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Submission on Environmental Biosecurity: The adequacy of arrangements to prevent entry and establishment of species likely to harm Australia's natural environment

The Wet Tropics Management Authority thanks the Senate Standing Committees on Environment and Communications for an opportunity to make a submission on environmental biosecurity issues in Australia. The Authority's submission covers the following major points:

- The Wet Tropics World Heritage Area contains globally significant biodiversity and ecosystem processes that are under increasing threat from a range of invasive species. These threats may also be exacerbated by climate change.
- Biosecurity in Australia should better incorporate the impacts of invasive species on the environment and give them equal consideration to the impacts on agriculture and human health. Environmental impacts often overlap with agricultural and socioeconomic impacts.
- The varied jurisdictions and responsibilities for biosecurity prevention (pre-border) and management (post-border) can create a lack of effective coordination of biosecurity management and lead to shifting of costs and responsibilities down the chain.
- Biosecurity management should foster a local and regional focus to better protect areas like the Wet Tropics World Heritage Area, rather than management and decision-making being based on ability to eradicate invasive species across Australia or individual states.
- The costs of prevention and early detection and eradication are far less than the subsequent costs for control or containment and the costs to the environment. Contingency plans and availability of additional resources early on can save a lot of money and minimise impacts in the long run. There are some examples where prompt responses and adequate funding have shown positive results for pest prevention and eradication.
- It is very important to target potentially invasive species already identified in areas close to our borders. It is equally important to manage the many potentially invasive species which are already here in Australia as small outbreaks or sleepers.
- High quality research, corporate knowledge, detection and eradication capacity, and community education are all vital for effectively managing the spread of invasive species.

A detailed submission is attached below.

Yours sincerely

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The Wet Tropics World Heritage Area

The Wet Tropics bioregion has Australia's greatest diversity of animals and plants within an area of just 0.26% of the continent. Many plant and animal species in the Wet Tropics are found nowhere else in the world (they are endemic to the area). The diverse vegetation communities are habitat to numerous rare and threatened species. The Wet Tropics has the oldest continuously surviving tropical rainforests on earth. In 2013 a scientific study by an international team of scientists¹ identified the most irreplaceable places on the planet when it comes to protecting biodiversity and preventing extinctions of the world's mammals, birds and amphibians. The Wet Tropics of Queensland World Heritage Area ranked sixth overall in global irreplaceability on the basis of all species and eighth on the basis of threatened species. With respect to World Heritage properties, the Wet Tropics ranked as the second most irreplaceable natural World Heritage site. The study stated that irreplaceability was an important aspect of the Outstanding Universal Value of World Heritage properties.

A hotspot for invasive species

The Authority contends that the threat of invasive species to areas of environmental significance such as the Wet Tropics should be a particular focus for biosecurity in Australia. The Wet Tropics is a hotspot for newly invasive species and its unique and specialised flora and fauna are particularly susceptible to invasive species. The Wet Tropics is a hotspot for newly invasive species for a range of reasons. It is close to West Papua and Papua New Guinea, a major source of new invasive species. It has an international port and airport (yellow crazy ants are known to have arrived in shipping containers). The Wet Tropics has a very favourable growing season most of the year and a range of favourable habitats. There are numerous specialised tropical plant importers in the region. Tropical cyclones have also contributed to the spread of weeds in recent years and made eradication efforts difficult.

There are already over 500 weeds which are naturalised within the Wet Tropics region and the numbers of new weed species have increased more rapidly in recent times. Many of the species on the Northern Australia Quarantine Strategy (NAQS) target list have now arrived in the Wet Tropics and are becoming established in the region. Recent arrivals include a range of weeds which are known to invade and take over intact tropical ecosystems. They include several miconia species, siam weed, limncharis, clidemia and mikania to name a few. Diseases that have potential to threaten Wet Tropics ecosystems include the phytophthora root fungus, frog chytrid fungus (believed to have caused some upland frog extinctions) and the recently arrived myrtle rust. Many feral animals in the Wet Tropics are in common with those found throughout Queensland and northern Australia including feral pigs, dogs, deer, cane toads and cats. However, the yellow crazy ant, electric ant and Asian honey bee have been discovered in the Wet Tropics since 2000 and can pose a major threat to the environment, agriculture and people's quality of life. Tilapia have spread rapidly since their introduction in 1989 and, unfortunately, are still being deliberately spread into additional Wet Tropics waterways.

The Wet Tropics Periodic Report (2011)² identifies invasive terrestrial and freshwater species as significant factors which negatively affect the Outstanding Universal Value of the World Heritage Area. The periodic report is submitted to the Australian Government to become part of an overall

¹ Bertzky, B., Shi, Y., Hughes, A., Engels, B., Ali, M.K. and Badman, T. (2013), Terrestrial Biodiversity and the World Heritage List: Identifying broad gaps and potential candidate sites for inclusion in the natural World Heritage network. IUCN, Gland, Switzerland and UNEP-WCMC, Cambridge, UK. xiv + 70pp.

² Periodic Report for the Wet Tropics of Queensland (2011), <http://www.wettropics.gov.au/periodic-reports>

report to UNESCO on the governance and state of Australian World Heritage properties. As such, effective management of invasive species in the World Heritage Area fulfils the Australian Government's commitments under the World Heritage Convention. The State of the Wet Tropics Report (2011), tabled in the Australian and Queensland Parliaments, focuses on major biosecurity issues and impacts in the Wet Tropics³.

The Authority argues below that some of these recently arrived weeds, feral animals and diseases could perhaps have been prevented, delayed or eradicated with more adequate resources and prompt responses. In some cases, decisions on funding and resources for invasive species detected in the Wet Tropics have been based on statewide criteria with insufficient consideration for local environmental values, impacts and circumstances.

Climate change will exacerbate the impacts of invasive species

It is important to note that climate change is considered as an important driver of increased vulnerability to pest invasion and changing risk profiles of introduced species⁴. Climate change will significantly increase the potential for weed and pest invasions in the Wet Tropics and decrease the resilience of Wet Tropics ecosystems. These changes will render many current and past assessments inadequate. There is an urgent need to update risk assessments to better account for how future climate will affect the invasive potential of introduced species. These should include modelling of suitable habitat for invasive weeds and consideration of disruption to ecosystem function, changes to weather and rainfall patterns, and the potential for more intense cyclones and more severe droughts.

Environmental impacts are everyone's business

While some environmental impacts may seem relatively insignificant to society at large, particularly in the initial stages of infestations, many will have significant socioeconomic impacts as infestations spread and may affect agriculture and people's quality of life. The Wet Tropics World Heritage Area and surrounding environment is a vital asset to the local community. Invasive species have the potential to disrupt and devalue a range of ecosystem services as well as people's ability to enjoy the World Heritage Area. For example, weeds such as the four tropical weeds (discussed below as a successful eradication model) can affect agriculture as much as the environment and cause significant costs to farmers. Feral pigs cause both environmental damage and crop damage. Most pig trapping in the Wet Tropics occurs in areas where feral pigs range between forests and farmlands. Myrtle rust has the capacity to affect a broad range of eucalypts, melaleucas and other myrtaceous species in the wild, domestic gardens and nurseries. There is also the potential for a range of wildlife diseases to have impacts on human health.

The yellow crazy ant infestation in the Cairns area is a recent example of an environmental pest which can have huge social and economic impacts. The infestation has now spread from suburbia into over 30 hectares of the rugged terrain of the Wet Tropics World Heritage Area. As well as devastating the local ecology and killing all other animal species within the infested area, yellow crazy ants affect people's quality of life and their ability to enjoy their property and surrounds with family, friends and pets. Crazy ant infestations will lower land values and deter new business and

³ Wet Tropics Management Authority (2011), State of the Wet Tropics 2010-2011: Biosecurity Theme Report, <http://www.wettropics.gov.au/annual-reports>.

⁴ Wet Tropics Management Authority (2008), State of the Wet Tropics 2007-2008: Climate Change in the Wet Tropics – Impacts and Responses, <http://www.wettropics.gov.au/annual-reports>

social investment in infested areas. Tourism is also likely to be affected if the crazy ants infest local visitor sites.

Biosecurity management structures, policies and funding must incorporate environmental impacts

A number of submissions to the Beale Review⁵ in 2008 stated that *'Australia has a relatively poor knowledge of the biosecurity threats to its natural environment. This is largely a function of the absence of commercial incentives to research and monitor environmental pests and diseases. As a result, the principal responsibility for biosecurity research as it relates to the natural environment lies with governments and the community. These activities have not received a high priority for funding. Unlike incursions that impact on primary production, where active engagement by business is motivated by self-protection, the effort required to respond to an incursion affecting the environment must be provided primarily by governments.'*

Recommendation 26 of the report stated that *'the membership of Animal Health Australia and Plant Health Australia should be broadened to encompass environmental pest and disease issues including those affecting the aquatic and terrestrial environments.'* The Authority notes that the Invasive Species Council and others have gone further and recommended the establishment of Environment Health Australia as a third body dedicated to national biosecurity to ensure there is no conflict of interest between the needs of agriculture and industry and those of the environment.

Similarly, Burgman et al (2009)⁶ have argued that *'increasing threats from invasive pests, diseases and pathogens, salinity, changed climate and disturbance regimes require new legal responses which should embrace a more cohesive legal framework together with ecosystem thinking that supplements list-based, species-focused legislation.'* They state that *'the list-based translation of conventional science into regulation creates a tendency towards 'patches' of protection of scientific icons, within a landscape of continuing degradation. This trajectory is not likely to result in the type of resilient landscapes that are needed to achieve national policy goals. We have to alter the legal instruments to place greater emphasis on the protection and enhancement of substantial ecosystems, their processes and services.'*

The Australian Government's update on biosecurity reform⁷ in 2012 makes a point of addressing a range of reforms to create a risk-based approach and a biosecurity continuum, but gives little emphasis to environmental pests beyond the general preamble. The strongest statement is that the *'National Environmental Biosecurity Response Agreement, as the first deliverable of the Intergovernmental Agreement on Biosecurity, aims to significantly strengthen Australia's biosecurity system by establishing national arrangements for responses to nationally significant biosecurity incidents where there are predominantly public benefits.'*

The Wet Tropics Management Authority supports the concept of a stand-alone environmental biosecurity body to work alongside the established Plant Health Australia and Animal Health Australia. This body should be appropriately resourced and empowered to focus on public-good environmental values. It should provide a long term ecological perspective and the application of

⁵ Beale et al (2008), One Biosecurity, A Working Partnership: The independent review of Australia's quarantine and biosecurity arrangements report to the Australian Government

⁶ Burgman et al (2009), Designing regulation for conservation and biosecurity, The Australasian Journal of Natural Resources Law and Policy, Vol 13, No 1.

⁷ Department of Agriculture, Fisheries and Forestry (2012), Reform of Australia's biosecurity system: An update since the publication of One Biosecurity: a working partnership.

the precautionary principle when assessing risks. It is vital to be able to present an expert and holistic perspective where commercial interests may conflict with potential environmental impacts. For instance, many of our worst weeds have been deliberately introduced for horticultural and agricultural purposes and the interests of these industries appear to be given greater weight than the impacts on the environment. Some are still actively being promoted for pasture feed or biofuel crops, for instance, without effective consideration of their current or potential weedy impacts.

Another option to incorporate the environment into biosecurity decision-making is to provide a role for the Department of the Environment in biosecurity management and assessment of risk and impacts; and to make better allowance for community consultation and review of decision-making.

We need contingency plans and agreed national lists for invasive species with environmental impacts

While Australia has developed contingency plans for major agricultural pests, we still need a similar set of contingency plans to defend against environmental pests, weeds and diseases. These plans should focus on species or suites of species and the likely pathways for their entry into Australia or spread throughout Australia. For instance, when looking for likely invasive species, the Wet Tropics tends to focus on pantropical weeds and pest animals that are already established in neighbouring countries, along common trade routes or elsewhere in Australia.

While species lists should not be the sole means for identifying and preventing biosecurity risks, they remain a most valuable tool for identifying particular species (or suites of species) of concern. The Authority emphasises the need to harmonise invasive species lists and classes across the country. There remain considerable discrepancies between lists of the Australian, State and Territory governments. This can cause biosecurity issues. For example, weeds that are prohibited in one state may be easily transported or available for sale from elsewhere in the country.

The Authority supports the findings of the Senate report 'Turning back the tide – the invasive species challenge'⁸ which recommended that several national invasive species control classes be developed, with official lists under each, and agreed by the Australian and all state and territory governments. These lists include the:

- National Quarantine List of high-risk invasive species that may or may not have already invaded Australia, and whose early detection will enable cost-effective eradication.
- National Alert List of high-impact invasive species that are naturalised, have a restricted range and whose eradication is feasible and cost-effective.
- National Control List of high-impact invasive species that are naturalised and generally widespread, and whose containment or control will help protect the values of areas of national environmental significance.

Such lists would assist in the early identification and detection of invasive species which threaten the environment and agriculture. They would also promote more effective prevention and management strategies and promote community awareness. It is vital that we learn more about the most common paths for pests arriving in Australia and how they can subsequently move around the country.

⁸ The Senate Environment, Communications, Information technology and the Arts reference Committee (2002), Turning back the tide – the invasive species challenge: Report on the regulation, control and management of invasive species and the Environment Protection and Biodiversity Conservation Amendment (Invasive Species) Bill 2002

Just a few examples of invasive species which imminently threaten the Wet Tropics region are listed below. The example of myrtle rust shows how our biosecurity systems can fail if they are not implemented correctly. Recent reductions in biosecurity personnel and funding, both at the Australian and Queensland levels, will reduce the likelihood of early detection of these and other environmental pests.

Some feral animal pests on our doorstep

The Invasive Animals CRC submission to the Beale review highlighted a few of the animal species which are currently established in nearby Papua New Guinea and would be a significant threat to the nearby Wet Tropics environment and other areas of Australia. They include:

- The Asian black-spined toad (*Duttaphrynus melanostictus*) which has found its way into Australia numerous times but has yet to become established. It would have similar impacts to the cane toad – it has poison glands, eats a broad diet and is a prolific breeder.
- The climbing perch (*Anabas testudineus*) has been recently found on Saibai Island in Torres Strait. It is native to south-east Asia and its use in commercial aquaculture and subsistence fisheries has resulted in it being intentionally moved into Papua New Guinea, where they are now widespread in the south Fly River system and impacting on native fish species.
- The walking catfish (*Clarias batrachus*) is a voracious predatory fish that is native to south-east Asia, where it is used in commercial aquaculture fisheries. It is one of the world's 100 worst alien invasive species. It was first recorded in the southern Fly River system of Papua New Guinea in the early 1990s where it is now widespread.
- Long-tailed macaques (*Macaca fascicularis*) escaped into the environment in Irian Jaya about 50 years ago and are now progressively spreading across the island towards Papua New Guinea, from where they could be carried as pets to Cape York. Monkeys would outcompete some Australian marsupials, such as tree kangaroos and gliders.
- A recently detected insect invader is the erythrina gall wasp (*Quadrastichus erythrinae*) which was found in the Torres Strait islands in 2013. This is an environmental pest that potentially threatens local populations of several species of coral tree.

Some weeds on our doorstep

Two serious environmental weeds that are present in Papua New Guinea, but not yet known to be in Australia, are the spiked pepper (*Piper aduncum*) and sour grass (*Digitaria insularis*). Spiked pepper, in particular, poses a significant threat to ecosystems within the Wet Tropics World Heritage Area. Sour grass has the potential to become invasive across a broad swathe of the northern Australian savannah ecosystems, affecting both the environment and the pastoral industry.

Myrtle rust – a recent arrival with potential for devastating environmental impacts

Contingency plans and response procedures are not sufficient to prevent the introduction of invasive species if they are not implemented effectively.

Myrtle rust (*Puccinia psidii*) is a plant disease with the potential to threaten over 200 myrtaceous plant species in the Wet Tropics, some of which are represented in great abundance (including eucalypts, syzygiums and melaleucas) and some of which are valued for being rare, endemic or endangered. The myrtle rusts were recognised as a serious threat to Australian production forests

and ecosystems in 2006 by the Primary Industries Ministerial Council. It was first detected in Australia in a northern New South Wales nursery in 2010 and is now widespread in eastern Queensland, including the Wet Tropics. The myrtle rust spreads easily through windblown spores and eradication is not considered possible.

The Authority has previously raised its concerns about the introduction of myrtle rust and the apparent failure of biosecurity procedures to adequately consider its environmental impacts with Australian and Queensland Government Ministers in June 2012. The Authority's letter⁹ stated that: *'Indications are that there was a serious failure in Australia's biosecurity system with respect to prevention and response procedures, especially following the initial detection of myrtle rust in New South Wales. In particular, it appears that officials failed to implement the Threat Specific Contingency Plan for the rust, which was prepared by Plant Health Australia. This is despite the fact that the Ministerial Council at its April 2006 meeting noted that the Office of the Chief Plant Protection Officer is leading the process to develop preparedness and prevention strategies across all government through the Plant Health Committee'¹⁰*. The letter also noted that *'in the Plan for Transition to Management of myrtle rust (November 2011) that the National Management Group agreed there was a need for ongoing arrangements for the management of the pathogen and that these arrangements should, focus on mitigating the impact of myrtle rust on the natural environment, including threatened and endangered species ... and its impacts on natural ecosystems'*. However, none of the \$1.5M funds allocated seemed to be for research into environmental impacts.

It should be noted that we only have one strain of myrtle rust in Australia. There are other strains which need to be kept out. Recommendations from the Myrtle Rust – Forest Industry Issues Paper 2011¹¹ emphasise the importance of keeping out new strains of the rust by restricting importation of plant material of the myrtle family and limiting movement of potentially infected myrtaceous plant materials to nurseries.

Saving money through prevention, early detection and eradication

The established principle for dealing with biosecurity threats is that prevention and early detection and eradication are the most effective and economical way to deal with a newly invasive species. In practice they have proved to be the only way to achieve success. Research shows that under many circumstances infestations are no more amenable to containment than to eradication. Converting an eradication program to a containment program is often neither more economic nor more effective¹².

There are several success stories detailed below to prove that early detection and eradication can work. The Authority acknowledges that there are also cases where any action was unlikely to prevent an invasive species becoming established once it had arrived. However, some action can often help to slow down the spread and impacts of the invasive species and allow initial research to try and learn more about the particular invasive species and develop effective control measures.

⁹ Letter from Peter Valentine, Chair WTMA Board to Senator Joe Ludwig and cc'd to other Ministers, 25 June 2012.

¹⁰ Myrtle Rust – Forest Industry Issues Paper June 2011 and 'Myrtle Rust arrival in Australia – a major threat to native biodiversity', Aust. Network for Plan Conservation Inc, 2010

¹¹ See footnote above

¹² Pers.comm. - Helen Murphy (2014), Project Leader NERP 7.2: Invasive species risks and responses in the Wet Tropics

Some success stories of early detection and eradication

The following examples demonstrate the benefits of prior knowledge of potential invasive species, early detection and the ability to rapidly mobilise resources, research into effective eradication techniques, ready resources available through cost-sharing arrangements, effective cooperation between governments at all levels with industry and landholders. Community education has always played a major role in these eradication efforts.

Four tropical weeds

The National Four Tropical Weeds Eradication Program commenced in 2003 to target four species of tropical weed in north Queensland – miconia, mikania, clidemia and limncharis – which have had an enormous impact on agriculture and environmental areas overseas. The target weeds were most likely introduced to Australia during the 1990s, although miconia was introduced as a garden ornamental in the 1970s. As these weeds were already on the NAQS weed target species list, they were reported as soon as they were found. The eradication program is funded through cost-share arrangements between the Australian Government and other states and territories with the eventual aim of completely removing every last individual of these species from mainland Australia. To date the \$8M eradication program has been extremely successful in tracing all infestations of these species in Australia and dramatically reducing the population numbers to the point where only a few square metres of some of these species remain. This program has averted the significant impact these species would have inflicted on the both the environment and agriculture in Australia. The program is a good example of how investment in post-border surveillance and eradication can play an important role in safeguarding Australia's assets when border biosecurity fails. Improved detection techniques such as the use of drones to identify individual plants in the rainforest promise to assist in early detection and eradication. More details can be found in the latest annual report¹³.

Papaya fruit fly

The Papaya Fruit Fly Eradication Program in Far North Queensland successfully eradicated one of the most serious exotic pest outbreaks in this nation's history when the Asian papaya fruit fly was detected in papaws near Cairns in 1995. Within ten days an initial area was quarantined and within a month the pest quarantine area was extended to cover about 78,000km² across the Wet Tropics and beyond. The fruit fly had the potential to be a severe agricultural and environmental threat and the massive \$34M eradication program was funded under national cost-sharing arrangements and it is also estimated to have cost a further \$100M in indirect costs. This underlines the ability of government and community to work together to eradicate a newly introduced pest with sufficient resources and immediate action.

Future success stories?

Electric ants

Electric ants are an aggressive tramp ant which can inflict painful stings. They threaten people's quality of life in residential areas and are an environmental threat, particularly to wildlife. They were first detected in Cairns in 2006 and are still subject to an eradication program run by the

¹³ Biosecurity Queensland, Department of Agriculture, Fisheries and Forestry (2013), National Four Tropical Weeds Eradication Program Annual Report July 2012 – June 2013.

Queensland Government. Electric ants have been successfully eradicated from four locations in Cairns and numerous other sites are awaiting verification that eradication has been successful. The ants still remain active at various sites in Port Douglas, Kuranda and Cairns and it is anticipated that these sites can be successfully eradicated in the next few years. However, funding under current national cost-sharing arrangements has not yet been approved beyond June 2015.

Yellow crazy ants

The Wet Tropics Management Authority is currently conducting a \$2M program to eradicate yellow crazy ants from the Edmonton and Kuranda areas around Cairns. Partners in the program include Queensland government departments, local governments, Conservation Volunteers, CSIRO, James Cook University, rural and suburban landholders, pest controllers and Traditional Owners.

The yellow crazy ant infestation at Edmonton was first detected in 2001 and traced to their arrival at the Cairns Port. The original infestation at Cairns Port was eradicated, but the Edmonton infestation has become established over about 600ha in the Bentley Park, Edmonton and Mount Peter areas south of Cairns. Yellow crazy ants were detected within the World Heritage Area and Little Mulgrave National Park in 2012 and now cover up to 30ha within these protected areas. In 2013 an infestation of yellow crazy ants was found in the Russett Park area near Kuranda and has become established over about 27ha. It is thought that this infestation was brought from Edmonton with earth moving machinery.

While it is hoped that the \$2M eradication program, including community education, will be successful over the next five years, it is clear that eradication of the original infestation could have been achieved with less time and resources. The Australian Government funding was provided primarily to eradicate the yellow crazy ants from the Wet Tropics World Heritage Area, given its Outstanding Universal Value. While the Queensland Government continues to provide some expertise and assistance, the state government's transition to management (and to stop efforts for eradication) has resulted in a significant reduction in staff and resources for yellow crazy ant control. The issue of making statewide decisions rather than local decisions is discussed below.

Local resources and eradication measures

The Authority has some concerns about the delegation of responsibilities for eradication and control of invasive species. It is acknowledged that there is very little chance of eradication of some invasive species once they are detected, no matter how many resources are available. However, in some cases, lack of effort for early detection and on-ground eradication can save resources in the short term and ultimately lead to responsibility and costs being devolved down through the levels of government and to landholders and the community.

While the Australian Government is primarily responsible for identification and prevention of invasive species outside Australian borders, once they have entered the country they often become the responsibility of the relevant state government – both responsibility and costs are shifted. Similarly, while state governments put significant resources into declaration and eradication of new invasive species, the failure to succeed in eradication attempts can often result in a decision being made that statewide eradication is impossible and a transition to management is the only feasible option.

The Authority has concerns that decisions to manage invasive species on a statewide basis do not take into account their potential environmental impacts in biodiversity hotspots such as the Wet

Tropics. The examples of yellow crazy ants, myrtle rust and Asian honey bees below show how statewide decisions may be made without adequate consideration of the environmental impacts in the Wet Tropics. The Authority understands that state authorities are likely to be concerned about the costs to government and industry of any internal quarantine system. However, regulatory restrictions on movement of bananas and other agricultural commodities are in place and enforced. Clearly, the public good of environmental protection is given a lower priority.

Yellow crazy ants

The Queensland Government website¹⁴ states that '*eradication of yellow crazy ants is no longer feasible in Queensland. ... Despite Biosecurity Queensland's ongoing treatment and surveillance activities, the known infested areas have increased since 2007. Several of the known infested areas were discovered in the past twelve months, significantly increasing the total area of infestation. Given the new infestations found last financial year, statewide eradication is not considered possible. Biosecurity Queensland's efforts will now focus on working with local governments, industry and landholders to manage yellow crazy ants and their ongoing impacts rather than eradication activities*'. The decision to transition to management may be reasonable, based on a statewide analysis. However, it does not consider the possibility of local eradication of yellow crazy ants in important ecological area such as the Wet Tropics. While Queensland Government staff still offer advice and technical assistance where they can about this declared species, in effect dedicated staff and resources have been largely withdrawn from the eradication program.

Transition to management across the state can also mean that local governments and landholders then bear the burden of costs and responsibilities for local infestations. This devolution of responsibility and costs does not offer any real incentive to succeed in managing biosecurity threats and, in fact, may be sometimes be seen to offer a temptation not to make the necessary and expensive efforts to succeed in preventing environmental impacts. The devolution of responsibility also means that there is no coordinated regional response beyond that now arranged by the Authority and individual landholders will typically be frustrated in their eradication and control efforts due to re-infestation from neighbouring properties.

Myrtle rust

In its letter to the Australian and Queensland government Ministers about myrtle rust, the Authority also questioned why 'the decision made to revoke Queensland quarantine measures when these measures could have assisted in slowing the spread of the disease long distances? This could have provided extra time in which to investigate potential control and adaptation measures.' Once again, a decision was made on a statewide basis which did not take into the impacts on the Wet Tropics and allowed the rapid transfer of the rust to north Queensland on infected plants transported from south-east Queensland by road. While it may be controlled in a nursery situation, or even a garden, myrtle rust cannot be controlled now it is out in the natural environment. The Queensland Government website pages on myrtle rust do mention restrictions of movements of infected plant material interstate, but there is little publicity or enforcement of these measures and the website maps of distribution have not been updated since May 2012.

¹⁴ <http://www.daff.qld.gov.au/plants/weeds-pest-animals-ants/pest-animals/a-z-listing-of-pest-animals/photo-guide-to-pest-animals/yellow-crazy-ant>

Asian honey bees

The transition to management can also be made without due consideration of the potential environmental impacts of an invasive species. For instance, the Authority has previously expressed concern that eradication efforts for the Asian honey bee came to an end 'before the full implications and potential impacts of this new pest on the natural environment were fully understood and that a more precautionary approach to such decisions needs to be considered'¹⁵.

Australian Government leadership on biosecurity

The Authority welcomes the intention of the Australian Government to amend biosecurity legislation to create 'new powers to allow the Commonwealth to respond to biosecurity risks within Australia and help state and territory governments manage a nationally significant pest or disease outbreak, including in our marine environment'¹⁶.

The \$2M funding for the eradication of the yellow crazy ants from in and around the Wet Tropics World Heritage Area showed the importance of the role of the Australian Government protecting its environmental responsibilities when the state government had made a decision to transition to management and withdrawn funding from the eradication program. It also shows there can be benefits in targeting resources where outcomes are achievable and impacts likely to be greatest (although earlier funding would have been more beneficial to prevent the ants' spread into the World Heritage Area).

Australian Government leadership and contingency plans with the states are also vital to prevent delays in responding to newly discovered invasive pests. These should be clear about which agencies are responsible for on-ground actions and funding any response. There should also be improved mechanisms for reporting to environmental stakeholders on new and potential pest incursions which can have an impact on the environment. For instance, it would greatly assist early detection if the Wet Tropics Management Authority and northern Australian land managers were notified about potential invaders which have been recently found in nearby areas such as the Torres Strait Islands (as mentioned above). Agencies such as the Authority are responsible for the maintaining the Outstanding Universal Value of the World Heritage Area and can play an important role in community education and awareness.

Numerous sleeper invasive species are already here and waiting to have an impact

As well as prevention and eradication of newly invasive species, a commitment is also needed to identify and manage those naturalised sleeper pests that have not yet realised their potential invasive threat. While quarantine laws are being strengthened to prevent entry of new potential weeds into Australia, there needs to be greater recognition of the large number of potential new weeds that are already in the country, many of which are available for sale but have not had their risk assessed. The Hawke review¹⁷ in 2009 stated that: '*Currently, several thousand plant species persist as ornamentals or as naturalised populations in urban settings. They represent a vast reservoir of potential future problems.*' Potential weed spread within Australia is highlighted in Morin *et al*

¹⁵ Wet Tropics Management Authority (2011), State of the Wet Tropics 2010-2011: Biosecurity Theme Report, <http://www.wettropics.gov.au/annual-reports>.

¹⁶ Historic Biosecurity Bill 2014 to safeguard Australia, media release by Hon Barnaby Joyce, 7 July 2014.

¹⁷ Hawke (2009), The Australian Environment Act, Report of the Independent Review of the Environment Protection and Biodiversity Conservation Act 1999.

(2013)¹⁸. When predicting which plant taxa are most likely to become future weeds in Australia, they used a dataset containing 6690 plant taxa of which 1599 were absent from Australia and 5091 taxa were present in Australia (14.2% were Australian natives which could become weedy outside their natural range).

Movement of these species within Australia is effectively unconstrained and response to the issues they raise varies substantially between the States and Territories'. By remaining in commercial trade, some garden plants may present a major threat as they enjoy a level of dispersal well beyond that of natural means. Even plants that have already naturalised are given the opportunity to spread further, wider and faster while they remain in trade.

One of the major limitations of the risk assessment process is its narrow focus on species that are not yet present in Australia. Numerous harmful species are, therefore, exempt from any assessment of their invasiveness potential, simply because they were brought into the country prior to the implementation of risk assessments. The narrow focus also precludes assessments of new varieties of plants which have significantly greater invasive potential because they have been bred to improve hardiness or fertility or behave differently.

The Authority endorses the recommendations in the Beale review regarding post-border surveillance and monitoring. Section 7.4.6 of the Beale review stated that 'there is a strong case for a substantially greater effort to assist in detecting and managing post-border risks'. The report recommended that the Commonwealth establish a comprehensive monitoring and surveillance program for national priority exotic pests and diseases—covering terrestrial and aquatic environments as well as traditional agriculture. The design of the program should reflect the risk pathways and probability of occurrence to ensure early detection. The data collected should provide early warning for new or emerging pathogens or alternatively demonstrate Australia's freedom from exotic pests and diseases. The program should include the Northern Australia Quarantine Strategy. Consistent advice to the Panel is that this is a highly effective Commonwealth investment that, with some relatively minor changes, could be enhanced significantly.'

Research, knowledge and skills

The Wet Tropics Management Authority places a high priority on research into invasive species, their impacts and management responses. It agrees with section 7.3.2 of the Beale review which states that, because there is little commercial incentive to investigate the impacts of environmental pests, 'the principal responsibility for biosecurity research as it relates to the natural environment lies with governments and the community. These activities have not received a high priority for funding'.

Research requires long term investment in knowledge and skills. Funding cuts to university departments and biosecurity agencies have meant a decreasing emphasis on environmental research into invasive species and a significant loss of corporate capacity and knowledge. For instance, the current skills base in many areas requiring advanced taxonomic abilities such as plant, invertebrate, fungus and bacteria taxonomy, plant disease epidemiology and surveillance science is very limited as universities discontinue taxonomic studies. The forthcoming National Environmental Science Program offers opportunities for the Australian Government to support continued investment into tropical environmental biosecurity research. Vital ongoing biosecurity research required for the Wet Tropics includes:

¹⁸ Morin L, Paini DR, Randall RP (2013) Can Global Weed Assemblages Be Used to Predict Future Weeds? PLoS ONE 8(2): e55547. doi:10.1371/journal.pone.0055547

- Identification of pest pathways for pantropical pests arriving in the Wet Tropics.
- Modelling to identify most likely potential Wet Tropics pests already established elsewhere in Australia and the world.
- Modelling of the impacts of climate change on habitat suitable for pest species.
- Risk analysis for high priority species which can be combined for use in pest adaption response strategies.
- Biocontrols and other control methods for established environmental pests.
- Taxonomic skills for pest identification.

Community education and participation and vital for success

It cannot be overemphasised that community education and participation are vital to the success of any identification and eradication program for environmental pests. The role of landholders, the pest control industry and the community identifying, eradicating and controlling weed spread on their properties should not be underestimated.

There is already a large amount of useful information available and programs funded through the Australian Government, such as the Authority's yellow crazy ant eradication program, incorporate community engagement and education as a necessary feature. The Wet Tropics Management Authority recommends that improved communication between biosecurity agencies at the national and state levels and distribution of recent information to the community would enable other environmental agencies and land managers to help spread the message about pests which require early identification and eradication. For instance, the Authority spends a lot of time and effort liaising with researchers and government departments about potential threats to the World Heritage Area, but is rarely contacted in any official way by biosecurity agencies about management of invasive species and their threats to the Area.