) are:

- to prevent new animal and plant pests (weeds and vermin) and diseases from entering WA
- to manage the impact and limit the spread of those already present in the State
- to safely manage the use of agriculture and veterinary chemicals and ensure agricultural products are not contaminated with chemical residues.

Legislation on these subjects has existed for many years but, because it was spread across 17 different Acts there have been inconsistencies, confusion and inefficiency. Under the BAM Act many of the existing Acts and regulations have been reviewed, updated and gathered into a single regulatory scheme. This has involved extensive discussion with relevant producer and community groups and Government agencies to ensure every aspect of biosecurity and agriculture management is regulated consistently. This will help safeguard Western Australia's primary industries, natural environment, economic future and lifestyle and provide a holistic approach to biosecurity protection.

The regulations and other subsidiary legislation necessary to bring the BAM Act into effect are currently being drafted in consultation with key stakeholder representatives. It is anticipated that the Act will be fully operational by July 2009.

Biosecurity Senior Officers' Group

The Biosecurity Senior Officers' Group, comprising of senior executives from each of the departments involved in biosecurity, provides guidance for the development of a more holistic approach to the State's biosecurity management. The Senior Officers' Group works closely with the Biosecurity Council.



Rob Delane

Deputy Director General and Executive Director
(Biosecurity and Research)
Department of Agriculture and Food



Gordon Wyre

Director Nature Conservation
Department of Environment and Conservation



Greg Paust

Director of Fisheries Management Services
Department of Fisheries



John McGrath

Manager Forest Science and Resources Branch
Forest Products Commission

Matters on which the Biosecurity Council is to give advice

The Council is to give advice to the Minister for Agriculture and Food and the Director General of the Department of Agriculture and Food, Western Australia on any matter related to biosecurity and in particular:

1. The requirements generally of a comprehensive and effective biosecurity system for the State of Western Australia, and necessary linkages to biosecurity systems established at the national and international levels
2. Strategic biosecurity policy required for the effective operation of the BAM Act including:
 - a. Any identified gaps in, or necessary improvements to, the biosecurity system implemented under the BAM Act and in particular in relation to the likelihood of incursions of high impact organisms² and prohibited organisms¹
 - b. Opportunities to improve the management of declared pests within the State
 - c. Opportunities to enhance biosecurity surveillance and incursion response capabilities
 - d. Opportunities to improve industry and public awareness and support of, and participation in, the achievement of biosecurity objectives
 - e. Opportunities to improve the capacity of regional communities and interest groups to contribute to effective biosecurity
 - f. The operation of regulations and other subsidiary legislation under the BAM Act and any amendments to this legislation that are identified as necessary
 - g. Identified opportunities to improve Government, community and primary producer cooperation and collaboration on biosecurity matters.
3. Any proposal to declare an organism to be a permitted organism, a prohibited organism or a declared pest on which the Minister decides to consult the Council under sections 12 and 21 of the BAM Act and
4. Any changes it may recommend to the matters set out in the Instrument of Appointment.

² Part 1, Section 6 *Biosecurity and Agriculture Management Act 2007*

3. OUTLINE OF MEETINGS

Meetings in 2008 Financial Year

The inaugural meeting of the Biosecurity Council occurred on 2 May 2008 at the Technology Park Function Centre, Bentley. The meeting was attended by all of the Biosecurity Council members, Senior Officer's Group and staff from DAFWA and DoF.

At this meeting, the biosecurity Senior Officers' Group presented details of the current status of biosecurity risk management in WA for each sector, including key biosecurity issues, major threats and opportunities for improvement for each agency.

An overview of the WA Biosecurity Review *Biosecurity Risk Management in Western Australia* that was completed in April 2007 was presented. This Review provides key recommendations for improvement of WA's biosecurity system.

Future meetings of the Biosecurity Council were planned for 23 July, 17 October and 12 December 2008. During these meetings, the strategic direction and scope of the Council will be explored in further detail and major areas of focus for the Council determined. In addition, the Code of Conduct, with which the Council will comply, will be agreed upon.

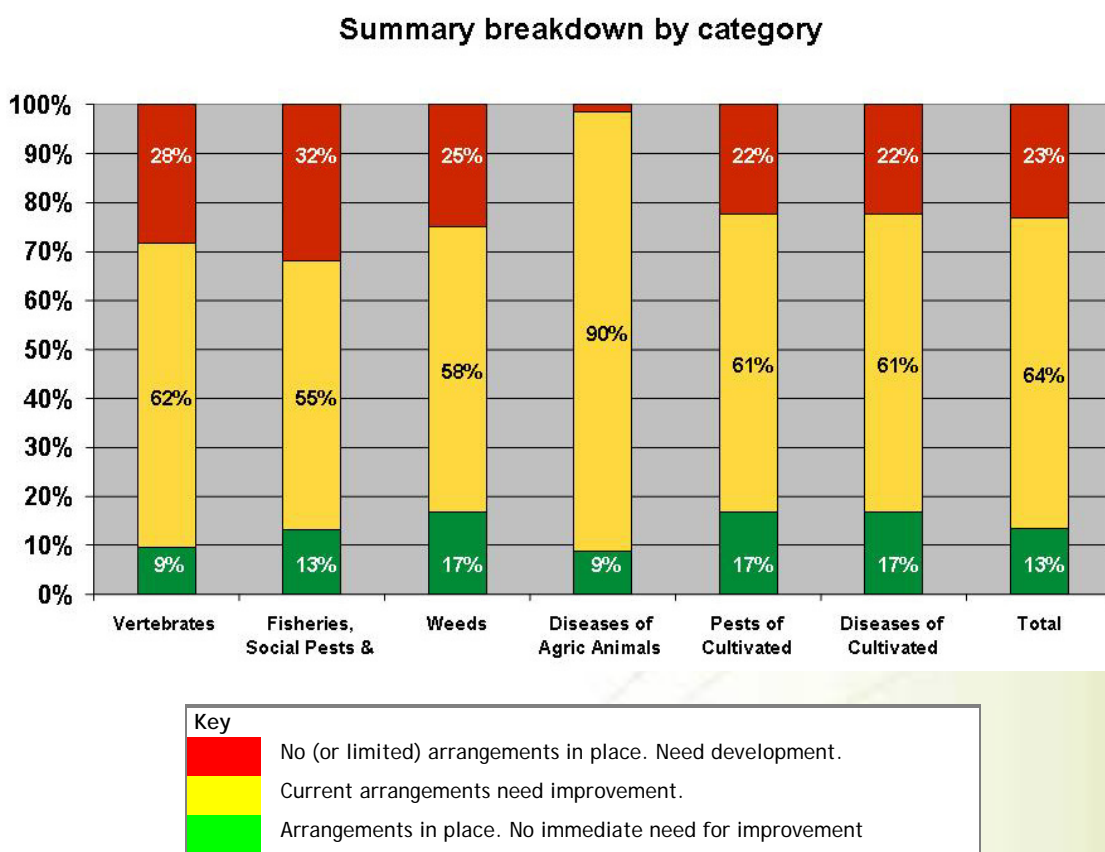
Council Member	Attendance at Meeting 2 May 2008
Allen, Mrs Michelle	Attended
Anderson, Mr David	Attended
Christy, Ms Lisa	Attended
Creagh, Mr Ron	Attended
Edwards, Prof John	Attended
Gillam, Mr Rob	Attended
Lilith, Dr Maggie	Attended
Machin, Mr Dan	Attended
Maher, Ms Lesley	Attended
O'Brien, Dr Phillip	Attended
Pearce, Mr Bob	Attended
Richardson, Mr Chris	Attended
Sclanders, Mrs Maxinne	Attended
Van Der Merwe, Mr Johann	Attended

4. OVERVIEW OF THE BIOSECURITY REVIEW

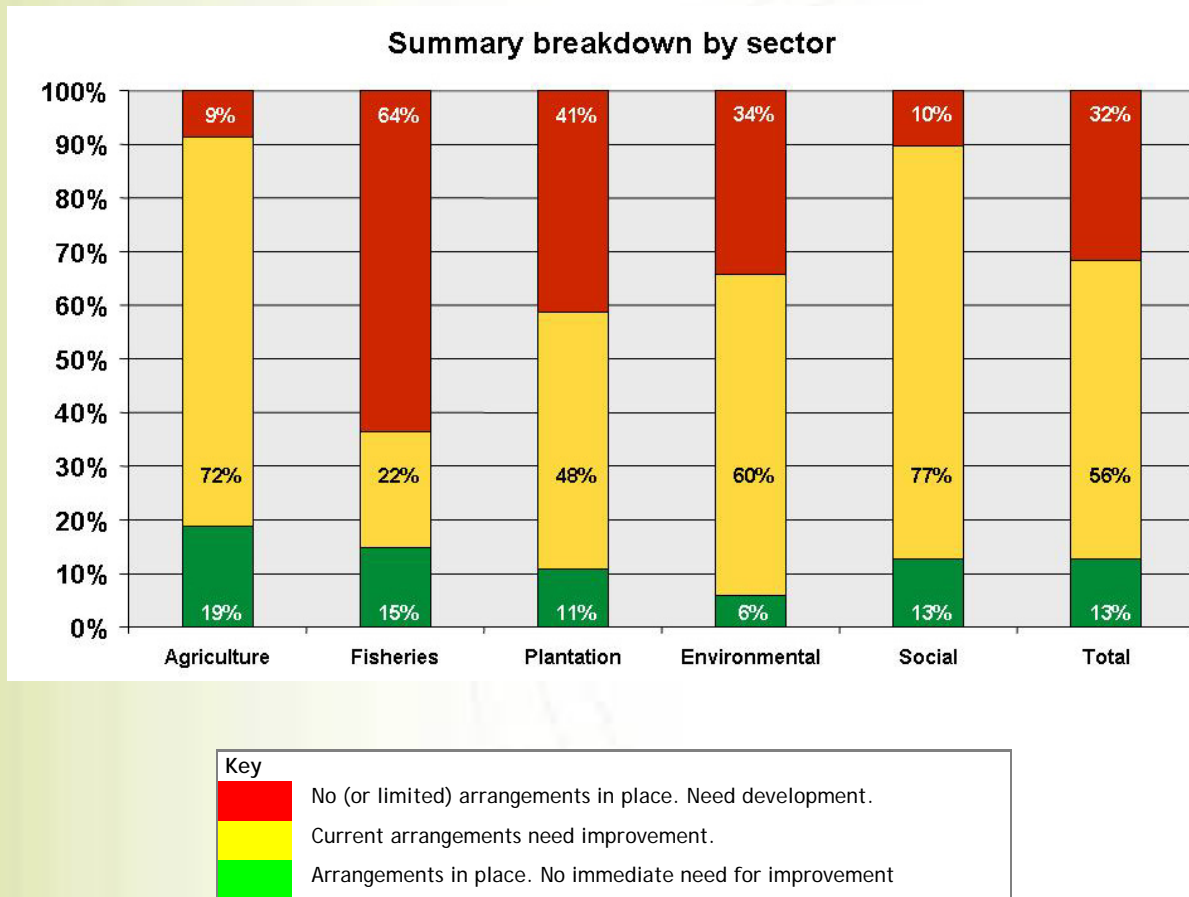
The first step in the development of a whole-of-government approach has been the completion in April 2007 of a comprehensive Biosecurity Review for WA (excluding human-specific health and disease matters) (*Biosecurity Risk Management in Western Australia*, 2007; the 'Biosecurity Review'). An executive summary of the Review is provided in Appendix 1³.

The Biosecurity Review includes detailed documentation of the current status, identification of risk management gaps, and suggested key improvements to address WA's needs across the environment, the community and primary industries. The Review process was chaired by one of Australia's pre-eminent biosecurity experts, Emeritus Professor Mal Nairn and involved a high level of inter-agency input and consultation with key industry and community bodies. A Reference Group comprising representatives from across the biosecurity spectrum oversaw the Biosecurity Review to ensure that it has relevance, completeness, consistency, logic and integrity, and that the review addressed the needs of stakeholders throughout the WA community.

Overview of sectoral biosecurity status provided in the review



³ Appendix 1: Executive Summary of "Biosecurity Risk Management in Western Australia", April 2007, WA Departments of Agriculture and Food, Environment and Conservation, Fisheries, and Forest Products Commission of WA.



The detailed analysis of gaps and weaknesses in current biosecurity risk management arrangements and processes in WA that was completed under the Biosecurity Review identified the need to substantially increase the State Government’s investment in public-good and market-failure biosecurity measures. The Review of existing biosecurity risk management arrangements has shown that, across all sectors (i.e. agriculture, fisheries, aquatic industry, plantation forestry, the environment, and society):

- 13 per cent of current arrangements were satisfactory with no immediate need for improvement
- 56 per cent needed significant improvements
- 32 per cent were either non-existent or in need of substantial improvement or development.

The status of arrangements varied significantly between the sectors. The Review recommended that a new investment of \$43 million per annum by 2013/14, with a staged increase from 2007/08, be made to address the identified gaps.

Requirements identified from the Biosecurity Review

Agency	Investment (\$)		IMPROVEMENT
	current	new	
DAFWA	22,158,000	14,750,000	Management Plans and Responsibilities for Established Pests, Weeds and Diseases
DEC	10,357,000	18,387,000	Contingency planning and preparedness
DFWA	800,000	6,532,000	Emergency response agreements
FPC	600,000	3,310,000	Biosecurity communication and response plans
Total	33,915,000	42,979,000	Strategies for incursion impact mitigation
			Legislative capability
			Database and information management
			Diagnostic capability
			Import risk assessment
			Quarantine surveillance
			Quarantine facilities
			Research
			Early detection and reporting

5. ACTIVITY PLAN FOR 2008-09 FINANCIAL YEAR

The Biosecurity Council activity plan for the 2008-09 financial year includes:

Action

To conduct a strategic planning workshop on 23 July 2008 in conjunction with the Senior Officers' Group, Agriculture Protection Board, DAFWA biosecurity managers and key biosecurity staff.

Objectives of the workshop are:

- to confirm a common understanding of the role and scope of the Council
- to explore expectations of all parties
- to identify key biosecurity issues to be addressed
- to prioritise the focus of the Council.

APPENDIX 1: EXECUTIVE SUMMARY

BIOSECURITY RISK MANAGEMENT IN WESTERN AUSTRALIA (APRIL 2007)

The purpose of the Biosecurity Review is to ensure ongoing protection of Western Australia's plant and animal-based primary industries, its unique and globally recognised environmental and biodiversity assets, and its high quality social assets and standard of living.

The State's primary industries alone are worth \$6.1 billion annually and contribute \$4.8 billion to the State's export earnings. The value of WA's environment, its biodiversity and human well-being are immeasurable, but there are many biosecurity threats that could impact on these assets and lower their value.

The Western Australian agencies that deliver biosecurity management are the Department of Agriculture and Food (DAFWA), the Department of Environment and Conservation (DEC), the Department of Fisheries (DFWA), and the Forest Products Commission (FPC). Between them these agencies currently invest \$36.168 million annually on biosecurity.

The Review of existing biosecurity risk management arrangements has shown that, across all sectors (i.e. agriculture, fisheries, plantation forestry, the environment, and society), 13 per cent of current arrangements were satisfactory with no immediate need for improvement, 56 per cent needed improvements, and 32 per cent were either non-existent or in need of substantial improvement/development; the actual proportions varied between sectors.

The review has identified areas of deficiency, recommended the key improvements to the State's biosecurity systems that would substantially improve current arrangements, and calculated the costs of these improvements.

The additional resources required to implement fully the key improvements totals \$42.97 million annually, allocated as follows:

Prevention activities	\$ 6.782 million (15.78%)
Pre-border activities	\$ 0.060 million (0.14%)
Border (quarantine) arrangements	\$ 3.965 million (9.23%)
Post-border activities	\$32.172 million (74.86%)

The breakdown of the \$42.979 million across agencies is as follows:

Department of Environment & Conservation	\$18.387 million (42.78%)
Department of Agriculture & Food	\$14.750 million (34.32%)
Department of Fisheries	\$ 6.532 million (15.20%)
Forest Products Commission	\$ 3.310 million (7.70%)

Preliminary estimates indicate that the tangible Marginal Benefit⁴ to agriculture, fisheries and forestry of this additional investment is likely to vary in the range of **\$130.99 million** to **\$168.84 million**, with an average value of **\$149.92 million**. Social and environmental benefits were not included in the above-mentioned benefits because of their difficulty to quantify.

It is considered that if the key improvements are not implemented, the biosecurity status of WA will decline, affecting the economic, environmental and social values of all Western Australians.

Some facts: What biosecurity measures protect, and what's at risk.

- Agriculture, forestry and fishing accounted for 3 per cent of Australia's GDP in 2003-04.
- Agricultural exports (livestock and crop sectors) accounted for around a quarter of Australia's merchandise exports in 2003-04 (\$26.1 billion).
- A single case of bovine spongiform encephalopathy (BSE), foot and mouth disease (FMD), exotic fruit fly or Karnal bunt could severely jeopardise our trading position and undermine the well-being of a significant number of Australians beyond those directly involved in agriculture.
- It has been estimated that an outbreak of FMD could cost the nation \$13 billion.
- An outbreak of European wood wasp killed more than five million *Pinus radiata* trees, valued at \$10-12 million, in South Australian plantations between 1987 and 1989.
- Pests and diseases such as Asian Gypsy Moth and Eucalyptus rust would both impact on commercial enterprises and have severe consequences for natural ecosystems.
- An outbreak of a new zoonotic disease such as Nipah virus or Highly Virulent Avian Influenza in Australia would have serious effects on the broader economy including health, education, hospitality, travel, tourism and business investment.
- Estimated costs of control and the value of production foregone for plant diseases and invertebrate pests of plants is at least \$0.7 billion and as high as \$2 billion per annum.
- For animal diseases and invertebrate pests of animals the estimate is at least \$1.2 billion per annum.
- Economic impact of weeds and 11 serious vertebrate pest animals already established in Australia has been calculated at \$4.3 billion and \$720 million per annum respectively. (These figures primarily represent production losses and control costs, as the cost of weeds to the environment and biodiversity is difficult to calculate.)
- An incursion of Black stripe mussel in 1999 in Darwin was eradicated at a cost in excess of \$2 million; however, if left unchecked, this mussel could have devastated major parts of Australia's \$250 million northern pearl industry.
- After habitat loss, invasive species are now identified as the greatest threat to Australian biodiversity.

⁴ A Marginal Benefit is the additional benefit from increasing investment by one unit. It declines with increasing investment.

Purpose

Western Australia's plant and animal-based primary industries contribute \$6.1 billion to Gross Value of Agricultural Production and \$4.8 billion to export earnings (13% of total WA). The State has a diverse range of ecosystems, including areas recognised as global biodiversity hotspots. In addition, the State's community has a high quality way of life that is sustained, in part, by the absence or low prevalence of a range of pests that afflict communities elsewhere in the world. The State's globally important biodiversity – especially its plant life – generates a significant proportion of WA's \$3.8 billion per annum earnings from tourism.

WA has a long history of managing risks for pests (including diseases and weeds) that potentially impact on its animal, plant and aquatic industries and its environment. Some pests also have implications for human health, stored foods and the built environment. Sanitary and phytosanitary measures continue to be applied offshore, at the International and Interstate borders, and within the State to mitigate against organisms that impact negatively on businesses (especially in primary industries), the environment and society as a whole, or which could have the potential to do so.

Protecting the favourable biosecurity status of Australia's primary industries and the environment is of prime importance to the State. WA agriculture, forestry and fisheries industries are export-oriented industries, and the maintenance of both reduced biosecurity-related costs compared with competitors, and sustaining market access is crucial for export success. For this reason, successive WA Governments have maintained a conservative approach to the management of biosecurity risks, in line with Australia's conservative approach to quarantine risk.

The following definition of biosecurity was developed for the AusBIOSEC process and has been agreed to by both the Primary Industry and NRM Ministerial Councils:

Biosecurity is the protection of the economy, environment and human health from the negative impacts of pests, weeds and diseases, and includes the management of invasive species if they become established.

Under this definition, biosecurity includes measures to:

- prevent the entry
- establishment and spread of invasive species
- detect new occurrences
- provide evidence of absence
- contain or mitigate the negative impacts of invasive species
- and prepare and respond to new incursions or the wider spread of established invasive species.

Biosecurity is also important to maintaining Australia's trading advantage, meeting our trading obligations and the terms of International treaties. This definition of biosecurity excludes human-specific pests and diseases.

Biosecurity is viewed as the protection of the economy, environment and society from pests, diseases and weeds. It encompasses industry (animal, plant, aquaculture) and the environment (flora and fauna), and includes the prevention of new pests, diseases and weeds arriving, and the eradication or control of those already present. Biosecurity also encompasses unintentional (e.g. contamination, accidental introductions by trade) and intentional (e.g. bioterrorism, industrial sabotage) biological incidents that present a risk to the health and safety of WA's animal (including aquaculture) and plant industries, and its environment.

All jurisdictions across Australia are facing challenges from new biosecurity issues. These include:

- monitoring and surveillance
- early detection and reporting
- incursion contingency planning and preparedness
- emergency response planning and training, and recovery plans
- reporting, management, control and eradication of incursions
- community awareness of biosecurity issues
- appropriate legislative capability
- databases and information management systems
- diagnostic and research capability
- security against bioterrorism.

With increased travel and trade by sea and air, and ever-present environmental factors such as the natural migration of animals, including fish and birds, there is always some risk of an occurrence of a biosecurity incursion despite WA's relative isolation. Therefore, there is no possibility of achieving a 'zero risk' system to protect WA's environment, the economy and the health of its animals, plants and people.

A risk management based approach to biosecurity is the basis of any realistic system to protect, as far as is possible, WA from pests, diseases and weeds and is consistent with the development and implementation of biosecurity policy Nationally and Internationally.

The biosecurity system should be viewed as a continuum with three important elements:

- pre-border
- border
- post-border components.

This Review report provides a platform to build upon the current capable implementation of biosecurity measures in WA and affords the opportunity for WA to ensure that its biosecurity system can meet the needs and demands of the future.

The International, National and State-level Biosecurity Context

International and National

Australia's biosecurity systems are shaped by several international and national arrangements that have emerged in recent years. These include global and regional conventions and treaties, and bilateral agreements.

Internationally, Australia is party to the following conventions and agreements relevant to biosecurity:

- World Heritage Convention
- International Plant Protection Convention
- World Trade Organisation Agreement on the Application of Sanitary and Phytosanitary Measures
- Convention of Biological Diversity
- Convention on Wetlands (Ramsar 1971)
- International Convention for the Control and Management of Ships' Ballast Water and Sediments 2004
- Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)
- Convention on Migratory Species

The National biosecurity framework is made up large number of significant strategies and plans that are either in place or in preparation, including:

- National Strategy for the Conservation of Australia's Biological Diversity, 1996
- Australian Biosecurity System for Primary Production and the Environment (AusBIOSEC) (under development)
- The draft Australian Pest Animal Strategy
- Australian Animal Welfare Strategy (AAWS)
- Australian Code of Practice for the care and use of animals for scientific purposes (and various other National Codes of Practice relating to animal welfare)
- Guidelines for the Import, Movement and Keeping of Exotic Vertebrates in Australia
- National Management Strategy for Carp Control 2000-2005
- National Marine Incursion Response Plan
- National System for the Prevention and Management of Marine Pest Incursions
- National Policy for the Translocation of Live Aquatic Organisms
- A Strategic Approach to the Management of Ornamental Fish in Australia
- National Strategy for the Conservation of Australia's Biological Diversity
- National Biodiversity and Climate Change Action Plan
- National Strategy for Ecologically Sustainable Development
- National Cooperative Approach to Integrated Coastal Zone Management
- The Australian Weeds Strategy
- Weeds of National Significance Strategies
- National Weed Awareness Action Plan
- National Weed Spread Prevention Action Plan (in development)
- Emergency Animal Disease Response Agreement (EADRA)
- The Australian Veterinary Emergency Plan (AUSVETPLAN)
- Protect Australian Livestock Campaign (PALC)
- National Surveillance and Diagnostic Strategies (under development, for Animal and Plant Health)
- Emergency Plant Pest Response Deed (PLANTPLAN)
- National Aquatic Animal Health Strategy (AQUAVETPLAN)
- Draft National Plantation Timber Industry Biosecurity Plan
- A Generic Incursion Management Plan for the Australian Forest Sector
- National Animal Health Strategy
- National Plant Health Strategy
- National Aquatic Animal Health Strategy
- National action Plan for Salinity and Water Quality
- Bureau of Rural Sciences – National pest management guidelines

Biosecurity in Western Australia

In WA there are several biosecurity arrangements in place or undergoing development that are of direct relevance to this Review. They include:

- The Biodiversity Strategy
- State of the Environment Report
- A Weed Plan for Western Australia
- WA Environmental Weed Strategy
- State of Fisheries Report
- Interagency Fish Kill and Aquatic Pest Response Plan
- Department of Fisheries Translocation Policy
- Western Australian Wild Dog Management Strategy 2005
- Western Shield Program (Western Australia)
- GrainGuard and HortGuard Industry Biosecurity plans
- StockGuard Industry Biosecurity Plans (for cattle, sheep and goats, pig, poultry and bee industries)
- Regional Support Units' Animal Biosecurity Plan
- WESTPLAN – Animal Diseases
- Swill Feeding Campaign

Biosecurity Agencies in Western Australia

Department of Agriculture and Food, Western Australia

The Department of Agriculture and Food, Western Australia (DAFWA) implements well-developed and comprehensive biosecurity risk management strategies. These strategies are backed by legislation which is currently being reformed.

Management of biosecurity is through four programs:

- Plant Biosecurity
- Animal Biosecurity
- Invasive Species
- Border Biosecurity and Emergency Services.

These programs achieve the Department's objectives via pre-border, border and post border policies and operations that are targeted to reduce the risk of introduction, establishment and spread of pests. Science-based demonstration of freedom from specified pests and contaminants is increasingly applied for gaining and maintaining market access under evolving International trading policies and consumer expectations.

The primary objective of the **Plant Biosecurity program** is to safeguard Western Australia's plant industries from exotic and established biological threats. The Plant Biosecurity program provides leadership, excellence and innovation in safeguarding the State's agriculture and natural resources from the risks associated with the entry, establishment and spread of plant pests and helps industry in gaining (and maintaining) biosecurity-assisted access to Interstate and International markets.

The **Animal Biosecurity program** is responsible for the strategic and operational management of a broad range of animal biosecurity regulatory and collaborative services. Activities include policy development and advice, implementation of legislation, participation in the management of State and National animal health programs, control of movement of stock from Interstate and between areas of the State, emergency animal disease preparedness, assuring the animal health status of the State for export purposes, and industry liaison.

The **Invasive Species program** is responsible for the strategic and operational management of animal pests and weeds that pose a threat to agriculture production systems or to market accessibility for agricultural produce in WA. Severe outbreaks of Australian Plague Locusts are also managed under this program. Activities include state and national policy development, risk assessment, research and development, provision of technical advice and information, implementation of regulations, emergency response, property inspections, industry liaison and the planning and coordination of significant weed control/eradication programs.

The **Border Biosecurity and Emergency Services program** is responsible for developing and maintaining capacity and capability for incident management and regulatory standards. DAFWA, through its Western Australian Quarantine and Inspection Service (WAQIS), operates a comprehensive domestic quarantine service, including highway checkpoints, rail and air passenger checks, and air, road, rail and sea freight checks.

DAFWA, in conjunction with the agricultural industry bodies, has developed biosecurity plans for seventeen plant industries and five major livestock industries. These plans outline the key biosecurity threats to the respective industries and plans to manage these.

DAFWA's current investment in Biosecurity programs totals \$29.197m (CF component, 2006/07), with the following breakdown into key activity areas.

Preparedness	\$3,239,700
Pre-border	\$916,900
Border	\$5,730,300
Post-border	\$19,310,100

Department of Environment and Conservation

The Department of Environment and Conservation (DEC) administers three pieces of legislation relating to management of lands vested in the DEC (the *Conservation and Land Management Act 1984*), environmental protection (the *Environmental Protection Act 1986*) and conservation of flora and fauna (the *Wildlife Conservation Act 1950*).

The DEC has responsibility for managing 24 million hectares of National parks, nature reserves, State forest and other lands (almost 10% of the State's land area). Since 1 July 2003, responsibility for animal and plant pest control across nearly 90 million hectares of unallocated Crown land and unmanaged reserves has been transferred to the DEC. The Department is also responsible for conserving the State's biodiversity. As part of meeting those responsibilities the Department undertakes vertebrate pest and weed control programs on those lands.

By its nature, most of the DEC's biosecurity responsibilities are focused on the post-border aspects for both exotic plant and animal control and exotic disease management. Plant diseases such as *Phytophthora cinnamomi* are the basis of major quarantine programs to limit their spread and impact on lands managed in the southern part of the State.

Western Shield is a feral predator control program implemented by DEC since 1996, focused on recovering the status of native fauna through feral predator control. The program operates via baiting (aerial and ground) across nearly 3.5 million hectares, predominantly in the south-west. In February 2003 an Independent Review of Western Shield found that it is a 'world-class predator threat abatement program that is strategically targeted at the recovery of a wide range of threatened fauna'.

WA's State Weed Plan (2001) provides a framework for integrated management of agricultural and environmental weeds across the State, including coordination between the various land managers and key stakeholders associated with weed management. Significant additional funding has not yet been allocated for implementation of the State Weed Plan, aside from some funding for the operation and executive support of the Western Australian Weeds Committee (WAWC), which began meeting in May 2004. The WAWC, which includes representation from DEC and the Department of Agriculture and Food, Western Australia (DAFWA) has reassessed the original State Weed Plan draft Action Plan and determined an updated priority action list and cost estimate for effective operation of the WAWC. The Environmental Weed Strategy for WA was prepared in 1999 and lists 1,350 environmental weeds, giving each of these a rating of high, moderate, mild or low, according to the potential invasiveness, distribution and environmental impact of each species. The document is used to assist land managers in prioritising weed control actions.

The DEC also plays a role in pre-border biosecurity matters through its involvement in the assessment of applications to the Federal authorities to import and keep exotic plants and animals for biocontrol programs, medical and scientific research, statutory zoo and wildlife park collections, domestic aquarium fish trade and private pet keeping. A number of DEC staff (Wildlife Officers) are also authorised officers under the provisions of the *Agriculture and Related Resources Protection Act 1976*, and carry out inspections at the border or immediately post-border to confirm the identification of exotic animals entering the State, and where necessary to seize animals and instigate prosecutions under that Act.

DEC has recently prepared a draft Good Neighbour Policy in collaboration with the WA Farmers Federation, the Pastoralists and Graziers Association and the WA Local Government Association. The policy includes guidance on the management of both weeds and vertebrate pests across all lands managed by the Department, with an emphasis on improved management of public/private boundaries. Whilst community stakeholders place a strong emphasis on management at these boundaries by Government land managers, it is

the view of DEC that strategies for effective management of animal and plant pests must be at a landscape scale. This includes management across all of the public conservation state, plus the unallocated Crown land and unmanaged reserves.

There has been extensive consultation regarding animal and plant pest management in WA via the development of two key strategies: the 2001 State Weed Plan and more recently the proposed regional model for better management of animal and plant pests. The latter involved the Department of Agriculture and Food, Western Australia (DAFWA), DEC, the Agriculture Protection Board (APB), the WA Farmers Federation, the Pastoralists and Graziers Association, the WA Local Government Association, the Natural Resource Management Council and the WAWC, as well as consultation with individual local Government authorities, regional natural resource management groups, APB Zone Control Authorities and other stakeholder groups.

DEC's current investment in biosecurity totals \$5.549 million (CF component, 2006/07), with the following breakdown into key activity areas.

Preparedness	\$351,000
Pre-border	\$25,000
Border	nil
Post-border	\$5,173,000

Department of Fisheries

Invasive aquatic animals and plants, like their terrestrial counterparts (such as rabbits, foxes and blackberries) pose a significant threat to the environment and the State's economy. Pest species pose risks to aquatic biodiversity, fish stocks and aquaculture operations, and may have implications for both Interstate and International trade. These invasive species often have long lasting impacts, and they are usually impossible to eradicate once they have become established. Even controlling the abundance of most marine pests is not currently possible as there are very few tools available for control. In addition current knowledge of the ecology of marine ecosystems is often inadequate to predict the impact on native species and the ecology from the establishment of pest species.

The authority for the Department of Fisheries (DFWA) to carry out aquatic biosecurity management is contained within the *Fish Resources Management Act 1994*. The objects of the Act are to conserve, develop and share the fish resources of the State for the benefit of present and future generations. In particular the Act has the objective (*inter alia*) to conserve fish and to protect their environment. Under the Act the department has wide ranging management power over the take, movement and trade of fish. Fish is broadly defined as an aquatic organism, or a part of an aquatic organism of any species (whether alive or dead), including eggs and other sources of reproduction. The exception is that aquatic mammals, reptiles, birds and amphibians are not covered by the *FRMA* and pearl oysters are managed under the provisions of the *Pearling Act 1990*.

The *FRMA* contains provision for the management of aquaculture and at **Part 9** specifies powers for the prescription and management of noxious fish. The movement into and within the state of fish not endemic to the State are managed under **regulation 176** of the *Fish Resources Management Regulations 1995*. DFWA has one officer to manage translocation, and this position was first established in 1997. The Fish and Fish Habitat Program provides policy development and support and two full time Biosecurity Policy Officer positions have been established. Recently a Biosecurity Research Group has been established within the Department's Research Division and the group has attracted Commonwealth funding for a marine pest audit and to assess the National Port Monitoring Strategy in Western Australia.

DFWA, in cooperation with DAFWA, has operated a Fish Health Unit since 1988 and currently has staff of approximately five full time employees. The unit has developed capacity to provide pathological diagnostic services to the fishing and aquaculture industry in WA, to investigate fish kills in the State's marine and freshwater environment, to provide input to policy development at State and federal level, and to carry out research on diseases and aquatic organisms.

Within the State, DFWA has been appointed by Government as the lead Agency to develop and implement management arrangements to restrict the translocation of invasive aquatic animals and plants, and any associated diseases. There is a wide range of vectors involved, which includes ballast water from ships, hull fouling of commercial and recreational vessels, live fish (ornamental fish, live fish for the restaurant trade, and aquaculture stock) and dead fish and fish products. Management of these vectors presents significant challenges and emerging management issues.

When the *Biosecurity and Agriculture Management Act* (BAM Act) and the subsequent regulations come into effect (anticipated over the next 24 months), DFWA will concentrate its efforts on introducing measures to reduce the further introduction of aquatic pests and diseases, whether by vectors such as ships' hulls and ballast water, the aquaculture industry or the aquarium trade.

DFWA intends to establish and develop a small unit that will undertake Aquatic Biosecurity management including the following:

- Inspect ships entering WA from other States and Territories to ensure compliance with Ballast Water exchange requirements.
- Inspect certain classes of vessels arriving from overseas (including apprehended fishing vessels) and large marine infrastructure, such as dredges and barges, for invasive species that are attached to the hull surfaces and internal compartments.
- Assist in the development and delivery of marine pest surveys at selected WA ports as part of the National System for the Management Marine Pests and Marine Pest Incursions.
- In the event of an aquatic pest incursion or disease outbreak in Western Australia, provide the expertise to coordinate and lead Government's response.
- Manage translocation approvals and biosecurity inspections associated with the aquaculture industry.
- Develop and coordinate measures require to manage the biosecurity risks arising from the aquarium trade; and
- Provide policy and legislative advice to the Executive, Government and at National forums.

DFWA's current investment in Aquatic Biosecurity totals \$800,000 (CF component, 2006/07), of which \$300,000 sits within the Fish and Fish Habitat program and the rest (approximately \$500,000) finances the Fish Health Unit.

The break down is estimated to be as follows:

Preparedness and Pre-border	\$80,000
Border	\$8,000
Post-border	\$712,000

Forest Products Commission

The Forest Products Commission (FPC) of Western Australia is a Government Trading Enterprise (GTE) responsible for the allocation and sale of forest products from State owned and State managed plantations and the State's native forests. This combined forest resource is located across the south west region of Western Australia, the adjacent agricultural areas and the semi arid to dry areas of the State. The recent focus of the FPC has been establishing new plantations in low to mid rainfall agricultural areas.

The FPC was established by the *Forest Products Act 2000*. It should be noted that this legislation provides for no lead role in biosecurity management at the State level. The FPC has, however, adopted a support role where identified pests are associated with the timber plantation industry: an example of this is in the current eradication program for European House Borer (EHB).

As a Government Trading Enterprise (GTE) the FPC does not attract core funding currently from the State Government through general revenue, but meets its operating costs from the income received from its commercial activities. The FPC is also expected to provide an annual dividend to Government. In 2006 the FPC was successful in attracting funding under the National Action Plan (NAP) for salinity management. This funding, however, is limited to a 3 year period, and there is no guarantee of funding from this source beyond 2008.

As a consequence of its limited funding capacity, the FPC has relied heavily on the successful implementation of existing biosecurity programs, especially those of the Department of Agriculture and Food, Western Australia (DAFWA) and the Australian Quarantine Inspection Service (AQIS).

FPC's focus has been on the control of established pests to plantations, as well as to responding to exotic biosecurity threats as they are reported by DAFWA. The FPC does have a surveillance program in place within its pine plantation estate for the exotic pest, *Sirex noctilio* (Sirex wood-wasp), which is established in the Eastern States but not WA.

FPC's current investment in biosecurity covers routine management of established plantation pests, including those of plantations in the arid rangelands, and totals approximately \$622,000 per annum, with the following breakdown into key areas:

Preparedness	\$50,000
Post-border	\$572,000

(This includes operational control of organisms such as goats, insects and parrots.)

Terms of Reference for the Biosecurity Review

The review was conducted within the context of the following terms of reference:

1. Complete a general review of the biosecurity status of Western Australia in relation to primary industries, natural resources and those animal and plant pests/diseases that may also affect community amenity and well-being. (*Human-specific pests and diseases were not included.*)
2. Report on any areas of particular concern identified in the course of the audit and review, with particular references to the risks posed to each primary industry sector, natural resource systems and regions, and to the economic well-being and way of life of the Western Australian community.
3. Review and report on the status of current biosecurity plans/systems for primary industry and natural environments in WA, and those animal and plant pests that may also affect community amenity and well-being.
4. Report any weaknesses identified in biosecurity awareness information and participation and suspected weaknesses in biosecurity strategies.
5. Collate and report on any stakeholder comments made in relation to the effectiveness and efficiency of pre-border, border and post border biosecurity policies and strategies.

Organisation and management of the review

Three different groups were involved with various aspects of the review.

a) Reference group

The Reference Group, chaired by Professor Mal Nairn, was composed of representatives from the major peak bodies for the primary industries, conservation, local government and environment interests.

Membership:

- Independent Chair (Emeritus Professor Mal Nairn)
- Aquaculture Council of WA (Dan Machin)
- Conservation Council of WA (Chris Tallentire, Felicity McGeorge [proxy])
- Forest Industry Federation of WA (Bob Pearce)
- Pastoralists and Graziers Association (Barry Large)
- WA Farmers Federation (David Leake)
- WA Fishing Industry Council (Graham Short, Brett McCallum [proxy])
- WA Local Government Association (Nathan Malin)
- WA Weeds Committee (Judy Fisher)

b) Steering committee

The Steering Group was chaired by Chris Richardson (Chairman, Agriculture Protection Board) and comprised senior managers from agencies responsible for biosecurity matters in Western Australia.

Membership:

- Chairman (Chris Richardson, Agriculture Protection Board)
- Department of Agriculture and Food, Western Australia (DAFWA) (Rob Delane, Deputy Director General (Biosecurity & Research))
- Department of Environment & Conservation (Gordon Wyre, Director Biodiversity)
- Department of Fisheries (Peter Millington, Director Fisheries Management Services)
- Forest Products Commission (Gavin Butcher, Executive Manager - Operations)

c) Writing group

The writing group, chaired by Greg Pickles (DAFWA), was made up of technical specialists from the Departments of Agriculture and Food, Environment and Conservation (DEC), and Fisheries (DFWA), and the Forest Products Commission (FPC). Their task was primarily to write the text used in the Status report, but they also provided information and commentary used in the assessment of the State's current risk management arrangements (presented as the 'Traffic lights' section) and identification of the Key Biosecurity Improvements.

The full list of writers is provided at the end of the Status report.

The main members of the Writing Group were:

- Chair (Greg Pickles, DAFWA)
- Writing group coordinator (Jon Dodd, DAFWA)
- Frances Casella, John Botha (DAFWA Plant Biosecurity)
- Marion Massam, Sandy Lloyd, Jon Dodd (DAFWA Invasive Species)
- Fiona Sunderman (DAFWA Animal Biosecurity)
- Kellie Agar, Amanda Moncrieff, Peter Mawson (DEC)
- Craig Astbury (DFWA)
- Alan Seymour, Ray Fremlin (FPC)

Methods

Specialists with expert knowledge of the biosecurity status of this State's major production systems (agriculture, fisheries and plantation forestry), the environment and society provided detailed summaries of notable biosecurity issues in the form of invasive species (animal pests and weeds) and the pests and diseases of animals and plants. Collectively these summaries provide a whole-of-state overview of WA's biosecurity concerns and capacity, which is presented in the accompanying Status Report.

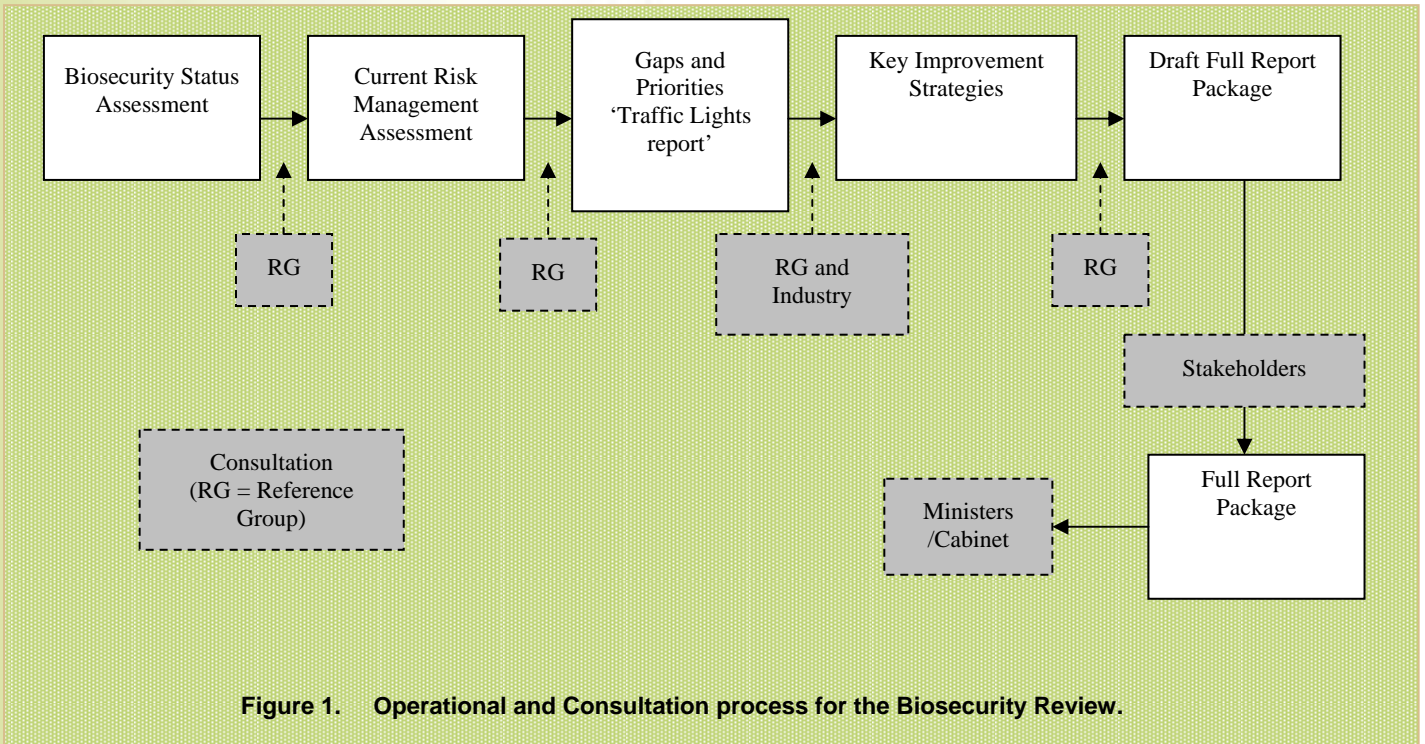
The Status Report provides information on the major biosecurity threats, including discussion of species that are: a) exotic to Australia; b) exotic to Western Australia but established in Australia; and c) established in this State. The major introduction and spread pathways are described in the status report, along with current and potential impacts. Included in the status reports are Case Studies that generally present examples to illustrate biosecurity principles.

Writers and other contributors to the Status report participated in workshops and similar activities that led to a critical assessment of the State's current biosecurity arrangements (summarised in the Traffic Lights report) and the identification of the major improvements required to WA's biosecurity systems (summarised in the Key Biosecurity Improvements document).

The traffic lights report summarised and assessed WA’s current treatments of biosecurity risks (pre-border, border, and post-border) and identified Key Gaps and Deficiencies in current biosecurity arrangements.

The Key Improvements document arose from consideration of material presented in the Status Report and the Traffic Lights report, and presents priorities for implementing the improvements and provides estimates of the costs involved.

The operational and consultation process followed is illustrated in Figure 1.



How to read the Review documents

WA's biosecurity threats are drawn from a wide range of biological categories, including **vertebrate pests** such as birds, mammals, fish and amphibians, **invertebrates** such as insects, molluscs and echinoderms, **weeds**, and **diseases** due to viruses, fungi, and bacteria.

Between them, these organisms impact on a wide range of sectors that can be broadly summarised as primary industries (agriculture, fisheries and forestry), the environment, and society.

In order to arrange the material on the threats and their impacts in a workable manner, the review has been organised according to the following sections:

Vertebrate Pests affecting Production, the Environment and Society

This section deals with vertebrate pests. Because most of these pests are generalists, they usually have equal impacts on production (agriculture and forestry), the environment and society.

Pests and Diseases affecting Fisheries, the Environment or Society

This section deals with an assortment of pests and diseases that impact mainly on fisheries, the terrestrial and aquatic environment, or society. The examples include invertebrate and vertebrate pests of fisheries and the aquatic environment in general, as well as a range of diseases of native animals and plants. A few examples also have minor agricultural impacts.

Weeds of Agriculture and the Environment

This section deals with weeds whose impacts are predominantly on the environment or production (agriculture). A few examples also affect society, the forestry industry and fisheries.

Diseases and Pests of Agricultural Animals

The examples in this section predominantly affect production animals (i.e. agricultural livestock), while a few have direct impacts on humans and society.

Pests and Diseases of Cultivated Plants

All the examples of pests and disease in this section affect plants that are cultivated as agricultural, horticultural or forestry crops.

Terminology: Exotic vs Established

Throughout the report, the examples of biosecurity threats are discussed in terms of the three major stages of invasion – pre-border, border, and post-border. In the Status report, the examples are described in the categories: a) exotic to Australia; b) exotic to Western Australia but established in Australia; and c) established in this State.

A newly arrived pest that is undergoing active management (usually eradication) is not viewed as established; for example the Red Imported Fire Ant (RIFA), although present in Queensland, is the target of a major eradication program aimed at preventing its establishment and is therefore described as exotic to Australia. Similarly, European wasps are listed as exotic to Western Australia, because they are the subject of active surveillance and eradication measures in this State to prevent their establishment.