



AUSTRALIAN NETWORK for PLANT CONSERVATION INC

22nd August 2014

Committee Secretary
Senate Standing Committees on Environment and Communications
PO Box 6100
Parliament House, Canberra ACT 2600
ec.sen@aph.gov.au

Dear Sir/Madam

Re: Senate Inquiry into the adequacy of arrangements to prevent the entry and establishment of invasive species likely to harm Australia's natural environment.

The Australian Network for Plant Conservation Inc. (ANPC) is a national, not-for-profit, non-government incorporated association of people and organisations, founded in 1991, dedicated to the conservation of Australia's native plant species and vegetation communities, which are part of our living national heritage and underpin the health and productivity of our continent. An outline of the ANPC's role and activity is appended to this submission.

The ANPC would like to congratulate the Senate on launching this timely and important inquiry. The need for reform of biosecurity arrangements has gained increased attention in recent years, but the area of environmental biosecurity is almost always treated as an 'add on' issue to that of primary industry, and is rarely explored in depth. The ANPC regards this Inquiry's Terms of Reference as well-framed to open a public dialogue on these environmental aspects, and we hope that the outcomes of the Inquiry will contribute to a much-needed rethink of institutional, policy, and investment settings on the issue.

We feel that environmental biosecurity policy needs to be shaped by ecological principles and address biodiversity priorities, rather than be an add-on to agricultural biosecurity.

We do not undervalue the enormous work, over many decades, of quarantine and primary industry agency staff in this work, but the reality is that a very large number of exotic organisms have arrived in this country, more are arriving every year, and many of them are naturalising. For example, nearly 30% of plant species growing 'wild' in New South Wales are naturalised exotic species.

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A recent example of great concern, which the ANPC has been closely monitoring, is the incursion of the plant pathogen Myrtle Rust (*Puccinia psidii*), which since 2010 has naturalised along most of Australia's eastern seaboard. Myrtle Rust has already proved capable of infecting over 350 species of native plants in the Myrtaceae family, which encompasses around 10% of Australia's total native flora. Some native species are already in severe decline as a direct result of this introduction, and some are likely to become extinct in the next decade. This case illustrates how much can hinge on maintaining really strict environmental criteria for our overall biosecurity.

In this submission we will address only a few aspects of the Inquiry Terms of Reference. We feel that given the role of the Senate Inquiry, and the influence it may have in the slow process of reforming Australia's biosecurity legislation and philosophy, our contribution is best focussed on some of the institutional and process aspects of the problem, rather than technical aspects.

In summary, our experience and analysis leads us to the conclusion that sound management of Australia's natural environment requires dedicated resources for environmental biosecurity within an overall national biosecurity structure, based on:

- **Specific new investment and expertise development, preferably reflected and fostered through dedicated institutional arrangements and capabilities;**
- **Improved cross-disciplinary and cross-institutional strategic threat forecasting and environmental impact analysis, coordinated at a national level;**
- **Closer interaction of the main biosecurity bodies with non-government environmental sector, the environmental and regional natural resource management (NRM) agencies, and with sources of taxonomic and ecological expertise;**
- **A greater continuity of approach through the phases of pre-arrival analysis, initial incursion response, and post-naturalisation response – this continuity will sometimes require a continued national co-ordination role after naturalisation, rather than simple hand-off to the States as tends to be the current practice.**

THE SIGNIFICANCE OF THE ENVIRONMENTAL THREAT POSED BY INVASIVE ORGANISMS.

The greatest historical adverse impacts on Australian native plant species and vegetation communities, since European settlement, have been through habitat loss (particularly land-clearing) and its fragmenting effects on species and communities. But in the wake of this historical process and its continuing effects, it is invasive species that are currently the greatest single compounding threat to native species and communities (plant and animal). The combined effects of feral predators/herbivores, invasive weeds, and introduced pathogens are in very many cases the main proximal threats to native species. This is particularly true in landscapes already fragmented

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by clearing, where remnant patches and species are especially vulnerable to invasive organisms, but it is also true for many relatively undisturbed habitats.

Australia takes some pride in its past quarantine arrangements, but with limited justification. Successful exclusions of invasive organisms, by their nature, go unrecognised – we do not undervalue the enormous work, over many decades, of quarantine and primary industry agency staff in this work. Yet a very large number of exotic organisms have arrived in this country, more are arriving every year, and many of them are naturalising. Of these naturalised exotic taxa, a significant and possibly increasing proportion are becoming environmental weeds or pests. It is also the case that a significant proportion of Australia's serious environmental weeds were deliberately introduced as agricultural or land management plants – Tall Wheat Grass, African Lovegrass, and Buffel Grass being examples – without assessment of their environmental impacts, which have become severe.

Whereas agricultural biosecurity is mainly focused on excluding or managing exotic biota (weeds, pests, diseases) that affect a relatively narrow range of crop or livestock species and varieties or production landscapes, with a definable economic value, environmental biosecurity as part of Australia's overall conservation effort must focus on the whole range of native biota and their associated ecological communities and ecological processes.

Estimates vary, but this native biota may encompass as many as 650,000 non-microbial species of plants, fungi and animals (in contrast to the few dozen species in most agricultural systems, or the several hundred that make up the bulk of the horticulture industry). The native biota and ecological relationships are essential, in their totality, to the overall ecological health of the continent, including its production systems. Various attempts to place dollar values on these 'ecological services' have rarely succeeded in adequately capturing their scope and importance over intergenerational time-frames, and in any case miss the point. Just as indices of human health as a component of society's well-being cannot be meaningfully reduced only to dollar values, but are nevertheless recognised as a fundamental social priority, so too the health of the natural environment.

HOW ENVIRONMENTAL BIOSECURITY DIFFERS FROM AGRICULTURAL BIOSECURITY.

Australia's biosecurity settings and investment in the past, and currently, have been overwhelmingly slanted towards protection and promotion of the agricultural and pastoral industries. Management of biosecurity at all governmental levels has been vested in, or answerable to, primary industries agencies. The great bulk of investment and expertise (particularly as regards pathogens) has been focussed on invasive organisms prone to adversely affect the limited number of species deployed in agriculture.

Contemporary conditions of growth in international trade and travel, and of human-mediated movement of invasive organisms within Australia, are rapidly increasing the level of threat to native biota from invasive taxa. Of particular concern is the increasing likelihood of arrival and establishment of animal and plant pathogens, several of the latter having the potential to cause decline and even extinction in a relatively large number of native

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species, with little prospect of effective management in the wild. In these circumstances, correction of the imbalance of resources between agricultural and environmental biosecurity is increasingly urgent. This correction should not be at the expense of agricultural biosecurity – it is an unavoidable fact that new investment is needed.

The assets at stake for primary industry are almost always quantifiable in economic terms. They are usually spatially contained, and threat-reduction measures against the invasive organism are often financially and operationally feasible – there is moreover a large sectoral base of capital for investment to identify and refine such measures. A relatively small range of crop or livestock species and varieties are involved (albeit larger in ornamental horticulture), with well-understood characteristics, making standardised approaches the norm. For disease (pathogen) threats in particular, industry adaptation to the threat may often take the form of replacement of the susceptible organism (e.g. by breeding new varieties, adoption of new production species, or adaptation of production conditions). The threatening invasive organisms themselves (their mode of action and effects on the asset organism) are also generally well understood, and if not are given rapid research funding priority.

The ‘assets’ at stake in conservation are not replaceable – each species and ecosystem is important, and are legislatively recognised as such. A very large number of these ‘assets’ are involved, their spatial distribution does not lend itself to easy or standardised management, interventionist management is far more problematic and expensive, and we are in any case still ignorant as to the biology, and ecology of very many native species (and of the biological detail of the invasion process by exotic organisms). Selective breeding for a more robust response to invasive threats is seldom an option, is very expensive, and ‘return to the wild’ of improved genotypes is highly problematic. The value of native biota cannot be quantified in economic terms, except in limited aspects. This last factor alone means they are often undervalued when biosecurity priorities are decided. It does not however mean that they are without recognised national value – the whole trend, over several decades, of public opinion and of government environmental and NRM policy, confirms the recognised importance of the natural environment. The question is how to give this recognised social value more effect in the biosecurity area, where the under-emphasis on environmental considerations remains systemic.

The distinctive features of environmental biosecurity mean that anticipation of exotic threats, and prevention of their arrival, are of even greater importance than on the agricultural side. Opportunities for effective management in the wild, and for adaptive management of the susceptible native species, are much, much less than for an agricultural problem. Failure to exclude an invasive exotic, or to interdict it very soon after arrival, is likely to lead to a permanent addition to the range of threats to native biota. There are few instances in which fully naturalised invasive environmental treats have actually been eradicated, even among those which could easily be eliminated with a modicum of will and investment (many ‘sleepers’ weeds and some vertebrate pests fall into this category). Once a potentially invasive environmental species establishes, even on a limited basis, it tends to go off the eradication radar and falls into the area of “management”, which all too often is a euphemism for under-invested and ultimately ineffectual attempts to slow the spread or prevent local impacts.

The historical bias towards agricultural biosecurity is understandable, given the centrality of agriculture in the Australian political, economic, and cultural landscapes in the past, the ease with which threats can be expressed in dollar values, and the capacity of agricultural industry to both press for, and financially contribute to, governmental biosecurity measures. In contrast, the environmental responsibilities of government and society (i.e. stewardship of the nation's biodiversity and ecological health) have only been recognised much more recently – in policy and investment terms mainly since the mid-1970s. The environment sector does not command either the financial or political clout of its primary industries analogue. Regardless, continued imbalance in resource allocation to agricultural and environmental biosecurity is unacceptable and against the national interest.

To sum up the implications of these differences between agricultural and environmental biosecurity needs, we can find no better formulation than that of the Invasive Species Council in a recent paper entitled 'One Biosecurity – integrating the environment':

“Some implications of these differences for biosecurity laws, policies and programs:

- *Biosecurity policy needs to be shaped by ecological principles and address biodiversity priorities, rather than be an add-on to agricultural biosecurity.*
- *Because of ecological uncertainties and limited management options, applying the precautionary principle is vital.*
- *Biosecurity policy units and advisory bodies need more ecologists and conservationists.*
- *Biosecurity should be a high and joint priority for both environmental and agricultural agencies.*
- *There needs to be more research into potential environmental invaders, the impacts of invasive species on biodiversity and environmental management.*
- *The imbalance in resources for industry and environmental biosecurity needs to be redressed with increased public funds going to public good biosecurity priorities.*
- *There is need for an environmentally meaningful way of quantifying and prioritising environmental threats and comparing threats across sectors.*
- *Post-border biosecurity needs to be much more preventive and ecologically defensive.*
- *Environmental biosecurity needs meaningful involvement of the community and environmental NGOs in policy development.”*

INSTITUTIONAL AND JURISDICTIONAL SETTINGS.

The ANPC is strongly of the view that current institutional and process arrangements for Biosecurity need reform if they are to adequately provide for environmental protection. Three steps are needed:

1. The establishment of a stronger focus on environmental biosecurity at the national level, recognised in legislation. In our view, this would be best achieved by the establishment of a permanent body of expertise

equivalent to Plant Health Australia (PHA) and Animal Health Australia (AHA), both of which are, despite good intentions, overwhelmingly oriented to primary industry concerns.

The ANPC supports the concept of a new 'Environment Health Australia' body, with some level of statutory authority, as advanced by the Invasive Species Council (<http://invasives.org.au/publications/keeping-nature-safe/>) to research and help develop responses to environmental biosecurity threats and issues, whether exotic or domestic in origin. We would urge the Senate Inquiry to seriously examine this proposal and to consider recommending it to the Parliament.

Such a body would need a core of its own expertise, and could also act as a training and communication centre for short-term seconded staff from the relevant environment, NRM, and primary industry agencies and sectors, thus improving the capabilities of these external partners and their own clienteles, and providing a much better opportunity for 'war-gaming' preparedness scenarios than exists at present.

The ANPC does not regard the establishment of a short- to medium term 'CRC'-type body as an adequate variant of this proposal. The past Weeds Cooperative Research Centre and some other similar bodies did excellent and indispensable work over their limited lifetimes, but then their programs and expertise came to a crashing halt, and very large areas of their unfinished work have not been maintained or renewed. We do however recognise that in the current fiscal climate, establishment of a new permanent body in the immediate future is a big reach. As a possible interim step we would therefore urge the Inquiry to consider recommending interim improvements to the current arrangements of PHA and AHA, by closely examining:

- the actual levels of interaction that they have with Commonwealth and State environmental agencies and NRM regional bodies (beyond just nominal positions on committees);
- whether these current interactions result in any net improvement of biosecurity capabilities and preparedness in those collaborating agencies, and whether there is effective skills transfer to the operational and research arms of those bodies;
- whether there are adequate arrangements for external (including non-governmental) input on policy and practice, and for the transfer and development of skills and capability for other environmental stakeholders (both commercial and not-for-profit),
- how improvements could be made within the current PHA/AHA/Biosecurity Australia arrangements (and COAG arrangements – see below), pending a stronger independent environmental biosecurity body.

2. Stronger arrangements for the integration of Commonwealth and State/Territory environmental agencies in pre-border planning and threat assessment, post-arrival response, and on-going impact assessment and mitigation of naturalising or naturalised incursions.

We note the existence for many years of technical and policy committees relevant to biosecurity under the former COAG arrangements in both the primary industries (PI) and environmental areas, which provided filtered avenues (however slow) for raising issues of national significance and coordinating action across jurisdictions.

However, with successive reorganisations of the COAG Councils, and then the abolition of the Primary Industries and Environment & Water Councils in late 2013, there is a very worrying apparent absence of COAG-level assessment and coordination of issues in these two portfolio areas, including the biosecurity and invasive species management aspects. The earlier abolition of Land & Water Australia had already reduced Australia's capacity to anticipate nationally significant trends and issues in NRM and to communicate these to government, as are declining levels of scientific expertise in many State agencies. We, and we believe many other environmental stakeholders, are unaware of whether the COAG technical and policy committees are still in place, and of how matters requiring a national and cross-jurisdictional approach will be managed (whether biosecurity related or not). We do not feel that "ad hoc arrangements as needed" (the words of one Federal Minister last December on one of these two former Council areas) are an adequate approach – especially not given the foresight, pre-planning, and coordinated response needed for environmental biosecurity issues. New biosecurity legislation will not by itself solve this wider institutional problem.

Improved involvement of stakeholders from the non-government environmental sector (both commercial and community-based) should be part of any new institutional settings, at both Commonwealth and State levels. We note that at the recent (April 2014) national Biosecurity Roundtable, which focussed on the biosecurity aspects of the Agricultural Competitiveness White Paper, there were some 80 or 90 organisations represented from the primary industries sector. There were four organisations represented concerned with the conservation of natural biodiversity. This does not reflect a lack of interest from that sector. Rather, it reflects the capacity difficulties faced by a largely community-based, not for profit sector, and perhaps a forgivable unfamiliarity with the environmental sector on the part of the Commonwealth Department of Agriculture. One government panellist at this forum commented that "One of the problems with the environment sector is working out who does represent those interests" – a fair comment, but one that could equally be applied to the highly diverse (but better resourced) primary industry sector. The point is to engage with the environment sector and work towards an effective representational arrangement that still taps into the full range of concerns and expertise available. Just as with primary industry, this will mean recognising multiple stakeholders. In addition to the government environment agencies that already have a notional place in the biosecurity system, effective engagement is needed with the non-government parts of the environmental sector. This includes conservation advocacy groups (specialist and general, mostly community based, some professionally based); the ecological consultancy industry; the ecological restoration sector (community and commercial); and the growing non-government environmental land management organisations. Some of these sub-sectors already have peak bodies; in other cases, suitable representational arrangements could evolve. In still others (especially specialist and professionally based groups) direct representation at meaningful consultative levels would be to the advantage of the biosecurity effort.

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3. Greater recognition of the need for continued national-level coordination of, and investment in, exotic threat responses after any initial emergency phase is over.

Australia has not yet resolved the somewhat impractical division of responsibility for biodiversity and natural resource management imposed by our 1901 constitutional arrangements and subsequent legislation, among the Commonwealth and the States. From being the exclusive preserve of the States, these matters have in recent decades increasingly come under parallel Commonwealth purview. This is not always a bad thing, but in the area of biosecurity and invasive species it has too often resulted in a truncated view of the national interest, and increases the likelihood that once the Commonwealth steps back from the initial emergency (first incursion) response, if this is unsuccessful, the on-going problem becomes subject to poorly coordinated and under-invested attempts at management by the States. In the case of *environmental* invasives, this falls to the State environmental agencies, which over the last decade or more have been steadily contracting in their financial, scientific and operational capabilities and sometimes have limited off-reserve powers, or to the even more stretched regional NRM bodies.

We do not necessarily advocate a continued and indefinite Commonwealth role in *all* such incursions -- case by case assessment is needed. However there are enough examples where a strong and continued national approach would be, or would *have been*, productive, to make the point. Many involve vertebrate pests of initially localised distribution that have, or have the potential to, become more widespread and invasive later (Smooth Newt and Palm Squirrel are arguably such cases).

One recent case, involving the fungal pathogen Myrtle Rust (*Puccinia psidii*, a.k.a. Eucalyptus Rust) is discussed in some detail further below. As a case demonstrating the need for a wider scope of co-ordinated leadership however, it is a useful example here. The disease was first detected in Australia in April 2010; an initial (and premature) declaration that it was ineradicable was made at the end of that month, but was reversed a week later as a result of timely intervention by PHA. A second declaration was made in December 2010, at which point the formal Commonwealth involvement required under the Emergency Plant Pest Response Deed lapsed. Again there was recognition by PHA that there was a need for a continued Commonwealth discretionary role and it initiated a 'Transition to Management Plan', which up to July 2013 funded some important research projects (though not the environmental priorities), and maintained a communication forum (but with only limited buy-in from the environmental agencies).

The failure here was one of lost opportunity on the environmental side. 2010-11 was the start of a period of spread of a nationally significant pathogen whose effects were clearly going to be serious and to play out over decades. From the environmental point of view, the most pressing need then and now was to ensure that

(a) the State/Territory agencies were fully engaged and allocating adequate resources to coordinated goals that maximised their further options,

(b) that there was an effective process of baseline monitoring of disease progress and impacts (in the wild) in place in all relevant jurisdictions, and

(c) that some mechanism to ensure continued national technical and strategic coordination was in place for an unavoidably indefinite future.

Despite the good efforts of PHA officers, and with some honourable exceptions from individual officers in various State agencies, this did not happen. No programs were launched or funded at either State or Federal level for systematic wild-impact monitoring or assembling of baseline data (although some other good activity has been, or has been supported by them).; no environmental agency task force was convened; the opportunity to build an environmental dimension onto on the successful DPI-based citizen-science ‘spotters’ programs in NSW and Queensland was not taken up. No agency (other than PHA for a limited period to July 2013) was prepared to assume a continuing national coordination role or to act as a national communications hub. That remains the situation in August 2014. The point is not to allocate blame, but to learn from the experience.

Our argument would be that the overly prescriptive terms of Commonwealth/State responsibility boundaries, and the lack of buy-in by nearly all the environmental agencies, in this case resulted in the problem being handed off by the Commonwealth to the States and nobody (on the environmental agency side) retaining or assuming responsibility for continued national coordination and communication. This is not to blame the State agencies either, or not entirely. The primary industries agencies in the affected States were flat out dealing with their own responsibilities; environment agencies were stretched on other matters. Some agencies, including those in two key Myrtle rust-affected States, were undergoing acute staff reductions in the forest health area in exactly this 2011-13 period, and/or departmental reorganisations that fractured the relevant expert teams and the continuity of projects on the pathogen (for example, our understanding is that the Queensland Myrtle Rust response group in the primary industry department went from seven people down to one – for reasons that had nothing to do with the seriousness of the issue).

There have to be limits to Commonwealth investment, but we would encourage greater case by case strategic assessment as to whether post-emergency handoff is being done in a way that yields best results, and closer attention to ensuring that state-level arrangements and resource allocation do meet the need for problems of continuing national significance. This may require an expansion of resources; on-paper responsibility boundaries do not necessarily translate to actual capacity to assume those responsibilities.

CASE STUDY: OTHER LESSONS FROM MYRTLE RUST (*Puccinia psidii*):

The ANPC has been closely monitoring the incursion of the plant pathogen Myrtle Rust (*Puccinia psidii*) since its first detection in Australia in 2010. This disease, under the alternative common names of Eucalyptus Rust and Guava Rust, had been identified as a potentially serious threat to Australian plant species of the family Myrtaceae, which includes eucalypts, as early as 1983. Some forestry-focussed work by CSIRO and South American

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collaborators was conducted in the 1990s, but it was not until 2006 that the issue was seriously addressed in an institutional sense, through a resolution of the then Primary Industries Ministerial Council. A contingency plan was produced by PHA in 2009 (Plant Health Australia, 2009: *Threat Specific Contingency Plan – Guava (eucalyptus) rust Puccinia psidii*. <http://www.planthealthaustralia.com.au/pidd-docs/200%20-%20Guava%20rust%20CP%20-%202009.pdf>).

That Plan identified *Puccinia psidii* as having:

- a high potential for entry to Australia, and for establishment here,
- a high-to-extreme spread potential,
- a high environmental impact, and
- a high-to-extreme economic impact.

The disease was first detected in NSW in April 2010 – its source and mode of arrival are not known. Since then, this pathogen has naturalised along the eastern seaboard from about Narooma NSW to Cooktown in Queensland. It has proved capable of infecting over 350 species of native plants in the Myrtaceae family (in the wild, in cultivation, and/or through laboratory susceptibility testing). This family encompasses some 2,250 native species, around 10% of Australia's total native flora – of these, around 1,000 occur in the climatic zones most conducive to Myrtle Rust naturalisation.

Myrtle Rust is already known to be causing catastrophic decline in two hitherto-common species (Scrub Turpentine *Rhodamnia rubescens*, and Native Guava *Rhodomyrtus psidioides*), and there is now a strong likelihood that these species will become extinct in the wild within the decade. More than 30 other species, some of them already listed as Threatened under State and/or Commonwealth legislation for other reasons, are regarded as 'highly' or 'extremely' susceptible to Myrtle Rust according to ratings published by the Queensland Department of Agriculture, Fisheries and Forestry. An unknown number of these or other species are also likely to be undergoing significant impact – systematic monitoring studies have so far been limited to three species only.

The ANPC has been a close external observer of the institutional and process factors at play during the Myrtle Rust emergency response of 2010 and the subsequent devolution of most response actions to the States. We have also been an active participant, mainly through the development and delivery of a comprehensive training workshop on Myrtle Rust, so far delivered at 20 regional centres in Australia in close collaboration with local primary industry and environmental agencies, and in abbreviated form in Java Indonesia and in Papua New Guinea. We have participated in the national workshops maintained until 2013 under the Plant Health Australia 'Myrtle Rust Transition to Management' program. Accordingly we feel able to offer some observations on the response process and what we feel have been problems.

The need for pre-arrival research into pending environmental threats: At the time of first detection of Myrtle Rust in April 2010 there was some taxonomic disagreement as to whether the incursion was *Puccinia psidii*

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(Eucalyptus Rust), or another closely related species *Uredo rangelii*, described in 2006. This injected a considerable degree of confusion into the initial response, causing some stakeholders to legitimately wonder what level of response was appropriate, and less legitimately providing an excuse for others to ‘spin’ the story (perhaps for international trade reasons) that we didn’t have Eucalyptus Rust at all – a ‘don’t frighten the horses’ approach that also involved the creation of the new common name ‘Myrtle Rust’. In the event, subsequent taxonomic investigations fairly quickly proved the incursion to be Eucalyptus Rust (*Puccinia psidii*), although the Myrtle Rust common name has stuck.

ANPC’s view is that no process should seek to pre-empt or pre-determine taxonomic or other scientific issues. Uncertainty in these areas, if seriously founded, has to be recognised and factored into decision making. But leaving the proper investigation of these fundamental issues to the last minute, for a known major threat, almost guarantees a problematic and confused response. The existence of multiple ‘strains’ (pathotypes) of *P. psidii* had been well-established by South American forestry researchers, and there had been episodic involvement of Australian scientists in the 1990s – but only in relation to a few species of forestry interest, and the resources for definitive basic taxonomic work on the whole range of *P. psidii* strains had never been invested. As a result, we are still playing catch-up on this issue four years after the incursion (*Uredo rangelii* has been laid to rest, but it remains vital to understand the different strains of *P. psidii* – see below). The long-range scoping of threatening invasive organisms needs to include early investment in filling basic taxonomic, ecological and biological knowledge gaps, as a precursor to effective contingency planning.

Levels of secrecy and sectoralism in response arrangements: ANPC fully understands the need for some level of confidentiality in the phase of emergency response to incursions of organisms that pose biosecurity threats, for example to secure the goodwill and cooperation of owners of infected premises.

It does nevertheless seem to us that the levels of secrecy applied to the Myrtle Rust incursion of 2010 probably exceeded the need, and in the circumstances contributed to the tardy reaction from the environmental sector and environmental agencies (from which they have not yet recovered). As an external non-government stakeholder deeply concerned with the environmental implications, but not having been part of the magic circle (participants had to be invited and to sign confidentiality agreements), the ANPC found it difficult for some months to get much information. Things opened up eventually, but the ability of more than a small closed circle to analyse and learn from the Myrtle Rust response remains hampered by the non-release of a post-incursion review, which we understand was conducted by biosecurity authorities in 2012-13. Again we can understand the need for some confidentiality provisions (a blame exercise is not necessarily helpful), but the failure to release even a redacted version of this report seems to us to be counterproductive.

We also feel that a major opportunity has been missed to galvanise the environmental agency and sector responses, and to create an agency-plus-citizen-science constituency to gather baseline data on environmental impact (still lacking today). The potential for such a broad collaborative constituency clearly exists, as was clearly shown by the public response to the NSW Department of Primary Industries' call for 'spot' records of Myrtle Rust through 2010-11. DPI did a good job in soliciting a lot of data, however the design of this data-gathering exercise never factored in ecological and species-impact considerations, and by early 2012 DPI NSW had virtually discontinued gathering data except for new spot records in new areas. There was no attempt by DPI or by the NSW Office of Environment & Heritage (or by any national agency) to develop an ongoing environmental impact tracking system, although a suitable platform for this was offered by the Atlas of Living Australia project.

The problem of future arrival of further strains of Myrtle Rust – does current regulation allow sufficiently strong measures to exclude new infra-species variants of species already naturalised?

The *Puccinia psidii* pathogen has several overseas strains or pathotypes, which are not yet fully understood but which appear to differ in their host preferences and severity, and perhaps also in their ecological and climatic tolerances and breeding system. Further arrivals of new strains may thus extend and exacerbate the effects of the disease (e.g., the strain already here does not appear to be as virulent on eucalypts as some others). New strains may also increase the capacity of the pathogen to adapt more successfully to its new environment.

Similar differences may of course exist for any invasive organism – the broader its genetic base in the invaded country, the greater the problem is likely to become. It is clearly in Australia's interests to rigorously exclude any further genotypes of undesirable organisms beyond the ones already here. An excellent summary of the reasons for maintaining rigorous exclusion of further *Puccinia psidii* pathotypes, with strong parallels for Australia, is given in a recent scientific paper (*The Challenge of Retarding Erosion of Island Biodiversity through Phytosanitary Measures: An Update on the Case of Puccinia psidii in Hawai'i*; L. L. Loope and J. Y. Uchida, *Pacific Science* 66(2): pp.127-139, 2012. DOI: <http://dx.doi.org/10.2984/66.2.3>. URL: <http://www.bioone.org/doi/full/10.2984/66.2.3>).

ANPC, having been represented at two of the national Myrtle Rust workshops in 2012-13, is therefore concerned at an apparent level of uncertainty, even among experience biosecurity personnel, as to whether current quarantine prescriptions are fully adequate to exclude further genotypes of undesirable organisms already naturalised (whether strongly invasive yet or not). Clarification of this point would be desirable, and rectification of procedures if necessary.

The need, not yet met, for a national environmental strategy for Myrtle Rust:

As already noted, there is currently little prospect of effective management of Myrtle Rust in the wild. There is a rapidly increasing likelihood of severe impact on, and possible extinction in the wild of, an unknown number of

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highly susceptible species, at least two and potentially as high as 20 or 30. Environmental “management” responses in this situation are clearly problematic, but there are three essential needs:

- to ensure close tracking of the disease process, and its ecological correlates, in order to understand the threat and to identify the constraints on it that may contribute to the limited management options;
- to conduct large-scale impact surveys to be able to anticipate, even by a few years, the effects on vulnerable species and ecosystems, and to identify potentially resistant individuals and populations (resistance genotypes are known in several otherwise susceptible species, and may occur in many more, but are not yet well understood, and natural selective processes for these are likely to be overwhelmed by the disease before they become dominant);
- to conduct large-scale precautionary seed-banking for the 1,000 or so Myrtaceae species in the high-risk climatic zones, to maximise our options for the future, including resistance research, for an eventual if distant return-to-wild program for those species most affected.

The ANPC believes that while rigorous exclusion of all alien potentially invasive organisms is the paramount need, closely followed by early detection and vigorous response, the Myrtle Rust case demonstrates that it is also vital to recognise environmental biosecurity as an extended process, requiring adequate leadership, coordination, resource allocation and adaptive management long after the arrival and establishment of invasive species, and continued exclusion of new genotypes of already naturalised species.

The ANPC appreciates the opportunity to contribute to this Senate Inquiry.

For contact with the ANPC, please phone our national office on (02) 6250 9509 or email anpc@anpc.asn.au.

Yours sincerely,

Jo Lynch
Business Manager

Appendix (over): **ABOUT THE AUSTRALIAN NETWORK FOR PLANT CONSERVATION Inc. (ANPC)**

Australian Network for Plant Conservation Inc. (ANPC)
GPO Box 1777 Canberra ACT 2601 Australia
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ABOUT THE AUSTRALIAN NETWORK FOR PLANT CONSERVATION Inc. (ANPC)

The ANPC is a national, not-for-profit, non-government incorporation of people and organisations, founded in 1991. It is dedicated to the conservation of Australia's native plant species and vegetation communities, which are part of our living national heritage and underpin the health and productivity of our continent. Our membership encompasses more than 350 individuals and organisations, and includes professional botanists, ecologists, foresters, horticulturalists, restoration specialists, and community conservation practitioners. Our Management Committee includes leading conservation scientists and practitioners. ANPC is on the Commonwealth's Register of Environmental Organisations, and has Deductible Gift Recipient and Charity Concessions status with the Australian Taxation Office. Our income derives from membership fees, donations, course and conference fees, grants and service fees. Our expertise and delivery capability is mainly based on the voluntary and in-kind input of our individual and organisational members, many of whom are specialists in their field.

The ANPC exists to:

- Facilitate linkage and information flow across boundaries;
- Provide a conservation knowledge network with long-term continuity;
- Disseminate scientific knowledge and practical skills and insights; and
- Encourage dialogue and contact across the conservation sector.

We specialise in the exchange of knowledge and practical experience between scientists, land managers, and conservation practitioners by:

- delivering courses and workshops (more than 50 since 2003, mostly in regional centres);
- publishing the quarterly bulletin *Australasian Plant Conservation* as a plain-English forum for practitioners across the sector in the Australasian region;
- running biennial national conferences and forums;
- producing nationally recognised best practice guidelines on plant conservation techniques – e.g. *Guidelines for the translocation of threatened plants in Australia* (2nd edition, 2004), and *Plant germplasm conservation in Australia – strategies and guidelines* (revised edition, 2009);
- undertaking best practice on-ground works, specialising in the translocation of threatened plant species, and associated surveys, propagation, research and monitoring.

Management of invasive organism threats (weeds, pests and pathogens) features in much of our activity. In 2011 we developed a comprehensive manual and workshop '*Myrtle Rust – a new threat to Australia's biodiversity*' (2012-). This has been delivered at over 20 regional locations in four State and Territories, with abbreviated versions in Java, Indonesia and in Papua New Guinea.

Please see www.anpc.asn.au for more information.

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