BIOSECURITY

A SHARED RESPONSIBILITY

Government, industry and the people of NSW working together to protect the economy, environment and community from the negative impacts of animal and plant pests, diseases and weeds for the benefit of all people in NSW.

NEW SOUTH WALES

BIOSECURITY STRATEGY

2013 – 2021

NSW GOVERNMENT

NSW BIOSECURITY STRATEGY 2013–2021

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FOREWORD

We are pleased to present the *NSW Biosecurity Strategy 2013–2021*.

The NSW Government is committed to strengthening the State's biosecurity measures and this new strategy is an important tool in safeguarding our $12 billion primary industries sector and protecting and conserving our environment.

The strategy establishes a clear vision for how we manage biosecurity threats including animal and plant pests, diseases and weeds. It highlights why biosecurity is important for NSW and identifies four key goals and a number of outcomes and strategies for implementation to better manage the risks of pests, diseases and weeds entering, establishing and spreading in Australia.

The most important goal of the strategy is that biosecurity is recognised as a shared responsibility.

Importantly, the strategy brings together all three levels of government and the wider community to look at ways we can best manage emerging biosecurity risks.

Our economy, environment, health and social amenity are all dependent on our biosecurity measures and these measures can be strengthened with support from the entire community and through everyone playing their role.

We are confident that this strategy will allow us to build a strong and resilient biosecurity management system that will protect our key industries, the environment and community from future biosecurity challenges.

The Hon Barry O'Farrell MP

Premier of New South Wales

The Hon Katrina Hodgkinson MP

Minister for Primary Industries

VISION

BIOSECURITY:
A SHARED RESPONSIBILITY

Government, industry and the people of NSW working together to protect the economy, environment and community from the negative impacts of animal and plant pests, diseases and weeds for the benefit of all people in NSW.

INTRODUCTION

‘Biosecurity’ means protecting the economy, environment and community from the negative impacts of pests, diseases and weeds. Biosecurity is vital for the health, wellbeing and prosperity of everyone in NSW.

The NSW Biosecurity Strategy sets the overall direction for the management of animal and plant pests, diseases and weeds in NSW terrestrial and aquatic environments. It is based on the principle that biosecurity is a shared responsibility.

Broad objectives for biosecurity in NSW

Biosecurity is about risk management. The broad objectives for biosecurity in NSW are to manage pest, disease and weed risks by:

- preventing their entry into NSW
- quickly finding, containing and eradicating any new entries
- effectively minimising the impacts of those pests, diseases and weeds that cannot be eradicated.

Aims and objectives of the strategy

The NSW Biosecurity Strategy outlines how government, industry and the community need to work together to identify, minimise, respond to and manage biosecurity risks. It **aims** to highlight the importance of biosecurity for NSW and identifies the objectives that we will pursue over the next eight years through implementation of the strategy.

The **objectives** of the strategy are to:

- communicate a clear vision and build support for a strong and integrated biosecurity system for NSW
- help achieve the government’s priorities as set out in *NSW 2021*, particularly by contributing to the goals for a strong economy and strengthening local environments and communities
- maintain or improve where necessary NSW’s capacity to respond to, manage and control biosecurity threats according to our state and national obligations
- provide the foundation for all stakeholders to work together, and help to make best use of the knowledge and expertise across all groups
- identify a clear set of goals, outcomes and strategies for implementation that are meaningful to the NSW community as a whole
- provide guidance for prioritisation, decision-making and actions at state level
- provide a framework for more detailed planning, monitoring and reporting of biosecurity programs
- provide a clear direction for biosecurity research.

Scope of strategy

Biosecurity risks are broad-reaching and can impact on all aspects of the economy, environment and community.

The focus of the NSW Biosecurity Strategy is on biosecurity risks that affect:

- animal and plant industries, including agriculture, aquaculture, recreational and commercial fishing and forestry
- biodiversity and the natural (terrestrial and aquatic) and built environment
- human health:
  - directly through the transfer of diseases between animals and humans (such diseases are known as zoonoses), or through weed species that may cause problems such as asthma and allergic reactions, or
  - indirectly through the ingestion of chemically-contaminated food products arising from pest and disease treatment or pathogen-contaminated food
- lifestyle, recreation and social amenity
- infrastructure and service industries, including energy, shipping and water supplies.

Areas such as animal welfare, genetically modified organisms and crops, and chemical contamination of the environment are also important to biosecurity, however are not explicitly dealt with in this strategy. For example, heavy metal contamination of land as a result of past industrial practices is managed through environmental protection legislation and animal welfare is managed through animal welfare legislation.

Why is it important to manage biosecurity risks?

Effective biosecurity is important because it contributes to our wellbeing and prosperity. We need to manage biosecurity risks effectively to protect the economy, environment and community.

Economy

International markets often prefer Australian products because they are free of many of the pests, diseases and weeds found in other parts of the world. Similarly, our ability to trade animal and plant products with other Australian jurisdictions is also underpinned by our biosecurity status. Some pests, diseases and weeds that exist in Australia today are found only in specific parts of the country. Those parts that presently do not have them want that freedom to remain. NSW agricultural and forestry industries are heavily export focused, and our strong biosecurity status is crucial for developing and maintaining both overseas and domestic markets. This provides significant economic advantages, as well as environmental and social benefits. NSW's primary industries sector has a gross value exceeding $12 billion each year and accounts for about 20% of Australian agricultural production, all of which is protected by maintaining our biosecurity status.

To access new, and safeguard existing domestic and international markets, it is important that we have world class quality assurance processes and schemes in place. The financial consequences of temporary or prolonged market closures due to pest or disease outbreaks can be very significant. For example, it is estimated that a 12 month outbreak of foot and mouth disease would reduce Australia's gross domestic product by between $10.3 billion and $16.7 billion over 10 years (equivalent to a one to two percent reduction in gross domestic product for one year).

A 12 month long incursion of the wheat disease Karnal bunt would result in a loss of $350 million, a national outbreak of citrus canker would result in a loss in the order of $400 million, and an outbreak of highly pathogenic avian influenza infecting people as well as birds could cost over $10 billion.

A biosecurity event does not just have a negative impact on industry. There will always be flow on effects to related industries such as processing, transport and tourism. For example, during the foot and mouth disease outbreak in the United Kingdom in 2001, the tourism industry in the Lakes District lost a whole season of income and total losses to the country were estimated to be in the order of £8 billion.

Failure to protect our aquatic environments from the introduction of new pests and diseases will reduce the value of aquatic tourism, fishing and aquaculture industries, and will affect the functioning of aquatic ecosystems which then impact on commercial and recreational fishing, and the environment. The direct value of aquatic tourism and recreational activities in Australia is estimated to be $12 billion, which equates to 19% of the total value of the tourism sector for Australia ($64 billion in 2009–10).

Food security

The people of NSW, along with others around the world, share a heightened awareness of the constraints facing world food production.

Modelling indicates that global food production will need to have doubled between now and 2050 to meet expected demand. It is clearly important that we do everything we can to protect our food production capacity from pests, diseases and weeds that negatively affect productivity; this includes protecting our stored and dried food products and our agricultural and fisheries resources.

Environment

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

Pest animals and weeds are among the biggest threats to biodiversity and the natural environment in NSW. Around 19% of native terrestrial mammal species in NSW have become extinct since European settlement. Pest animals (especially cats, foxes, rabbits and wild dogs) are considered to be the primary causes of most of these extinctions. Pest animals are also contributing to the decline of many other native animals (in particular, bird and reptile species), including approximately 40% of NSW's threatened species.

Over 1650 species of exotic plants have become established in the wild in NSW. At least 300 of these weeds are highly invasive and pose a substantial threat to biodiversity. A large number of these are escaped garden plants. Many weeds are widespread and beyond the scope of eradication or containment programs.

The number and distribution of introduced species, including aquatic pests, becoming established in the natural environment is increasing. Pest populations usually have a high reproductive capability, can colonise new areas rapidly, and recover quickly after targeted control programs have concluded. The absence of natural predators or environmental control measures often adds to this impact.

CASE STUDY:

MANAGING MYRTLE RUST IN COASTAL NSW

Myrtle rust is a serious fungal disease that attacks new foliage of plants in the Myrtaceae family. This includes many typical Australian native plants such as eucalypts, paperbarks and tea trees.

First detected in NSW in 2010, myrtle rust continues to spread across the east coast of NSW and is impossible to eradicate and difficult to contain. The disease produces large numbers of spores, which are easily spread by wind, human activity and animals.

Ongoing research and monitoring of myrtle rust infections shows that the disease is severely affecting plant health and seedling growth of susceptible Myrtaceae species along coastal NSW. However, the level of infection varies and the severity of symptoms is closely linked with weather patterns and the susceptibility of the species. Other areas of NSW are currently free from the disease.

The active ongoing everyday management of myrtle rust in NSW is now the responsibility of land managers. There are a number of practical control treatments and management options that can be used to limit the spread of the disease. Further work to enhance the management of this disease and to develop a seed bank that will safeguard the long-term survival of highly susceptible species is occurring. Ongoing vigilance will be required to detect other strains of this disease if it reaches Australia.

To reduce the spread of myrtle rust in NSW it is important that biosecurity awareness and good hygiene practices are embedded in everyday management activities in commercial and recreational operations.

Image: Louise Morin, CSIRO

CASE STUDY:

WORKING ON MANAGEMENT PROGRAMS TO OUTSMART THE RED FOX

The European red fox (*Vulpes vulpes*) is a significant pest throughout Australia and is one of the country's greatest threats to native animals. As a consequence, fox predation is listed as a key threat in NSW under the *Threatened Species Conservation Act 1995*. Foxes also have a significant impact on agricultural industries.

Foxes are highly mobile and elusive predators and scavengers, which makes them successful in a diverse range of habitats. They are also very efficient breeders and are widespread and numerous across the landscape.

To mitigate fox impacts in natural areas, the Office of Environment and Heritage has prepared a Threat Abatement Plan to manage fox predation impacts. Under this Plan, approximately 60 sites across NSW, covering a range of land tenures are subject to ongoing fox management. This is leading to an increase in native animal populations in many of these areas.

The DPI Vertebrate Pest Research Unit has been researching and developing cost-effective, long-term, fox management programs for land managers. This is because, while one-off programs may kill a few foxes in the short term, they generally fail to account for the resilience of this pest and have little impact on the fox population.

What we know is that no single control technique will completely remove foxes from an area. However, research shows that targeting fox biology 'weak spots', using different control methods and coordinating efforts with others across the landscape can help to control fox populations.

Sustained and cooperative management programs allow land managers to use their resources more effectively, significantly improve livestock production and profits as well as contribute to the protection of vulnerable wildlife.

Ongoing partnerships with research providers such as the Invasive Animals Cooperative Research Centre, will provide the information to allow control techniques and community engagement practices to be refined to make fox management more efficient across NSW.

Community

Biosecurity risks, if not adequately managed, can directly affect both human health and people's ability to enjoy their surroundings. Managing biosecurity risks directly benefits the community.

Human health

Diseases such as Avian influenza (bird flu), swine flu, mad cow disease, Nipah virus, SARS (Severe Acute Respiratory Syndrome), rabies, Hendra virus, anthrax, Menangle virus, and Lyssavirus can and do move from animals to people, causing severe disease in many cases. Biosecurity management aims to reduce the risk of this occurring.

Organisms found in livestock and wildlife, such as the bacteria *Salmonella*, pathogenic *Escherichia coli*, *Campylobacter* and *Listeria*, can also cause disease and death in people if they are not controlled and are allowed to contaminate food.

Weed species such as rhus, privet and parthenium can also have a detrimental effect on people, causing severe illnesses such as asthma and allergic reactions.

Poor practices in the handling of many of the chemicals and antibiotics used to treat pests and diseases can also adversely affect human health, either directly or through contamination of food. Inappropriate or long-term use can lead to chemical or antibiotic resistance in pests, diseases and weeds so identifying alternative methods of pest, disease and weed control is also a vital part of managing biosecurity risks.

CASE STUDY:

PROTECTING THE STATE'S EQUINE INDUSTRIES FROM HENDRA VIRUS

Hendra virus is carried by flying foxes and can be passed on to horses, and occasionally passed on to humans in close contact with the infected horses. The virus can be deadly to both horses and humans.

Flying foxes are widespread throughout Australia and highly mobile, which means Hendra virus can potentially occur anywhere flying foxes are found. To date infected bats have been found from Queensland to South Australia.

The disease is almost invariably fatal in horses and four of the seven people known to have been infected with Hendra virus died, despite intensive hospital treatment. Humans who survive the initial infection with Hendra virus may relapse, as in the case of a person who died 13 months after his initial recovery.

In horses, Hendra virus generally causes nervous and/or respiratory problems, but early signs can be vague and can be mistaken for other diseases. In humans, the virus can cause a flu like illness that progresses to pneumonia, and/or encephalitis (inflammation of the brain).

Ten horses on eight properties in north eastern NSW died due to the infection in 2011. It is critical that horse owners continue to take steps to minimise exposure to the virus. This includes keeping horses out of paddocks where trees are fruiting and flowering and most attractive to bats.

The DPI funds the testing of horses with symptoms consistent with Hendra virus to rule out the disease. There has been widespread publicity about the Hendra virus and how to reduce the risks.

Currently, when Hendra virus is confirmed as the cause of illness or death in horses, the DPI, NSW Health and other local authorities manage the situation to minimise the risk to people and other animals, and to track the likely cause and extent of the infection.

Research to better understand the disease and to develop methods of control, such as vaccination, is continuing.

Public amenity

Australians value their outdoor way of life. Some pests, diseases and weeds can have a major impact on lifestyle and threaten these values.

For example, the red imported fire ant, originally from South America has been introduced into Australia and can be found in an area around Brisbane, Queensland. These ants have a vicious and painful bite that can kill animals and severely limit people's enjoyment of outdoor activities. Before a control program was undertaken in the affected suburbs of Brisbane, everyday activities such as walking and backyard barbecues had become impossible.

What are the consequences of breaches in biosecurity?

The potential impacts of not effectively managing biosecurity risks are best demonstrated by some facts:

- Diseases such as avian influenza, mad cow disease, ebola and SARS can spread from animals to humans. Between 1940 and 2004, 60% of new human diseases came from animals.
- A 12 month outbreak of foot and mouth disease in Australia could cost the economy between $10.3 and $16.7 billion.
- Indonesia stopped Australia's $100 million a year live cattle export trade following an anthrax incident in NSW in the 1990s.
- Hendra virus, which is present in flying fox colonies in eastern Australia, has been responsible for a number of deaths in both people and horses in Queensland.
- Weeds and pest animals are estimated to cost the NSW economy over $1.3 billion a year in losses to agricultural production and the cost of control measures. This does not include impacts on biodiversity, landscape, tourism and water.
- The long-term survival of many native plants, including paperbarks, tea trees and many rainforest shrubs, is threatened by the outbreak and establishment of myrtle rust.

Who are the key players in biosecurity and what are their roles?

Government, industry, industry associations and professional bodies, research providers, universities, museums, non-government organisations (NGOs), individuals and the community as a whole all have a role to play in the management of biosecurity risks.

Government

Governments at the national, state and local levels all have important roles to play in biosecurity risk management. Pests, diseases and weeds do not recognise local government areas or state borders so biosecurity activities must be carried out within a national framework. All levels of government must collaborate closely to deliver positive outcomes.

NSW is a signatory to a number of national agreements including the Intergovernmental Agreement on Biosecurity (IGAB), Emergency Animal Disease Response Agreement (EADRA), Emergency Plant Pest Response Deed (EPPRD) and National Environmental Biosecurity Response Agreement (NEBRA).

These agreements outline the roles and responsibilities of government and industry in responding to emergency animal and plant pest and disease incidents and detail how those responses will be funded.

The NSW Government plays an important role in the management of biosecurity risks by leading the development and implementation of policies and strategies that encourage a comprehensive and responsive biosecurity system and by ensuring that there is a strong legislative and regulatory framework underpinning the system.

NSW operates within a national biosecurity framework outlined in the IGAB and the three supporting deeds and agreements. The NSW Biosecurity Strategy is designed to develop and implement management arrangements for specific biosecurity risks in line with national goals set out in the IGAB. Underneath the NSW Biosecurity Strategy will be policies, strategies and operational plans that relate to specific biosecurity issues such as invasive species and regional pest management.

The Department of Primary Industries (DPI) takes the lead on biosecurity activities within the NSW Government. The establishment of Local Land Services in 2014 will provide an important link in the delivery and implementation of this strategy, particularly at a regional level.

Local government will continue to play a significant biosecurity role particularly in the management of pests and weeds and has an important role to play in engaging local communities, managing public lands and assisting with emergency management.

The NSW Government will help industries and the community manage biosecurity risks by:

- building awareness about biosecurity
- leading and coordinating prevention, preparedness, response and recovery programs for outbreaks of significant emergency pests, diseases and weeds
- forming partnerships and identifying and delivering funding opportunities to deliver key initiatives
- engaging with Aboriginal Traditional Owners who have access to invaluable and unique knowledge of the environment and ecosystems
- developing non-regulatory quality assurance programs such as Interstate Certification Agreements that support market access
- protecting and managing environments through effective pest and weed management
- coordinating diagnostic, surveillance, tracing and monitoring systems
- conducting biosecurity research in priority areas
- collaborating with universities, museums and research providers on research initiatives and pest and disease identification.

Industry

Primary industries benefit from effective biosecurity management through increased productivity, higher quality products and greater market access for their product or service by demonstrating freedom from disease.

By projecting a healthy and sustainable image of NSW's terrestrial and aquatic environments, the tourism and recreation industries can likewise reap the benefits of sound biosecurity management and attract increased numbers of tourists and consumers choosing to enjoy their holidays and recreation here.

Industry associations and professional bodies and their members play an important role in achieving these outcomes. They also lead industry participation in the development and implementation of industry standards, guidelines and codes of practice, and represent their members in negotiations with the Commonwealth and State governments regarding biosecurity response agreements and cost-sharing arrangements.

In some cases, industries also contribute to increased biosecurity risks through the following high risk pathways:

- inappropriate disposal of farm or municipal waste
- allowing diseased animals to move from property to property
- releasing contaminated ballast or bilge water into local waterways
- transporting biofouling organisms to new ports on ships' hulls
- allowing pests and weeds to be moved on agricultural machinery and equipment.

Industries must take a strong leadership role in biosecurity risk management by:

- identifying, reporting and managing biosecurity risks that may threaten their or other businesses
- complying with regulations, especially in relation to record-keeping and reporting biosecurity incidents
- being vigilant by keeping a watchful eye out for unfamiliar pests, diseases and weeds
- participating in responses to biosecurity incursions
- educating their members about their roles and obligations
- working with governments and other stakeholders to develop and implement policies and strategies that will protect Australia and NSW's biosecurity status and agreements relating to biosecurity responses and their funding
- funding or co-funding educational programs to develop or improve biosecurity skills
- funding or co-funding research programs in priority biosecurity areas.

Community

Biosecurity awareness and active participation of the community is an essential component of effective biosecurity risk management regardless of where they live. Members of the community can be very effective 'eyes and ears' with respect to the detection of biosecurity incursions.

In addition, the ongoing management of established pests, diseases and weeds greatly benefits from NGOs that have significant expertise in community engagement and greatly assist in hands-on biosecurity activities such as leading volunteer groups that conduct weed removal, bush regeneration projects and rehabilitation of aquatic habitats.

Members of the community have a general responsibility to:

- be aware of, and manage, biosecurity risks where they occur on their land (for example, by controlling weeds), in their animals or plants, or in waterways, coastal waters and other shared spaces such as public land
- quickly report significant or unusual pests, diseases and weeds
- participate in community programs that build resilience in the natural environment and help reduce the risks from pests, diseases and weeds.

CASE STUDY:

TACKLING THE SPREAD OF POMS

Pacific Oyster Mortality Syndrome (POMS) is a viral infection that only affects Pacific oysters. The virus was first detected in Australia by DPI researchers at the Elizabeth Macarthur Agricultural Institute in 2010 when oyster farmers reported the unexplained mortality of wild and farmed Pacific oysters in the Georges River and Port Jackson.

POMS was again detected in 2013, this time in the Hawkesbury River.

With each outbreak, the DPI has worked closely with industry to take immediate action to limit the spread of this disease, protecting the livelihood of oyster farmers. This may include a total ban on the movement of oysters from known infected estuaries to any other estuary in NSW. Movement controls may also be adopted to prevent the movement of contaminated oyster farming equipment from these estuaries to other oyster growing estuaries in NSW.

One of the key priorities in limiting the spread of POMS is to educate commercial and recreational fishers and boat owners on the risks of moving biofouling organisms, bilge water and ballast water between waterways. A range of educational material has been developed to explain how everyone can work to minimise and manage the spread of POMS.

Oyster farmers and the general public are encouraged to report mortality outbreaks in Pacific oyster populations or unusual fish kills along our coastlines so that action can be taken.

The DPI is undertaking research into POMS and working closely with industry and other research providers to improve our understanding of how the virus is spread and how it can be managed.

MANAGING INCREASING RISK

New challenges for biosecurity

Australia's geographic isolation has helped protect us from external threats. However we are becoming increasingly vulnerable to the entry of pests, diseases and weeds. Some key factors influencing increasing biosecurity risks are described.

Globalisation of trade

Globalisation is integrating the world's economy and increasing the volume and range of food products traded internationally. NSW is on the doorstep of some of the world's largest and fastest growing food markets, such as China, India, Korea and Indonesia and other markets of the Asia Pacific. Rapid growth in trade, tourism and in passenger and cargo movements is increasing the risk of pest, disease and weed incursions, despite biosecurity measures pre-border and at the Australian border. The number of international vessels arriving at Australian ports is expected to continue to rise with increases in trade volumes. Studies have shown that 70% of introduced aquatic pest species in Australia arrived here in the ballast water, or on the hulls of vessels. The need for appropriate management of aquatic invasions is now being widely acknowledged and acted upon by the shipping industry and governments internationally.

Population growth

The world's rapidly growing human population, combined with changing demographics, migration patterns, increased urbanisation and land clearing, is placing more pressure on natural ecosystems and driving competition for resources in Australia and elsewhere. The growing popularity of small 'hobby' farms is extending the interface between urban and rural areas ('peri-urban' areas) increasing the risk of animal and plant pests and diseases affecting food production, the environment (particularly wildlife) and human health. This is highlighted by the fact that 60% of emerging infectious diseases in humans have originated in animals, and the vast majority of these diseases have been from wildlife. The increasing pressure of human populations encroaching on areas previously populated by wild animals suggests that this trend is likely to continue.

Climate variability

Although the precise impact of increases in climate variability on biosecurity risks to NSW is not clearly understood, it is recognised as a major threat to environmental systems and to industries. Over the coming decades, NSW is expected to experience more extreme weather events and increases in average temperatures.

The predicted change in weather patterns and local conditions is likely to favour the establishment, spread or shift of some biosecurity risks but limit the distribution and impact of others. For example, the geographic distribution of some insects is likely to alter as a result of increased climate variability. Insects can help pollinate plants but can also damage crops. Changes in insect distribution will affect the horticultural and cropping industries. Some insect-borne livestock viruses (arboviruses), such as blue tongue, three-day sickness and Japanese encephalitis, are all likely to spread further south and cause disease in areas where they are not currently found.

The extent to which weed species will spread, and the possible impacts on scarce resources such as productive agricultural land and water, remain unclear. In addition, damaging tropical and subtropical pest species (e.g. cane toads, cattle ticks and tilapia fish) may increasingly move south as the climate there becomes warmer.

Imports of animal and plant materials

Every year new animal and plant materials are imported into Australia. Without these new materials, our industries would cease to prosper and develop and would slowly lose competitiveness on world markets. Our plant industries rely on new genetic material to develop varieties with improved productivity and resistance to pests and diseases. However, this new material brings with it its own challenges. Many plant species legally introduced into Australia have subsequently proved to be invasive in NSW environments and are now considered weeds. It is significant that 70% of weeds in Australia are garden escapees. Early detection of new weed species is an ongoing challenge. Left undetected, 'sleeper' weeds can be costly to eradicate and can have significant impacts on industry and the environment.

In addition, some animal and plant materials and aquarium species enter Australia illegally and therefore go unchecked, posing significant biosecurity risks that are initially unmanaged. For example, the illegal introduction of contaminated meat products remains the most likely pathway for the introduction of foot and mouth disease into Australia. The consequences of a single outbreak of this disease would be devastating for our national economy.

Competing priorities for resources

There are always competing priorities for resources and funding in both the private and the public sector. Significant financial pressures on government and industry and on many businesses to maintain profitability make it crucial that active and constructive partnerships between government and industry and clear decision-making processes are established.

The future of biosecurity management in the State of NSW

Australia's biosecurity regulations are among the most rigorous in the world. NSW has a strong track record in safeguarding our livestock, crop, fisheries and forestry sectors and natural environment from pests, diseases and weeds. Important service industries and overall community wellbeing have also been protected. However, given the diverse nature of the challenges, we must find smarter ways to manage biosecurity risks to ensure optimum use of scarce resources.

To achieve more efficient biosecurity management, together we will:

- continue to develop measures to prevent the incursion of new pests, diseases and weeds
- develop and implement innovative and effective biosecurity systems, for example, for pest, disease and weed surveillance and product tracing
- train and develop people so that we have the full range of skills and capabilities we need
- form closer partnerships among government, industry, educational and research institutes and the community
- create a clearer understanding in the community of the value of biosecurity and how it can be maintained
- develop and implement a contemporary and responsive legislative and regulatory framework.

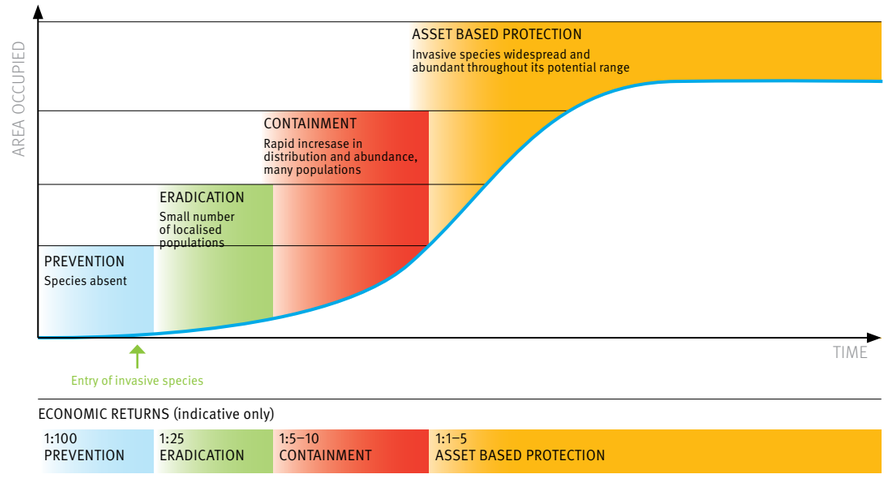
Most importantly, processes are required that support good decision-making underpinned by robust analysis of risks. Risk analysis involves identifying high-risk biosecurity threats, prioritising activities, developing and delivering targeted biosecurity programs, and providing for an equitable spread of costs for delivering those programs.

When developing biosecurity policy, the DPI uses a 'Biosecurity Threat Decision Tree.' This model, which is based on economic principles, ensures that biosecurity investment decisions are made as objectively as possible. It determines whether a role for government exists in relation to a specific problem by using 'market' failure tests. It then prompts the user to identify one or several government activities or programs that have the potential to address the problem in question. Where appropriate it guides the user to the most efficient cost recovery mechanism. The Biosecurity Threat Decision Tree can be found at **Appendix A**.

No measure or strategy can completely remove the risk of a pest, disease or weed entering, becoming established or spreading in NSW. Nor is the eradication of all biosecurity risks a technically feasible or realistic objective. Consistent with the Australian Government's concept of appropriate level of protection, NSW aims to minimise biosecurity risks while simultaneously maximising trade.

Prioritising biosecurity investments

Generalised invasion curve showing actions appropriate to each stage



*Invasion Curve sourced from Biosecurity Victoria, Department of Primary Industries, Victoria

This figure illustrates the return on investment for different phases of invasive species management. It highlights that a high return on investment is achieved through preventing entry of exotic and new threats, followed by early intervention and eradication if they do appear as opposed to investing in the management of widely established or endemic invasive species. This principle can generally be applied across the board to all pests, diseases and weeds.

The NSW Biosecurity Strategy communicates a vision for an integrated biosecurity system and outlines goals, outcomes and strategies for implementation.

The **goals** of this strategy are that:

1. Biosecurity is a shared responsibility.
2. Biosecurity contributes to sustainable economic growth.
3. Biosecurity protects the environment and the community.
4. Biosecurity is underpinned by a responsive and consistent legislative framework.

These goals, together with relevant outcomes and strategies for implementation are discussed in the following sections and included in the **Summary table**.

The NSW Biosecurity Strategy sets out the government's long-term objectives for how we will work together to manage biosecurity in NSW. The strategy will be underpinned by policies, strategies and implementation and operational plans that will provide a detailed road map of how the outcomes of this Strategy will be achieved. Specific actions, targets and time frames for delivery will be outlined in more detail in these underpinning documents and will be reported against annually or as required.

The NSW Biosecurity Strategy provides the framework for achieving good biosecurity outcomes in a smarter way. Government resources, policies and procedures will need to be realigned within existing budgets to achieve these objectives. The government will continue to work with industry to identify opportunities for additional investment by industry in, for example, research, development and education.

GOAL 1

Biosecurity is a shared responsibility.

Background

'Biosecurity is a shared responsibility' is the most important goal of this strategy. Engagement of all stakeholders – industry, other jurisdictions, and crucially, the wider community – is imperative for good biosecurity outcomes in NSW.

Achieving this goal

Outcomes

Together we will strive for:

1. improved community engagement in biosecurity management
2. stronger partnerships across the biosecurity spectrum.

1. Improved community engagement in biosecurity management

Biosecurity is vital to the health, wellbeing and prosperity of everyone who lives in NSW. The value of biosecurity needs to be explained well so that everyone can understand its importance, namely what it means for them and for future generations.

For example, community members such as private landholders, fishermen, bushwalkers or tourists are often best placed to detect a new pest, disease or weed. Early identification and reporting of new incursions is vital and greatly increases the chances of eradication.

Tourists, including Australians returning from overseas or interstate, need to ensure they do not return with biosecurity risk materials which may endanger NSW's or Australia's biosecurity status.

The tools to identify and report biosecurity risks must be widely promoted and readily accessible. It is important that people know what they are looking for and why, what to do if they find it, who to notify, and what might happen after they report it. Investing in education and community engagement will achieve:

- greater commitment to pest, disease and weed reporting
- greater support for routine prevention work
- greater understanding and compliance during an emergency response and recovery
- greater support for ongoing biosecurity management efforts.

Engaging the community in biosecurity awareness is a major education task for government and other relevant institutions such as universities and museums. Industries and NGOs are also actively involved in keeping pests, diseases and weeds out of NSW, as well as in managing those that are already here. They also have an important role to play in communicating their biosecurity successes and challenges to the community.

The wider community is becoming increasingly aware of environmental issues. Continuing urbanisation has meant that the community has become more aware of the value of the natural environment and people expect a quick and effective response to environmental risks. In addition, many community members actively participate in volunteer programs to help protect the environment.

However, many people do not understand the link between promoting healthy ecosystems and minimising pest, disease and weed risks. Healthy habitats are more resilient to these threats. Raising community awareness of biosecurity issues in natural environments will help promote the role the community can play in protecting NSW from pests, diseases and weeds.

Effective community engagement processes are informed by a good understanding of community perceptions and expectations which in turn improves the impact and effectiveness of the engagement but also helps create longer-term and self-sustaining programs.

Equally important for community engagement will be incorporating the results from science and research in focused education and information campaigns about priority biosecurity issues. Better, clearer ways to communicate scientific knowledge to the wider community in a simple and easy-to-understand format will be investigated.

A wide range of new tools and approaches is now available including social media networks, to understand, involve and engage target audiences and communities. Ways to use these platforms to engage the community more proactively in biosecurity issues will be explored.

Strategies for implementation

To improve community engagement in biosecurity management, together we will:

1.1 increase the capacity and capability of the community in biosecurity activities by leading and facilitating targeted education and information programs

1.2 provide advice to industries and the general community about how they can meet their biosecurity obligations

1.3 develop programs to actively manage priority established pests, diseases and weeds

1.4 develop and promote easy-to-use technologies for the reporting of pests, diseases and weeds

1.5 improve understanding of social factors influencing implementation of biosecurity practices.

CASE STUDY:

RABBITSCAN: HELPING LANDHOLDERS TO MANAGE RABBIT POPULATIONS

Since their deliberate release into Australia by European settlers in the 1800s, rabbits have degraded millions of square kilometres of the environment and been a chronic and costly economic burden on Australia's agricultural production.

Efforts to control them, although spectacular at times through biological control agents, have had limited or temporary success with rabbit populations still well established throughout the continent.

One of the most important aspects of rabbit management is having an accurate picture of rabbit distribution and abundance across Australia.

So, in early 2011, the DPI launched RabbitScan, a new website for landholders, communities and pest controllers to record sightings of rabbits, map the damage they cause, and report where rabbit control is being undertaken. The site includes a mapping tool to help visitors create a rabbit management map of their local area.

RabbitScan is now an Australia-wide program that allows anyone to spot, collect and report visual or other evidence of rabbits and their impacts.

Landholders will find the tool particularly useful as they can create a map of their property containing their own rabbit data, which can help them to plan and evaluate rabbit control strategies.

It is hoped the website will improve the on-ground management of rabbits through monitoring and collaborative action.

The project is an initiative of the Invasive Animals Cooperative Research Centre in partnership with the DPI and the Australian Bureau of Agricultural and Resource Economics and Sciences – a research bureau of the Australian Government.

CASE STUDY:

WORKING TO STOP DIDYMO FROM ENTERING AUSTRALIA

Didymosphenia geminata (known as Didymo or 'rock snot') is a freshwater alga (single celled plant) that is causing serious environmental problems around the world.

Didymo has invaded rivers, lakes and native waterways in Europe, Asia, North America and New Zealand and is smothering stream beds, killing aquatic plants and insects and reducing fish habitat and food. Didymo masses can also clog pumps used to extract water for irrigation and industrial use, as well as being detrimental to the recreational use of waterways.

Didymo was first found in the southern hemisphere in 2004, in the Lower Waiau River in New Zealand. In only a few years it has spread to 150 rivers in the South Island of New Zealand.

Human activity is thought to be the main cause of the spread of Didymo. Only one cell (invisible to the naked eye) transferred on footwear, fishing and boating equipment can spread this alga. Didymo cells can be transported easily on any damp materials.

It is essential that Australia prevents this serious environmental pest reaching our shores. Computer modelling suggests that our environment is suitable for didymo to become established in parts of Tasmania, Victoria and NSW.

Everyone visiting the South Island of New Zealand should be aware of this pest and take steps to ensure that they do not bring it back to Australia.

In 2009 the Australian Government introduced new questions on arrival cards for international travellers to identify high-risk equipment (including used fishing rods and footwear) that may have come in contact with infested waterways. This allows the equipment to be treated.

Image: Liz Poon, CSIRO

2. Stronger partnerships across the biosecurity spectrum

Biosecurity activities in NSW are conducted within a national framework, because pests, diseases and weeds have no respect for borders.

A key reform at the national level has been the development of the IGAB. The IGAB calls for a stronger science and risk-based approach to biosecurity. As well, the IGAB facilitates an improved working relationship between governments, industry and the community through pre-agreed governance and cost-sharing arrangements under complementary agreements, and it provides for the states and territories to be consulted on a range of key issues.

Strong partnerships that are reinforced by formal agreements are vital for effective biosecurity management. However, there are still some industry sectors in NSW that are not signatories to the existing emergency response agreements and this needs to be addressed.

National strategies such as the National Plant Biosecurity Strategy and Australian Pest Animal Strategy result from collaboration and agreement between the Commonwealth, other jurisdictions and industry. These strategies establish a vision and develop outcomes and actions relating to management of biosecurity risks in their respective sectors.

Other examples of collaborative partnerships supporting biosecurity include participation in the National Biosecurity Committee and specialist sectoral and technical committees. These bring together representatives from the Commonwealth, other jurisdictions, universities, museums and industry to develop policies and protocols at a national level.

NSW's involvement in these strategies and committees is important for building partnerships with other key players in biosecurity and is essential in managing biosecurity risks through an endorsed and complementary approach.

Strategies for implementation

To build stronger partnerships across the biosecurity spectrum, together we will:

2.1 continue to participate in forums to develop, agree and adopt formal consistent national biosecurity arrangements in all jurisdictions

2.2 develop and coordinate risk mitigation strategies for established pests, diseases and weeds

2.3 develop and implement arrangements for biosecurity prevention, preparedness, response and recovery, including funding arrangements that reflect the shared responsibility for biosecurity

2.4 ensure biosecurity is a key feature of Local Land Services.

GOAL 2

Biosecurity contributes to sustainable economic growth.

& GOAL 3

Biosecurity protects the environment and community.

Background

Management of biosecurity risks contributes to sustainable economic growth, protecting the environment and improving community wellbeing. Goals 2 and 3 are interdependent, and although similar directions and approaches may be taken to achieve them, each may require different specific strategies for implementation.

Achieving these goals

Outcomes

Together we will strive for:

3. improved identification, diagnostic, surveillance, reporting and tracing systems for pests, diseases and weeds
4. improved response to biosecurity emergencies
5. reduced impacts from established pests, diseases and weeds
6. strengthened biosecurity science and research capacity and capability
7. increased numbers of well-trained and resourced people.

3. Improved identification, diagnostic, surveillance, reporting and tracing systems for pests, diseases and weeds

Timely detection, notification and identification of a suspected animal or plant pest, disease or weed is critical to ensure that it does not have time to establish and spread. Landowners, occupiers and the community all have important roles to play in the early detection of biosecurity risks.

Notification. The NSW Government has established telephone hotlines and web-based systems for reporting suspected pests, diseases and weeds. We will continue to promote these existing systems and develop and implement innovative ways to simplify and further encourage early identification and notification.

Diagnosis. Accurate and timely diagnosis of pests, diseases and weeds is crucial, as management actions will vary depending on the type of risk. Credible surveillance and tracing systems rely on accurate diagnosis. Prompt identification of a potential biosecurity risk could save millions of dollars in production or markets that could be lost if an industry had to shut down while a diagnosis was being made.

The Elizabeth Macarthur Agricultural Institute at Camden, NSW, is part of a national network of diagnostic facilities and is recognised for its world-class research, including into the development and delivery of improved diagnostics. Scientists at the Institute and at the DPIs other world class scientific facilities collaborate with a range of providers to form the national network of scientific capacity underpinning biosecurity. Given the large numbers of pests, diseases and weeds in Australia, it is crucial that we continue to develop our diagnostic capabilities in a collaborative manner.

Surveillance. Well coordinated surveillance helps with early detection of biosecurity threats and monitors performance of management programs thereby allowing appropriate management actions to be implemented in a timely manner. It also helps to track the spread of pests, diseases or weeds. Effective surveillance systems also provide the necessary evidence of absence of pests and diseases for ongoing market access.

NSW's animal disease surveillance programs, which are conducted by the government with the support of industry, have helped to eradicate major endemic diseases such as brucellosis and tuberculosis in cattle. Active plant disease surveillance programs are being developed.

The current systems must be fundamentally reviewed so that surveillance activities are better prioritised and coordinated and underpinned by robust science and risk management frameworks. Surveillance activities that are effectively prioritised and coordinated will provide consistent and compatible data that can then be accessed not only within NSW but also nationally.

Traceability. Product traceability is an increasingly important element of the export certification demanded by NSW's valuable food export markets. The ability to trace a product posing a biosecurity risk back to its source is an essential part of a robust biosecurity system. Being able to demonstrate traceability from origin to consumer helps to safeguard Australia's reputation as a safe and reliable source of food and agricultural and horticultural products.

The ability to trace livestock and plants from their source, and determine whether other animals or plants could have been infected is also an essential part of managing disease outbreaks and control programs.

NSW has implemented the National Livestock Identification System (NLIS) across the major livestock industries which allow for the tracing of livestock movements. This system must be expanded to include other livestock species. Systems with similar aims need to be developed for the plant-based industries.

Strategies for implemention

To improve identification, diagnostic, surveillance, reporting and tracing systems, together we will:

3.1 improve early detection and reporting systems, drawing on the latest technologies and diagnostics

3.2 undertake surveillance activities that are underpinned by robust science and prioritised according to risk

3.3 improve current tracing systems so that they meet national performance standards

3.4 expand the National Livestock Identification Systems to allow tracing of additional livestock species

3.5 continue to develop more efficient ways of demonstrating proof of freedom from pests, diseases and weeds

3.6 increase focus on coordinated surveillance activities and strategic information management and accessibility

3.7 develop and implement effective surveillance systems in natural environments

3.8 consider including plant industries and peri-urban properties in property registration and traceability systems.

CASE STUDY:

NLIS WORKING TO PROTECT AUSTRALIA'S AGRICULTURAL INDUSTRY

The National Livestock Identification System (NLIS) is Australia's scheme to identify and trace livestock across the country. It is a key industry initiative in partnership with government, which enhances Australia's ability to respond to a major food safety or disease incident.

In 2012, the DPI ran a livestock tracing exercise that simulated an outbreak of foot and mouth disease (FMD).

Called Exercise Tuckerbox, the desktop simulation used a real life scenario and sheep movement data from the NLIS database.

The simulation demonstrated the speed and effectiveness of the livestock traceability system to respond to a major disease emergency, with all animals traced within less than 12 hours. Using data from the NLIS was equivalent to seven staff tracing approximately 438,000 cattle, sheep and goats to 2300 properties throughout NSW.

Tracing also revealed other traced premises (properties, saleyards and abattoirs) located in Victoria, Queensland, South Australia, the ACT and Tasmania. However, further tracing of livestock from these premises was not carried out. In an actual FMD outbreak livestock traced to other jurisdictions are referred to the affected state or territory for follow up.

Exercise Tuckerbox demonstrated how critical NLIS data is in tracing livestock in the event of an emergency disease outbreak.

CASE STUDY:

NLIS HELPING TO CONTROL WEED OUTBREAKS

The DPI has led the development of an innovative technique for tracing weed incursions using data collected and stored on the NLIS database.

Using NLIS data, tropical soda apple, an invasive weed carried by cattle, was discovered at Holbrook in southern NSW, 1200 km from where it was originally found. Subsequent surveys have discovered three more outbreaks across the State.

Using reports from the NLIS database DPI staff traced the movements of individual cattle from infested properties to other properties in NSW, Queensland and Victoria, which enabled the weed to be quickly eradicated.

The use of the NLIS database gives weed managers a significant advantage in controlling weeds that are transported by livestock. Early detection allows land managers to eradicate weeds before they become endemic and widespread.

CASE STUDY:

TRACING TICK INFESTED CATTLE POSSIBLE WITH NLIS

The NLIS database records livestock movements across the country and was invaluable in tracing cattle movements to and from a property near Quirindi when a case of tick fever occurred in 2012.

The NLIS database showed various cattle movements to the Quirindi property, including 37 cattle from a Moree property via the Moree saleyards. These cattle originated from a property near Paterson in Queensland, a cattle tick infested zone.

Information from the NLIS database allowed DPI Agricultural Compliance staff to quickly identify the tick infestation and follow up on whether the cattle had been dipped or not. Cattle originating from a Queensland tick infested zone are required to be treated for cattle tick before they move into NSW.

The database was also useful in tracing cattle sold from the affected Quirindi property to Victoria and other local properties. DPI Victoria was then notified of the risk of tick fever in the cattle from the infected NSW property.

Image: Simon Freeman Photography, supplied by NLIS Ltd

4. Improved response to biosecurity emergencies

The IGAB and its associated deeds and agreements (EADRA, EPPRD and NEBRA) define a number of significant animal and plant pests and diseases as emergency pests and diseases. Together these documents outline how new pests and diseases are assessed to determine whether they require an emergency response and if so, who should bear the cost of the response. The principle of 'risk creator' and 'beneficiary' is inherent in EADRA, EPPRD and NEBRA. This principle proposes that those who create the risk or the impact should share in the costs of conducting a response, or if the risk creators cannot be identified or effectively be charged with the cost, then those that receive the benefit – the beneficiaries – should jointly bear the cost of the response.

Most of the pests or diseases identified in the above agreements are presently exotic to Australia and NSW. However some, such as Hendra virus and anthrax, do occur in Australia but are limited in their distribution and occur infrequently.

Being prepared and responding quickly are the keys to avoiding or limiting the devastating impact of an emergency pest, disease or weed outbreak. NSW already responds to a substantial number of biosecurity threats each year.

NSW has a sound reputation as a leader in biosecurity emergency response management. The State Emergency Management Plan provides a well-established management framework including an integrated 'all sectors, all hazards' model for responding to emergency pest, disease and weed incidents, whether terrestrial or aquatic. The State Emergency Management Plan is supported by national arrangements and plans which together, provide for emergency prevention, preparedness, response and recovery, including surveillance, field operations, laboratories, extension and research.

NSW works closely with the Commonwealth and other jurisdictions to manage biosecurity risks. This enables a coordinated response to emergencies by all agencies that have responsibilities for emergency management.

A number of established agricultural industries and businesses also have industry biosecurity plans in place that detail their systems for minimising biosecurity risks, as well as their emergency prevention, preparedness, response and recovery arrangements. However, newer and/or smaller agricultural industries, as well as the forestry and aquatic sectors in general, are less well prepared for biosecurity emergencies. In addition, systems for addressing biosecurity risks to the environment have been identified as requiring further development.

It needs to be widely understood that investment in early detection and emergency responses is far more cost-effective than long-term management of established pests, diseases and weeds. New and emerging pest, disease and weed risks need to be considered, as does the extent to which increased climate variability and other factors will influence the spread of established pests, diseases and weeds.

Strategies for implementation

To improve our response to biosecurity emergencies, together we will:

4.1 identify and prioritise biosecurity threats across terrestrial and aquatic environments and the agriculture and aquaculture sectors

4.2 improve biosecurity prevention, preparedness, response and recovery across all sectors, but particularly where gaps currently exist, for example in fisheries and forestry industries and the environment

4.3 improve cross-jurisdictional collaboration in biosecurity management, in particular in relation to emergency management and early detection

4.4 continue to incorporate research findings into the decision-making framework for responding to emergencies.

CASE STUDY:

EQUINE INFLUENZA ERADICATION CAMPAIGN A SUCCESS

In August 2007, the rapid spread of a respiratory disease in horses at Centennial Park in Sydney rang alarm bells with the attending veterinarian. By the end of the day, laboratory testing at the Elizabeth Macarthur Agricultural Institute (EMAI) confirmed that the horses were infected with Equine Influenza (EI).

The rapid diagnosis was made possible by the foresight of Dr Peter Kirkland, head of the virology laboratory at EMAI, who had recently upgraded the laboratory capacity for real-time PCR (polymerase chain reaction) technology for the detection of viral diseases. It meant the laboratory was equipped to handle the most serious emergency animal disease Australia has experienced in recent history.

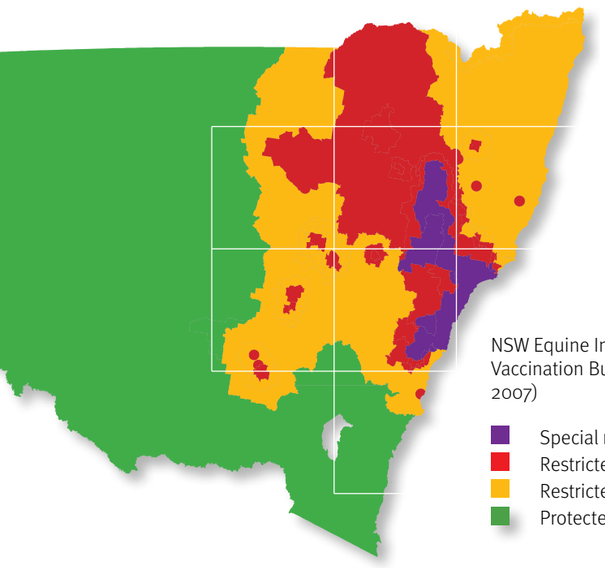
Led by the DPI, the campaign to eradicate the disease was the largest of its kind ever undertaken in Australia. At the peak of the influenza outbreak, 47,000 horses were infected in NSW on 5943 properties.

Following an initial standstill of all horse movements to limit the spread of the disease, a major program to trace horse movements and quarantine affected properties was undertaken. NSW was divided into zones that indicated the distribution of spread and vaccination was employed in buffer zones between infected and uninfected zones and as part of the tactic to allow the disease to burn itself out.

Within the infected zone, a purple zone was created to enable movements within that zone so that horse industry activities could continue. The financial impact of preventing normal horse activities would have been catastrophic and would have undermined the entire program.

While the impact on the horse industry was still enormous, the DPI was able to employ some of the people whose livelihoods were affected by the outbreak. Their knowledge was invaluable in arranging to test and vaccinate horses in their local areas.

Using the latest laboratory, vaccine, surveillance, mapping and communication technologies, the disease was eradicated within six months, well ahead of predictions. By July 2008 horse industry operations had returned to normal.



NSW Equine Influenza Protection Plan Vaccination Buffers and Areas (31 October 2007)

- Special restricted area
- Restricted area
- Restricted area
- Protected area

5. Reduced impacts from established pests, diseases and weeds

Biosecurity involves managing risks and making decisions on the basis of an understanding of the potential threats, the likely pathways of their introduction and spread, and the factors influencing change. Ideally, intervention should be applied to the areas of highest risk and return.

Weed species pose some of the greatest threats to biodiversity and primary production in NSW. Ongoing introductions of non-native plants, through trade of plant materials, dispersal of aquatic weeds during flood events and transport of fodder across regions, pose substantial challenges. One of the most effective ways to minimise the impacts of invasive plants is to prevent their initial incursion. Once weeds get into a new area, they have the ability to rapidly establish and successful control often depends on a timely and rapid response.

Once it has been determined that a pest, disease or weed cannot be eradicated, appropriate management arrangements need to be co-ordinated and implemented to minimise impacts. For example following an unsuccessful nationally supported emergency response that attempted to eradicate myrtle rust, it was agreed that eradication was not possible. A national program of asset protection and research is now being undertaken to learn how myrtle rust will affect Australian plants and how it can be managed in the future.

Strategies for implementation

To reduce the impacts from established pests, diseases and weeds, together we will:

- 5.1 develop and adopt an integrated decision-making framework to prioritise and inform decisions on where to direct investment
- 5.2 improve the effectiveness of control programs through research, advice and new technologies
- 5.3 improve capacity to manage pests, diseases and weeds
- 5.4 develop biosecurity risk mitigation strategies for established pests, diseases and weeds within NSW and in collaboration with other jurisdictions
- 5.5 work with other jurisdictions to harmonise arrangements across borders
- 5.6 continue to contribute to national arrangements for managing established pests, diseases and weeds.

6. Strengthened biosecurity science and research capacity and capability

Science and research are critical to achieving effective biosecurity providing detection tools for diagnosis and surveillance, as well as evidence-based strategies and solutions to eradicate or manage biosecurity risks and impacts. All these activities must meet community expectations regarding environmental protection and human health.

Science provides essential inputs into managing risk and uncertainty, and ultimately into the effectiveness of any decision. For example, it is through science that we identify new technologies and approaches to new and emerging biosecurity challenges.

This strategy recognises that the capacity to prevent, respond to and manage biosecurity risks in NSW depends upon an effective and responsive research capability. Our underpinning science is used to inform risk analyses, policy development and decision-making.

Tactical research and development enables the prevention of, preparedness for, and rapid response to, immediate biosecurity challenges. This includes the development of new and improved diagnostic techniques for existing and emerging pests, diseases and weeds of integrated pest and disease management systems.

Strategic research and development anticipates and monitors future and emerging biosecurity challenges. This includes bio-economic and population modelling and forecasting the impacts of increases in climate variability on the prevalence and range of pests, diseases and weeds.

Strategies for implementation

To strengthen biosecurity science and research capacity and capability, together we will:

- 6.1 prioritise biosecurity research in collaboration with industry, research providers, the Commonwealth, and other jurisdictions
- 6.2 work with the Commonwealth, other jurisdictions and industry to develop a nationally integrated biosecurity diagnostic network
- 6.3 strengthen research partnerships and encourage research to address knowledge gaps across the biosecurity continuum
- 6.4 improve capacity to manage animal pests using techniques that incorporate best-practice principles and animal welfare based outcomes
- 6.5 develop innovative approaches to the management of biosecurity risks such as the use of remote sensing and landscape management approaches
- 6.6 invest in biological control programs for key pests and weeds.

7. Increased numbers of well-trained and resourced people

It is critical to continue to build on our capability and capacity to achieve biosecurity outcomes by having people with the right training, skills and knowledge, as well as the technology, tools and infrastructure to help them in their work. Government cannot provide all of these resources but it has an important coordinating role in relation to their availability.

People. Today, biosecurity requires people with a broader range of skills than ever before, including in policy development, project management, risk assessment, surveillance techniques, research and diagnosis, compliance monitoring, management of service providers, conflict management, and community engagement, to name a few.

Ensuring that we have enough people with appropriate skills is an important element of building a modern biosecurity system. We need to continue to invest in training our people to build baseline capacity within the NSW public sector and also look at ways of sharing these responsibilities through partnerships with universities, the private sector, industry and local community groups.

Technology. Equally important for good biosecurity outcomes are the development and adoption of new technology. NSW has an innovative approach to technology. We not only provide investment to generate or modify new ideas and technologies, we also implement them as rapidly as possible. Innovation is facilitated by close working relationships between our research, diagnostic and surveillance functions.

Both the public and private sectors need to continue to invest in new technology so that we can continue to enhance our ability to detect and quickly eradicate pests, diseases and weeds.

Information management systems. Information management systems are also essential tools in the biosecurity system. They hold valuable data that supports surveillance, incursion responses, program management and communications.

NSW has in place a number of excellent systems for detecting and tracing the spread of animal and plant pests and diseases. However, there is potential to improve on the accessibility of information via new technologies and make more strategic use of the information gathered to allow us to take a more proactive approach to surveillance.

Strategies for implementation

To increase numbers of well-trained and resourced people, together we will:

- 7.1 develop skills, knowledge and capability for the delivery of biosecurity activities within government and among stakeholders by providing opportunities for continuing education and postgraduate training
- 7.2 continue to develop, adopt, and invest in new technologies
- 7.3 develop and adopt information management systems that allow for strategic information management and easy access to information.

CASE STUDY:

CAMERAS KEEPING CATTLE TICK OUT OF NSW

Cattle tick is the most serious external parasite of livestock in Australia. It was introduced from Indonesia over 100 years ago, and is estimated to cause losses of approximately $146 million per year in northern Australia.

Cattle tick are endemic in south-east Queensland – from the Great Dividing Range to the coast – and there are strict regulations in place to ensure cattle, horses and other livestock do not move freely out of tick-infected Queensland into NSW.

Controlling and eradicating cattle ticks is extremely important for the viability of the cattle industry in north eastern NSW. Livestock transported south into NSW must be examined and treated for cattle ticks before entering the state.

Historically there were manned inspection gates at many border crossings. Now, Bordercam electronic camera surveillance systems have been installed at seven Queensland border crossings points to monitor the movement of livestock. The system is similar to the fixed speed camera installations on highways and city streets around NSW.

Bordercam provides continuous crossing surveillance and can identify target vehicles carrying livestock such as cattle trucks and horse floats and pass on that information to regulatory officers. The officers then investigate if livestock has been illegally brought into NSW and can prosecute offenders.

GOAL 4

Biosecurity is underpinned by a responsive and consistent legislative framework.

Background

The effectiveness of any biosecurity system is underpinned by the quality of its regulation and compliance programs. Robust, harmonised regulation and compliance programs are required across jurisdictions to support efforts to prevent, contain, eradicate and manage biosecurity risks across the terrestrial and aquatic environments. Cross border collaboration must also occur where contact in border regions highlights differences between adjoining jurisdictions.

The Australian Government has responsibility for international trade and travel movements into and out of Australia, including management measures pre-border and at the Australian border with associated compliance and enforcement.

Responsibility for land and water management lies with the state and territory governments who have progressively implemented their own legislation and policies to respond to their own biosecurity issues and challenges.

Much of NSW's biosecurity legislation was developed in the early part of the last century and since then, has been amended on an ongoing basis. The NSW Government is reviewing all biosecurity-related legislation and will develop a single new NSW Biosecurity Act.

This new legislation proposes a contemporary biosecurity legislative and regulatory framework that will protect the community and the environment within NSW and contribute to economic growth. The new legislation will adopt a risk-based approach for responding to pests, diseases and weeds. Its purpose will be to:

- support best practice biosecurity management
- clearly define the rights, responsibilities and obligations of government, industry and the community with respect to biosecurity
- encourage better self-management of biosecurity risks
- support and comply with national policies and commitments
- achieve compatibility with Commonwealth legislation and legislation in other jurisdictions
- meet international standards and not jeopardise overseas and domestic market access

- reduce red tape by providing support for industry co-regulation and quality assurance programs
- define cost-recovery mechanisms
- facilitate emergency responses and easy transition to longer-term management of biosecurity risks.

Achieving this goal

Outcomes

Together we will strive for:

8. a consistent and contemporary legislative framework
9. reduced red tape and improved market access
10. greater self-management of biosecurity risks by industries, businesses and other stakeholders.

8. A consistent and contemporary legislative framework

NSW has about 20 Acts dealing with different aspects of biosecurity management with separate Acts relating to animal pests, animal diseases, plant pests, plant diseases, noxious weeds and fish biosecurity issues, to name a few. To date there has not been a comprehensive review of all biosecurity-related legislation so duplication and inconsistency among Acts are common, particularly in relation to emergency management, compliance provisions and enforcement powers.

Traditionally legislation has focused largely on government management of emergency responses and ongoing control programs. In many areas, it has relied on outdated regulatory tools that are difficult to adapt to contemporary biosecurity management requirements.

Our legislation must be consistent with national policies and commitments and be compatible with other jurisdictions – particularly those bordering on NSW. This consistency will enable more effective management, enforcement and compliance activities.

The NSW Government has a clear role to play in biosecurity management, but other stakeholders – in particular industry and the community – also have important roles. The new legislation clarifies the rights, responsibilities and obligations of these stakeholders and empowers better self-management of biosecurity risks.

The new legislation is informed by NSW's past experience in biosecurity management, with time-frames and powers that better match the circumstances, and a broader range of management tools that reflect the level of risk being addressed.

Strategies for implementation

To implement a consistent and contemporary legislative framework, together we will:

8.1 review existing NSW legislation, taking into consideration legislation in other jurisdictions

8.2 develop and implement a new NSW Biosecurity Act that is in harmony with legislation in other jurisdictions.

9. Reduced red tape and improved market access

Access to domestic and export markets for our food products depends on NSW being able to demonstrate that credible and high-quality certification systems and processes are in place to show that our products are free from pests and diseases. Our regulatory systems need to be robust and trustworthy and at the same time, simple and streamlined so as not to overburden our industries. This will allow them market access and competitive advantage now and into the future.

There is considerable scope to develop legislation that is more responsive to biosecurity risks and can be implemented more efficiently by government and industry. Removing inconsistencies and duplication will reduce the risk of error, reduce red tape, and help to provide cost savings for industry and government through decreased regulatory burden.

The legislation will allow for more industry-based codes of practice, and accreditation and compliance schemes that can be audited by third parties while retaining the government approvals processes required by domestic and overseas markets.

Strategies for implementation

To reduce red tape and improve market access, together we will:

9.1 streamline certification systems

9.2 develop an audit framework based on risk and compliance history

9.3 streamline regulation.

10. Greater self-management of biosecurity risks by industries, businesses and other stakeholders

Biosecurity risks have traditionally been managed largely by government through regulatory tools enforced by inspectors such as quarantines, bans and restrictions.

Recently there has been a move towards partnerships between government, industry, and the community, with each sector taking an active role in reducing the impacts of biosecurity risks. All stakeholders have an obligation to manage biosecurity risks. Biosecurity regulation needs to recognise and formally acknowledge these partnerships and provide support for a range of approaches to managing biosecurity risks, such as through codes of practice and best-practice guidelines. This will provide more effective biosecurity management by making the best use of available resources and people. A key area where this can occur is through auditing, surveillance, and reporting new pests, diseases and weeds by industry and local community members.

Strategies for implementation

To encourage industries, businesses and other stakeholders to self-manage biosecurity risks, together we will:

10.1 develop regulatory standards and, where appropriate, third-party auditing schemes

10.2 support the development of best-practice guidelines

10.3 develop clear guidelines outlining the roles and responsibilities of stakeholders in biosecurity management.

CASE STUDY:

WORKING TO REDUCE THE NUMBER ONE THREAT TO GRAPEVINES IN NSW

Phylloxera is a small yellow insect that lives and feeds on the roots of grapevines. Phylloxera infestation reduces the growth of, and can eventually kill grapevines, which makes it a significant threat to the viability of the State's thriving wine industry.

Unfortunately, it is not possible to eradicate phylloxera once it becomes established on vines. The only solution is to replace whole vineyards with new vines grafted on phylloxera resistant root-stocks.

There are strict regulations covering the movement of phylloxera risk material, including grapevines and vineyard machinery from phylloxera infested zones in NSW and Victoria. This is an important measure in minimising the spread of the pest to grape growing and wine making businesses.

Many wine grape growers have implemented their own on-farm biosecurity measures to help protect their vineyards. One of the most important measures to reduce the spread of phylloxera is to ensure risk materials are not brought onto a property without inspection and approval of the vineyard manager.

Other measures include:

- restricting access to the vineyard and confining visitors to the cellar-door area of wineries
- providing training for all staff on phylloxera management protocols
- confirming all planting material brought on to the property is from a phylloxera free zone or treated to approved standards
- ensuring harvesters and other machinery are inspected before entering the vineyard.

Summary table. Goals, outcomes and strategies for implementation of the NSW Biosecurity Strategy

Goal 1

Goal 1: Biosecurity is a shared responsibility

OUTCOMES	STRATEGIES FOR IMPLEMENTATION
1. Improved community engagement in biosecurity management	1.1 Increase the capacity and capability of the community in biosecurity activities by leading and facilitating targeted education and information programs 1.2 Provide advice to industries and the general community about how they can meet their biosecurity obligations 1.3 Develop programs to actively manage priority established pests, diseases and weeds 1.4 Develop and promote easy-to-use technologies for the reporting of pests, diseases and weeds 1.5 Improve understanding of social factors influencing implementation of biosecurity practices
2. Stronger partnerships across the biosecurity spectrum	2.1 Continue to participate in forums to develop, agree and adopt formal consistent national biosecurity arrangements in all jurisdictions 2.2 Develop and coordinate risk mitigation strategies for established pests, diseases and weeds 2.3 Develop and implement arrangements for biosecurity prevention, preparedness, response and recovery, including funding arrangements that reflect the shared responsibility for biosecurity 2.4 Ensure biosecurity is a key feature of Local Land Services

Goals 2 and 3

Goal 2: Biosecurity contributes to sustainable economic growth

Goal 3: Biosecurity protects the environment and community

OUTCOMES	STRATEGIES FOR IMPLEMENTATION
3. Improved identification, diagnostic, surveillance, reporting and tracing systems for pests, diseases and weeds	3.1 Improve early detection and reporting systems, drawing on the latest technologies and diagnostics 3.2 Undertake surveillance activities that are underpinned by robust science and prioritised according to risk 3.3 Improve current tracing systems so that they meet national performance standards 3.4 Expand the National Livestock Identification Systems to allow tracing of additional livestock species 3.5 Continue to develop more efficient ways of demonstrating proof of freedom from pests, diseases and weeds 3.6 Increase focus on coordinated surveillance activities and strategic information management and accessibility 3.7 Develop and implement effective surveillance systems in natural environments 3.8 Consider including plant industries and peri-urban properties in property registration and traceability systems
4. Improved response to biosecurity emergencies	4.1 Identify and prioritise biosecurity threats across terrestrial and aquatic environments and the agriculture and aquaculture sectors 4.2 Improve biosecurity prevention, preparedness, response and recovery across all sectors, but particularly where gaps currently exist, for example in fisheries and forestry industries and the environment 4.3 Improve cross-jurisdictional collaboration in biosecurity management, in particular in relation to emergency management and early detection 4.4 Continue to incorporate research findings into the decision-making framework for responding to emergencies
5. Reduced impacts from established pests, diseases and weeds	5.1 Develop and adopt an integrated decision-making framework to prioritise and inform risk-based decisions on where to direct investment 5.2 Improve the effectiveness of control programs through research, advice and new technologies 5.3 Improve capacity to manage pests, diseases and weeds 5.4 Develop biosecurity risk mitigation strategies for established pests, diseases and weeds within NSW and in collaboration with other jurisdictions 5.5 Work with other jurisdictions to harmonise arrangements across borders 5.6 Continue to contribute to national arrangements for managing established pests, diseases and weeds

OUTCOMES	STRATEGIES FOR IMPLEMENTATION
6. Strengthened biosecurity science and research capacity and capability	6.1 Prioritise biosecurity research in collaboration with industry, research providers, the Commonwealth, and other jurisdictions 6.2 Work with the Commonwealth, other jurisdictions and industry to develop a nationally integrated biosecurity diagnostic network 6.3 Strengthen research partnerships and encourage research to address knowledge gaps across the biosecurity continuum 6.4 Improve capacity to manage animal pests using techniques that incorporate best-practice principles and animal welfare based outcomes 6.5 Develop innovative approaches to the management of biosecurity risks such as the use of remote sensing and landscape management approaches 6.6 Invest in biological control programs for key pests and weeds
7. Increased numbers of well-trained and resourced people	7.1 Develop skills, knowledge and capability for the delivery of biosecurity activities within government and among stakeholders by providing opportunities for continuing education and postgraduate training 7.2 Continue to develop, adopt, and invest in new technologies 7.3 Develop and adopt information management systems that allow for strategic information management and easy access to information

Goal 4

Goal 4: Biosecurity is underpinned by a responsive and consistent legislative framework

OUTCOMES	STRATEGIES FOR IMPLEMENTATION
8. A consistent and contemporary legislative framework	8.1 Review existing NSW legislation, taking into consideration legislation in other jurisdictions 8.2 Develop and implement a new NSW Biosecurity Act that is in harmony with legislation in other jurisdictions
9. Reduced red tape and improved market access	9.1 Streamline certification systems 9.2 Develop an audit framework based on risk and compliance history 9.3 Streamline regulation
10. Greater self-management of biosecurity risks by industries, businesses and other stakeholders	10.1 Develop regulatory standards and, where appropriate, independent third-party auditing schemes 10.2 Support the development of best-practice guidelines 10.3 Develop clear guidelines outlining the roles and responsibilities of stakeholders in biosecurity management

APPENDIX A: BIOSECURITY THREAT DECISION TREE

1. ACTION: Clearly Identify the Nature of the Problem – then conduct a Market Failure Test as below

1a **Externalities**: Would the biosecurity threat be likely to significantly affect those not directly involved in the risk spreading transaction? For example, the spread of a pest or disease.

No → **1b** **Industry goods**: Would the private sector/industry (if left unassisted) fail to provide an adequate level of investment to remove (or reduce to an acceptable level) the biosecurity threat?

For example, an industry may fail to pay for a monitoring program (that provides industry benefits), due to lack of an appropriate collection/delivery mechanism.

No → **1c** **Asymmetric information**: Does one party to a transaction have more or better information than the other party in relation to the biosecurity threat, thus creating an imbalance of power in the transaction? (this includes 'adverse selection' and 'moral hazard') e.g. sale of stock with OJD.

Yes / Yes / Yes → **Market failure present – Government action may be justified**

No / No → **Government action is not required**

2. ACTION: Devise a Proposed Biosecurity Program or Activity

The proposed intervention should be designed to overcome the specific market failure identified above (see notes). (The component parts of each activity/program should be considered separately through the remaining part of this diagram.)

3 Would it be necessary to regulate for the provision of this activity/program (e.g. to pursue impactors, establish industry levies, enforce compliance certification, etc)?

No → **4** Do not provide unless industry requests government involvement and agrees to pay for the provision (this may also require a regulatory basis).

Yes → **5** Would the activity/program involve 'Registration / Approvals' or 'Compliance / Enforcement'?

Compliance / Enforcement

8 Would it be appropriate to recover costs from the individual risk creator i.e. individuals/firms (through a fee or fine, as opposed to recovering costs from an entire industry through a levy)?

Yes → **10a** Would charging an individual/firm for the activity/program be efficient and cost effective i.e. are the affected parties identifiable, is there (or could there be) a fee collection mechanism in place and would the amount of money collected be likely to significantly outweigh the administrative costs of doing so?

Yes → **Regulatory**

No → **10b** Would 'group-based' cost recovery be both efficient and cost effective i.e. are the affected parties identifiable, is there (or could there be) a levy collection mechanism in place and would the amount of money collected be likely to significantly outweigh the administrative costs of doing so?

Yes → **Regulatory**

No → **Non-regulatory**

Registration / Approvals

9 Would other individuals/ firms be able to free ride on the approval of the first applicant?

No → **10b** Would 'group-based' cost recovery be both efficient and cost effective i.e. are the affected parties identifiable, is there (or could there be) a levy collection mechanism in place and would the amount of money collected be likely to significantly outweigh the administrative costs of doing so?

Yes → **Non-regulatory**

Yes → **6a** Would the major beneficiaries be a narrow identifiable group (e.g. individuals or industries)?

No → **6b** Would any of the identifiable minor beneficiaries capture enough benefits to warrant paying for the provision (sufficiency principle)?

No → **10b** Would 'group-based' cost recovery be both efficient and cost effective i.e. are the affected parties identifiable, is there (or could there be) a levy collection mechanism in place and would the amount of money collected be likely to significantly outweigh the administrative costs of doing so?

Yes → **Non-regulatory**

Yes → **7** If provided, a fee on individuals/firms should be considered first, otherwise cost recovery via a levy on an entire industry should be pursued (see 13a or 13b).

10a Would charging an individual/firm for the activity/ program be efficient and cost effective i.e. are the affected parties identifiable, is there (or could there be) a fee collection mechanism in place and would the amount of money collected be likely to significantly outweigh the administrative costs of doing so?

Yes → **Regulatory**

10a Yes / **10b** Yes / **10b** No / **10b** No / **10a** Yes

11. ACTION: Conduct a Benefit Cost Analysis

Only proceed with options in which benefits are greater than costs.

12 If the impacts of the biosecurity threat lie solely within one sector or industry, the responsible funding party (government/levied industry) may decide for the proposed biosecurity activity/program not to be provided. Otherwise...

13a Cost recovery via **FEE** on individuals/firms

13b Cost recovery via **LEVY** on individuals/firms

Provision with **NO COST RECOVERY** (taxpayer funding)

13b Cost recovery via **LEVY** on individuals/firms

13a Cost recovery via **FEE** on individuals/firms

14 Would there be actual or potential competition for the provision of this activity/program?

Yes → Provision with cost recovery @ **COMMERCIAL COST** *A+B+C+D+E

No → **16** Would the provision of this activity/ program involve additional data collection, analysis or research beyond what is already taxpayer funded?

Yes → Provision with cost recovery @ **AVOIDABLE COST** *A+B+C

No → **17** Provision of this activity/program involves the further dissemination of a basic product.

→ Provision with cost recovery @ **MARGINAL COST** *A+B

15 Cost recovery fee or levy set to achieve fully distributed cost recovery → Provision with cost recovery @ **FULLY DISTRIBUTED COST** *A+B+C+D

*Cost recovery components

A – Salaries and on-costs
B – Operating expenses
C – Overheads
D – Return on assets
E – Profit margin

Regulatory

Non-regulatory

How can I contribute to the strategy?

Everyone can contribute to the NSW Biosecurity Strategy by appreciating the importance of the strategy and by being aware of, and participating in, biosecurity issues.

Everyone has a role in supporting this strategy and together, we will work towards achieving its outcomes.

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