INVESTING IN WESTERN AUSTRALIA'S *BIOSECURITY*

Department of Agriculture and Food
Department of Environment and Conservation
Department of Fisheries
Forest Products Commission

"...It is far cheaper to maintain our natural systems than it is to allow them inadvertedly to be damaged and, subsequently, to inherit a costly repair bill."

(*Prime Minister's Science, Engineering and Innovation Council, 2002*)

What is Biosecurity?

Biosecurity is the protection of the economy, environment and human health from the negative impacts of pests, weeds and diseases, including the management of invasive species if they become established (definition adopted by AusBIOSEC).

This requires steps to **prevent the entry** of harmful organisms, as well as the **timely and efficient management** of them if they do enter.

Biosecurity threats range from catastrophic diseases such as Foot and Mouth Disease, which causes rapid and widespread animal deaths, to more subtle and slower spreading problems such as invasive weeds, mussels that foul vessel hulls and fungus-induced dieback disease of trees. These less well-known pests and diseases can equally cause enormous economic and environmental damage.

The Importance of Biosecurity to WA

Protecting the favourable biosecurity status of WA's primary industries and its environment is a high priority area for the State. Sound economic management of WA's agriculture, fisheries, forestry and related industries requires maintenance of domestic and international market access in an ever-changing risk environment. WA retains its competitive advantage through maintaining and demonstrating its disease-free status.

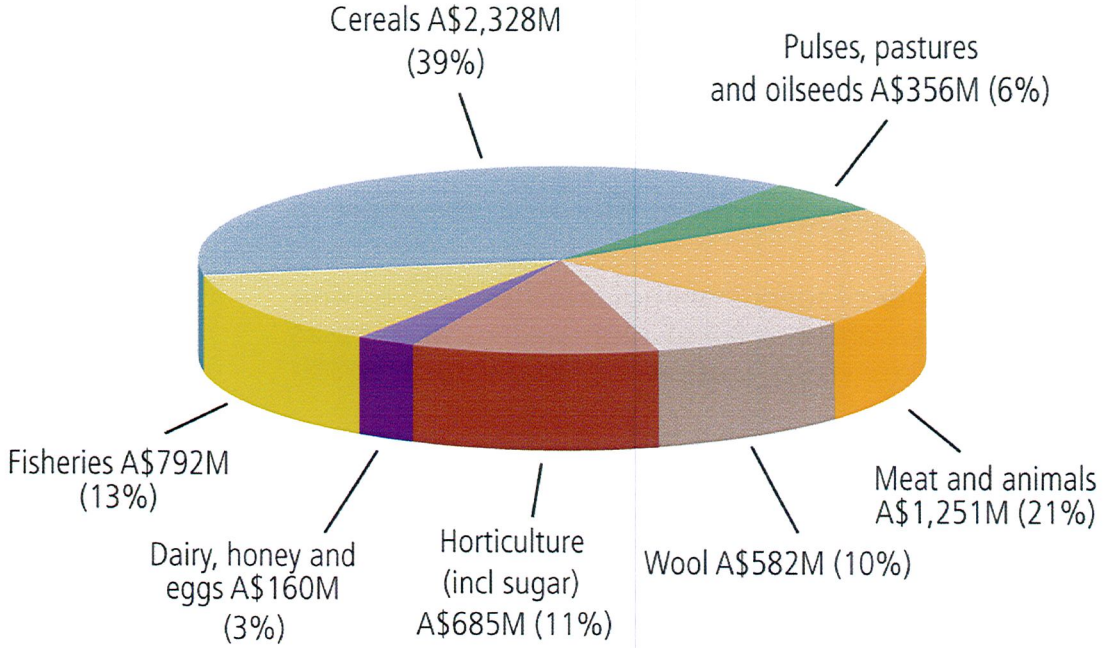
The WA community places enormous value on its unique environment, biodiversity and social well-being. While this is impossible to quantify, there is a clear responsibility on the part of the State Government to meet the challenges posed by the increasing number of biosecurity threats to these assets and protect our environmental heritage for future generations.

So far, WA has a reasonably successful history of managing pest and disease threats that could potentially harm its animal, plant and aquatic industries and its environment. Some biosecurity threats can also impair human health, stored foods and the built environment. Quarantine and biosecurity measures applied offshore, at international and interstate borders, and within the State are critical to protect against organisms that impact negatively on the economy, the environment and society as a whole.

The State's primary industries alone are worth $6.1 billion annually and contribute $4.8 billion to the State's annual export earnings (ABS/DAFWA).

Supplying Food to WA and the World

Encouraging risk management practices is a priority as WA food production industries rely on the ability of individual industries and communities to manage threats to production system efficiency and sustainability, product safety and quality, and rural infrastructure.



Western Australian agriculture and fisheries production 2006/07- Total: A$6,154 million

Current Biosecurity Status of WA

Western Australia has an enviable biosecurity (pest and disease freedom) status, resulting from its geography, relatively recent development, 100 years of Australian quarantine, many years of interstate quarantine, long-running industry/community engagement, inter-agency collaboration and outstanding commitment from biosecurity staff over many years.

- The South West Botanical Province of Western Australia (from Kalbarri south east down to Esperance) has been identified as one of only 25 biodiversity hotspots on earth. It is the only biodiversity hot spot in Australia.
- Western Australia is free of more than 1200 weeds that exist elsewhere in Australia.
- Western Australia is free of a number of serious animal diseases (e.g. Bovine Johne's disease, anthrax, bat viruses, and liver fluke), plant pests and diseases (apple scab and codling moth, sirex wasp, pasture ceola chafers), which are currently present in other states
- Western Australia remains free of cane toads, European wasps, house sparrows, Indian myna birds and largely free of wild deer and starlings which afflict the natural and community environments of eastern Australia.
- Western Australia champions its "clean and green" image as a key advantage for domestic and international food product markets - this status results largely from continued exclusion and limited spread of serious pests and diseases.

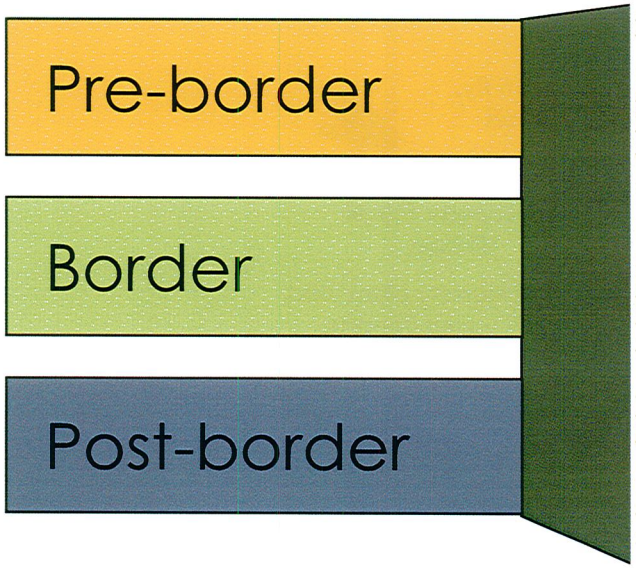
In 2007, an Ocean Reef home was fumigated to eradicate Khapra beetle - the world's worst grain insect pest.

Similar fumigations were used to destroy incursions of exotic grain pests and drywood termites In 2002 and 2007.

In 2007 DAFWA fumigated 150 lots of infested furniture as a result of post-border breaches.

Biosecurity Continuum

Biosecurity management is a multidimensional discipline involving science, policy, regulation, communication and operations. It is aimed at the protection of the economy, environment, and community by managing the risks posed by biological threats.



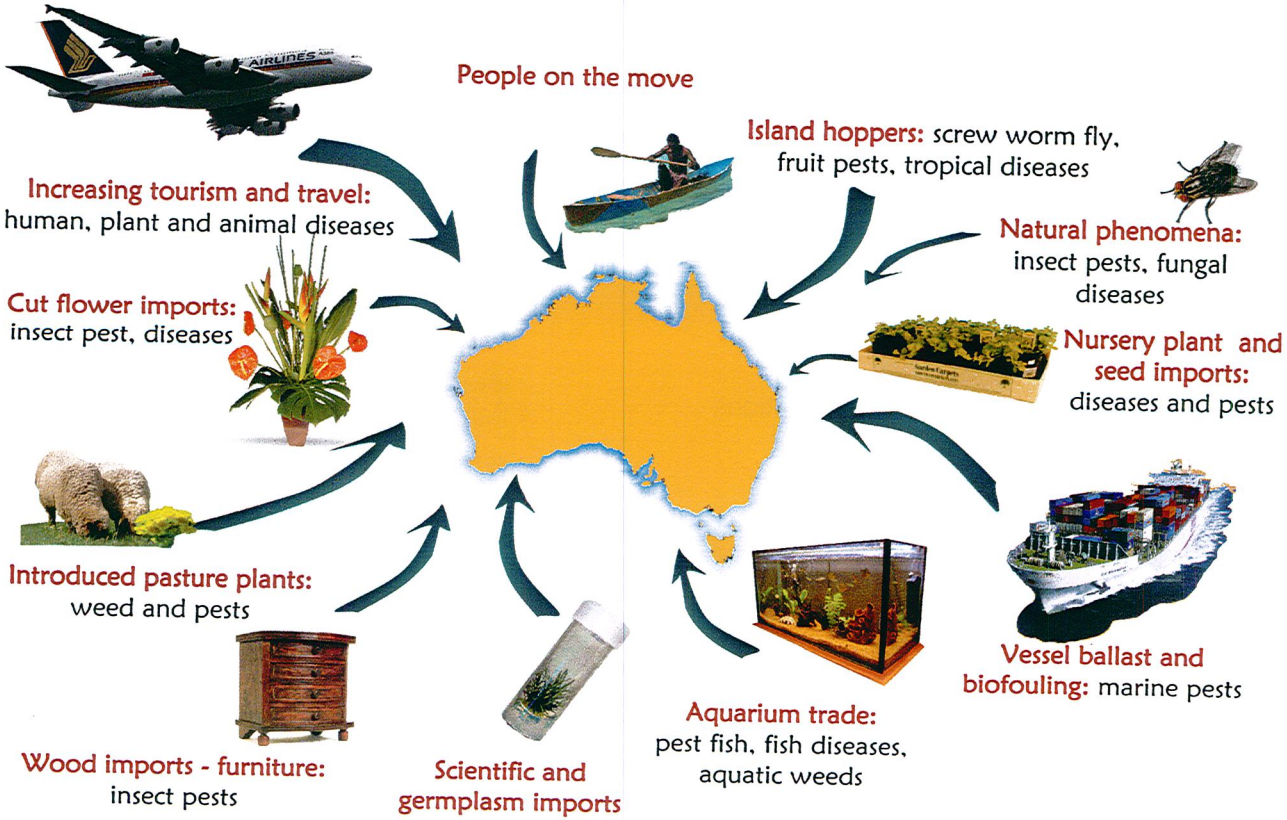
Optimal biosecurity requirements

Risk Assessment	• threat characterisation • potential external threats	• protocols in place
Surveillance	• inspections at ports • risk based	• general surveillance
Response and Preparedness	• regulations • response plans	• logistics • countermeasures
Training	• staff training • research staff	• inter agencies • procedures
Communications	• international • inter agencies	• trading bodies and parties • public awareness
Recovery	• restoration	• attribution/explanation
Research Intelligence	• biological controls • databases	• scientific networking • funding

Biosecurity Threats: *Pathways*

Plant and animal pests and diseases can enter the state and disperse within the state in a variety of ways.

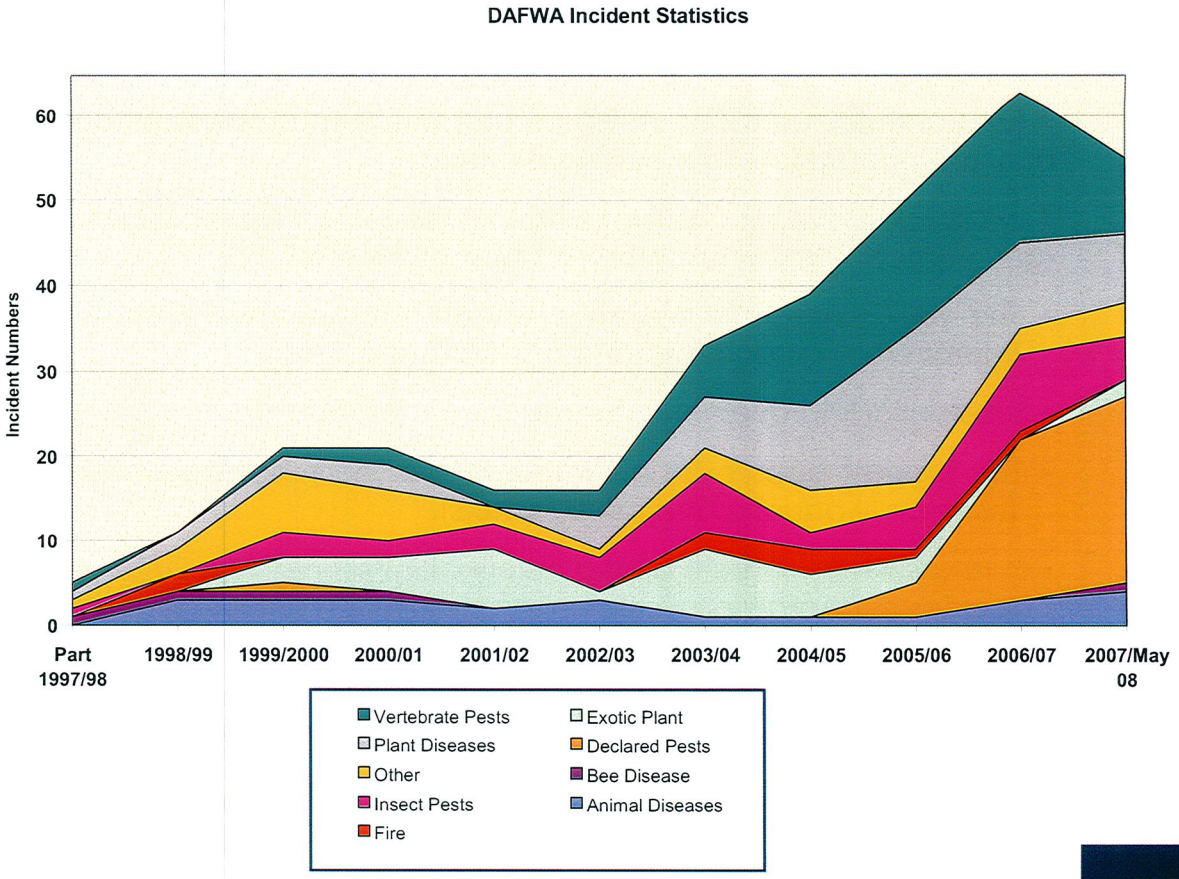
Increased movement of people and commodities, as a result of global population expansion and intensified trade and travel, escalate the risk of entry and establishment of harmful organisms. These pressures impose greater demands on biosecurity resources.



Managing Incursions

A wide range of terrestrial animal and plant pests and diseases affect both primary production and the natural environment:

- 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.)
- Estimated cost of control and the value of production foregone for plant diseases and invertebrate pests of plants is at least $0.7 billion per annum.
- For animal diseases and invertebrate pests of animals the estimate of animal production losses is at least $1.2 billion per annum.
- The number and range of biosecurity incidents in WA is increasing (see graph).



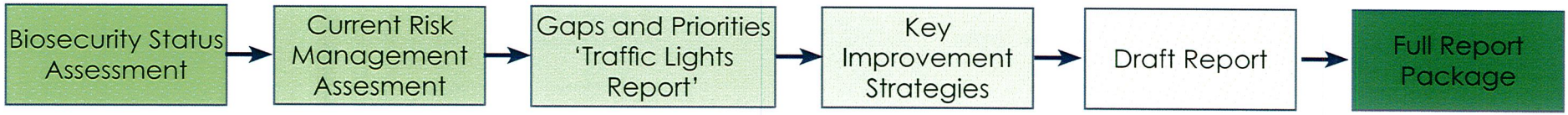
Biosecurity Review: *Current and Future Requirements*

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 (DoF), and the Forest Products Commission (FPC). These agencies currently invest $36.2 million annually on biosecurity measures.

A fundamental aspect of adequate biosecurity management is a realistic assessment of current practices and whether they are appropriate to meet requirements.

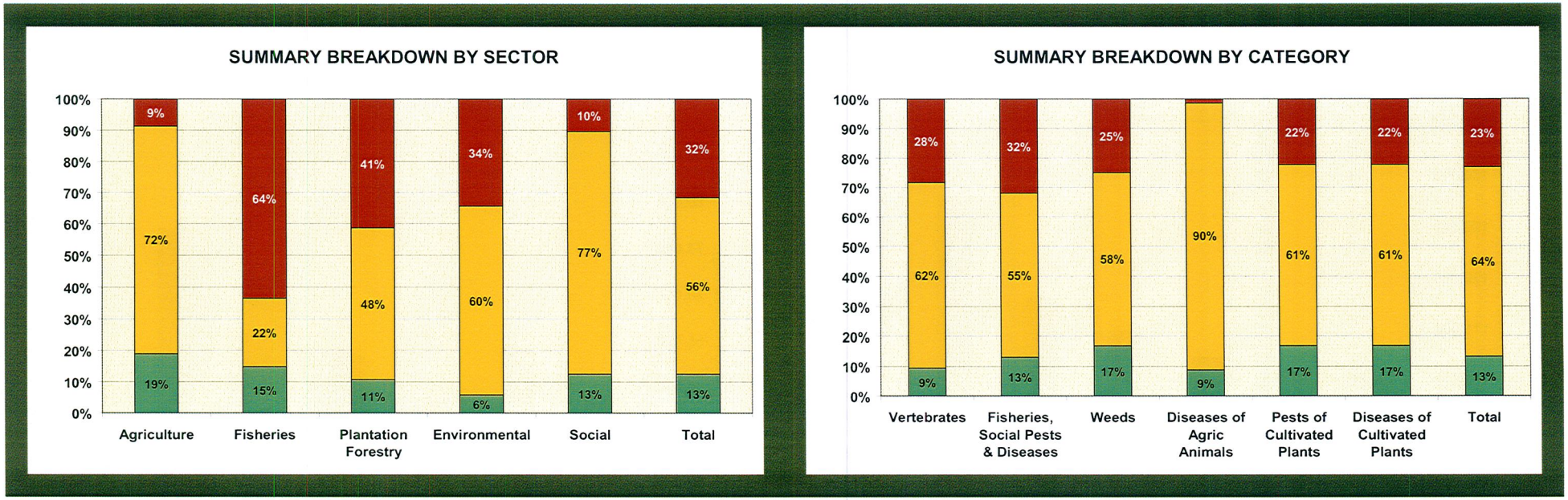
A comprehensive, pro-active review of the State's biosecurity status has identified major gaps, both in areas of public (government) and industry/community responsibility.

- The 2007 Biosecurity Review provides a robust assessment of the gaps in the State's biosecurity measures, key improvements necessary and resources required.
- Substantial improvements are required in preparedness, border and post-border biosecurity strategies
- The biggest gaps exist in sectors where there has been a historical lack of investment in biosecurity measures (especially aquatic and forest sectors).
- In areas where there is a long history of investment via DAFWA (for example, animal and plant industry biosecurity), real-terms decline in investment has resulted in serious gaps and weaknesses.



The WA Biosecurity Review

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 and development (the actual proportions varied between sectors).

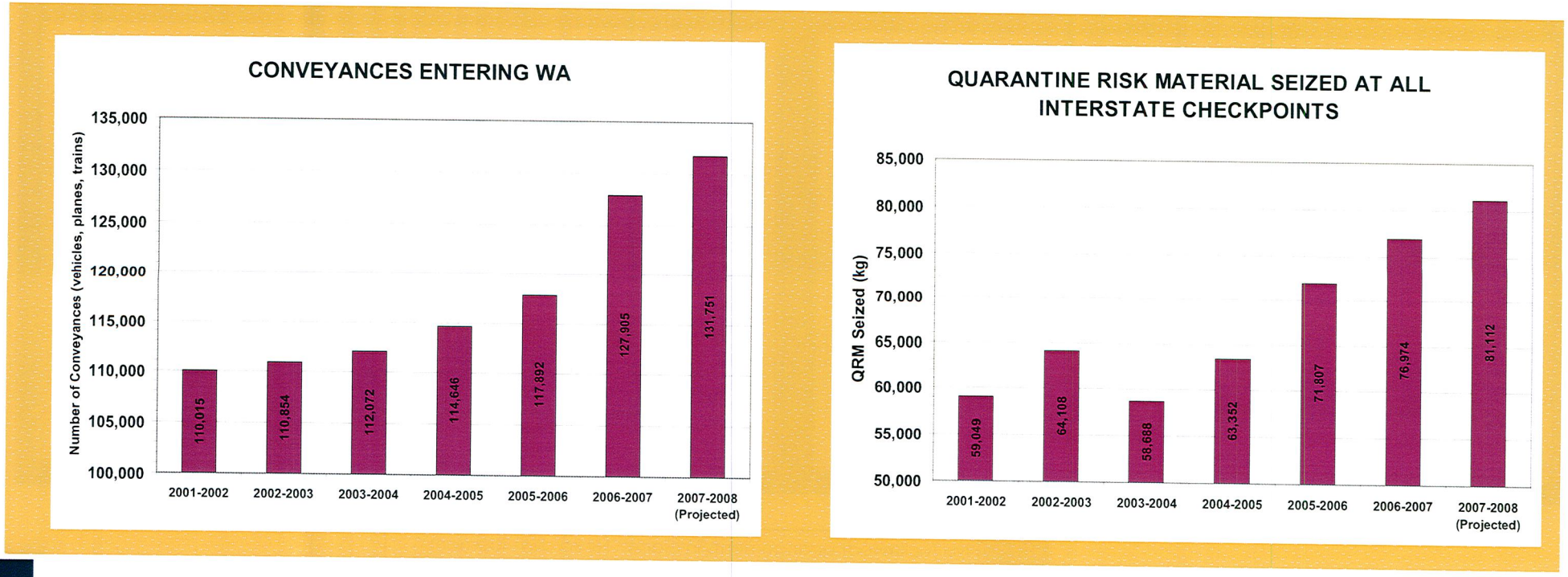


Key

	No (or limited) arrangements in place. Need development.
	Current arrangements need improvement.
	Arrangements in place. No immediate need for improvement.

Threats and Risks: Interstate Quarantine Operations

Interstate border quarantine operations are struggling with the scope and complexity of biosecurity measures, and pressures from travel and trade. Over the last 7 years there has been 45% increase in flights into WA, 105% increase in passengers on flights, 49% increase in train and rail freight containers, 48% increase in imported consignments/lines that must be inspected, 17% increase in the number of vehicles entering the state through road checkpoints.



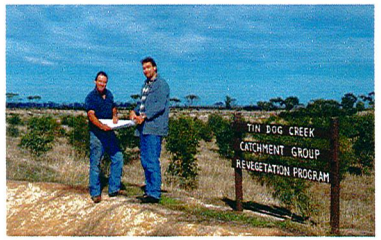
Threats and Risks: Small Landholding Trends

The total number of small landholdings in Western Australia continues to increase and the total area occupied by small landholdings in 2007 was 646,000 hectares.

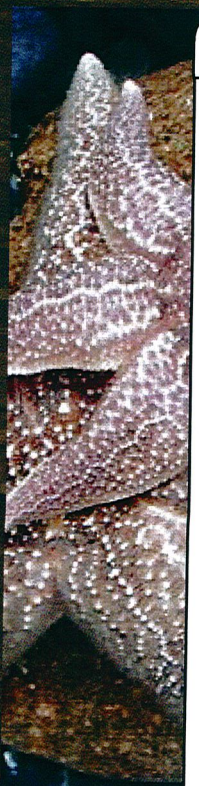
No new funding has been provided to address increased and diversified biosecurity risks posed by existing and emerging small land holdings in peri-urban, rural and fragmented bushland areas.

Small landholdings are a potential source of greater biosecurity risk to neighbouring properties because of inadequate levels of awareness and management capacity for invasive species, orchards and small animal flocks.

Property Size	2004	2005	2006	2007
1-2 Ha	10,802	11,557	11,603	11,933
2-20 Ha	31,260	31,833	32,376	32,560
20-10 Ha	3,449	3,452	3,146	3,423
40-100 Ha	6,457	6,411	6,349	6,223
Total No. properties	**51,968**	**53,254**	**53,934**	**54,139**



Threats and Risks to the Environment...



Northern Pacific Seastar

Environmental Impacts:

- Potential to rapidly establish large populations
- Voracious predator which feeds on a wide range of native species
- Directly implicated in decline of the endangered spotted handfish in Tasmania
- Threat to wild fisheries

Economic Impacts:

- Aquaculture operations: $4 million direct costs and $10 million estimated loss in potential on 1 Tasmanian scallop farm
- Commercial fishery operations: 40% reduction in fish stock numbers in Port Phillip Bay over 3 years following invasion, damage to gill nets, snapper fishers reported 100% loss of bait in 1 deployment (200 hooks)

Social Impacts:

- Loss of public and tourist ventures

Control programs of Northern Pacific Seastar cost the Victorian Government more than $200,000 to eradicate one outbreak, with extensive volunteer support.

Starlings

Environmental Impacts:

- Competition with native species and other biodiversity impacts
- Western rosella, Carnaby and Baudin's black cockatoos, Muir's corellas are endangered species threatend by starlings

Economic Impacts:

- Property damage
- Consumption of livestock feed
- Damage to grains and horticultural crops
- Spread of livestock disease

Social Impacts:

- Human health and safety problems

Estimated starling damage in the USA is $800 million per year (excluding costs to biodiversity). Costs to WA is $3.3 million in State government contributions to date.

To Production...

Khapra beetle

Economic Impacts:

- Impacts all forms of stored grains and seeds
- Losses to stored grain have known to reach as high as 70%
- Affecting exports of grains from WA
- Phosphine treatments to control grain pests may not be effective against some resistant strains

Social Impacts:

- Communities and labour that depend on producing and processing grains will be affected
- Reduced public access to a staple comodity due to increased costs in testing, segregation, and certification of grains

Direct program costs of $75,340 (over 2 years) includes DAFWA time inputs and WA contribution. to national cost sharing.

Impact cost to WA estimated at $46 million to $117 million per year (based on costs associated with export market losses)

Asian Green Mussel

Environmental Impacts:

- Forms dense populations (up to 35,000 individuals/ m^2) which can out-compete native species
- Causes changes in community structure and food webs

Economic Impacts:

- Industrial complexes: clogs pipes, increases corrosion, reduces efficiency in water systems
- Vessel operations: increased maintenance, decreased fuel efficiency, blocked/damaged internal pipes
- Aquaculture operations: alters maintenance routines, harvest times and may restrict water flow with impacts on product quality

Social Impacts:

- Mussels accumulate high levels of toxins/heavy metals, linked to shellfish poisoning in humans

To the Built Environment...

European House Borer

Economic Impacts:

- Threat to softwood industry.
- Impacts to the housing industry.
- Potential negative impact on the market for the State's pine plantations.

Social Impacts:

- Damage to property (structural and furniture)

Losses to industry estimated over $6 billion over 100 years (total costs to industry, housing, control costs)

EHB program costs WA $4.5 million/yr (containment and eradication). EHB is potentially a $50 million program over the next 15 years

Chinese Auger Beetle

Economic Impacts:

- Threat to hardwood industry.
- Negative impacts to the housing industry.
- Seriously damage timber integral to housing construction.

There have been 5,000 imported consignments in Western Australia of willow fencing screens since 2007 resulting in 22 Chinese auger beetle detections.

To Community and Lifestyle

Red Imported Fire Ant

Environmental Impacts:

- Declared 'Key Threatening Process' (*Environment, Protection and Biodiversity Conservation Act)*
- Reduces species diversity and complexity

Economic Impacts:

- Infrastructure damage mainly to electrical equipment (airport runaway lights, traffic junction boxes)
- Mounds interfere with hay cutting and baling
- Affects the nursery industry
- Impacts to workers harvesting crops
- Livestock health impacts (blinding and gastro-intestinal upset)

Social Impacts:

- Human health problems (allergic reactions, skin disorders, death)
- Lifestyle impacts with outdoor activities affected

In the USA, RIFA costs $1.2 billion annually. The Queensland government's 7 year eradication program is estimated at $175.4 million. Over 30 years, the estimated cost to the Australian economy is $8.9 billion.

Equine Influenza

Environmental Impacts:

- Spread of diseases as a consequence of dead feral populations

Economic Impacts:

- Support industries (transporters, farriers, feed merchants etc)
- Racing and breeding sectors of the horse industry
- Wagering ($12 billion/year)

Social Impacts:

- Local community and non-profit associations
- Recreational sector of the horse industry

Cost benefits for industry eradication of Equine influenza over a 20 year period is estimated at $1.7 billion. To date, $240 million has been spent in mitigating losses and controlling the disease. National cost shareable expenses total $108 million and cost to WA so far is $1.3 million.

Funding Trends

Despite sustained growth of the State's economy, including recent dramatic expansion in trade, travel, peri-urban and regional development, funding for core biosecurity functions has been in prolonged real term decline.

Agriculture Protection Board funding declined dramatically during 1990 to 2005 (Figure 1) without being replaced by environment or community funding.

In addition, the combined agency funding for core biosecurity functions has been barely maintained in real terms during 2001 to 2008 (Figure 2).

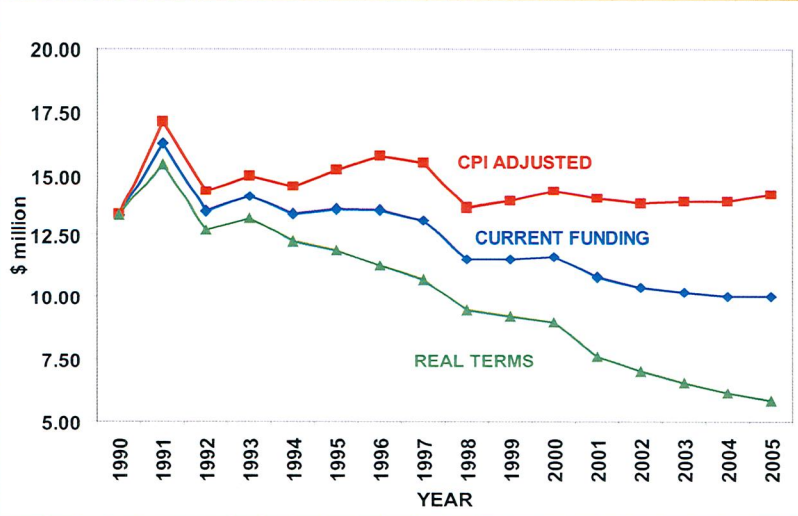


Figure 1

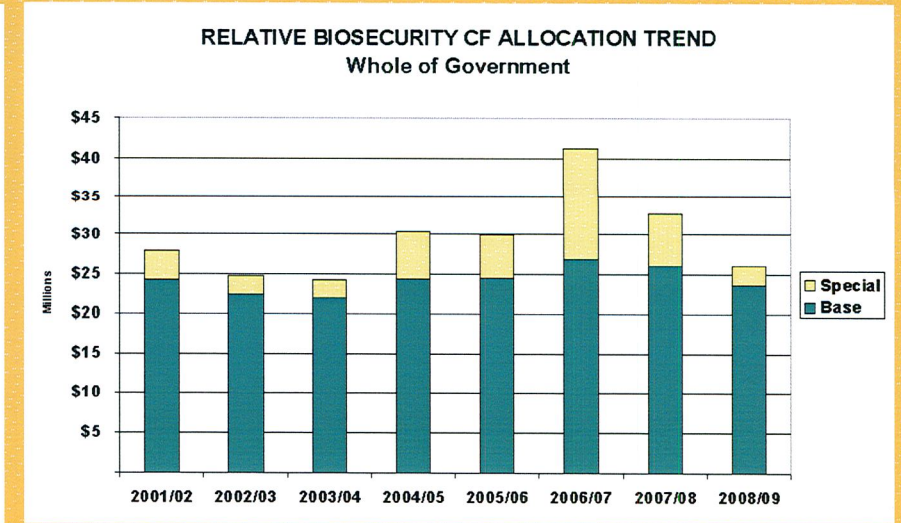


Figure 2

Funding Comparison Examples

Biosecurity Resourcing
Combined Biosecurity Agencies

Current investment
$385 million over 5 years
$29,615 per km coast
$152 per sq km
Total cost estimated as twice operational budget to aid comparison with Gorgon Partners financial figures.

Proposed Increased Investment
$770 million over 5 years
$59,230 per km coast
$304 per sq km

Barrow Island
$300 million over 5 years
$3.3 million per km coast
$1.3 million per sq km
WA – using operating budget figures only

State Government has required Gorgon to invest 56 times the amount the State invests (based on coastline length figure) or 4276 times using the land area data.

Biosecurity Resourcing
Environment and Conservation

- DEC area managed for pest animals and weeds = 114 million ha (bigger than NSW and Vic combined).
- DEC Pest Animals and Weeds Budget 07/08 $8.9 million, = $0.08 per ha
- DEC Pest Animals and Weeds Budget 08/09 $6.2 million, = $0.05 per ha
- Even if DEC only applies pest animal and weed management in all conservation reserves and forests and only 20% of UCL, it is still responsible for 44 million hectares (about twice the area of Victoria or over half the area of NSW), with an average of $0.14 per ha.
- Comparisons should include NSW Parks and Wildlife at $2.72 per ha over 6.6 million ha and Vic Sustainability and Environment $0.78 per ha over 4.1 million ha.

How can DEC do an adequate job with less than 1/20th of the budget per ha that NSW National Parks and Wildlife devote to controlling pests and weeds?

Funding Justification

Across many sectors, the current levels of funding for biosecurity management in WA fall far short of the resourcing directed towards this function in other jurisdictions. Several State based reviews have reported on the need for consistent control of pests and weeds across the landscape, finding that Government land management has committed inadequate resources to biosecurity (pest and weed) management issues. These reviews have resulted in increased resources being applied at the State land manager level and commitments that Government land will be managed to produce similar, if not better, control outcomes, than private land expectations under State legislation.

Global and regional food security targets will not be met without adequate investment in prevention and impact mitigation measures for key biosecurity threats to productivity, product spoilage, product integrity and food safety.

The *Biosecurity and Agriculture Management Act 2007* requires State land managers to have management outcomes generally consistent with private land managers, with the Biosecurity Council and Department of Agriculture and Food to report annually on State land managers that do not meet adequate pest animal and weed management outcomes.

Funding Justification

Western Australia is a very large State with a low population density; extensive Crown land areas, large borders, both internationally and to the Northern Territory and South Australia. These factors increase the cost involved in effective biosecurity management.

Biosecurity threat prevention (especially interstate quarantine) and preparedness (including detection, diagnostic capability and emergency response capability) must be addressed if the tide of pest incursion and establishment is to be slowed. The long-neglected State Barrier Fence needs to be completed to facilitate the control of vertebrate pests.

While border control is feasible in some areas, in others it is more cost effective to manage buffers to significant conservation, pastoral and mining areas.

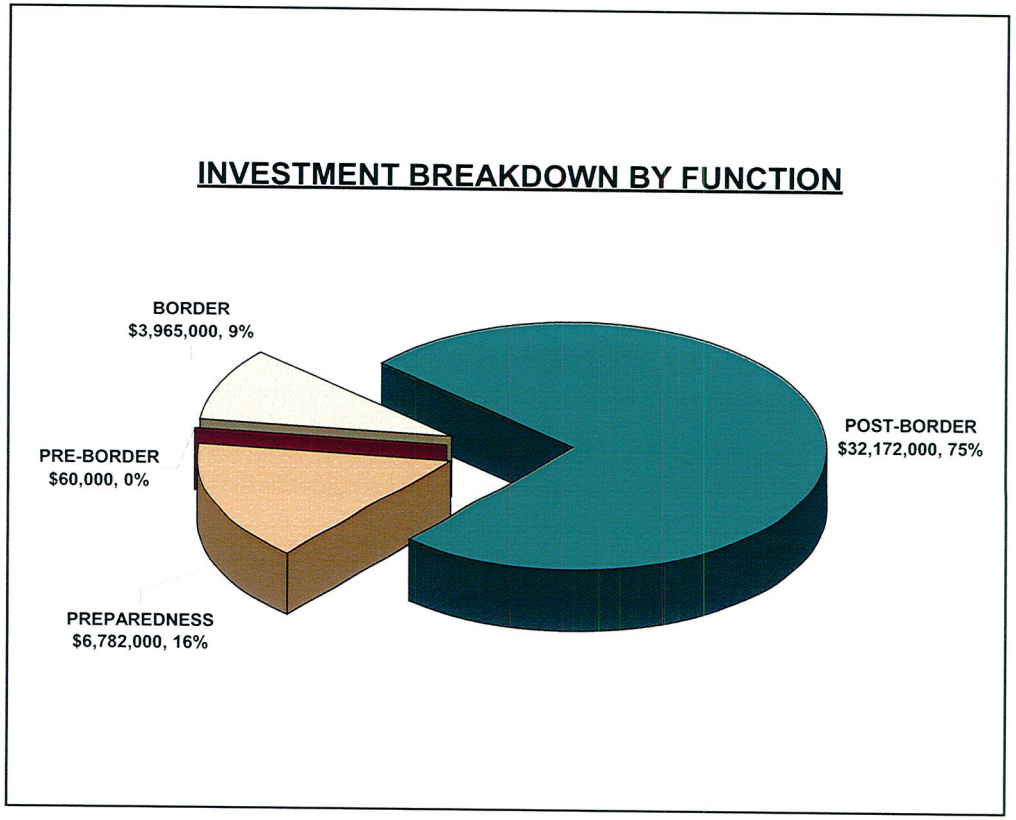
We have largely been ineffectual in past efforts to manage these buffers due to inadequate resourcing of agencies and regional landholder groups, which are best placed to deliver these services.

Cost sharing of invasive species control is possible under the BAM Act, with the formation of Recognised Biosecurity Groups that will allow the collaborative interaction of parties with mutual goals to enhance the cost effectiveness and efficiency in delivery of invasive species control measures. This mechanism is supported by dollar for dollar matching of private landholder contributions by State Government. Without substantial funding, no progress will be made in this area, leading to further environmental degradation and economic losses to agriculture.

New Resource Needs

Western Australia's biosecurity gaps, and the short and long-term protection of the economy, community and environment from serious pests and diseases will not be effectively addressed with small, piece-meal responses.

- **A dramatic increase in investment is required to redress long-standing real-terms funding decline and to meet emerging needs.**
- An outcome-based approach is being taken with collaboration of Government agencies, using existing and developing skills and infrastructure to deliver public good outcomes.
- A whole-of-government response aided by
  - *Biosecurity and Agriculture Management Act 2007*
  - Biosecurity Council
  - Biosecurity Senior Officers Group
- Industry and community must meet industry and private good responsibilities for preventative and response actions to maintain favourable biosecurity status – through clarification of responsibilities, cost-sharing, cost-recovery and fee-for-service measures.



New Resource Needs

Based on the analysis completed under the Biosecurity Review, it is recommended that State funding to agencies with biosecurity responsibilities for preparedness, pre-border, border and post-border biosecurity measures should grow by more than $46 million per annum by 2013/14 with a staged increase process.

Total impact on state finances	**2008/09 $ M**	**2009/10 $ M**	**2010/11 $ M**	**2011/12 $ M**	**2012/13 $ M**	**2013/14 $ M**	**2014/15 $ M**
DAFWA	-	4.275	10.377	13.364	13.055	14.750	14.750
DEC	-	4.125	11.544	15.190	16.532	18.387	18.387
DoF	1.878*	4.578	5.860	5.647	6.532	6.532	6.532
FPC	-	0.856	2.206	2.838	2.955	3.310	3.310
Sub-Total I - Requirements identified by Biosecurity Review	1.878	13.834	29.987	37.039	39.074	42.979	42.979
DEC allocation (AusBIOSEC emergency response funding)	-	0.500	0.500	0.500	0.500	0.500	0.500
Matching funding for landholder contributions within the South West Land Division under the new *Biosecurity and Agriculture Management Act 2007* (BAM Act)	-	1.000	2.000	3.000	3.000	3.000	3.000
State Barrier Fence capital development	-	3.500	4.500	3.500	2.500	-	-
Sub-total 2 - Additional Biosecurity requirements	-	5.000	7.000	7.000	6.000	3.500	3.500
Total public sector net operating balance	**1.878**	**18.834**	**36.987**	**44.039**	**46.074**	**46.479**	**46.479**

* Addressed separately with Treasury

Funding Breakdown

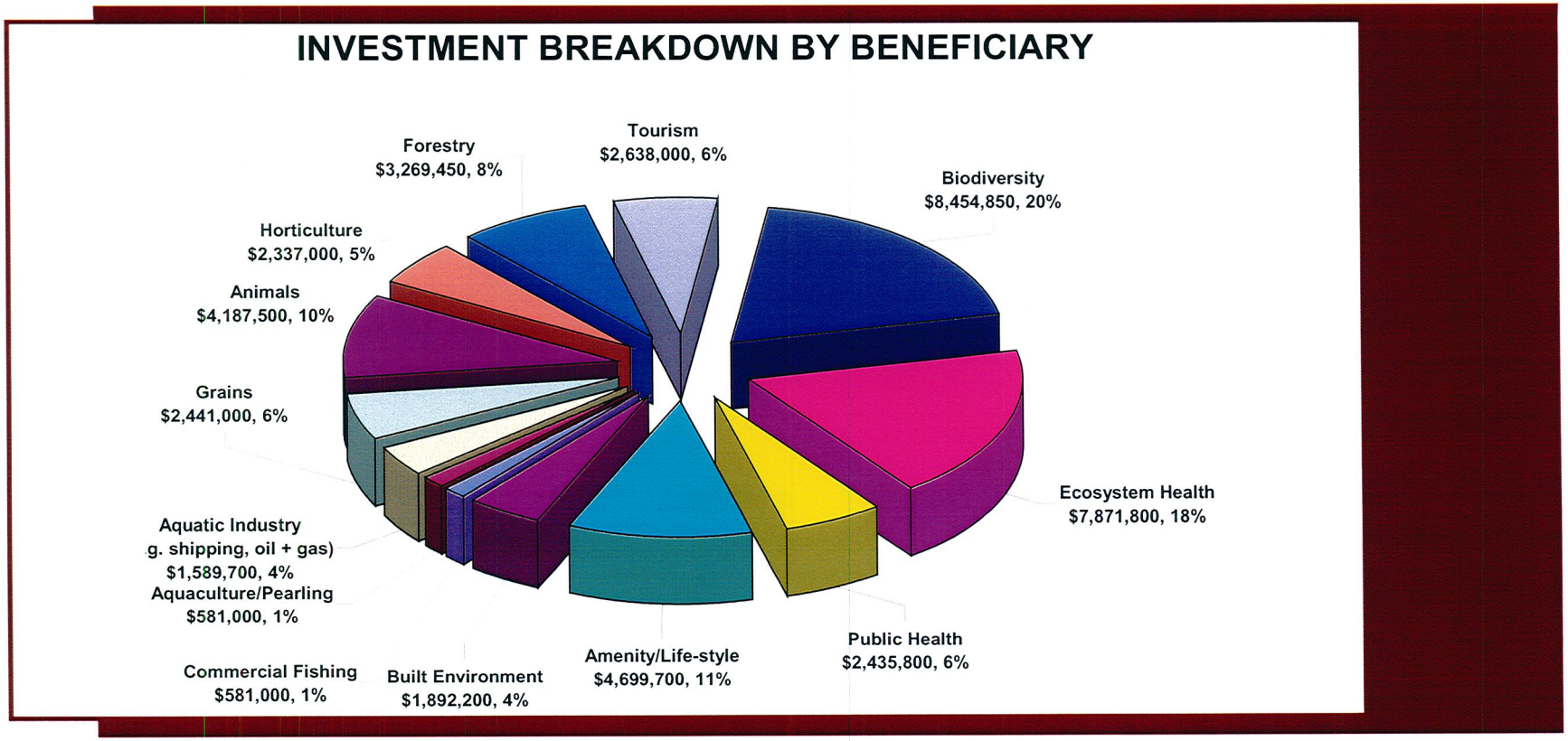
Requirements indentified from the Biosecurity Review

Agency	Investment ($)	
	current	new
DAFWA	22,158,000	14,750,000
DEC	10,357,000	18,387,000
DFWA	800,000	6,532,000
FPC	600,000	3,310,000
Total	33,915,000	42,979,000

IMPROVEMENT
Management Plans and Responsibilities for Established Pests, Weeds and Diseases
Contingency planning and preparedness
Emergency response agreements
Biosecurity communication and response plans
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

Biosecurity Beneficiaries

The proposed increased investment of $43 million p.a. (requirements identified in the Biosecurity Review) in economic (41%), environmental (38%) and, social and cultural (21%) biosecurity benefits will deliver a benefit:cost ratio of 3.82-5.14 from the State's new investment in biosecurity measures.



The Ecological Bottom Line

With increased travel and trade by sea and air, there is a heightened risk of occurrence of a serious biosecurity incursion despite WA's relative isolation.

While it is not possible to achieve a 'zero-risk' biosecurity system, a risk assessment and management based approach to biosecurity is the most cost-effective and efficient safeguard. This method is consistent with the development and implementation of biosecurity policy nationally and internationally.

The environmental, social and economic impact of biosecurity incursions is diminished when there is early detection (adequate risk-based monitoring and investigation of potential threats) and a rapid response to detection (e.g. control and eradication is enhanced by availability of appropriate databases, technology and resources to identify affected regions and properties, and those in contact or at risk).

The proposed new investment in biosecurity measures builds upon current capabilities and affords the opportunity to ensure that WA's biosecurity system can meet the current and future needs of the State's community and environment.

The Investment Bottom Line

WA's plant and animal-based food-related primary industries contribute $6.1billion to the State's economy and $4.8 billion to export earnings. WA's forestry sector contributes $265 million p.a. to our economy from exported forest products and $620 million p.a. from our domestic market. 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 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 plant and aquatic life – generates a significant proportion of WA's $3.8 billion per annum earnings from tourism.

The most comprehensive review ever undertaken of Western Australia's biosecurity status, current risk mitigation measures, gaps and needs has concluded that a new investment of $46.5 million per annum is required. The professional assessment of the State's biosecurity specialists is that this level of investment is required to redress the past decline in investment and to maintain, and in some areas enhance, the State's biosecurity status.




Prepared by Department of Agriculture and Food WA in cooperation with Department of Environment and Conservation, Department of Fisheries and Forest Products Commission