



Tackling invasive species - a stronger biosecurity system for the environment

2023-24 Federal Budget Submission

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About the Invasive Species Council

The Invasive Species Council was formed in 2002 to advocate for stronger laws, policies and programs to keep Australian biodiversity safe from weeds, feral animals, exotic pathogens and other invaders. It is a not-for-profit charitable organisation, funded predominantly by donations from supporters and philanthropic organisations.

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Overview

Investing in prevention and early action are always the most cost-effective and damage mitigating approach to invasive species, but the current level of funding allocated to environmental biosecurity priorities is insufficient and this is costing Australia. Agencies, including the Environmental Biosecurity Office (EBO) and Chief Environmental Biosecurity Officer (CEBO), that are intended to provide national leadership and coordination are underfunded and understaffed. The level of funding for on-ground action and research and development is also well below what is needed to prevent new incursions or protect threatened species and precious places like our World Heritage areas.

In this submission, we outline the additional funding required for initiatives and policies over the next four years which would improve Australia's capacity to keep nature and agriculture safe from new and established invasive species. It is not a simple task – it will take concerted action and an ambitious, long-term vision shared by all parts of society, with strong leadership by our national government.

Summary of funding proposals for this budget:

| Proposal | Department / Agency | Funding sought | Timeframe |
|--|---------------------|----------------------------|---------------------------------|
| Sustainable biosecurity funding | DAFF | Total \$50 million | Per year over four years |
| Environmental biosecurity functions | | | |
| Tackling priority threats to nature - Established Pests and Weeds | DAFF | Total \$120 million | Over four years |
| Increase funding to the Established Pests and Weeds program | | | |
| Tackling priority threats to nature - Abating threats | DCCEEW | Total \$326 million | Over four years |
| Grants to manage invasive threats | | \$32 million | |
| Grants for Indigenous ranger groups | | \$24 million | |
| Ten National Coordinators for key invasive threats | | \$8 million | |
| Modernise and improve national information and data sharing | | \$60 million | |
| Threat abatement planning | | \$22 million | |
| Implement a national deer action plan | | \$28 million | |
| Manage spread of feral deer in Tasmania | | \$1.95 million | |
| Manage feral horses in the Australian Alps | | \$18 million | |
| A National Islands Recovery Program | | \$32 million | Per year over four years |
| Continue Lord Howe Island weeds eradication | | \$3 million | |
| Support Feral Cat Taskforce and Domestic Cat Working Group | | \$0.1 million | |
| Preventing new invaders | DAFF | Total \$7.4 million | Per year over four years |
| Resource the Environmental Biosecurity Office | | | |
| Enhancing RD&E | DAFF | Total \$100 million | Over five years |
| Continue existing R&D pipeline | | \$20 million | |
| High priority environmental research & innovation | | \$20 million | |

Introduction

Strengthening environmental biosecurity – stopping new invasive species arriving and establishing and limiting the harm caused by established invaders – must be an Australian government priority of the highest order in the upcoming budget. We welcome the government’s commitments to no new extinctions - but this will require substantially strengthening environmental biosecurity across the spectrum of prevention to management of entrenched threats.

The recent State of the Environment report was a wake up call which showed that the health of Australia’s environment is in significant decline. Our mega-biodiverse country – one of only a few on the planet – is in the grips of an extinction crisis. Since 2009, three unique animals have been wiped out and two others lost from the wild. Four of these recent extinctions were due to invasive species.

COVID-19 has taught the world a lesson about invasive species – their ability to spread, change pathway risks and challenge existing systems. A resilient and responsive national biosecurity system has never been more important. Between 2012 and 2017, the annual number of interceptions of biosecurity risk materials at Australian borders rose by almost 50%, to 37,014 (CSIRO 2021), and this continues to grow.

As an island nation with a trove of unique wildlife that evolved in isolation from the rest of the world, Australia is particularly susceptible to biological invasions. Invasive species have caused the majority of species extinctions in Australia over the past 230 years and, along with loss of habitat, are the highest impact threat to nationally listed threatened species and ecosystems.

The economic costs of invasive species are also staggering – an estimated \$25 billion a year, or more than 1% of Australia’s GDP. A functional and strengthened system protecting the environment also benefits human places, such as gardens and pets.

Past achievements show that with early action, dedication and resources, Australia can achieve world-leading results. We have, for example, eradicated several red fire ant populations, as well as rats and cats from many islands, and beaten back weeds through biocontrol or concerted removal (bitou bush, sea spurge and prickly pear, for example). So far, we’ve been able to keep out destructive new invaders such as the Asian black-spined toad, giant African snail and wattle rusts.

To protect and restore Australia’s ecosystems, we need a more concerted effort to tackle the likes of feral cats, yellow crazy ants, carp, myrtle rust, gamba grass and hard-hoofed invaders such as feral deer and horses. We also need stronger, more collaborative, better funded biosecurity to prevent and eradicate new invaders and stop the spread of others.

The National Biosecurity Strategy 2022-2032¹ identifies similar priorities, calling for sustainable funding that will be required for a stronger system. The 2021 State of the Environment report identified invasive species as the leading cause of extinctions in Australia² (**Figure 1**). These threats include already established pests and diseases, and the vast range of invasive species that have potential to harm our environment. To address this risk, Australia must invest more funding that is better targeted to strengthen the biosecurity system that protects us from these invasive species.

¹ DAFF 2022 - National Biosecurity Strategy 2022-2032

<https://www.biosecurity.gov.au/about/national-biosecurity-committee/nbs> accessed 10/01/2023

² DCCEEW 2022 - State of the Environment Report 2021 - <https://www.dcceew.gov.au/science-research/soe> accessed 10/01/2023

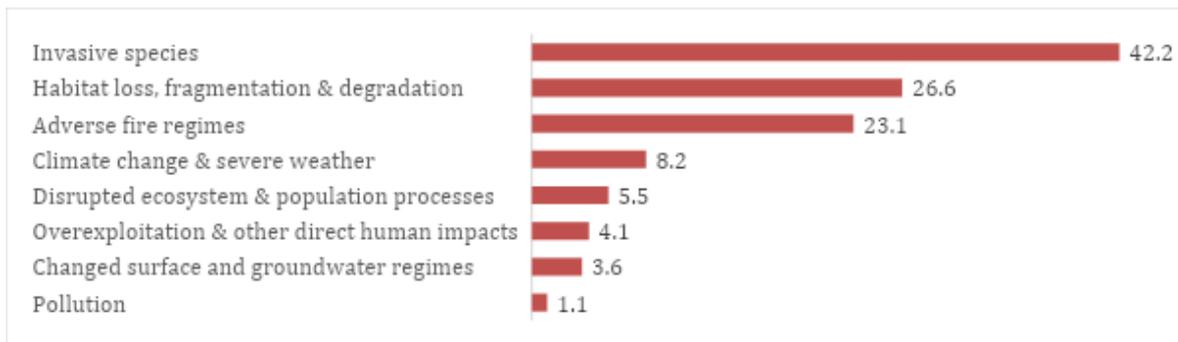


Figure 1. The percentage of EPBC listed threatened taxa impacted to a high or medium degree by each major threat category

While agriculture and industry priorities have had the lion’s share of funding, Research, Development and Extension (RD&E) activities, and support from various funding sources, environmental biosecurity has not been equally prioritised. There have been positive actions in this space, with the establishment of the Environmental Biosecurity Office (EBO) and Chief Environmental Biosecurity Officer (CEBO) role, the National Priority List of Exotic Environmental Pests in the Department of Agriculture, Fisheries and Forestry (DAFF). However, these initiatives are still underfunded and understaffed to adequately perform their functions effectively, let alone strengthen prevention and preparedness into the future. It is timely that the Government has committed to implementing long-term, sustainable funding for biosecurity.

As stated in the IGAB review, “Environmental considerations should be comparable to human health and primary production with respect to biosecurity, and comprehensive national arrangements need to be explicitly developed (pre-border, at the border and post-border) to address environmental biosecurity risks.” Environmental biosecurity is worth this investment. While the systems that are established to protect agriculture and the environment are shared (risk assessment, response, surveillance, diagnostics, R&D and legislation), it is the priorities and practices for the environment that are not understood or adequately resourced. All Australians, including our industries, are direct beneficiaries of a strong environmental biosecurity system.

The budget must also allocate funding to address the critical threats to nature, such as feral deer and horses, and ongoing eradication activities such as Red Imported Fire Ant and Yellow Crazy Ants in Queensland. Invasives such as these pose devastating risk to Australia’s listed natural, historic and Indigenous places of outstanding significance to the nation.

Funding is needed to meet commitments

The budget priorities outlined in this submission are relevant to many of the current Government’s programs and commitments. These include the recent **zero new extinctions pledge**, the ongoing funding for a **national landcare program, sustainable biosecurity funding** initiative, **Agriculture 2030**, the **National Biosecurity Strategy 2023-2032**, and implementation of findings from reports such as the **State of the Environment Report 2021**, the review of the **Intergovernmental Agreement on Biosecurity (IGAB)**, and international obligations for protection of Australia’s nationally significant places. This includes RAMSAR wetlands, migratory species, and the UN’s Global Biodiversity framework and **Convention on Biological Diversity**. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) report is also expected to be released in 2023.

Through these budget allocations, Australia will be on the front foot to respond to the threats that will be outlined within this report.

It is positive to see the commitment of the Government to funding stronger biosecurity, with the Agriculture Minister's announcement of a \$134 million investment as a "first step".

The detailed funding priorities and subsequent recommendations in this document are intended to serve as a list of priority actions that should be part of a budget package to prevent future invasions, and tackle the impacts of invasive species in Australia. These priorities will contribute to the zero extinctions commitment of the Government. Agencies that are intended to provide national leadership and coordination are underfunded and understaffed, and the level of funding for on-ground action is paltry in comparison to preparedness for industry priorities (such as foot-and-mouth disease). Nature needs more. Australia has had a decade of underfunding for environmental outcomes, and a rapid increase of funding is urgently required if we are to tackle these threats to nature.

Detailed Funding Priorities

1. Support sustainable biosecurity funding

The Australian Government has committed to implementing long-term, sustainable funding for biosecurity. It is also one of the priorities of the National Biosecurity Strategy, endorsed in July 2022 by federal and state/territory agricultural ministers.

The Invasive Species Council strongly endorses the need for substantially and sustainably boosting funding for the biosecurity system – as do other biosecurity participants – so that Australia can more effectively keep out harmful new species, eradicate harmful new arrivals and effectively manage major invasive threats to the environment, economy and human health.

To inform the investigation of funding options, it is important to estimate the future funding needed for Australia to achieve the Appropriate Level of Protection (ALOP), the new invasive alien species target under the Convention on Biological Diversity and the Australian Government's commitment to no new extinctions. It is also important to consider the funding needs for the entire biosecurity system, from pre-border to post-border, for federal and state/territory responsibilities.

As the 2017 review of the Inter-Governmental Agreement on Biosecurity (IGAB) concluded, one of the highest priorities for increased funding should be environmental biosecurity. Although progress has been made on strengthening environmental biosecurity since that review, there are still major gaps (see section 3 - Prevent new invaders). Additional funding is needed for essential work such as risk assessments, contingency planning and surveillance for high priority invasive risks for the environment.

The industry sectors in biosecurity have the benefit not only of a stronger historical focus on their priorities, but the commercial incentive to contribute to biosecurity, as exemplified by industry levies and contributions for research and Animal Health Australia and Plant Health Australia. But, as governments acknowledge, the environmental priorities need to be funded as a public good.

To enable environmental priorities to be more adequately addressed, and match the well supported industry mechanisms, we recommend an additional \$50 million a year be dedicated to environmental priorities within the federal biosecurity portfolio.

We strongly encourage the Australian Government to explore all options for sustainable funding. We support many of the potential mechanisms listed in *"Sustainable funding and investment to strengthen biosecurity: discussion paper"* released by the Department of Agriculture in November 2022 – in particular risk creator options such as the container levy proposed in 2018, which was supported by most biosecurity stakeholders. Had this levy been implemented, it would have raised an additional \$325 million over 3 years for biosecurity – almost the level of funding we propose in this submission. Further investigation into high risk pathways (such as exotic pets and live fish) in considering risk related mechanisms would also have merit. These pathways incur greater administrative costs to monitor and enforce compliance, and greater potential environmental costs if invasive species enter the environment.

Recommendations

- Increase funding dedicated to environmental biosecurity functions by at least \$50 million a year.
- Comprehensively investigate all potential sustainable funding mechanisms for biosecurity and ensure that a substantial proportion of new funding is allocated to environmental priorities.
- Focus the investigation of funding options across the entire biosecurity spectrum, including the functions administered by state/territory governments.
- Proceed as a first step with the container levy proposal of 2018.

2. Tackling priority threats to nature from invasive species

Avert extinctions and protect precious places

To achieve the Australian Government's much-applauded commitment to 'no new extinctions' will require significant new funding for tackling invasive species threats to nature.

Invasive species have been by far the major cause of animal extinctions in Australia, primarily responsible for at least 42 acknowledged extinctions (about three-quarters of the total), including 5 of the 6 recorded since 2000. Recent studies under the National Environmental Science Program have identified another 100 or so species on the edge of extinction with a >50% likelihood of extinction within the next 20 years.

The Australian Government has allocated almost \$150 million over 4 years to the Established Pest Animals and Weeds Measure. This needs to be at least doubled in the short term if Australia is to avoid many more extinctions and an ever-growing list of threatened species (in addition to other measures). Funding should also be directed towards on-ground threat abatement through the Australian Government's Natural Heritage Trust Special Account and National Landcare Program.

Increased funding to better manage invasive species threats will also be necessary for Australia to meet its obligation under the United Nations Convention on Biological Diversity, which includes the requirement to 'eradicate or control invasive alien species on islands and other priority sites'. More funding is needed for Australia to better meet its obligations to protect world heritage areas, Ramsar wetlands and nationally significant places as well as prepare and implement threat abatement plans and the Threatened Species Action Plan.

Given the importance of indigenous lands for biodiversity and Indigenous rangers as land managers, we recommend that funding for the Indigenous ranger program be boosted to increase support for management of priority invasive threats.

Australia's plans and strategies for tackling invasive species have often failed due to a lack of national coordination and leadership. The need for this has been recognised with the appointment of national coordinators for action plans for feral pigs, feral deer and feral cats and foxes. We recommend the appointment of 10 additional coordinators to lead national efforts to tackle priority environmental threats. The focus could be particular invasive species or species groups (such as invasive fish, invasive ants, invasive pasture grasses, plant diseases and chytrid fungus) or particular habitat types (such as the Australian Alps and native forests). A transparent prioritisation process is needed to determine these priorities.

To underpin management of invasive species and other threats to nature, Australia needs a modern, harmonised national information and data sharing system. Different agencies currently use different platforms and standards. Priorities include enhancing the Atlas of Living Australia database and the system for invasive species data, the establishment of an Aus Pest Check database or equivalent for compiling information about environmental invasive species, citizen science grants to support data collection and surveillance capacity and a national communications campaign about environmental invasive species to enhance the awareness in the public.

Recommendations:

DAFF Portfolio:

- \$120 million in grants to be matched with funding from state and territories from DAFF Established Pests and Weeds Budget.

DCCEEW Portfolio:

- \$32 million in grants to NRM groups, Landcare groups and private land conservation groups for management of invasive threats to priority places and to protect species that are priorities under the Threatened Species Action Plan.
- \$24 million grants to Indigenous ranger groups for management of their priority invasive species threats.
- \$8 million for 10 additional national coordinator roles focussed on key environmental invasive threats.
- \$60 million to modernise, harmonise and improve national information and data sharing.

Key Threatening Processes - funding for DCCEEW

It is a high priority to adequately resource DCCEEW to prepare threat abatement plans for all high priority invasive species threats.

Threat listing and prioritisation is the first stage of the process, with identification of Key Threatening Processes (KTPs) comprehensively completed and listed under the EPBC Act. There has been moderate progress in this area relating to invasive species. Unfortunately, the listing of key invasive threats is not yet comprehensive. The all-encompassing “novel biota” KTP, while convenient to use for multiple invasive species, currently does not lead to any abatement actions. Highly invasive species including exotic fish, most invasive ungulates, myrtle rust, several ant species, and many highly invasive plant species are not listed as KTPs. Additionally, no assessments of invasive KTPs have been initiated since 2008, despite several being nominated.

A high priority is therefore to systematically and comprehensively assess and list the critical high priority invasive threats as key threatening processes, including at a taxa-specific level. All industry action plans have coordinators and national task forces, and this model should be applied to environmental plans.

There has been similarly limited progress on the development of threat abatement or action plans. Unlike invasive species affecting agriculture, there remains a lack of national or action plans to address ongoing risks and damaging threats to the environment. To date, only ten TAPs have been prepared for invasive species.

Recommendation:

- \$22 million for the development and implementation of priority invasive species Threat Abatement Plans, including
 - Adequately fund DCCEEW to rapidly progress the assessment and listing of critical invasive threats as KTPs
 - Finalise the Myrtle Rust action plan, as this disease spreads from East to West

- Provide \$100,000 to support the operation of the Feral Cat Taskforce and the Domestic Cat Working Group.

Stop degradation by feral deer and feral horses

Two of Australia's most precious and popular places, for which the Australian Government has some statutory responsibilities, are at risk of being trashed by large invasive hard-hoofed animals – feral horses are proliferating in the national-heritage-listed Australian Alps and feral deer are invading the Tasmanian Wilderness World Heritage Area. Protecting these places should be a high national priority.

The Australian Alps are a priority place under Threatened Species Action Plan yet are under threat from hard-hoofed invaders such as feral horses and feral deer. There are now estimated to be more than 18,000 feral horses in the national heritage listed Kosciuszko National Park. Feral horses imperil more than 30 threatened species in the alps and their population continues to expand. The Environment Minister listed the mountain skink as an endangered species in 2022. One of the direct threats to this species has been identified as the growing number of feral horses.

Feral deer in Tasmania have been rapidly increasing in numbers and distribution. The costs are both environmental and economic, with the damage to agriculture, forestry and tourism likely to be costing up to \$100 million a year. Deer are also becoming a serious hazard for motorists. In addition to the Tasmanian Wilderness World Heritage Area, deer have invaded Bruny Island, one of the priority places to be protected under the 2022–2032 Threatened Species Action Plan.

Across much of south-eastern Australia, feral deer are emerging as one of the most serious threats to the environment and agricultural businesses. The recently prepared National Feral Deer Action Plan now needs to be implemented to prevent the spread of feral deer into new areas and reduce the impacts on primary production, communities and the environment.

Recommendations

- Commit \$28 million to the implementation of the national deer action plan
- Protect Tasmania from feral deer through the allocation of an additional \$0.85 million for (a) eradication in the Tasmanian Wilderness World Heritage Area (\$0.4 million), eradication on Bruny Island (\$0.4 million) and control in the Midlands (\$0.3 million).
- Provide \$18 million for the control and management of feral horses in the Australian Alps

A national islands recovery program

A Senate inquiry into environmental biosecurity in 2015 recommended that the federal government work with states and territories to establish a national framework for managing biosecurity on Australia's islands. There have been great successes to date in eradicating pests and weeds from some Australian Islands. More work is needed on K'Gari (Fraser Island), with an Indigenous focus, while bushfire recovery on kangaroo island continues to be challenging with species losses still to be understood. Australian Governments have shown the willingness to invest in our unique and sensitive islands, however a nationally coordinated effort is required to prioritise and support the expansion of these initiatives to achieve an Australia wide island recovery program. The Macquarie Island Eradication Program achieved successful eradication of rats, mice and rabbits with a

commitment of \$24 million (in 2007) of matched federal and state and territory funding. With more ambition and a National program, Australia can lead the world in island ecosystem protection. This funding ask will require both DCCEEW and DAFF to work together to achieve and would therefore need to be allocated to both portfolios.

Restore Australia's islands and create havens for threatened species

Islands are special places for biodiversity – crucibles for the evolution of unique species. But island species have proven to be highly susceptible to extinction from invasive species. Having evolved with fewer competitors, predators and parasites than species on continents, they often have poor defences against invaders. Although islands, excluding Tasmania, comprise less than 0.5% of Australia's land area, island species have accounted for almost a quarter of Australia's extinctions.

Islands often also offer excellent opportunities to recover threatened species because of the potential to eradicate invasive species. The likes of cats, foxes, rats, pigs and goats cannot be eradicated from the mainland with available methods but it is feasible on islands. Australia has been a global leader in island eradications and achieved some outstanding successes. The Lord Howe Island weed eradication program showed success and this must be continued, to complement the rodent eradication efforts and respond to recent regrowth.

A striking example of the benefits of island eradications is Macquarie Island. Until recently, globally important seabird populations and unique sub-Antarctic ecosystems were being destroyed on Macquarie by feral cats, rabbits, ship rats and house mice. Since completion of the eradication program in 2014, populations of several threatened bird species have either stabilised or recovered.

Recommendation

- Establish a national islands recovery program with \$32 million a year matched by state and territory funding.
- \$3 million over 4 years with matched state funding for the Lord Howe Weed Eradication Program

Gamba Grass

The Government has committed to fund \$9.8 million in the Northern Territory to control the spread of Gamba grass, a species that outcompetes pasture grasses and significantly raises bushfire risks. We support this commitment and encourage further investment to control and minimise the impact of this key threat to the Northern Australian environment.

3. Preventing new invaders

Increase the capacity of the Environmental Biosecurity Office

Environmental biosecurity benefits and affects all Australians. From enjoying our natural heritage through activities such as bushwalking, fishing and tourism, Australians rely on strong environmental biosecurity to maintain the ability to enjoy these activities. We all know the negative impact that invasive species can have on our unique and beautiful environment. Carp in rivers, die-back of forests, losses of birds from predators have unfortunately all occurred and will only get worse unless our biosecurity system strengthens the focus and attention the environmental side requires.

One major biosecurity advance in recent times has been the 2018 appointment of the Chief Environmental Biosecurity Officer. This came about after recognition in several reviews and inquiries – the 2008 Beale review, 2009 Hawke review of the EPBC Act, the 2015 senate report on environmental biosecurity and the 2017 Craik review of the Intergovernmental Agreement on Biosecurity – that work in environmental biosecurity has long lagged behind that for industry and warrants a specific focus.

The Chief Environmental Biosecurity Officer has provided much needed leadership and coordination and considerable progress has been made. But there are still major gaps in environmental biosecurity and the current level of resources are insufficient to address high priority needs. The environmental biosecurity office is understaffed and under-resourced.

Although the biosecurity arrangements for industry are more mature than those for the environment, having been in place for many years more, far more resources continue to be dedicated to industry priorities than to environmental priorities. The environmental biosecurity office has up to 10 FTE staff (but currently only 6) while the offices and bodies focussed primarily on industry priorities have several times more staff – Animal Health Australia (28 staff), Plant Health Australia (32 staff), and the offices of the Chief Plant Protection Officer and Chief Veterinary Officer (unknown staff numbers).

A high funding priority should be to expand the core staff in the Office of Environmental Biosecurity to enable the fundamental work needed to prepare for, and respond to, established and emerging biosecurity risks. Some of these priorities are explained in the following sections.

Recommendations:

- Allocate \$7 million a year to increase staff numbers in the Office of Environmental Biosecurity:
 - 8 additional permanent FTE staff to undertake core functions, including:
 - management of the National Priority List of Exotic Environmental Pests, Weeds and Diseases (EEPL) and implementation of the EPPL plan
 - national outreach and communication
 - increased support for the work of the Environment and Invasives Committee
 - contingency planning and development of surveillance programs for priority environmental risks

- 12 temporary FTE staff (contractors at APS6, \$3.6m over 4 years) or experts contracted from CSIRO, universities, state agencies or other bodies, to undertake risk assessments for priority environmental risks.

Reduce the risk of new environmental invasions

One major advance in environmental biosecurity has been the recent development of the first priority list of species for the environment: the *National Priority List of Exotic Environmental Pests, Weeds and Diseases* (EEPL). It is only a partial list of high-risk potential invaders (although the listed species are intended to functionally represent many other species), and should be maintained as a live list to update as new information and analyses become available.

Major gaps in EEPL priorities include plant pathogens and species already in Australia but not naturalised (e.g. animals in the pet trade, plants in the nursery trade, and plant and animal pathogens in pets and domestic animals). As demonstrated by the recent arrival of myrtle rust, which has already rendered 16 endemic plant species close to extinction, Australia is at high risk of new fungal invaders, which should be a high priority for prevention. The highest-risk category for imminent new invaders consists of species already in the country and permitted for domestic trade and keeping – particularly plants in the nursery trade and exotic pets including aquarium fish. The current EEPL contains only a couple of species in this category. The highest-risk ‘imminent invaders’ should be identified and a national strategy developed to mitigate the risks of avoidable invasions.

One of the highest priorities for the Office of Environmental Biosecurity is to finalise and implement the draft EEPL implementation plan (released for consultation in 2021). Full implementation will be required to achieve Australia’s ALOP. Among the high-priority tasks are gap analysis to identify capability deficiencies for managing EEPL risks, full environmental risk assessments of higher risk EEPL species, high-risk pathway analyses, *incorporation of environmental priorities into country of action lists*, contingency planning and surveillance programs.

Other high priorities are to fully implement existing prevention-focused plans – particularly the recently developed *National Hitchhiker (Contaminating) Plant Pest Action Plan 2022–2032*, the *National Invasive Ant Biosecurity Plan 2018-2028* and the *Environmental Risk Mitigation Plan for Acacia 2021*.

Conduct surveillance for high-risk potential invaders

A major gap in environmental biosecurity is the lack of a surveillance strategy (in contrast to multiple such plans and strategies for industry) and surveillance programs for high-risk species. Harnessing the observational powers of the community is an essential and highly cost-effective component of environmental surveillance. It has been estimated that a \$1 million investment in public engagement for the eradication program for red fire ants saved \$60 million in active surveillance costs between 2006 and 2010.³ To facilitate broader community participation in line with the Government’s National Biosecurity Strategy, we propose the establishment of a Community Surveillance Coordinator role, which would be most effective if hosted external to government, with strong academic links, and including a focus on rural communities and partnerships with Indigenous rangers (many of whom are already engaged in biosecurity).

³ <https://link.springer.com/article/10.1007/s10530-016-1362-4>

An additional priority is to increase funding for the Environmental Biosecurity Project Fund, currently set at just \$0.85 million a year. There have been some valuable projects funded so far, and can be viewed on DAFF's website⁴.

Recommendations

- Allocate \$0.4 million for Community Surveillance coordinator role for \$0.4 million a year (salary at EL2 level, plus travel and event expenses, and Indigenous partnerships programs)
- Allocate \$8 million over 4 years to the Environmental Biosecurity Project Fund (as part of an \$80 million fund for environmental biosecurity research and innovation priority - see next section).
- Ensure the capacity of the Office of Environmental Biosecurity is sufficient to develop and implement high-priority plans to strengthen environmental biosecurity, including tasks under the EEPL implementation plan such as risk assessments, contingency planning and surveillance programs.

Eradicate new high-risk invaders

The costs of eradication are high, but always a positive return on investment and vastly less costly than compared to inaction or transition to management. Australia is currently committed to eradicating the invasive Red Imported Fire Ant, and Yellow Crazy Ant. It is critical to maintain the momentum that has started for eradication programs already underway, and vital that these ongoing programs are maintained and funded to the level they require or risk losing valuable, hard won ground.

Red Imported Fire Ants

The Government must continue to support the ongoing Red Imported Fire Ant eradication in line with the upcoming review of the program in 2023. This eradication will need whatever increased funding level is required in order to be successful. Since this program is continuing and there are no signs of jurisdictions or the Commonwealth government withdrawing support, the funding asked for in this submission is to be considered separate from this eradication program. The Australian Government must maintain its strong commitment to this program.

Yellow Crazy Ants

It is very positive that the Australian Government has recognised the importance of eradicating this invasive ant from the Queensland tropics. We support the roll out of the committed \$27.6 million to support the eradication efforts. It will be critical to continue efforts after eradication is successful on a regional level. This serious pest will require ongoing surveillance and rapid response in place.

⁴ DAFF - Environmental Biosecurity Project Fund - funded projects
https://www.agriculture.gov.au/biosecurity-trade/policy/environmental/projects#_20202021

Deadly ant invasions

The ongoing cost of eradication

In February 2001, a Brisbane resident reported painful stinging ants in her garden. A taxonomist identified them as dreaded Red Imported Fire Ant.

The Queensland Government declared a biosecurity emergency. They found 2 well-established populations – at the Brisbane port and in Brisbane's south-western suburbs – dispersed over some 36,000 hectares.



Newspaper reports warned of ecological, social and economic disaster; that even Australian way of life was at risk. People in the US could not even enjoy bare-foot picnic from fear of the painful stings.

Australia's governments decided to jointly fund eradication of red fire ants, with half the \$123 million budget (about \$200 million in 2021 terms) over 5 years to be paid by the federal government and the rest by the states and territories that were or could be affected. The ongoing eradication is a 10 year commitment by states and territories and the Commonwealth governments.

Sadly, due to early successes in eradication, part of the infested area remained. Funding had been prematurely reduced, and new incursions led to several new populations spreading.

Now, more than 20 years later, Australia is still striving to eliminate red fire ants. Some success has continued, but the biggest population, now covers 400,000 hectares across south-east Queensland. Eradication over such a large area, across a wide variety of ecosystems is very challenging. But it is less than 0.5% of the area likely to have been invaded if eradication had not been started. This experience has taught Australia many lessons, and eradications of other invasive ants have benefited and been far more successful.

Australia's governments have shown their preparedness to make decisions in the long-term public interest. The overall program cost is likely to exceed \$1 billion (2021 dollars), but this is a minor proportion of the costs that would result from permanent establishment of fire ants. The cost benefit is likely to be more than 25:1. The annual cost of impacts and control in the US is about \$US7 billion a year.

Finally, environmental biosecurity requires transparency and reporting to understand how to properly resource it into the future. Biosecurity agencies have not been able to provide this information, and without understanding the historical and current resourcing that is being dedicated to the environmental outcomes rather than broader biosecurity functions, it is challenging to determine what is needed to strengthen it. Currently, ISC is working to complete the first State of Environmental Biosecurity Report to answer these questions. Unfortunately, due to lack of data and lack of transparency around the data, it is difficult to accurately represent current spending and resourcing efforts by Australian government agencies. To resolve this, we propose commissioning the Australian National Audit Office (ANAO) to perform an audit of historical and current economic, staffing, and program allocations dedicated to environmental biosecurity outcomes. Complementing this, a Productivity Commission inquiry into the economic and environmental benefits of Australia's biosecurity system and prevention and early, effectively targeted action on addressing invasive species. These two complementary activities will inform a long term and sustainable resourcing approach with the enhanced clarity and baseline required to strengthen Australia's biosecurity system, to prevent deadly invasive species from damaging our environment. Alternatively, this resourcing could be directed into an Environment Protection Agency proposed as part of the Government's commitments to reform environmental laws and systems in 2023.

4. Enhancing Research Development, Innovation and Extension

History shows that Australia can overcome big problems through research and innovation – evidenced by the fact Australia once led the world in biological control – epitomised by the moth that beat back prickly pear and the viruses that keep rabbits from eating the land bare. Innovation is needed to deal with the most difficult problems, and to foster this, long-term grants for promising ideas are needed. A proportion of biosecurity research funding – we suggest at least 20% – should be dedicated to cracking the biggest challenges of environmental biosecurity. Long-term research efforts are needed to solve Australia's biggest invasion problems. This will be highly cost-effective because their impacts are so environmentally and economically costly.

Australia's first 5-year research plan in environmental biosecurity expired in 2019 without having been implemented. A new 5-year plan – the *National Environment and Community Biosecurity Research, Development and Extension Strategy 2021–26* – has been developed but half-way through the implementation period there has been no funding commitment for implementation.

In the absence of an implementation plan, high-priority foci that warrant immediate funding include:

- development of more-effective and human control methods for invasive vertebrate animals
- assessment of fungi and other pathogen risks for Australian native plants
- biocontrol programs for nationally significant invasive plants and animals (where feasible)
- maintenance and expansion of validated reference collections for biosecurity risk groups in Australia's national biological collections (CSIRO, state and territory museums and herbaria) to enhance Australia's capacity for rapid identification of exotic species
- improved diagnostics for environmental pathogens and other invasive organisms.

These programs would also be of great benefit to industry. An expanded research focus on cross-cutting innovation in molecular diagnostics, robotics, artificial intelligence (AI) surveillance, detection and data analytics and the application of new technologies for environmental priorities should also be a high priority that will enable much more cost-effective biosecurity in future.

Cross cutting innovation around molecular diagnostics, robotics, AI surveillance, detection and data analytics are all critical to the future of biosecurity management in Australia. Unfortunately, development of these have become plant, animal or even crop and species siloed. A modernised RD&E funding program needs to connect these cross cutting priorities to achieve outcomes for the environment. A national coordinator role is required to provide national and cross-sectoral coordination of Research Development and Extension activities.

Significant investment is also urgently required to enhance Australia's capacity for rapid identification of exotic species including the maintenance of validated reference collections for biosecurity risk groups in Australia's national biological collections (CSIRO, state and territory museums and herbaria).

Recommendations

- Allocate \$20 million over 5 years to continue existing research projects, including those under the current remit of the Centre for Invasive Species Solutions.
- Invest \$80 million over 5 years in high priority environmental research and innovation, including
 - implementation of the National Environment and Community Biosecurity Research, Development and Extension Strategy (NECBRDES)
 - development of more-effective and human control methods for invasive vertebrate animals
 - assessment of fungi and other pathogen risks for Australian native plants
 - biocontrol programs for nationally significant invasive plants and animals (where feasible)
 - maintenance and expansion of validated reference collections for biosecurity risk groups in Australia's national biological collections
 - Invest in rapid identification research for environmental pests and diseases, and rejuvenate Australia's ageing reference collections
 - expand the Environmental Biosecurity Project Fund from a mere \$850,000 to \$8 million over four years - kept within the EBO in DAFF.
 - Allocate \$0.4 million for a Research, Development and Extension coordinator role (salary at EL2 level plus travel and event expenses)