Queensland Invasive Plants and Animals Strategy 2025–2030




Queensland Government

This publication has been compiled by Invasive Plants and Animals, Biosecurity Queensland, Department of Primary Industries.

Cover images: feral pig (*Sus scrofa*), sulphur cactus (*Opuntia sulphurea*), red-eared slider turtle (*Trachemys scripta elegans*) and bitou bush (*Chrysanthemoides monilifer* subsp. *rotundata*), inside cover image: parkinsonia biocontrol UU (*Eueupithecia cisplatensis*).

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Acknowledgement of Country

The Department of Primary Industries proudly acknowledges all First Nations People (Aboriginal peoples and Torres Strait Islander peoples) and the Traditional Owners and Custodians of the Country on which we live and work.

We acknowledge their continuing connection to land, waters and culture and commit to ongoing reconciliation. We pay our respect to their Elders past and present.

Recognition of contribution

The Queensland Invasive Plants and Animals Strategy 2025–2030 was prepared by the Department of Primary Industries (DPI) in collaboration with the Queensland Invasive Plants and Animals Committee comprising representatives of industry groups, peak bodies and agencies encompassing conservation, agriculture, state and local governments, natural resource management and community.

The Department of Primary Industries is grateful for the comprehensive, passionate and insightful contributions of all Queensland Invasive Plants and Animals Committee members, including:

- Dr Rachel McFadyen AM, Chair
- AgForce Queensland
- Queensland Farmers' Federation
- Local Government Association of Queensland
- Queensland Water and Land Carers
- NRM Regions Queensland
- Invasive Species Queensland
- Queensland Conservation Council
- Department of Environment, Science and Innovation.

The Queensland Invasive Plants and Animals Committee acknowledged the quality and openness of the consultation process undertaken with all partners.

Thank you

The Department of Primary Industries and Queensland Invasive Plants and Animals Committee are grateful for the valuable feedback provided from all sectors of the community in finalising this strategy, including local government, industry, First Nations People, community groups and landowners.

Submissions and feedback received indicated overall support for the Queensland Invasive Plants and Animals Strategy 2025–2030.

Velvety tree pear (*Opuntia tomentosa*)

Giant rat's tail grass (*Sporobolus* spp.)

Introduction

Queensland is a unique and special place. It is the most biologically diverse of all Australian states and territories.

It has a thriving agricultural industry that is estimated to be worth $22.1 billion[1]. It is a world-leading tourist destination with spectacular landscapes, the Great Barrier Reef, and home to the world's oldest continuing living cultures.

Consistent with worldwide trends, invasive plants and animals are threatening Queensland's natural environment, native wildlife, agriculture, cultural heritage, and social wellbeing.

A response to these trends requires urgent and comprehensive action from all stakeholders.

The Queensland Invasive Plants and Animals Strategy 2025–2030 (this strategy) recognises that managing the risks and impacts of invasive plants and animals is occurring in the context of several potentially exacerbating factors. These include, but are not limited to, climate change, land use change, land degradation, biodiversity loss, global trade, and increasing movement of people through travel and migration.

The management of invasive plants and animals is the shared responsibility of landowners, land managers, industry, the community, and all levels of government. Shared responsibility has been made a legal requirement through the general biosecurity obligation under the *Biosecurity Act 2014*.

The primary responsibility rests with those who deal with biosecurity matter—they must reduce the risks that their activities create. They must take reasonable and practical measures to manage invasive plants and animals.

A nil-tenure approach that engages all stakeholders is best practice, particularly for highly mobile species. In this approach, control methods are applied in a cooperative and coordinated manner across land tenures by stakeholders at a landscape scale rather than at a property scale.

This strategy provides Queenslanders with a framework and a set of strategic actions to guide the management and prevention of invasive plants and animals in Queensland.

Importantly, it also details specific stakeholder roles and responsibilities for protecting Queensland from the impacts of invasive plants and animals.

[1] daf.qld.gov.au/news-media/campaigns/data-farm/primary-industries

Vision

The natural environment, economy, communities and lifestyle of Queensland are safeguarded from the impacts of invasive plants and animals.

Mission

Queenslanders deliver strategic and targeted actions to protect Queensland from the impacts of invasive plants and animals through a collaborative and resourced biosecurity system.

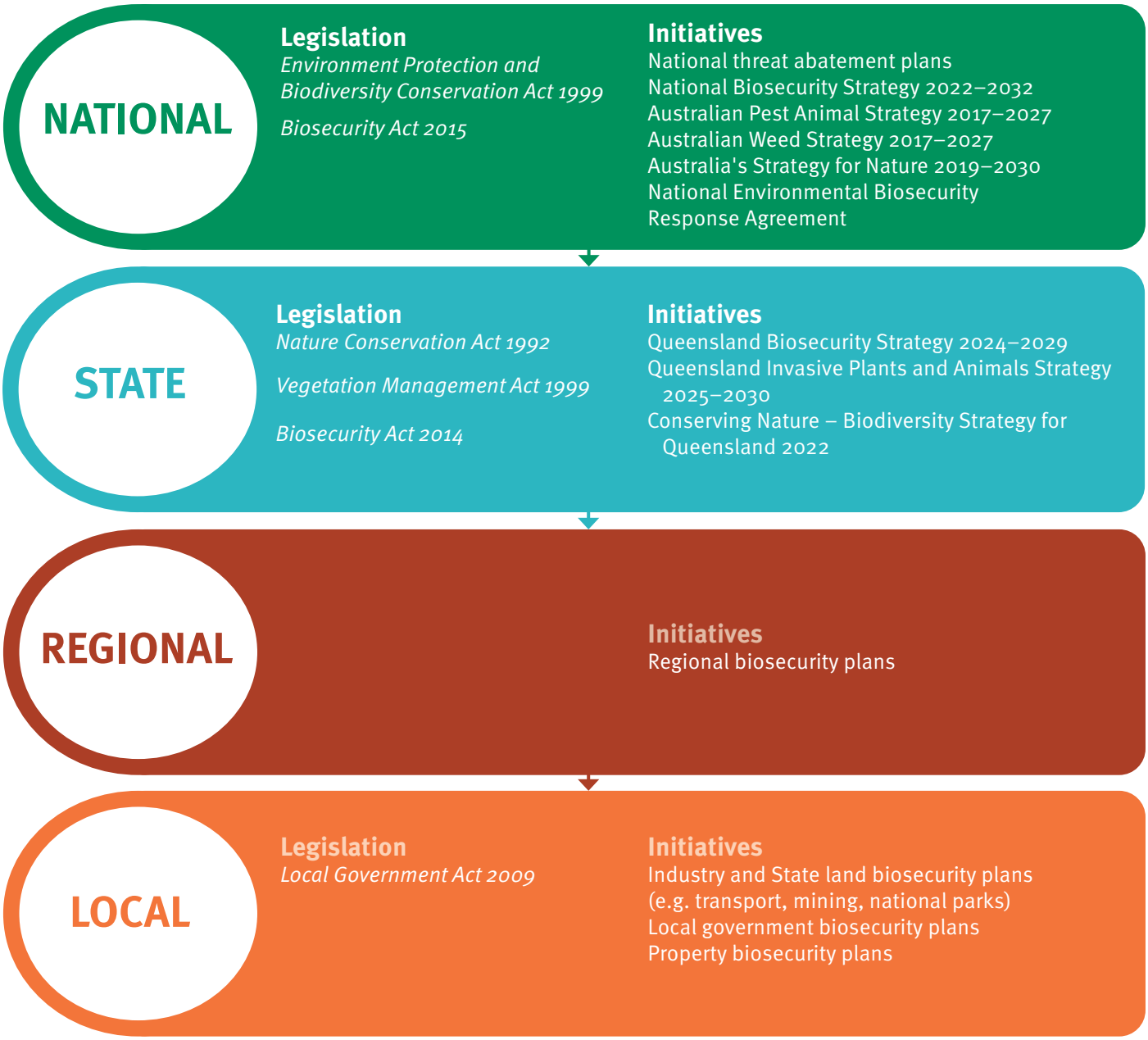
Scope

This strategy encompasses invasive plants and animals, including exotic weeds and pest animals, invertebrate pests, invasive fish and some pathogens.

The scope of this strategy is designed to provide guidance to manage invasive plants and animals in accordance with the *Biosecurity Act 2014*. It does not include environmental and health matters such as mosquitos (addressed in the *Environmental Protection Act 1994* or *Public Health Act 2005*), native plant and animal species that are regulated under the *Nature Conservation Act 1992*, marine pests (which are addressed in the national Marine Pest Plan), or pathogens that are not listed under the *Biosecurity Act 2014* or on a priority species list (national or state).

Alignment

This strategy aligns with other key documents as indicated below. More details on the national and state documents are provided in Appendix 1.



Guiding principles

This strategy embodies seven fundamental principles that underpin effective management of invasive plants and animals. They provide a common basis for all of Queensland.

These principles are most effective when they are:
- used by all partners in the biosecurity system to guide planning and investment
- implemented through strategies, plans, and actions across all management levels.

1. Integration, collaboration and coordination

Managing invasive plants and animals is an integral part of managing natural resources, biodiversity in our natural environment, and agricultural systems. It is best when integrated at every level by landowners, land managers, First Nations People, community, industry, and government.

To achieve a collaborative, coordinated and integrated approach to management, stakeholders need to establish long-term consultation and partnership arrangements, including the consistent reporting and sharing of agreed datasets, between land managers, local communities, industry groups, regional natural resource management organisations, and national, state, and local governments.

2. Strategic risk-based planning

Planning for the management of invasive plants and animals is most effective when guided by the latest research and best practice, and when focused on risk-based decisions and greatest return on investment. This will ensure that resources target the priorities identified at local, regional, state, and national levels.

3. Shared responsibility and commitment

To effectively manage invasive plants and animals, requires shared responsibility and long-term commitment by everyone in the biosecurity system, including landowners, land managers, First Nations People, the community, industry groups and government. Everyone must play their part, including by fulfilling their general biosecurity obligation, to minimise the impacts of invasive plants and animals on the economy, the natural environment, health, and our way of life.

Those who create risks or cause harm to the natural environment or other resources should bear the costs associated with managing those risks or mitigating that harm. Similarly, those who benefit from biosecurity management activities, such as research and development of new control methods, or implementation of quarantine measures, may also be called upon to contribute to the costs. This could include industries that benefit from biosecurity measures, and consumers who benefit from safe and secure food or agricultural products.

It is important that everyone considers their own invasive species and contributes to management for the common good.

4. Capability building through education and awareness

Public education and awareness campaigns on invasive plants and animals will increase the community's capability and willingness to participate in management and control. For long-term best practice management, Queensland needs ongoing, targeted capability and capacity building within industry, regional natural resource management organisations, community groups (such as Landcare), and local, state, and national governments.

5. Prevention, preparedness and early intervention

Risk-based prevention, preparedness and early intervention is the most cost-effective approach for managing invasive plants and animals. This approach can be assisted by:
- developing and implementing early detection, diagnostics, and monitoring systems
- effective regulation and enforcement
- preventing spread, especially human-assisted spread.

6. Best practice and research

Management is most effective when following evidence-based practices that protect the environment and the productive capacity of natural resources while minimising impacts on the community. Ongoing research and extension programs will inform the development, promotion and implementation of best practice management and policies. Sustained effort in controlling established invasive species and mitigating their impacts is required as part of best practice.

7. Monitoring and evaluation

Regular monitoring and evaluation of control activities, including establishment of baselines and reporting on agreed shared datasets, are needed to inform evidence-based decisions, and adopt a practice of continuous improvement of management practices.

‘Good neighbour policy’ approaches for invasive plant spread prevention

Maintain a weed-free property boundary. Buffer zones can be established along property boundaries and watercourses to reduce the likelihood of weed seed moving between adjoining properties. ‘Weed-free’ generally entails the control of all weeds to ensure no plants reach maturity and set seed within the buffer zone or start spreading over the fence or downstream.

How wide should the weed free buffer zone be?

The width of the buffer zones may change depending on the ecology of weeds in the area.

What are the benefits of weed-free buffer zones?

- Immediate reduction in weed seed movement between properties.
- Incentive for landholders implementing weed control programs to ensure that invasive plants from neighbouring properties are not re-establishing.
- Reduces tensions between neighbouring property owners.
- Helps fulfil weed management obligations.

Should biosecurity plan strategies use the good neighbour concept?

Maintaining a weed-free property boundary or watercourse buffer zone can be a very effective strategy to manage species such as prickly acacia (*Vachellia nilotica*), parkinsonia (*Parkinsonia aculeata*), and invasive grasses giants rat's tail grass (*Sporobolus* spp.) etc. All biosecurity plan strategies should consider whether the good neighbour concept can be adopted.

Impacts of invasive plants and animals

Queensland's environmental and climatic conditions favour the establishment of many invasive plants and animals. Many invasives have been introduced, either deliberately or accidentally. Some of these species have become invasive—that is, they have spread and multiplied to the point where they cause damage, impacting on the natural environment, the economy, and important social and cultural values of our communities.

Specifically, invasive plants and animals can have profound impacts on ecosystem function, reduce biodiversity, decrease productivity and profitability of our primary industries, threaten human and animal health and our much-coveted way of life.

Invasive plants and animals have the potential to adversely affect biosecurity considerations in Queensland. Under the *Biosecurity Act 2014,* a biosecurity consideration can be the environment, the economy or social values (human health, social amenity).

The environment and biodiversity

'Invasive plants and animals, including weeds, pests and diseases, now affect more than half of Australia's threatened plants, fish, reptiles and invertebrates' (Conserving Nature – A Biodiversity Strategy for Queensland, 2022).

Introduced invasive plants and animals place considerable pressure on biodiversity in our natural environment. This can be directly, for example by predation, or indirectly, by altering vegetation structure, ecological and physical processes, or landscape resilience.

Invasive plants and animals can disrupt native ecosystems by outcompeting native species for resources such as food, water, and habitat. This disruption can lead to declines in biodiversity and alteration of ecosystem structure and function, with consequences such as the extinction of native species.

Some of the negative impacts of invasive plants and animals on our natural environment and biodiversity are:

Impact	Description
Competition with native species	Invasive plants and animals often outcompete native species for resources such as food, water, and habitat. This competition can lead to declines in native species populations, sometimes even driving them to extinction.
Direct predation or herbivory	Invasive plants and animals may prey upon or consume native species, particularly if they have no natural predators or herbivores in their new environment. This can result in the decline or elimination of native species populations.
Alteration of ecosystem structure and function	Invasive plants and animals can disrupt the natural balance of ecosystems by altering habitat structure, nutrient cycling, and other ecological processes. Native animals can also be impacted by disruption to their ecosystem through increases in weed biomass restricting movements or changing fire behaviours leading to changes in habitat species composition.
Changes in species composition and diversity	The introduction of invasive plants and animals can change the composition and diversity of native plant and animal communities. In some cases, invasive plants and animals may dominate ecosystems, reducing overall biodiversity.
Disruption of mutualistic relationships	Invasive plants and animals can disrupt mutualistic relationships between native species, such as pollinators and plants, or between species and their symbiotic partners. This can have far-reaching consequences for ecosystem health and function.
Introduction of pathogens and diseases	Invasive plants and animals may introduce new pathogens and diseases to native species populations, leading to outbreaks and population declines. This can be particularly devastating in ecosystems where native species have no natural resistance to these pathogens.
Habitat degradation and fragmentation	Invasive plants and animals can contribute to habitat degradation and fragmentation by altering vegetation structure, reducing habitat quality, and creating barriers to movement for native species.

The economy

Invasive plants and animals can have significant impacts on the economy of Queensland. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) found in 2021 that invasive species now cost Australia approximately $25 billion a year[2]. This estimated cost does not include the environmental impacts of invasive plants and animals. Ecological damage, erosion of ecosystem services and loss of cultural values are inherently challenging to measure with the currently available data.

Some of the key impacts are:

Impact	Description
Ecosystem disruption	Invasive plants and animals can disrupt ecosystem services such as pollination, water purification, and soil stabilisation. The economic value of these ecosystem services can be substantial, and their degradation due to invasive plants and animals can result in economic losses for industries reliant on them, such as agriculture, forestry, and tourism. An example is the increased cost of fire preparedness and response due to spread of grasses that have high biomass, such as gamba grass.
Agriculture and livestock productivity reductions	Invasive plants and animals can directly prey on, or pose a toxicity risk to livestock, or damage crops, pastures, and orchards, leading to reduced yields, lower quality produce, and increased production costs for farmers. Some invasive animals also present a risk pathway for diseases not currently present in Australia, such as rabies and foot and mouth disease. Invasive plants and animals increase management costs which arise from the use of physical, mechanical, and chemical control methods.
Loss of tourism and recreational actitivies	Queensland's natural beauty and diverse ecosystems are major attractions for tourists, but invasive plants and animals can degrade these environments and diminish their appeal. For example, invasive plants like lantana can choke native vegetation in recreational areas, reducing their aesthetic value and recreational opportunities as well as impacting on the movement of native species, such as koalas. Invasive animals such as feral pigs and invasive ants can also impact wildlife viewing experiences and outdoor activities.
Damage to infrastructure	Some invasive plants and animals, such as certain types of invasive plants (lippia) or burrowing animals (rabbits) can destabilise soil and contribute to erosion which can damage infrastructure such as roads, buildings, and irrigation systems. This can pose safety hazards and result in costly repairs and maintenance.
Aquaculture and fisheries disruptions	Invasive plants and animals can disrupt aquatic ecosystems and impact aquaculture operations and commercial fisheries. For example, invasive aquatic plants like water hyacinth can clog waterways and impede navigation, while invasive fish species such as tilapia or carp can compete with native species for food and habitat. These disruptions reduce fishery yields, affect water quality, and increase management costs.
Biosecurity costs	The Queensland Government, local governments, industries and landowners invest significant resources in biosecurity measures to manage the introduction, spread and ongoing control of invasive plants and animals. This includes surveillance, monitoring and eradication programs aimed at protecting agriculture, natural ecosystems, and human health. The costs associated with these efforts, including staff salaries, equipment, and research, constitute a significant economic burden on state, local governments, industry and landowners.

[2]csiro.au/en/news/all/articles/2021/august/pest-plants-and-animals-cost-australia-around-25-billion-a-year

Rabbits (*Oryctolagus cuniculus*)

Social values

Managing the impacts of invasive plants and animals on social amenity and human health requires coordinated efforts at local, regional, state, and national levels, including prevention, early detection, rapid response, and sustainable management practices.

Invasive plants and animals can have significant impacts on social amenity and human health including:

Impact	Description
Impact on recreational activities	Invasive plants and animals can interfere with recreational activities such as hiking, camping, and boating by infesting walking tracks, campsites, waterways, and recreational areas. This can diminish people's enjoyment of outdoor activities and lead to decreased use of affected areas.
Psychological impacts	The presence of invasive plants and animals can have psychological and social impacts on communities, including increased stress, anxiety, and feelings of insecurity, especially with issues like predation on livestock or pets by wild dogs, feral cats, foxes or feral pigs. Disruptions to familiar landscapes and natural environments can also diminish community cohesion and affect social wellbeing.
Allergies and respiratory issues	Invasive plants like parthenium can produce pollen that triggers allergies and exacerbates respiratory conditions, such as asthma. Increased exposure to these allergens due to the spread of invasive plants and animals can negatively impact human health and quality of life.
Vector-borne and zoonotic diseases	Invasive plants and animals, like feral pigs, can act as vectors for diseases such as brucellosis, leptospirosis and parasitic infections. As these invasive animals spread into new areas, they can introduce or amplify the transmission of these diseases, posing risks to human health.
Contamination of water sources	Invasive plants like salvinia can proliferate in water bodies, leading to reduced water quality, clogged waterways, and increased costs for water treatment and infrastructure maintenance. Contaminated water sources can pose health risks to communities that rely on them for drinking water, recreation and agriculture.
Impact on food security	Invasive plants and animals can threaten agricultural crops and livestock, leading to reduced yields, increased production costs, and potential disruptions to food supply chains. This can affect food security and nutrition, particularly in communities that depend on local agriculture for sustenance.
Social disruption and conflict	Invasive plants and animals can cause conflicts between different stakeholder groups, such as landowners, conservationists, and government agencies, who may have conflicting priorities and interests regarding invasive plant and animal management. These conflicts can lead to social tensions, legal disputes, and challenges in implementing effective management strategies.

Reframing engagement with First Nations communities and people

Engagement and collaboration with First Nations People to determine cultural impacts of invasive plants and animals is important when undertaking biosecurity planning.

The impacts of invasive plants and animals on First Nations People, generally, affect their cultural, social, economic, and environmental wellbeing.

Some of the key impacts on First Nations People are:

Impact	Description
Impact on traditional practices	Invasive plants and animals can disrupt traditional hunting, fishing, and gathering practices that are integral to the cultural identity and subsistence of First Nations People. For example, invasive plants may outcompete native plants used for medicinal purposes, while invasive animals may prey on or compete with native species important for traditional hunting.
Loss of cultural knowledge	The spread of invasive plants and animals can lead to the loss of traditional ecological knowledge passed down through generations. As native species decline or disappear due to invasive plants and animals, the associated cultural practices, stories, and rituals tied to those species may also diminish.
Spiritual connections	Many First Nations People have deep spiritual connections to their land and its biodiversity. The introduction of invasive plants and animals can disrupt these connections and have impacts on culturally significant species, as native landscapes are altered, and traditional practices become more challenging or impossible to maintain. First Nations People rely on healthy ecosystems for cultural practices, spiritual connection and sustenance.
Social and economic impacts	The impacts of invasive plants and animals can exacerbate existing social and economic challenges faced by First Nations communities. Efforts to control or manage invasive plants and animals may require resources that could otherwise be directed toward community development initiatives.

It is acknowledged that there are unique impacts on First Nations People (in addition to the previously mentioned) and continuing to actively reframe the way First Nations organisations and people are involved in managing invasive plants and animals is important.

Addressing the impacts of invasive plants and animals on First Nations People requires culturally sensitive approaches that recognise the interconnectedness of biodiversity conservation, cultural preservation, and community wellbeing.

The expertise and perspectives of First Nations People and their connection to Country are critical to enhance Queensland's biosecurity system, building effectiveness and leading to sustainable and holistic approaches to land, water, and natural landscape management.

Collaborative efforts involving First Nations communities, local governments, government agencies, industry, researchers and other stakeholders are essential for developing effective strategies to mitigate the impacts of invasive plants and animals while respecting Indigenous rights and knowledge systems.

Challenges and solutions

In Queensland, invasive plant and animal management faces unique challenges due to the State's diverse ecosystems, threats to biodiversity loss and the vast and remote landscapes, that are part of Queensland.

"Australia has close to 3000 invasive alien species estimated to cost Australia approximately $25 billion every year in losses to agriculture and management costs.

Invasive alien species are a growing and significant problem around the world. Globally, they are in the top 5 drivers of biodiversity loss, alongside land and sea-use change, direct exploitation of organisms, climate change and pollution.

However, in Australia, they are number one – they are the leading cause of biodiversity loss and species extinction."

Dr Andy Sheppard
Chief Research Scientist
Biosecurity, CSIRO[3]

Coral cactus (*Cylindropuntia fulgida* var. *mamillata*)

Some of the priority challenges and solutions to invasive plant and animal management are:

Challenge	Challenge description	Challenge solutions
Protecting high-value biodiversity and ecologically sensitive areas	Queensland is widely considered a global biodiversity hotspot and is home to more than half of Australia's native species. Some of these species are found nowhere else in the world. Yet more than 1,000 of these plants and animals are listed as threatened, with numbers growing year-on-year[4]. Queensland's unique biodiversity and sensitive ecosystems are vulnerable to the impacts of invasive plants and animals. This puts the natural, economic, cultural, and other values of biodiversity at risk. Managing these impacts while minimising harm to native species and ecosystems is a key challenge for invasive plant and animal management.	Specific actions that may address challenges: • Target resources towards prevention and early intervention control measures for the most significant threats and/or most vulnerable or valuable areas maximises efficiency and effectiveness. • Implement targeted surveillance and monitoring programs in ecologically sensitive areas to detect and respond quickly to invasive plant and animal incursions. • Prioritise early invention, eradication or containment efforts for high-risk invasive plants and animals that pose severe threats to native biodiversity. • Use remote sensing and drone technologies, citizen science initiatives, and community engagement to enhance early detection efforts. • Implement integrated management strategies that combine various control methods, such as biological control, physical or mechanical removal, and targeted chemical treatments, to effectively manage invasive plant and animal populations. • Support the implementation of integrated natural resource management programs where managing invasive plants and animals is a key activity in building catchment health and landscape resilience.
Ownership and coordination gaps	Invasive plants and animals do not know property boundaries. When land ownership is fragmented across the landscape, there is sometimes confusion about who is responsible for control measures and how to coordinate management programs. This can lead to inaction and the spread of invasive plants and animals. Different landowners or agencies may have different resources and priorities. Management can be expensive and time-consuming. Without regulation enforcement, plans, codes of practice and guidelines, landowners can be hesitant to act.	Specific actions that may address challenges: • Formalise collaboration: creating multi-agency working groups can improve communication, sharing resources and cooperation. • Local-level collaboration: planning involving relevant landowners, First Nations People and community. • Drive landowner-led management programs and initiatives through a nil-tenure approach. • Encourage partnerships that ensure coordinated and collaborative efforts and resources across the landscape in a timely manner. • Data sharing platforms: developing online platforms where landowners and agencies can share data on invasive plant and animal distribution, control methods, and funding opportunities. • Standardise protocols: establishing consistent protocols for early detection, rapid response, and long-term management of invasive plants and animals. • Ensure enforcement of the management of invasive plants and animals to achieve consistency across the landscape.

[3]csiro.au/en/news/All/News/2023/September/Expert-Commentary-Invasive-Alien-Species
[4]nrmrq.org.au/nurturing-nature-cultivating-culture-nrm/biodiversity

Challenge	Challenge description	Challenge solutions
Data gaps	Limited distribution data: often, there is a lack of comprehensive information on where exactly invasive plants and animals are located and how widespread they are. This makes it difficult to prioritise eradication or control efforts. Different agencies and organisations may use different methods to collect data on invasive plants and animals. This inconsistency makes it difficult to compare data and get a clear picture of the problem.	Specific actions that may address challenges: • Standardise data collection protocols: implementing standardised data collection methods across regions ensures consistency and allows for easier data sharing and analysis. • Standardise prioritisation tools: implementing standardised prioritised tools using modelling, monitoring/surveillance and program evaluation. • Use remote sensing technologies (such as satellite, aerial and drones) and machine artificial intelligence learning to provide insights into invasive plants and animals early detection, distribution and habitat suitability. • Use novel and emerging technologies (such as environmental DNA analysis) for early detection of invasive plants and animals by identifying their presence/absence in water samples.
Climate change impacts	Climate change alters habitat suitability and can facilitate the spread of invasive plants and animals into new regions. Rising temperatures, changing precipitation patterns, and extreme weather events may create new opportunities for invasive plants and animals to establish and thrive. Climate-driven changes can make effective management decisions more uncertain and difficult over time, therefore increasing the cost associated with responding.	Specific actions that may address challenges: • Develop climate change adaptation plans that incorporate invasive plant and animal management strategies, such as habitat restoration, targeted surveillance in vulnerable regions, and promoting the resilience of native ecosystems. • Invest in research to understand the interactions between climate change and invasive plants including animal behavioural dynamics that can inform evidence-based management decisions. • Support natural disaster recovery initiatives that focus on controlling invasive plant and animal outbreaks.
Invasion pathways related to transport	Queensland's extensive coastline, international ports, and domestic transport connections increase the risk of invasive plant and animal introductions. Invasive plants and animals can move long distances in short amounts of time via human assisted transportation, both globally and domestically.	Specific actions that may address challenges: • Conduct risk assessments to identify high-risk pathways and vulnerable ecosystems to inform strategic prioritisation of invasive plant and animal management efforts including surveillance for early detection. • Communicate with the people and organisations creating the biosecurity risks in transportation pathways to ensure that they are aware of their biosecurity obligations. • Strengthen biosecurity measures at ports, airports, and state/territory border crossings to detect, intercept and prevent the introduction of invasive plants and animals. • Strengthen awareness and reporting practices within the supply chain. • Undertake training, education, and awareness activities.

Challenge	Challenge description	Challenge solutions
Limited resources	Many stakeholders face constraints in terms of funding, resources, and technical expertise for invasive plant and animal management. Limited resources may hinder efforts to prevent, detect, and control invasive plants and animals effectively.	Specific actions that may address challenges: • Prioritise investment in cost-effective management strategies with high potential for success and monitor outcomes. • Invest in a greater level of understanding (community, state and local government) of the long-term financial advantages of early intervention. • Seeking support for an increase in the continuity and level of funding and resources allocated to invasive plant and animal management programs, including government grants, research funding, and partnerships with non-governmental organisations and community groups. • Leveraging funding from all sectors: private, local, state, and national.
Public awareness and engagement	Engaging stakeholders, including landowners, communities and policymakers, is crucial for successful invasive plant and animal management. Increasing public awareness of the risks posed by invasive plants and animals and promoting citizen science initiatives can help mobilise support for prevention and control effort.	Specific actions that may address challenges: • Develop and support existing education campaigns to inform the public about the risks posed by invasive plants and animals and promote citizen science initiatives for early detection and reporting. • Encourage and promote community involvement in invasive plant and animal planning, control activities, volunteer programs, workshops, and collaborative projects with local organisations. • Support community-led approaches through promotion of tools, and development of evidenced-based approaches and methodologies.

Case studies

Case study

Turtles thrive after deer is eradicated from Wild Duck Island

An innovative feral deer management program on Wild Duck Island in the Broad Sound Islands National Park has resulted in a significant increase in turtle numbers.

Led by the Department of Environment, Tourism, Science and Innovation (DETSI) and DPI, this initiative has been pivotal in protecting one of Australia's largest flatback turtle (*Natator depressus*) rookeries.

High populations of rusa deer (*Cervus timorensis*) had been damaging the island's vegetation, including critical sand dune nesting sites for sea turtles.

A control program utilising aerial shooting and thermal imaging to reduce deer population numbers commenced in 2018. A grid of 44 cameras monitored population decline, confirming a 99.3% probability of complete eradication. The program was completed 2023 with vegetation recovering, enhancing nesting conditions for turtles, reducing the risk of nest damage and benefiting hatchlings.

This initiative highlights the success of innovative pest control measures and collaborative efforts in preserving sensitive ecosystems to conserve vulnerable species and their habitats.

Case study

Collaborative partnership tackles Queensland's only known *Mimosa pigra* infestation

Native to tropical America, *Mimosa pigra* is a thorny shrub that aggressively invades wetland ecosystems, affecting grazing production and restricting social and cultural uses. The only known infestation of *Mimosa pigra* in Queensland was found at Peter Faust Dam near Proserpine in 2001.

The infestation was successfully controlled in the early 2000s but ongoing surveillance is required to monitor for seedlings from the long-lived seed bed. To achieve this, DPI collaborates with Whitsunday Regional Council and Sunwater and undertakes routine surveys for the invasive plant as part of joint taskforce activities. These are necessary to verify that plants have not reached maturity, or seeds have not dispersed to gullies or other areas with difficult terrain or vegetation.

Apart from field logistics, a key challenge is managing for an indeterminant eradication timeframe. While the original infestation was successfully controlled during 2001–2005, most of this area remains submerged below the dam's water level. Only if water levels recede due to drought, lack of in-flows, or irrigation use are seeds exposed and dormancy broken by fluctuating temperatures.

Eradication at Peter Faust Dam is guided by the *Mimosa pigra* Stakeholder Group which also involves Canegrowers, Lake Proserpine Station and Reef Catchments NRM group members.

Case study

Many hands make light work – catchment scale invasive plant management

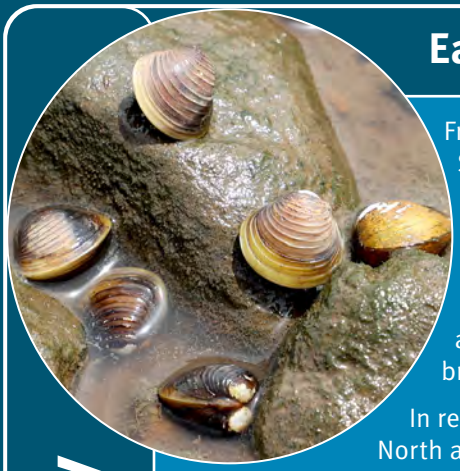
Over the past three years, various agencies have worked together to survey and treat gamba grass (*Andropogon gayanus*) in the Annan-Endeavour catchment while raising public awareness about the threats posed by this species.

Gamba grass is a fast-growing perennial grass that invades open areas and dramatically alters fire regimes by generating large fuel loads. Native flora including trees are susceptible to these hot fires and may not recover, as well as risks posed by altered fire regimes to communities and infrastructure. Gamba grass can overrun local ecosystems and impacts the nutrient and water availability in the soil.

The regional taskforce concept was developed by the Far North Queensland Regional Organisation of Councils. Partners have agreed to support each other in nominated invasive plant and animal management projects. Participants have included Cook Shire Council, Douglas Shire Council, Hinchinbrook Shire Council, Tablelands Regional Council, Mareeba Shire Council, Cairns Regional Council, South Cape York Catchments, Balngarrawarra Rangers, Jabalbina Rangers, Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development, DETSI and DPI.

Most recently the Gamba Grass Taskforce 2023 consisted of 10 field teams from eight agencies where gamba grass was treated across 59 private landholdings and adjacent roads across a three-day period. This temporary boost in highly experienced personnel has enabled the mapping and treatment of gamba grass within the catchment to a level impossible to achieve by a sole agency. Partners involved get to be immersed in peer interaction and comradery providing for visual learning opportunities for all skill levels. This work stems from stakeholders developing effective biosecurity plans and adopting strategies for invasive species that are reasonable and practical in achieving best management practices.

Case study



Early detection thanks to citizen science

Freshwater gold clam (*Corbicula fluminea*) was detected in the Brisbane River in September 2023 following a report received by a member of the public through iNaturalist citizen science platform. This is the first time a living specimen of the invasive clam, also known as Asian clam, Asiatic clam, or golden clam, has been confirmed in Australia.

The freshwater gold clam is a highly invasive species owing to its rapid growth and high reproductive rate, combined with an ability to spread its larvae over a broad area using water flows in rivers.

In regions where the clam has become established, including New Zealand and North and South America, it has been known to displace native clams and diminish water quality. It can clog irrigation, heat exchangers and other water infrastructure. The detection also represents a significant biosecurity threat to Australian freshwater ecosystems, including the Murray-Darling Basin which is located within 50 km of the nearest freshwater gold clam infestation.

Governments across Australia and scientific experts are working together to develop a national action plan which will include:

- containment and spread minimisation through the promotion of biosecurity measures and the development of reference materials for water users and infrastructure managers
- surveillance and early detection to support the national understanding of risk and impact.

The early detection of this clam through public reporting means that measures can be implemented to reduce its spread and impact.

Case study

Collaboration between organisations across the region

A major challenge in any eradication campaign is detection and removal of the last of the target species, particularly if the population is distributed over a large area.

Mexican bean tree (*Cecropia* spp.) is a target for early detection and eradication in Queensland due to its potential to become a significant invasive plant in tropical and subtropical rainforests.

The Southeast Queensland Mexican bean tree eradication project is a partnership between DPI, City of Gold Coast Council, Sunshine Coast Council, Scenic Rim Regional Council, Noosa Shire Council and the Queensland Herbarium.

Detection usually relies on a combination of public awareness/reporting and ground searching of suitable habitat. However, this project explored additional ways of finding plants through surveillance, including novel techniques such as DNA parental analysis, pollen detection, vector analysis, dispersal-distance analysis, plant ageing and drones, to improve detection and targeted response efforts.

Improved knowledge of Mexican bean tree biology and seed dispersion allowed targeted surveillance around known mature female trees. When a female tree was detected with the possibility of seeds having been produced, surveillance officers inspected an area within a 750-metre radius for a period of nine years to be confident that the seedbank had been exhausted.

The project has resulted in nine of the 26 locations known to previously have Mexican bean tree to be confirmed free from the invasive plant following ongoing treatment and surveillance.

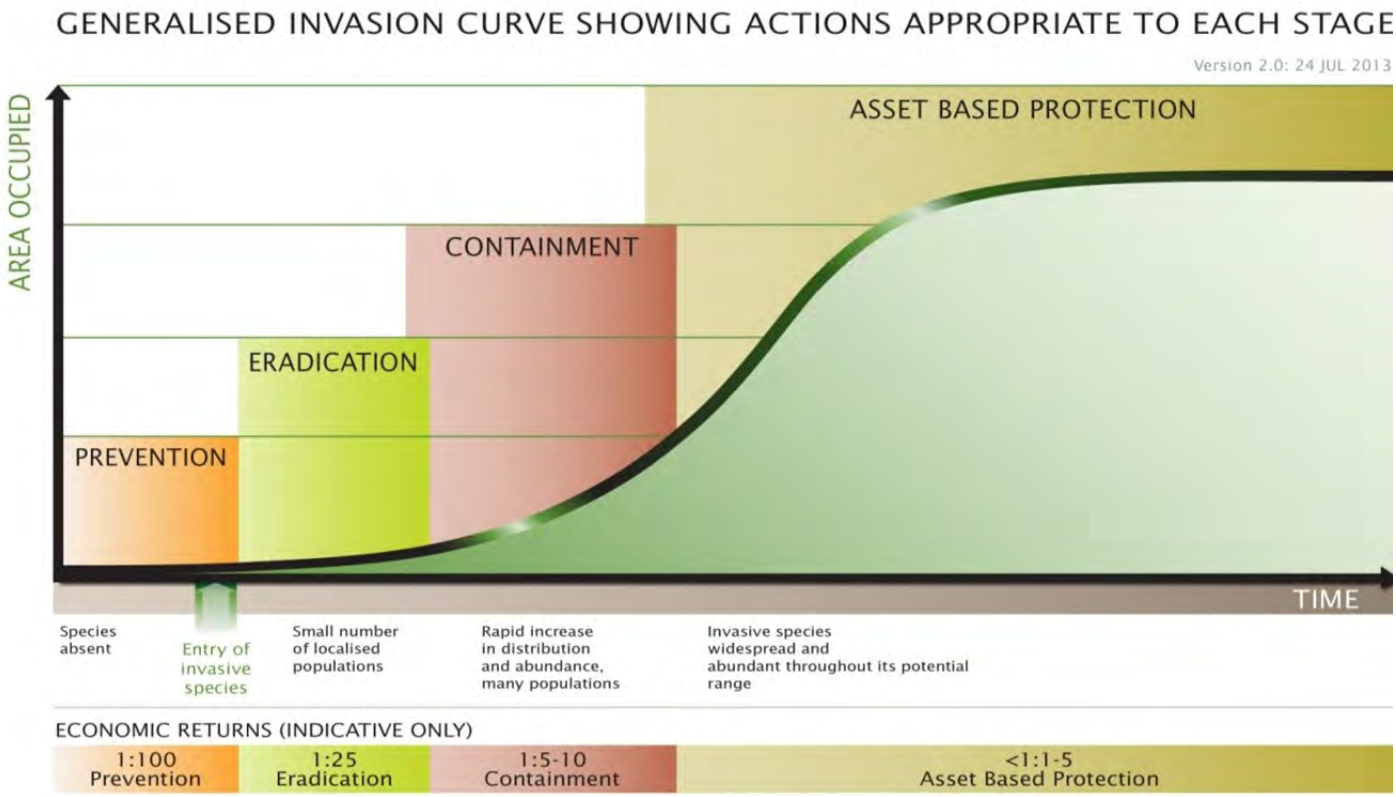
Implementing the strategy

This strategy seeks to clarify roles and responsibilities, any legal obligations and demonstrate the benefits of clear actions and accountabilities. All participants in the biosecurity system should understand their functional responsibility, the strategic actions they should be contributing to and how Queenslanders will know collectively if they have been successful. Everyone has a role to play in protecting Queensland from the impacts of invasive plants and animals.

Wild dog barrier fence

The stages and scope of management

To effectively address the impacts of invasive plants and animals, management needs to consider the context of the full continuum of activity as it relates to biosecurity. This continuum is shown in the following generalised invasion curve:



Source: Biosecurity Strategy for Victoria (2009)

Key management stages of the invasion curve are:

- prevention of an incursion (including planning and preparedness)
- eradication of an incursion (usually requiring early detection)
- containment of an incursion (to a geographical area)
- protection of assets (from impacts once an invasive plant or animal is established).

The invasion curve includes an indicative economic return for management/action at each stage. The return on investment for prevention is higher with total costs lower and likelihood of success higher compared to management of localised or widely established populations.

Operationally, the approach required to eradicate new invasive plants and animals is quite different from that required to protect assets from established invasive plants and animals. Managing established invasive plants and animals focuses on mitigating impacts on assets, as eradication may not be feasible.

The roles and responsibilities of each stakeholder change along the invasion curve, in line with the actions needed and who is best placed to carry them out. Given the higher costs and greater return on investment at the beginning of the invasion curve, governments have more involvement in the earlier stages of management—prevention, eradication and, to an extent, containment. The use of public funds at this stage provides for greater timeliness and efficiency, particularly when the impact or beneficiaries may not be fully understood.

Protection of assets (whether public or private) from the impacts of established invasive plants and animals is better managed locally by the owners and managers of those assets, or in some cases by local community groups. Decisions on the protection of private assets (such as land, crops, and livestock) are often best made at a property, enterprise, or local level. However, prevention and early detection can also be highly effective at a property level. Actions are most effective when prioritised through risk management and planning.

The management focus for invasive plants and animals may vary across spatial scales. For example, the management strategy for a certain invasive plant may be asset protection at the state level, but for some regions it may be containment and within that region, at a local level, it may be eradication. Therefore, the management of invasive plants and animals requires planning and coordination at national, state, regional, local, and even property levels.

The law

This strategy has the intention to provide guidance to all Queenslanders about how to meet their obligations under the *Biosecurity Act 2014* (the Act).

To cope with the threat posed by invasive plants and animals, Queensland needs flexible and responsive laws. The Act provides this by establishing a framework for minimising biosecurity risks and facilitating the timely and effective response to biosecurity events and impacts.

The Act imposes a general biosecurity obligation, known as the GBO, on each person to manage biosecurity risks in their control and prevent biosecurity events from occurring. Everyone must take all reasonable and practical measures to prevent or minimise biosecurity risks, such as those presented by invasive plants and animals.

Risk-based decision-making is included in the Act. This means that an appropriate level of response must be actioned to address a potential risk. More detail on the Act is provided in Appendix 2.

Ensuring compliance with the *Biosecurity Act 2014*

State and local governments are authorised to ensure that people dealing with invasive plants and animals do so in compliance with the Act. Local government has a role outlined in the legislation to ensure that people are fulfilling their general biosecurity obligation and their obligations with respect to prohibited and restricted invasive biosecurity matter. The leadership role of State and local governments is summarised below:

Queensland Government – DPI's compliance responsibilities

- Provide a framework that improves the capacity of local governments, industry and the community to respond to biosecurity risks.
- Administration of the Act including:
    - o providing for the management of biosecurity risks to prevent impact
    - o regulating activities involving biosecurity matter or carriers
    - o taking actions to prevent or respond to a biosecurity event
    - o looking for ways to minimise or mitigate biosecurity risks, monitoring and enforcing compliance with the Act
    - o providing for codes of practice, guidelines, programs and permits.
- Develop policies about the application of the Act and provides advice on how a person may comply with their obligations imposed under the Act.
- Monitor the implementation of the Act to ensure that those with functions and obligations under the Act take reasonable and practical measures to manage biosecurity matter.

Local governments' compliance responsibilities

The main function of a local government under the Act is to ensure invasive biosecurity matter is managed in their area in compliance with the Act. This means that local governments are responsible for the management of compliance programs that ensure invasive biosecurity matter is managed in accordance with the Act and in accordance with local government biosecurity plans.

- Implement the Act in Queensland as per section 48 obligations.
- Must have a biosecurity plan (section 53 of the Act) for invasive biosecurity matter in their local government area.
- Must meet their general biosecurity obligation for the management of invasive plants and animals on land that it manages.

Prickly acacia (*Vachellia nilotica*)

Roles and responsibilities

The roles and key responsibilities for invasive plant and animal management in Queensland, including the implementation of this strategy and the identified actions are summarised in Table 1. However, responsibilities may vary in certain circumstances, and many stakeholders undertake actions beyond those outlined.

Table 1. Stakeholder roles and responsibilities in invasive plant and animal management in Queensland

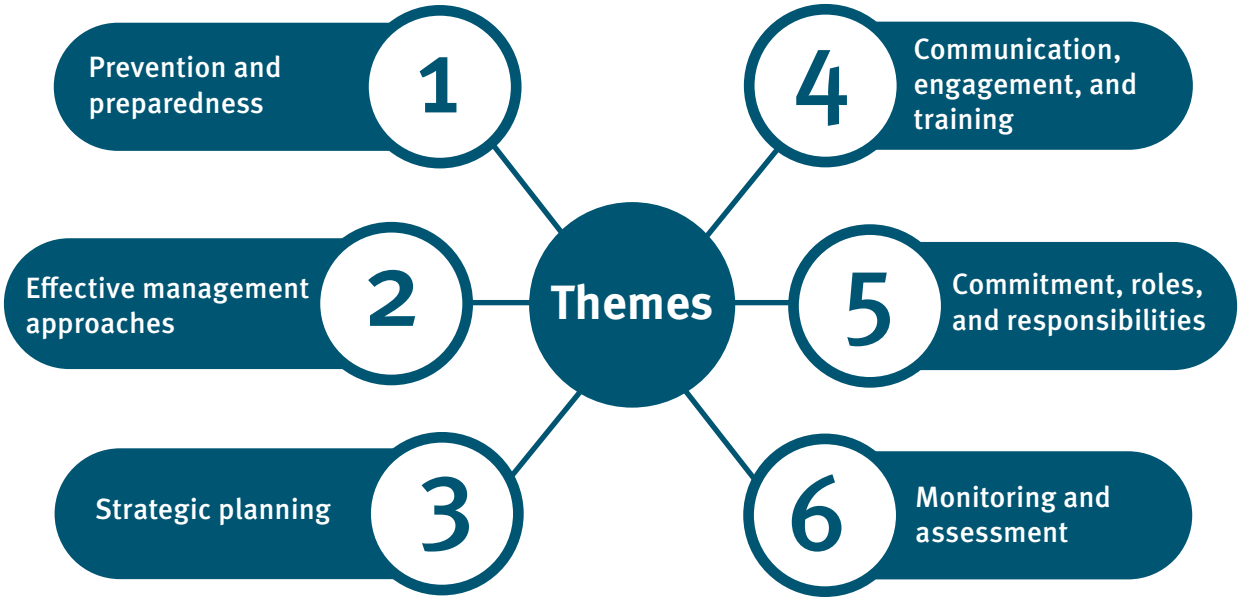
	Stakeholder	Responsibility
NATIONAL	Australian Government	• Border protection. • Emergency response coordination. • National legislation, policies and programs. • National arrangements such as Intergovernmental Agreement on Biosecurity, National Biosecurity Committee, Environmental Invasive Committee.
STATE	Queensland Department of Primary Industries (DPI)	• Lead and coordinate Queensland's biosecurity framework including invasive plant and animal legislation, Queensland Biosecurity Strategy 2024–2029, Queensland Invasive Plants and Animals Strategy 2025–2030 and policy development. • Ensure compliance with *Biosecurity Act 2014*. • State research capability and collaboration. • Coordination and declaration of emergency responses. • Undertake state responses and state component of national responses. • Develop and promote best practice management material for invasive plants and animals.
	State land management agencies	• Manage invasive plants and animals on state lands as per the general biosecurity obligation and local government plans. • Implement 'good neighbour' policy[5]. • Collaborate in local government biosecurity planning processes. • Develop and implement state land biosecurity plans. • Coordination across government agencies.
	Department of Environment, Tourism, Science, and Innovation (DETSI)	• Manage invasive plants and animals on protected areas as per the general biosecurity obligation. • Develop and implement the Conserving Nature–a Biodiversity Conservation Strategy for Queensland. • Collaborate in local government biosecurity planning processes. • Develop and deliver programs in accordance with policies for biodiversity conservation including for protection against threats posed by invasive plants and animals. • Implement 'good neighbour' policy. • Administer legislation for nature conservation/enforce compliance with the *Nature Conservation Act 1992* including for management of protected areas, control of threatening processes etc. • Ensure protected area plans include actions to manage invasive plants and animals.
	Queensland Invasive Plants and Animals Committee	• Oversee the development of the Queensland Invasive Plants and Animals Strategy 2025–2030. • Report to the Biosecurity Queensland Ministerial Advisory Committee on progress under the Queensland Invasive Plants and Animals Strategy 2025–2030. • Review and monitor the effectiveness of Queensland Invasive Plants and Animals Strategy 2025–2030.

[5]See glossary for definition

	Stakeholder	Responsibility
STATE	Research providers	• Deliver invasive plants and animals research and development. • Support extension, training, and education in best management practice. • Support the development of relevant policies.
	Industry groups	• Facilitate management for local priorities. • Assist to shape relevant policies. • Support land manager engagement. • Lead implementation of best management practice. • Develop and implement biosecurity plans.
REGIONAL	Darling Downs–Moreton Rabbit Board	• The Darling Downs–Moreton Rabbit Board is a statutory authority established under the *Biosecurity Act 2014* responsible for the maintenance of the rabbit barrier fence and supports the control of rabbits in the Board area. • Ensure compliance with the *Biosecurity Act 2014* in relation to rabbits within the Board area.
	Regional natural resource management organisations, Landcare, community, and conservation groups	• Facilitate regional and local strategies by contributing to regional planning processes. • Promote community awareness. • Provide technical and extension advice. • Investigate the delivery of incentives. • Facilitate land manager engagement. • Support and inform development of best management practice.
	Regional pest management subcommittees	• Determine regional priorities and associated management plans. • Foster involvement of all regional stakeholders and collaborate across all land tenures. • Develop and implement regional biosecurity plans.
LOCAL	Local government	• Ensure compliance with *Biosecurity Act 2014* and undertake enforcement activities within their local government area. • Develop and implement biosecurity plans. • Local government area policy development and management strategies. • Communicate about the general biosecurity obligation to people in the local government area. • Manage invasive plants and animals on local government lands as per the general biosecurity obligation. • Implement 'good neighbour' policy.
	First Nations People	• Actively promote Aboriginal peoples and Torres Strait Islander peoples perspectives when decisions about invasive species management are made that will directly affect them. • Share knowledge to support invasive pest management. • Participate in collaborative management activities and support the management of invasive plants and animals on country as per the general biosecurity obligation.
	Landowners/managers/ caretakers	• Manage invasive plants and animals on their own land as per the general biosecurity obligation. • Share knowledge to support invasive species management. • Undertake management activities. • Participate in collaborative management. • Use best management practice approaches. • Implement and practice 'good neighbour' policy. • Develop and implement property biosecurity plans.

Strategic actions

Strategic actions have been grouped into six key themes to help achieve the vision and provide the means for undertaking the mission.



Theme 1: Prevention and preparedness

Prevention and early intervention are the most cost-effective management strategies. It is often impossible to eradicate an established invasive plant or animal, particularly once it becomes widespread and abundant. The focus is then required to be on reduction of impacts. Management costs for these species are nearly always ongoing.

Commonwealth and State Governments usually have greater involvement in the earlier stages of prevention and eradication than in later stages of management. However, everyone has a role in preventing the introduction and spread of invasive plants and animals.

An invasive plant or animal may present various levels of risk in different regions, environments and production systems. These levels need to be determined before deciding on priorities for prevention and management.

Preventing the spread of existing invasive plants and animals will reduce the risk of further negative impacts.

Red imported fire ant (*Solenopsis invicta*)

Electric ant (*Wasmannia auropunctata*)

Yellow crazy ant (*Anoplolepis gracilipes*)

Theme 1: Prevention and preparedness

Objective	Strategic actions	Action by whom
Prevent the introduction, establishment and spread of invasive plants and animals	1.1 Collaborate with Australian state and territory governments to develop consistent, risk-based policies to prevent the introduction of potentially invasive plants and animals.	DPI, Australian Government
	1.2 Enforce legislative provisions and implement compliance strategies for high-priority potentially invasive plants and animals.	DPI, local governments
	1.3 Collaborate on the development of national invasive plant and animal response plans, including agreements on cost-sharing for new incursions.	DPI, Australian Government, other states and territories, industry groups, community groups
	1.4 Encourage industry-driven approaches (such as standard operating procedures and quality assurance advance agreements between government and industry) to improve prevention, eradication and control.	Industry groups, DPI, local governments
	1.5 Encourage community-driven approaches to improve early detection, eradication and control methods (including use of community volunteers and citizen science initiatives).	All
	1.6 Support and promote best practice prevention of spread of invasive plants and animals.	
	1.7 Develop and maintain biosecurity emergency preparedness based on quality information, training and administration systems.	DPI, Australian Government, local government, industry groups, landowners
	1.8 Develop and implement risk-based eradication, mitigation and control plans for specific invasive plants and animals.	All

Examples of success

1. DPI: deliver the requirements of national cost-shared eradication programs (e.g. National Tropical Weeds Eradication Program, National Electric Ant Eradication Program, National Fire Ant Eradication Program, Red Witchweed Eradication Program).
2. Local governments: undertake a surveillance program for invasive biosecurity matter in the local area to determine if landowners are meeting their general biosecurity obligation (e.g. City of Gold Coast Surveillance Program for Invasive Plants and Animals 2024–2026, Toowoomba Regional Council Biosecurity Surveillance Program 2024–2025, Cairns Regional Council Invasive Plants and Animals Surveillance Program 2024, Douglas Shire Council Invasive Plants and Animals Surveillance Program 2022–2026).
3. Landowners: get involved in local coordinated meetings such as Landcare and catchment care to coordinate management efforts across the landscape (e.g. Fitzroy Basin Association–Dawson and Isaac Catchment integrated pest control project).
4. All: everyone has a responsibility to report suspected new incursions of biosecurity matter.
5. DPI, local governments, natural resource management organisations, industry: share knowledge and information on how to become involved in community-driven approaches to improve early detection, eradication and control methods for invasive plants and animals (e.g. watergum-cats claw creeper biocontrol program).
6. DPI, local governments, industry: emerging biosecurity risks are identified and appropriate actions such as prevention and mitigation measures are adopted (e.g. protecting Queensland from invasive fish–tank tipping awareness).

Theme 2: Effective management approaches

It is widely accepted that, for invasive plants and animals, integrated management systems are the most effective. That is, best practice for effective control often involves multiple control methods, and successful long-term management relies on cooperation with neighbours and the coordination of control activities. Therefore, to ensure the best possible outcomes, all stakeholders are required to advocate and adopt best practice for management activities.

Legislation on the management of invasive plants and animals is backed by suitable enforcement measures, but enforcement is best used when other approaches have failed.

Theme 2: Effective management approaches

Objective	Strategic actions	Action by whom
Use management approaches that effectively reduce the impacts of invasive plants and animals	2.1 Develop best practice approaches for the management of invasive plants and animals.	Industry groups, DPI, research providers, local governments
	2.2 Extend (promote) best practice approaches.	DPI, landowners, local government, industry, regional natural resource management organisations
	2.3 Adopt best practice approaches.	All
	2.4 Develop control programs that include input from land managers and are consistent with sustainable management practices.	Landowners, local governments, DPI, regional natural resource management organisations
	2.5 Strengthen research capacity, including leveraging partnerships and increasing resources.	Industry groups, DPI, research providers, regional natural resource management organisations, universities
	2.6 Enhance control techniques through continued research, development and extension that informs best practice management.	Industry groups, DPI, research providers, universities

Examples of success

1. Local governments: develop prevention and control programs (e.g. Burdekin Shire Council Prevention and Control Program for Invasive Biosecurity Matter 2022–2025, Prevention and Control Program for feral animals under the *Biosecurity Act 2014* for the Sunshine Coast Council area, City of Gold Coast Prevention and Control Program for Invasive Plants and Animals 2024–2026, City of Townsville's Prevention and Control Program for yellow crazy ants under the *Biosecurity Act 2014*).
2. DPI: undertake research into prioritised invasive plant and animal management (e.g. integrated control for invasive aquatic plants project, biological control of parkinsonia, herbicide control of invasive grasses).
3. Landowners: implement best practice management to control invasive plants and animals on property.
4. Community groups: promote research outcomes by publishing materials so they are available to the community (e.g. promote latest research in newsletters to members).
5. All: utilise a regional strategic approach to managing invasive species (e.g. North West Queensland Regional Biosecurity Plan 2022–2027).
6. Research organisations: develop novel control tools to support the management of invasive plants (e.g. University of Queensland – BioHerbicides Australia stem injecting technology for woody weeds).

Theme 3: Strategic planning

Through strategic planning, actions can be prioritised to ensure that resources are used for maximum effect.

However, a strategic approach can only achieve common goals and priorities if there is effective communication and cooperation between all parties within the system. Biosecurity planning offers a 'partnership' mechanism to achieve this level of coordination and efficiency.

The *Biosecurity Act 2014* facilitates a risk-based approach to the management of invasive plants and animals; this approach promotes the efficient use of resources.

Theme 3: Strategic planning

Objective	Strategic actions	Action by whom
Develop strategic plans for managing invasive plants and animals in collaboration with stakeholders and using a risk-based approach	3.1 Develop local government area biosecurity plans in collaboration with the community, state land managers and regional natural resource management organisations (including input from regional natural resource management plans).	Local governments in collorabation with all
	3.2 Determine priorities and develop statewide and regional strategic plans for invasive plants and animals and specific practices.	DPI, local governments, natural resource management organisations and industry groups through regional pest regional subcommittees
	3.3 Develop biosecurity plans for government-controlled lands that complement local government plans.	State land managers, Australian Government
	3.4 Promote sharing of resources, expertise and knowledge to foster effective detection and management.	All
	3.5 Foster a long-term focus for resources and research, development and extension activities.	

Examples of success

1. Local governments: develop individual or regional biosecurity plans through consultation with significant landowners, managers and the community to support the understanding within communities of the general biosecurity obligations (e.g. Central West Regional Biosecurity Strategy 2024–2029, North West Queensland Regional Biosecurity Plan 2022–2027, Isaac Regional Biosecurity Plan 2024–2027, Rockhampton Regional Council Biosecurity Plan 2022–2026).
2. State land managers: biosecurity planning for state land reflects the priorities in the relevant local government biosecurity plan (e.g. A Master Plan for Queensland's parks and forests to 2025: DETSI, area management statements for national parks: DETSI).
3. DPI, local governments, natural resource management organisations, industry: education and awareness publications, best practice management and risk assessments are available and promoted through networks (scientific papers, best practice manuals, field days, web-based training, masterclasses for invasive grasses).

Biological control agent cactoblastis

Theme 4: Communication, engagement and training

Effective management of invasive plants and animals relies on broad stakeholder knowledge of the problem and the management issues. However, people are often not aware of the impacts that invasive plants and animals have on the natural environment or primary production, or that their own actions may be contributing to a problem.

In fact, many such problems are increased through lack of community knowledge. For example, people may not realise that they assist the spread of invasive plants and animals if they release domestic animals or pets into the environment or unintentionally move seeds of invasive plants (via contaminated livestock, soil or equipment).

The level of knowledge on invasive plants and animals is increasing, but more targeted public education and a higher public profile are needed. Different stakeholders need different information and support to raise their awareness of problems and increase their willingness to help with management.

Increased industry support for the management of invasive plants and animals is one way of increasing awareness of land managers.

Overall community awareness may improve when stakeholders have accessible, science-based information on invasive plants and animals, their characteristics, their impacts and required control actions. When people have this knowledge, they may also be enabled to take ownership of the issue with increased confidence and be more likely to act.

Theme 4: Communication, engagement and training		
Objective	**Strategic actions**	**Action by whom**
Communicate and engage with stakeholders so they understand their role and have the skills and knowledge to manage invasive plants and animals	4.1. Publicise and provide information on invasive plants and animals and the general biosecurity obligation to all relevant stakeholders and the wider community	DPI, local governments, regional pest management subcommittees, natural resource management organisations, industry groups, community groups, First Nations communities
	4.2 Effective use of citizen science initiatives to enhance management efforts.	All
	4.3 Improve communication networks at all levels to encourage best practice and discourage actions that contribute to or maintain invasive plant and animal impacts.	
	4.4 Promote and facilitate high-quality training in the management of invasive plants and animals.	Industry groups, education facilities, local government, Australian and State Government

Examples of success

1. DPI: provide information on the distribution of invasive plants and animals (e.g. invasive plants dashboard).
2. All: actively participate in local, regional and state level groups that support the management of invasive species where appropriate (e.g. Watergum-Community for Environment, Capricorn Pest Management Group, Statewide Oversight Group).
3. Local governments, DPI: information regarding invasive species management is maintained on organisational websites and social media platforms (e.g. DPI website hosts fact sheets, local governments promote biosecurity plans and programs on Tablelands Regional Council: Pest Weeds and Feral Animal Management webpage, Pest Fish Newsletter).
4. All: promote the use of citizen science initiatives to the community which supports the detection of invasive plant and animals (e.g. Weed Spotters Network Queensland promoted on DPI website, iNaturalist promoted on Sunshine Coast Council website).

Theme 5: Commitment, roles and responsibilities

To successfully control invasive plants and animals in the long term, clearly defined and accepted roles and responsibilities are needed. There is often some confusion within the community about the exact responsibilities of land managers, local governments, and the Queensland Government in the management of invasive plants and animals—this confusion must be addressed.

When planning and implementing management programs, stakeholders should recognise each other's capacity to deliver the desired outcomes. The broad scope and nature of problems demands a long-term commitment by all stakeholders; they need to recognise the effort, time and cost required for effective management.

Local government planning is crucial to the success of invasive plant and animal management and provides an opportunity to foster community commitment to roles and responsibilities. Natural resource management organisations facilitate planning and management at a regional level, while state government agencies have a responsibility to manage invasive plants and animals on lands and water bodies under their control. Community and local government planning must include all stakeholders (such as managers of state land) early in the process.

Theme 5: Commitment, roles and responsibilities

Objective	Strategic actions		Action by whom
Foster stakeholder commitment to coordinated, landscape-scale management programs and initiatives	5.1	Develop the knowledge, capacity and commitment of key stakeholders so that they can play an active and constructive role in the management of invasive plants and animals.	Queensland Government, local governments, regional pest management subcommittees, regional natural resource management organisations, industry groups, community groups, First Nations ranger groups
	5.2	Encourage all land managers, including government, to use a collaborative landscape approach to the management of invasive plants and animals.	
	5.3	Seek alternative investment opportunities (private, industry etc.) for projects addressing management of invasive plants and animals.	All
	5.4	Promote the economic, social, cultural and environmental benefits of managing invasive plants and animals to encourage co-investment.	

Examples of success

1. Natural resource management organisations: collaborate at a regional level to support a landscape approach to invasive plant and animal management (e.g. Burdekin Dry Tropics Regional Pest Management Strategic Approach 2020–2025).
2. DPI: continue to support the development of capacity in invasive plant and animal management in Queensland (e.g. provision of funding for capacity building through the Queensland Feral Pest Initiative).
3. Local governments, industry, natural resource management organisations: work with stakeholders to implement weed seed spread mitigation measures (e.g. 'reducing weed risks in fodder' guide) and ensure local biosecurity plans have strategies to inform the local community about the content of the plan and achievement of its objectives.

Theme 6: Monitoring and assessment

Reliable data from monitoring is needed to ensure that invasive plants and animals are managed holistically and for the long term. This data will inform progress and investment.

To control invasive plants and animals, a balance between prevention, surveillance and preparedness is required.

An increasing amount of information is available on the distribution, abundance and impacts of invasive plants and animals. However, this data could be better organised and analysed through existing and new technologies, leading to improved decision-making.

Investment in this area is critical to the success of the strategy.

Theme 6: Monitoring and assessment

Objective	Strategic actions	Action by whom
Develop and use standardised methods to monitor, report on and assess the status and effectiveness of invasive plant and animal management actions undertaken	6.1 Develop and promote standardised protocols for data collection to integrate invasive plants and animals monitoring systems from multiple sources and jurisdictions, including citizen science.	DPI
	6.2 Use standarised protocols to ensure collected parameters are consistent and useful for data sharing.	All
	6.3 Develop and establish monitoring and reporting programs for priority invasive plant and animal.	DPI, state land managers, local governments, industry groups
	6.4 Quantify and understand the impacts of significant invasive plants and animals through research programs to determine acceptable levels of risk and develop strategies to mitigate impact.	DPI, research providers
	6.5 Undertake regular risk reviews to update priority species.	DPI, local governments, regional pest subcommittees, Australian Government
	6.6 Monitor the implementation of this strategy and review in five years.	DPI, Queensland Invasive Plants and Animals Committee

Examples of success

1. DPI: state priority species management programs report results (e.g. annual research highlights, annual operational highlights, bitou bush program annual report).
2. DPI: promotes the use of standardised data collection protocols (e.g. spatial pest attribute standard).

Glossary

Asset	Something with environmental, social or economic value, whether publicly or privately owned, that invasive plants or animals may directly or indirectly affect.
Asset protection	Action taken to mitigate the impacts of invasive plants and animals on specified assets in a predefined area (e.g. indirect protection such as exclusion fencing for rabbits, wild dogs or foxes); not necessarily direct control, reduction or destruction of the species.
Biosecurity matter	1. A living thing other than a human or part of a human. 2. A pathogenic agent that can cause disease in a living thing other than a human, or in a human by transmission of the pathogenic agent from an animal to a human. 3. A disease. 4. A contaminant.
Biosecurity risk	A risk of any adverse effect on the environment, the economy, human health or social amenity caused or likely to be caused by biosecurity matter, by dealing with biosecurity matter or a carrier, or by carrying out an activity relating to biosecurity matter or a carrier.
Carrier	Any animal or plant (or part of an animal or plant) or any other thing—whether dead, alive, or inanimate—that is capable of moving biosecurity matter attached to or contained in the animal, plant or other thing.
Containment	Action taken to prevent the spread of invasive plants and animals beyond a predefined area.
Contaminant	A contaminant is anything that may be harmful to animal or plant health or pose a risk of any adverse effect on a biosecurity consideration e.g. weed seeds.
Eradication	The removal of an invasive plant or animal species from a defined area.
Established invasive plants and animals	An invasive plant or animal that is perpetuated, for the foreseeable future, within an area where it is not feasible (either technically or financially) to eradicate it.
First Nations People	A collective term for Aboriginal peoples and Torres Strait Islander peoples that emphasise Aboriginal peoples and Torres Strait Islander peoples as the original inhabitants of Australia who lived here for many thousands of years before colonisation.
Good neighbour policy	The development and maintenance of positive relationships with neighbours and the local community to help support invasive plant and animal management.
General biosecurity obligation	A legal obligation requiring a person who deals with biosecurity matter or a carrier, or who carries out an activity, to take all reasonable and practical measures to prevent or minimise biosecurity risks associated with that biosecurity matter or activity.
Invasive animal (pest animal)	Means a species of animal that has, or is likely to have, an adverse impact on the environment, the economy, human health or social amenity because of the introduction, spread or increase in population size of the species in an area.
Invasive biosecurity matter	As defined in section 48 of the *Biosecurity Act 2014*.
Invasive plant (pest plant, weed)	Means a plant species that has, or is likely to have, an adverse impact on the environment, the economy, human health, or social amenity because of the introduction, spread or increase in population size of the species in an area.
Land manager	An individual, company, organisation or government that owns, leases or manages private, commercial or government land.
Natural resource management (NRM) organsiations	An organisation that acts as a regional delivery agent (under the regional stream of the National Landcare Program and the Queensland Regional Natural Resource Management Investment Program) and focuses on on-ground activities that protect, improve and restore waterways and rangelands by managing invasive plants and animals, and improving soil, vegetation and water quality at a river-catchment or other landscape level.
Nil-tenure approach	An approach in which a range of control methods are applied across all tenures by all stakeholders at a 'landscape' (rather than 'property') level in a cooperative and coordinated manner.
Predation	The killing of one animal (prey) by another animal (predator) for food.
Prevention	Actions such as pre-border risk assessments and quarantine that minimise the risk of a species entering an area.
Risk management	The process of identifying risks and selecting and implementing measures to reduce levels of risk.

Appendix 1: Alignment with other strategies and frameworks

This strategy promotes actions that will complement those arising from the following documents.

Kunming-Montreal Global Biodiversity Framework

Target 6: reduce the introduction of invasive alien species by 50% and minimise their impact

Eliminate, minimise, reduce and or mitigate the impacts of invasive alien species on biodiversity and ecosystem services by identifying and managing pathways of the introduction of alien species, preventing the introduction and establishment of priority invasive alien species, reducing the rates of introduction and establishment of other known or potential invasive alien species by at least 50 per cent by 2030, and eradicating or controlling invasive alien species, especially in priority sites, such as islands.

Australia's Strategy for Nature 2019–2030

Australia's Strategy for Nature 2019–2030 sets out three goals to achieve its vison that 'Australia's nature, now and into the future, is healthy and resilient to threats, understood, and valued both in its own right and for its essential contribution to our health, wellbeing, prosperity and quality of life'.

Goal 1: Connect all Australians with nature
- Objective 1: Encourage Australians to get out into nature
- Objective 2: Empower Australians to be active stewards of nature
- Objective 3: Increase Australians' understanding of the value of nature
- Objective 4: Respect and maintain traditional ecological knowledge and stewardship of nature

Goal 2: Care for nature in all its diversity
- Objective 5: Improve conservation management of Australia's landscapes, waterways, wetlands and seascapes
- Objective 6: Maximise the number of species secured in nature
- Objective 7: Reduce threats and risks to nature and build resilience
- Objective 8: Use and develop natural resources in an ecologically sustainable way
- Objective 9: Enrich cities and towns with nature

Goal 3: Share and build knowledge
- Objective 10: Increase knowledge about nature to make better decisions
- Objective 11: Share and use information effectively
- Objective 12: Measure collective efforts to demonstrate our progress

Conserving Nature – A Biodiversity Strategy for Queensland (2022)

Queensland's Biodiversity Conservation Strategy sets out four goals, each with relevance for management of invasive plants and animals:

1. Protect: biodiversity is protected and managed, so large, representative areas of ecosystems are intact and as free from threats as possible. Protecting our habitats, ecosystems and threatened species from weeds and pests, and avoiding the spread of invasive plants and animals in protected areas, are focus areas.
2. Restore: Queensland ecosystems and species populations are recovered to maximise the viability of ecosystems and threatened species in the wild. Reducing the pressures of threats is essential to improve degraded habitat and reinstate lost ecosystem function.
3. Adapt: biodiversity is resilient to changing environmental conditions, including the current and future impacts of climate change. Managing the increased risk of invasive plants and animals and managing future impacts to maximise resilience are key elements.
4. Connect: biodiversity is valued, including for its contributions to wellbeing, and people are motivated to protect it. Building awareness, supporting community action and engagement in conservation, and ensuring policy decisions of government consider impacts on biodiversity and the precautionary principle, are key focuses.

Approaches to monitoring and evaluation are being identified to allow progress reporting and to inform future reviews or amendments of the Biodiversity Conservation Strategy.

Queensland Biosecurity Strategy 2024–2029

The biosecurity strategy outlines six themes for management within the Queensland biosecurity network:

1. Collaborative governance and leadership.
2. Every Queenslander plays their part.
3. Empowered to act.
4. Innovation and intelligence valuing and building on our investments.
5. Valuing and building on our investments.
6. Response effectiveness and preparedness.

Fireweed (*Senecio madagascariensis*)

Australian Pest Animal Strategy 2017–2027

The approach in this strategy embodies eight principles that underpin effective pest animal management:

1. Prevention and early intervention to avoid the establishment of new pest animal species is generally more cost-effective than ongoing management of established populations.
2. Pest animal management is a shared responsibility between land managers, community, industry and government.
3. Management of mobile pest animals requires a coordinated approach across a range of scales and land tenures.
4. Management of established pest animals should focus on the protection of priority assets (for example, a lambing paddock or a threatened ecological community) but also usually requires a 'buffer' management area around the asset to account for pest animal mobility.
5. Pest animal management should be based on actual rather than perceived impacts and should be supported by monitoring to measure whether impact reduction targets are being achieved.
6. Best practice animal management balances efficacy, target specificity, safety, humaneness, community perceptions, efficiency, logistics and emergency needs.
7. Best practice pest animal management integrates a range of control techniques (including commercial use where appropriate), considers interactions between species (such as rabbits and foxes) and accounts for seasonal conditions (for example, to take advantage of pest animal congregations during drought) and animal welfare.
8. The cost of pest animal management should be borne by those who create the risk and those who benefit from its management. Governments may co-invest where there is a net public benefit from any such intervention.

Australian Weeds Strategy 2017–2027

This strategy promotes seven principles that underpin effective weed management:

1. Effective weed management is a responsibility shared between land managers, community, industry and government.
2. Evidence-based decision-making should underpin the approach to weeds.
3. Risk-based prevention and early intervention is generally the most cost-effective approach for managing weeds.
4. Prioritisation of weed management must be informed by a risk-based approach, considering feasibility, likelihood of success and impact.
5. Coordination amongst land managers, community, industry and government is necessary to manage weeds at a landscape scale.
6. Sustaining capability and capacity across land managers, community, industry and government is fundamental to effective weed management.
7. Individuals, organisations and industry groups that create risks that may result in a weed entering, emerging, establishing or spreading in Australia have a role in minimising the impacts and contributing to the costs of management.

National threat abatement plans

Threat abatement plans provide for the research, management, and any other actions necessary to reduce the impact of a listed key threatening process on native species and ecological communities. Implementing the plan should assist the long-term survival in the wild of affected native species or ecological communities.

National Biosecurity Strategy 2022–2032

The National Biosecurity Strategy provides a collective vision for Australia's future biosecurity system – a biosecurity system that protects Australia's way of life.

To achieve the vision and purpose the strategy will act in six priority areas.

1. Shared biosecurity culture: We will enhance our culture of biosecurity action so that everyone understands its importance and plays their part.
2. Strong partnerships: We will strengthen and expand partnerships and networks between all stakeholders at local, regional, national and international levels.
3. Highly skilled workforce: We will develop and sustain a highly skilled workforce to ensure we have the right capability and capacity, in the right place, at the right time.
4. Coordinated preparedness and response: We will boost our system's adaptability and its capacity to prevent, detect, manage, respond to and recover from outbreaks.
5. Sustainable investment: We will ensure funding and investment is sufficient, co-funded, transparent, targeted to our priorities and sustainable for the long term.
6. Integration supported by technology, research and data: We will create a more connected, efficient and science-based system to facilitate more timely, informed and risk-based decisions.

Appendix 2: Further information on the *Biosecurity Act 2014*

Purposes of the Act

The main purposes of the Act are as follows:

- To provide a framework for an effective biosecurity system for Queensland that:
  - helps to minimise biosecurity risks
  - facilitates responding to impacts on a biosecurity consideration, including responding to biosecurity events, in a timely and effective way
  - to ensure the safety and quality of animal feed, fertilisers and other agricultural inputs
  - to help align responses to biosecurity risks in the State with national and international obligations and requirements for accessing markets for animal and plant produce, including live animals and plants.
- To manage biosecurity risks associated with the following:
  - emerging, endemic and exotic pests and diseases that impact on:
    - plant and animal industries, including agriculture, aquaculture, horticulture, fisheries and forestry industries
    - the built environment
    - companion or leisure animals
    - biodiversity and the natural environment
    - tourism, lifestyle and pleasure industries
    - infrastructure and service industries, including power, communication, shipping and water supplies
  - the transfer of diseases from animals to humans and from humans to animals
  - biological, herbicide and physical contaminants in carriers.

How purposes of the Act are primarily achieved

The purposes of the Act are to be achieved primarily by:

- imposing a general obligation on persons to prevent or minimise the impact of biosecurity risks on human health, social amenity, the economy and the environment (each a biosecurity consideration)
- regulating activities involving biosecurity matter or carriers
- including in risk-based decision-making under the Act the principle that lack of full scientific certainty should not be used as a reason to postpone taking action to prevent a biosecurity event or to postpone a response to a biosecurity risk
- providing for flexible and timely ways of minimising and mitigating biosecurity risks
- providing for monitoring and enforcement of compliance with the Act
- providing for codes of practice relating to a person's obligations under the Act
- providing for the chief executive to make guidelines or policies about the application of the Act and how a person may comply with obligations imposed under the Act
- providing for a framework that improves the capacity of local governments, industry and the community generally to respond to biosecurity risks.

General biosecurity obligation (GBO)

Biosecurity is everyone's responsibility, and we all play a role to ensure we minimise biosecurity risks to protect Queensland's lifestyle, industries and environment from pests and diseases.

Everyone in Queensland has a general biosecurity obligation under Queensland's *Biosecurity Act 2014* to ensure they do not spread a pest, disease or a contaminant. This also applies to corporations.

This means everyone is responsible for managing biosecurity risks that are under their control; and to the best of their ability, recognise and minimise biosecurity risks where they work, where they live and at places they visit.

Under the general biosecurity obligation, individuals and corporations whose activities pose a biosecurity risk must:

- take all reasonable and practical measures to prevent or minimise each biosecurity risk
- minimise the likelihood of causing a 'biosecurity event', and limit the consequences if such an event is caused by preventing or minimising the harmful effects a risk could have, and not do anything that might make any harmful effects worse.

Koster's curse (*Clidemia hirta*)

Feral cat (*Felis catus*)

Water hyacinth (*Eichhornia crassipes* Syn. *Pontederia crassipes*)

Precautionary principle

In addition, the Act includes the precautionary principle that a lack of full scientific certainty will not be used as a reason to postpone preventative action or to delay response to a biosecurity risk. The precautionary approach in the case of invasive plants and animals will refer to the prevention of introduction and establishment, or taking prompt action to control the spread, even when scientific certainty about the potential impact may be lacking.

For example, an inability to identify a specimen in the field would not prevent a person including an inspector or an authorised officer from taking immediate measures to prevent the escape or loss of the specimen thereby further exacerbating the risk where it is later determined to be biosecurity matter.

Invasive plants and animals

There are certain species of invasive plants and animals that are regulated as prohibited or restricted matter and invasive biosecurity matter under the Act due to the elevated level of biosecurity risk that they pose.

Not all invasive plants and animals are listed as prohibited or restricted matter in Queensland, but people dealing with unregulated invasive plants and animals still have an responsibility under the general biosecurity obligation to manage the biosecurity risks.

Prohibited invasive plants and animals

Prohibited invasive plants and animals:

- are not present in Queensland
- would seriously threaten Queensland's agriculture industries, natural environment, livestock, human health and people's livelihoods
- if found in Queensland, must be reported to Biosecurity Queensland within 24 hours of the sighting
- a person reporting the prohibited plants and animals must take all reasonable and practical measures to minimise the risk of it spreading until they receive advice from an authorised officer.

Restricted invasive plants and animals

Restricted invasive plants and animals:

- are established in Queensland
- seriously threaten Queensland's agriculture, natural environment, livestock, human health and people's livelihoods
- under the *Biosecurity Act 2014*, there are seven categories of restricted matter (i.e. restricted matter may include matter such as plants, animal diseases, pest fish, insects, invasive plants and animals).

Restricted invasive plants and animals may fall into one or more risk categories (listed below). Under each category the restricted invasive plant or animal has listed restrictions. The specific restriction requirements also apply to a person when dealing with restricted invasive plants or animals unless they have a restricted matter permit.

Restricted invasive plant and animal categories and restrictions:

- category 1: the invasive plant or animal must be reported to an inspector (the department) within 24 hours
- category 2: the invasive plant or animal must be reported to an authorised officer (local government or the department) within 24 hours
- category 3: the invasive plant or animal must not be distributed either by sale or gift or released into the environment
- category 4: the invasive plant or animal must not be moved
- category 5: the invasive plant or animal must not be kept
- category 6: the invasive animal must not be fed
- category 7: the invasive animal must be killed.

Invasive biosecurity matter

Invasive biosecurity matter refers to the following biosecurity matter that local governments in Queensland are obligated to manage within their local government's area in compliance with the Act:

- prohibited matter mentioned in schedule 1, parts 3 and 4
- prohibited matter taken to be included in schedule 1, parts 3 and 4 under a prohibited matter regulation or emergency prohibited matter declaration
- restricted matter mentioned in schedule 2, part 2
- restricted matter taken to be included in schedule 2, part 2 under a restricted matter regulation
- an invasive animal or invasive plant that is provided for under local law of a local government and in the opinion of the Chief Executive that satisfies the local invasive biosecurity matter criteria (section 48 (e) of the Act).


African boxthorn (*Lycium ferocissimum*)


Fox (*Vulpes vulpes*)


Parkinsonia (*Parkinsonia aculeata*)

More information

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Queensland Government