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Invasive Species Consultation
Department of Primary Industries
GPO Box 4440
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RE Discussion Paper for an Invasive Species Management Act

The Invasive Species Council and the Victorian National Parks Association welcome the opportunity to respond to the discussion paper on the proposed Invasive Species Management Act for Victoria.

Please find our detailed response to the discussion paper below. It is divided into two parts: Part 1. Improvements Needed and Part 2. Supported Aspects. Additional background material is contained in a series of four appendices (two attached as separate documents, and two on pages 8-16 & 17-19 at the end of this document).

We would welcome any opportunity to meet with you to discuss our recommendations.

To discuss this submission, please contact Andrew Cox (ISC) on 0438 588 040 or Phil Ingamells (VNPA) on (03) 9341 6506 or 0427 705 133.

Yours sincerely

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Response by the ISC and VNPA to the Discussion Paper on an Invasive Species Management Act

While we welcome the framing of a new Invasive Species Management Act and agree with many aspects of the proposed Act, we are concerned that important issues in relation to the management of Victoria's biodiversity are not presently adequately addressed.

Our natural heritage of some 100,000 native species has suffered and is still suffering under a range of impacts, most notably land clearing, invasive species and growing climate change impacts.

Invasive species in particular have wrought havoc on biodiversity in Victoria. Already Victoria has half as many exotic plant species as there are native plant species, and every year another ten weeds or other exotic plants are established. Of the 19 introduced mammals and 15 established exotic birds, many are already widespread such as foxes, rabbits and cats while others such as deer and pigs are still expanding. Climate change is expected to make the impacts worse.

These weeds and pests, along with pathogens such as Phytophthora and myrtle rust, continue to severely damage or push towards extinction our native species and terrestrial, aquatic and marine ecosystems.

In this context it is important, if we are to fulfil our state, national and international obligations to protect biodiversity, that this new Act enables effective action in regard to invasive species management.

Part 1. Improvements Needed

The discussion paper has a number of serious deficiencies. These are explained below.

Put the Environment Up Front

We need to bring the environment to the centre of our invasive species crisis. For too long, the attention has focused predominantly on threats to agricultural production and economic interests. While retaining this effort, we need to boost our efforts on invasives ruining our national parks, bushland patches, grasslands, rivers and the marine environment.

The discussion paper proposes that the Minister for Agriculture and Food Security administers the proposed Act. This approach has proven to give too little emphasis to the well-being of the natural environment. Both the agricultural sector and the biodiversity sector face very serious and growing threats from invasive species. While there is some cross-over between these two sectors, many invasive species that are highly problematic for native ecosystems are not a problem for agriculture, and vice versa, and the solutions in many cases are also different. A number of differences between the sectors are outlined in Appendix 4 (pp. 17-19).

The understanding and expertise necessary for establishing, or predicting, risks associated with invasives in natural areas, and for establishing appropriate management, are not generally found in the agricultural sector. And there are clear responsibilities in this regard that lie, under a range of existing legislation, with the Minister for the Environment.

It is therefore important that those responsibilities under the Act that currently sit with the Minister for the Environment are acknowledged in the new Act, and those responsibilities that currently rest with the Minister for Agriculture are similarly acknowledged. There are very real concerns that if responsibility under the proposed Act was left with just one Minister, then the responsibilities appropriate to the other Minister would inevitably be compromised.

It is essential to give the environment department and its Minister lead control of environmental invasive species and to include best practice elements of environmental law, including a focus on ecological sustainability and meaningful community involvement in decision-making.

There is also an unresolved conflict of interest arising where (if the Minister for the Environment is not given appropriate oversight) DPI may actually develop or breed an invasive species that will threaten ecological systems. This occurred recently with DPI's release and promotion of Tall Wheat Grass (*Lophopyrum ponticum*), now listed as a Potentially Threatening Process under the Flora and Fauna Guarantee Act 1988.

We note in this regard that, in the discussion paper, the concept: 'impacts of consideration' has the environment listed last. This lack of priority listing means that the environment may not get adequate funding or attention. A strong message must be sent about the importance of the environment and the major impacts caused by invasive species. The environment needs to be first or second in this list or, more appropriately, the needs of the agricultural sector and the natural environment should be listed as the two main priorities of invasive species management.

Reverse our approach - start with what's safe

Currently, new high-risk plant species (or taxa or cultivars) are permitted to be released unless, often after they have already gone feral, they undergo a lengthy and time-consuming process of assessment and declaration. Action is dependent on listing, wasting valuable time and not preventing many new harmful weed introductions.

We must move to a risk-based approach that has a default defensive position. Unless we know a plant, animal or pathogen is safe it should not be introduced into the State, sold, moved or kept. If it is already established but not widespread, we should eradicate or contain it, depending on what is feasible.

The same response should be applied to new cultivars or variants of a species. Even if a species is already determined to be safe, the new cultivars or variants may have different high-risk characteristics or exacerbate the threat of already established variants. It is common to breed drought-tolerant grasses and plants. These pose a greater risk of invasion than the original parent species.

Likewise different genetic material (a genet) of a taxon may be much more reproductive, eg Oxalis which does not normally produce seed because it is outcrossing, but may start to produce seed.

At one of the first community consultation meetings in Melbourne, DPI staff responded to a question about the 'white list' approach. The staff said that the nursery industry, traditionally opponents to the concept, were 'not flat out opposed'. There is no strong case why this important approach to dealing with invasive species, already in place in Western Australia and nationally, could not be adopted in Victoria. And there are strong economic and environmental reasons why it should be adopted.

Define a Clear Goal

Reducing the environmental impacts of invasives must be a clear goal, consistent with Victoria's obligations under Australia's National Biodiversity Strategy 2010-2030.

This goal of reducing the environmental impact (rather than simply *considering* it) must be defined in the Act's objectives. A statutory advisory body should also be formed to develop a plan to deliver this objective and oversee its implementation.

While the discussion paper rightly gives greatest focus to new and emerging threats, established threats must be better managed. The legislation needs a minimum standard of management of existing weeds and pests across all tenures to prevent irreversible biodiversity loss, along with an audit process to review progress. The worst outcome would be a 'solution' that merely matches or entrenches the available (and currently diminishing) resources. The new Act must be worded in such a way that it promotes or, at the very least, allows successful management of invasive species.

Independent Listing Process

Decisions on the risk or threat posed by different invasive species must be made by an independent expert-based committee (like decisions for listing threatened species). This group would rely on rigorous science and a precautionary approach and must make the final decision about the listing, not a Minister.

A subsequent decision to act on this independently-rated risk or threat would be needed to trigger action and potentially allocate additional public resources. This second stage of the decision would more appropriately be made by government or the Minister.

The community should be able to make proposals and comment on important draft decisions. Significant, and sometimes critical, expertise on most of these issues lies outside of government agencies and that expertise should be sought and used.

The listing process at present is opaque; consultation is either absent or tokenistic and often biased towards farming groups, especially with the requirement for at least half of CaLP boards to consist of farmers.

A transparent process will help build rigour into, and confidence in, the listing process. These matters must be spelt out in the new legislation rather than relying on the regulations for this important process.

Invest in Invasive Management

There are currently no new resources to be allocated to invasive species along with the new Bill. The discussion paper is silent on whether existing weeds and pests are being managed adequately, but most of us know that resources are being reduced over time while the problem is getting worse, and ultimately impacting on us all.

The Victorian Government needs to make a greatly enhanced investment in tackling invasive species which are impacting on the natural environment to better manage its own lands and waters, to support landholder and community efforts, and to invest in research programs and targeted eradications.

Extend to include species native to Victoria

The Act assumes native Victorian species are never invasive. Several of the most serious invasive species in the state are indigenous to one area, but become serious threats to biodiversity when introduced into others. Of the top 20 or so weed species in Victoria, three are indigenous to Victoria but naturalised outside their pre-European range: Sweet Pittosporum, Coast Wattle and Coast Tea-tree. Sweet Pittosporum is a major invader causing significant damage to the forests of the Otways, far from its normal range. The CaLP Act already lists a number of species native to Victoria and this should continue.

The movement of some native species in response to habitat disturbances, climate change or deliberate introductions, such as koalas and flying-foxes, can be sensibly dealt with through the independent listing process recommended above. Clearly, many changes to native species distributions should not be considered matters for invasive species management. Action can be taken depending on a number of factors, such as the severity of the environmental impact or whether or not it is part of changing natural processes.

The exclusion of native species may have been inadvertently proposed in the discussion paper because under the CaLP Act there is a clause that excludes from listing a species that naturally occurs in FFG Act listed communities. If this has informed the decision to exclude species native to Victoria, it is an ill-advised decision. The Act must extend its coverage to all species and taxa native to Victoria so that harmful natives can be properly managed.

Act Carefully, Otherwise Take Responsibility

There needs to be 'duty of care' obligations to require everyone to act responsibly and ensure that those who create or perpetuate invasive problems are required to remedy the damage. The failure of pine plantation owners to deal with escapes is an obvious example.

Such an approach was included in draft biosecurity legislation proposed by the Queensland government in 2010.

A bond could also be levied on new activities for which future control efforts are likely to be needed.

Improved consultation about the Bill

The discussion paper merely flags general ideas, and the next proposed opportunity for public input will be when the Act is tabled in Parliament in 2014. This is not acceptable for such an important piece of legislation. An exposure draft of the Bill must be released for public comment before it is tabled in Parliament. A community and expert advisory body should also be established to provide community and scientific input into the Bill's preparation.

The regulation needs to be released at the same time as the legislation to provide clearer guidance about how the legislation will operate, rather than being an empty vessel. Key principles and processes should be defined in the Act rather than in the regulation.

The timeframe for completing this reform, when the Act and the regulation are in place, is about five years. This is far too long to bring in much needed invasive species reform. We believe the preparation of the Bill can take place considerably faster, even with an additional opportunity for public consultation. Indeed, while community consultation can be time consuming, the passage of the legislation will be faster and the end result better supported if consultation is done properly.

The public consultation process to date appears to reinforce the agricultural emphasis of DPI. Most local conservation groups were not aware of the proposed change and their concerns were not actively sought. The advice and networks of DSE and the proposed expert advisory body must be drawn on during the reform process to ensure the environmental stakeholders are properly consulted.

We also note that the discussion paper that we have been asked to comment on was removed from the DPI website after submissions closed. This discussion paper should remain on the DPI website to help inform future responses to government proposals.

Part 2. Supported Aspects

The discussion paper promotes some sensible approaches:

Cross-tenure Approach

We support the approach that responsibilities are the same regardless of tenure, public or private

Cover all Life forms

We support the extension of the legislation to cover invertebrates and aquatic invasives.

Two-Tier Categories

The simplified two-tier categories of response is helpful. This system would be enhanced by:

- a) a safe list for low-risk species and
- b) a default unknown risk category for all other species/taxa,

because they are assumed to be high-risk until assessed and must be prevented from establishing. Containment of a species in a particular part of Victoria (as is being attempted now with Myrtle Rust) is not well accommodated by the proposed new two-tier regime.

Declarations Apply to Flexible Spatial Scales

Allowing declarations to be made at the appropriate scale ('spatial units appropriate to its management'), rather than an administrative boundary, through the instrument of management plans, is essential.

This approach would be further enhanced if

- a) a multiple-barrier approach was adopted, allowing different responses further away from an outbreak and
- b) cross-border cooperative arrangements and responses were administratively simple.

APPENDICES

1. *Control of Invasive Plants and Animals in Victoria's Parks*. Report of the Victorian Auditor-General. May 2010 (*attached as a separate document*).

2. *An assessment of the Weed Management program in land managed by Parks Victoria*. Report to the Victorian National Parks Association by Biosis Research. March 2008 (*attached as a separate document*).

3. Extracts from a 2011 report by Ecology Australia for VNPA's Nature Conservation Review (*on following pages 8-16*).

This unpublished report is an important reference, and will be appended to the VNPA's fourth Nature Conservation Review, due for release in 2012. The full Ecology Australia report will be published upon the release of the Nature Conservation Review. (Refer to VNPA for references in text.)

4. Accounting for environmental differences in biosecurity (*on pages 17-19 below*).

Appendix 3:

Extracts from a 2011 report by Ecology Australia for VNPA's Nature Conservation Review

Section 6.2 Invasive plants and animals

Invasive plants and animals (IPAs) have long been recognised as one of the most serious threats to biodiversity and are placed in the top three threats by some authors; others consider them the second-most or the most serious threat (AIAS 1976, Carr 1993, Trill and Porter 2001, NRMCC 2010 pp 22, 24-25, Dunlop and Brown 2008 p97, DSE 2010 p180, CES 2008 pp311-317). Of 19 threatening processes listed by the EPBC Act at June 2011, nine concerned invasive animals, two plants and three pathogens. The number of introduced plant and animal species has been used as a component of indices of environmental health (eg CES 2008 pp312, 313, DPI 2010 p22). It is expected that climate change will result in changes in invasive plant and animal behaviour with potential increases in extent, range and severity of impact (Low 2011 p35, Dunlop and Brown 2008). The development and introduction of drought-resistant, low-nutrient demanding, self-perpetuating organisms for agricultural uses presents a risk of new invasions (eg DPI 2008 p13, Hennessy et al 2007 p525). The development of a biofuels industry (eg DPI 2008 p13) presents risks in release of invasive species (Low and Booth 2007).

Weeds

There are at least 970 weed taxa established in native vegetation in Victoria, and around 580 of these threaten biodiversity, landscape and/or social values (DSE 2009e). Over 1000 exotic species occur in the parks network (PV 2010d), most of which will pose some degree of weed threat. Invasion of indigenous vegetation communities by environmental weeds is listed as a threatening process under the FFG Act, and several weed species are also specifically listed as a threatening process (Spartina, Blackberry, Sweet Pittosporum, with Tall Wheat Grass listing in process). Loss of habitat due to garden escapees is a threatening process under the EPBC Act, as is invasion of northern Australia by Gamba Grass and other introduced grasses. At least fourteen weed species of national significance occur in the state (CES 2008 p310). Weed invasion is directly responsible for degradation of large areas of EPBC-listed vegetation in Victoria's volcanic plains (TSSC 2008 p14; TSSC 2008b).

Unfortunately there is a serious lack of information on the extent and impact of weed infestations in Victoria (eg DSE 2009f p2), and very few targeted, systematic surveys of environmental weeds have been undertaken. Targeted surveys and research would

undoubtedly increase the number of weed taxa known to occur in the state and show more clearly the extent of weed infestations and their impact on biodiversity values (eg Carr et al 2011). The weedy species in poorly known non-vascular plant groups (mosses, lichens, liverworts, algae) are especially under-documented (DSE 2009f p2).

Indigenous plants have the capacity to become seriously invasive in many situations, establishing in areas well outside their natural range (Saunders et al 1996 p4-20, DSE 2009f p2). This includes both 'native' species, extending beyond their natural range [eg PV 2001 p2], or locally-occurring indigenous species that may become weedy within their natural range. In both cases the species may out compete and exclude other indigenous species, and alter faunal habitat. Causes include disturbance of the host communities, reduction of herbivory (ie lower grazing or browsing pressure), changed fire regimes, and environmental changes favouring these species at the expense of others. In many situations they threaten highly significant vegetation. Species of particular concern include Coast Tea-Tree *Leptospermum laevigatum* (eg invading nationally significant vegetation along the Great Ocean Road at Anglesea), Coast Wattle *Acacia longifolia* ssp. *sophorae* (eg invading undisturbed bushland in Grampians-Gariwerd and widely in south-western Victoria) and Sweet Pittosporum *Pittosporum undulatum* (eg invading vegetation outside its natural range from East Gippsland to the far south-west of the State). It is expected that climate change may increase the invasive potential of a number of indigenous plant species (Low 2011, Dunlop and Brown 2008 p19).

The flow of genetic material from non-local plants into local gene pools of a species is an under-recognised aspect of invasiveness. This process can result in the loss of local genetic diversity (eg Barbour et al 2008). Plantation species able to interbreed with local species can contribute significantly to this problem (Barbour et al 2008, Potts et al 2001, Potts et al 2003).

Invasive animals

Faunal invasions can have significant impacts on indigenous biodiversity (flora and fauna) values, (CES 2008 p311, BA 2006) (Peel et al 2005). There are 19 exotic mammal and 15 exotic bird species established in Victoria (DPI 2011c p5). The EPBC Act lists impacts of rabbits, cats, foxes, pigs, goats, rats and fire ants as threatening processes; the FFG Act lists as threatening processes faunal invaders including cat, fox, rabbit, sambar deer, feral honeybees, bumble bees, Argentinian ants, and fish outside their natural range. Modes of impact include predation, browsing and grazing, competition for resources, and habitat modification. Deer, for example, impact on a number of threatened plants and vegetation communities, including rainforest and Shiny Nematolepis *Nematolepis wilsonii*, with the latter listed under both the FFG and EPBC Acts; modes of action include browsing, rubbing and wallowing (Peel et al 2005, Bennett and Coulson 2011, PV 2009a p14). Long et al (2003 p2) note that 100 flora species, 19 fauna species, one flora community and one fauna community are threatened by rabbit disturbance in

reserves managed by Parks Victoria.

Although the impacts of vertebrate and invertebrate pest animals are well known in productive systems, our knowledge of their distribution, population levels and trajectories in natural environments is relatively limited. Knowledge of invertebrate and microbial invaders – number of taxa, distribution and impacts – is extremely limited.

Native fauna species outside their natural range may pose as serious a threat to biodiversity as exotic organisms (Saunders et al 1996 p4-20). Indigenous faunal species may also become over-abundant due to a range of factors including favourable habitat changes (eg increase in food sources such as improved pasture; increased availability of water), or removal of predators or competing species. Over-abundant native species may impact seriously on biodiversity values (CES 2008 p 311), through overpopulation, overbrowsing, and outcompeting and displacing indigenous species. Species recognized as invasive in some contexts with potentially very serious biodiversity impacts, include Kangaroo, Brush-tailed Possum, Koala (DSE 2010 p55). Noisy Miners and Bell Miners pose severe threats to fauna and flora in disturbed environments, including the endangered Helmeted Honeyeater.

Pathogens

Pathogens (native as well as exotic) pose very serious threats to biodiversity in Victoria (eg Saunders et al 1996 p4-20). For example Myrtle Wilt fungus of *Nothofagus* forests and Phytophthora affecting a range of plant taxa, and Chytrid fungus impacting on frog populations, are recognised as having a major impact on biodiversity values. Chytrid fungus has had a serious impact on many frog species and populations. Several pathogens are listed as threatening processes under the FFG Act and/or EPBC Act, including Myrtle Wilt impact on *Nothofagus* forest (FFG), Chytrid fungus infection in amphibians (EPBC and FFG), and Phytophthora (EPBC and FFG). The newly introduced Myrtle Rust in Australia may have the potential to cause major disruption to Australian ecosystems but it has not yet been recorded for Victoria. The taxonomy, distribution, impact and trajectory of pathogens in Victoria are extremely poorly known.

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Section 7.1 Invasives

1. Invasives are one of the top three threats to biodiversity. The control of invasives is required under the CBD (CBD 1993 art 8h). Australia's biodiversity conservation strategy sets a 2015 target of a 10% reduction in the impacts of invasive species on threatened species and ecological communities (NRMMC 2010 p10). The Australian Weed Strategy (NRMMC 2007a) and the Australian Pest Animal Strategy (NRMMC 2007b) set out national objectives and strategies for dealing with invasives, and Caring for Country funding is directed towards their management (CC 2010a pp5, 7, CC 2010b pp 42-49). Significant attention is given to

2. In Victoria, DSE is responsible for managing invasives on public land, while DPI is responsible on private land (DPI 2008b). DPI is responsible for overall invasives strategy and planning (DPI 2008b).
3. Along with the CALP Act, the Invasive Plant and Animal Policy Framework (IPAPF) is the most important Victorian government policy statement on invasives (DPI 2010). Consistent with the Victorian Biosecurity Strategy, the IPAPF sets out a biosecurity approach to invasives management, based on prevention, eradication, containment, and asset-based protection, depending on how established the organism has become (DPI 2010 p14). This is implemented through the CALP Act (s4e), by CMAs. CMAs should prepare regional plans, including for weeds (EWWG 2007 p15). Only weeds listed under section 4e of the CALP Act have regulatory significance (DSE 2009f p1), although the objectives of various other Acts require invasive or exotic species more generally to be controlled (eg National Parks Act section 17 (ii), (iii), (iv); FFG Act). Under the CALP Act pest animals may be categorised as prohibited, controlled, regulated or established, while pest plants may be categorised as prohibited, regionally controlled, or restricted (Part 8 Division (1), variously at state or regional level. Each of these categories imposes different regulatory responsibilities on landholders.

The biosecurity approach is : 'prevent new, high-risk invasive plants and animals from becoming established, eradicate high-risk IPAs in their early stages, contain high-risk established IPAs, and protect priority assets from the impacts of weeds and pests.' (DPI 2008 p30)

4. Various Acts and regulations require action on invasives where they threaten native ecosystems, including the FFG Act, the National Parks Act (DSE 2009f p1), and the VPPs. The Code of Practice for Timber Production (DSE 2007b) requires a number of actions to protect against pest plants, animals and pathogens during operations on both public and private land.
5. While the focus of the IPAPF and the CALP Act are to prevent the introduction and establishment of new invasives and high-risk organisms (DPI 2008 p30), established invasives (ie organisms that have expanded to occupy their full range – see DPI 2010) continue to seriously impact on biodiversity values. Examples of established invasives include Rabbit, Cat and Fox. An asset- or place-based approach to invasives management is offered within the IPAPF, and may be applied to protect high-value assets (eg PPWCMA 2011).
6. Management of invasives through the IPAPF and the CALP Act has several limitations. Firstly, there is a failure to address indigenous invasive species, secondly they only act on weeds considered eradicable in the state or region, and thirdly, they may not address weeds

7. The contradiction between the CALP Act approach and the management of invasives for biodiversity protection can be seen by comparing the CALP Act noxious weeds list (119 taxa) and the ‘advisory’ lists prepared by DSE, which refer to 580-odd species with the potential to impact on biodiversity and other values (DSE 2009f p1). These list weeds considered by expert opinion to pose a threat to Victoria’s bioregions (eg DSE 2009e, DSE 2009f). While these are not prepared using the same level of detail used to assess CALP Act weeds (DSE 2009f), and have no regulatory status, they nonetheless provide a guide for public land managers and others and identify which species present significant risks (DSE 2011).
8. The state’s key biodiversity assets are contained in the reserve system. Asset-based management approaches are used to address invasives issues on public land, such as reserves administered under the National Parks Act. There are guidelines for undertaking weed management programs on public land in Victoria (EWWG 2011), which include guidelines for prioritising weed incursions, and a 12-step local area planning approach (EWWG 2007 eg pp1, 22-23, 24-25 etc); see appendix 4 of this report. The process has been developed and refined through the Glenelg Eden and Otways Eden projects (eg Platt et al 2008). These guidelines and the approach set out in the demonstration projects should be applied widely. Unfortunately, government commitment to management of invasives on the public estate appears weak: the 2011-2012 Victorian budget commits to treating a meagre 1,100 ha to ‘minimise the impact of pest plants, pest animals and overabundant native animals in parks managed by Parks Victoria’ (Victorian Government 2011b p313).
9. A number of indigenous Victorian species have the capacity to establish in areas outside their natural range, and act as serious environmental weeds or pests with major impacts on the communities they invade. They may also become overabundant in communities in which they occur naturally, as a result of removal of natural constraints or changed environmental or ecological conditions. Flora species showing particularly serious invasive potential include Coast Tea-tree, Coast Wattle, Burgan and Sweet Pittosporum, while faunal species include Kangaroo, Koala, Brushtail Possum and Noisy Miner (DSE

10. Integrated, cross-tenure, landscape-scale, multi-outcome approaches to invasives control are increasingly being used and promoted in Victoria (eg EWWG 2007 pp6, 13, 19, 22). Prominent programs include Southern Ark and Glenelg Ark (DPI 2011c) and Highlands Down (EGCMA 2011). This model has been identified for use elsewhere (DSE 2006 p38).
11. Expenditure on invasives is spread over many programs. The Victorian Government's Future Farming strategy in 2008 allocated \$20 mil over four years to weed and pest initiatives (DPI 2008 p31). Parks Victoria has reported spending 25% of its natural values budget on managing invasives (PV 2007 p2). Invasives management programs require ongoing funding and commitment (PPWCMA 2011 p27), which is rarely obtained. The Victorian budget allocated \$17 million for management of weeds and pests on public land over four years (Victorian Government 2011 p23). This is presumably in addition to funding from other sources, as it is a very small amount.
12. Compiling information on invasives is essential for effective management. Information is required not just on the number of invasive taxa, but their distribution, population densities and trajectories, biodiversity and ecosystem impacts and the assets they threaten. Several invasive species databases exist, including DSE's Flora Information System, DPI's Integrated Pest Management System, and PV's Environmental Information System (DSE 2009f p2). DSE advisory lists invite input, including notification of new and emerging weeds or plants not currently considered significant risks or that are poorly known (DSE 2009f pp 2, 4, (6). Plants may be proposed to the Minister for listing by CMAs (PPWCMA 2011 p19), and input into and review of CMA regional weed lists may be 'ongoing' (PPWCMA 2011 p19). However there is a need for dedicated and comprehensive surveys for invasive species. For instance, a recent study of the weeds of the Warrnambool-Port Fairy coast found six new weed species not previously recorded for Victoria or Australia, in a surveyed area of 2.2 km² (Carr et al 2011). Adair et al (2008 p2) point out there is very little known about the weed flora of some groups eg non-vascular plants. There is a need for comprehensive, integrated, cross-tenure, cross-jurisdictional, landscape-scale information systems.

'[There is a] lack of data available on rabbit distribution within parks (and within Victoria as a whole). Parks Victoria's capacity to prioritise and monitor the effectiveness of rabbit control would be greatly improved if a systematic method of surveying rabbit distribution and abundance in parks were implemented.' (Long et al 2003)

13. A monitoring, evaluation, reporting and improvement (MERI) approach is recognised as essential for invasives management (DPI 2010, PPWCMA 2011 ch9). Appropriate measures of real outputs must be used to assess results (eg DPI 2010c p3). For example, the number of hectares treated to reduce the impact of invasives is often used as a measure (eg Victorian Government 2011b p313); however, this is an output, rather than an outcome – ultimately success must be measured in terms of how much the impact of invasives on biodiversity is reduced, or more importantly, an increase in biodiversity values in the areas treated. It is vital that MERI be used to improve invasives management rather than just to meet regulatory requirements.
14. Standards and protocols should guide work done by contractors on both public and private land. The 'Weedstop' program developed by DPI already provides training and certification for weed contractors and managers in all organisations and operations dealing with weeds. Weedstop and similar standards and protocols should be further developed and widely applied.
15. Lists of prohibited taxa are the basis of the IPAPF and the CALP Act invasives management approach (ie only species assessed as high risk are listed). This creates a problem – a misplaced focus on the listed species, at the expense of many other taxa that pose serious threats. We require a permitted list for the use and trade of plants in Victoria, rather than a prohibited list, in which all taxa are prohibited from entry, use or trade, unless proven to be low risk. The CALP Act list for declared animals appears to be more in line with a permitted list, by listing a very high proportion of all vertebrate fauna of the world as 'restricted' in Victoria, compared with the approach to plants, which lists only a miniscule fraction of the world's plant taxa.

Issues

1. The very serious issue of invasive native and indigenous species is not adequately addressed by Victorian policy, regulation and practice.
2. The issue of indigenous species extending their range in response to climate change needs to be addressed, in the light of the risk of invasive and overabundant indigenous species (eg see Dunlop and Brown 2008 pp 15, 97-99).
3. The current weed management structure means that most serious environmental weed species are not declared under the CALP Act (EWWG 2007 p5) and are not addressed by CMAs and other organisations that use the CALP lists to identify what species to target

4. DPI has responsibility for overall IPA management, including responsibility for policy and strategy (DPI 2008b). The appropriateness of DPI taking overarching responsibility for management of invasives in the state's 3 mil ha of public conservation reserves needs to be reconsidered, as the management objectives and methods differ significantly from those in productive agricultural lands, which is DPI's primary area of expertise.
5. Criteria for assessing invasives risk potential need to be re-examined, eg Adair et al (2008 p2) state that 'long-established, widespread, and successful invasive plants that occupied most of their range will be considered less of a risk than those that are still increasing in numbers' – while sensible, it is necessary to ensure this approach does not direct effort away from important asset-based weed management.
6. Modelling is widely used in weed risk assessment, but models are not in themselves adequate: Melbourne & Hastings (2009) point out that a high degree of uncertainty should be attached to models; input from experts would help improve such assessments; for example DSE advisory lists are prepared using the 'expert opinion' approach (Platt and Lowe 2008 p22, Adair et al 2008 p1). The mismatch often observed between known climatic 'envelopes' used in many models and actual distribution of invasives suggests that this is not always a good predictor of the potential range of invasive species.
7. Invasives in a number of taxonomic groups are largely ignored, eg fungi, non-vascular plants (Adair et al 2008 p2).
8. A number of weedy species have been, and continue to be, actively promoted by government agencies. These include Tall Wheat Grass and Bituminaria, both promoted by DPI, and variously by CMAs (eg Booth et al 2009). Conflicts arise between use of plants for productive uses and the risk some of these pose to ecological values.
9. Pest plants and animals are not adequately controlled on public land, including National Parks, for example Sweet Pittosporum in the Otways NP and *Acacia longifolia* in the Grampians-Gariwerd NP pose fatal long-term threats to these assets, yet little or no action is taken against them.
10. A number of plant and animal taxa present in Victoria have the potential to dramatically increase their range with serious negative implications for indigenous flora and fauna and ecosystem services. Most serious plants include Panic Veldt Grass, Tall Wheat Grass, Sweet Pittosporum, St John's Wort, Trifolium species and other legumes. A priority list of the most serious weeds posing threats to biodiversity and ecosystems in the state is required. Animal species on the increase include Samba Deer, other deer species and Horses.
11. Serious impacts on biodiversity can result from the introduction of genetic material from non-local sources into local populations of a plant or animal. This may occur when non-locally indigenous plants are introduced into an area, and interbreed with local plants.

12. Plantations and horticultural plantings may present a high risk of interbreeding, depending on the taxa and their ability to exchange genes with local species. This is referred to as 'genetic pollution'.
 13. There is a need for a comprehensive examination of the overarching negative impacts of invasives – Ainsworth et al (2008 p2) show that almost no assessments of the impacts of multiple invasives on biodiversity values have been undertaken. More broadly, there has been no work comprehensively documenting the impact of invasives, addressing ecological, biological, social, economic impacts.
 14. Guidance is required on how to deal with conflicts in invasive species management; for example, the use of *Phalaris* as a pasture grass vs its demonstrated impacts on biodiversity
 15. Many highly invasive plant species are traded legally and promoted by the agricultural and horticultural industries and the nursery trade.
 16. Domestic animals and plants may seriously impact on biodiversity in areas adjoining settlement.
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Appendix 4.

Accounting for environmental differences in biosecurity

ISC and VNPA support the ‘one biosecurity’ approach recommended by the 2008 Beale review of federal biosecurity that envisions a “seamless” cross-sectoral, cross-jurisdictional approach to biosecurity. The One Biosecurity integration is essential in a federal system, with biosecurity functions spread across three levels of government under numerous laws and policies, and with invasive threats having a multitude of pathways and drivers. ‘One biosecurity’ requires, however, recognition of the distinctive requirements of environmental biosecurity.

Many invasive species have both economic and environmental impacts, and sometimes social impacts as well, warranting a joint approach. But protecting the natural environment differs in many ways from protecting industry assets and requires a distinctive ecologically based approach to biosecurity. Environmental biosecurity cannot just be a bolt-on to existing industry approaches.

Following is a brief outline of some of the differences that underpin distinctive requirements of environmental biosecurity.

The values at stake – biodiversity and environmental health: Conservation requires a biosecurity focus on hundreds of thousands of species, from microbes to macropods, and their interactions that constitute ecosystems and ecosystem processes in terrestrial, freshwater and marine systems. In contrast, industry biosecurity is mostly focused on protecting individual economically valuable species that number no more than a few dozen (except for the nursery and aquarium industries, which use a wider range of species). The values at stake for industry are quantifiable in economic terms and are often replaceable (by new breeds, species or enterprises). The values at stake in conservation are not replaceable – each species and ecosystem is important – and cannot be quantified in economic terms. This means they are often undervalued when biosecurity priorities are decided.

Scale and complexity of threats: Because of the diversity of ecosystems, invasive species threatening the environment far outnumber those threatening agricultural assets and the impacts are more complex. For example, myrtle rust affects industry by infecting particular cultivated species but environmental impacts will consist of the impacts on hundreds of susceptible species and the flow-on effects on dependent wildlife. As the federal Department of Agriculture, Fisheries and Forestry (DAFF) has acknowledged is likely for weeds, the impacts of invasive species on the natural environment are even greater than their impacts on agricultural industries:

“The cost of weeds to agricultural industries is estimated at about \$4 billion a year. The cost of weeds to the environment is difficult to calculate but could be greater than the estimated cost to agricultural industries.”¹

State of knowledge: Much more is known about cultivated species and biosecurity risks than about biodiversity and invasive threats. The lack of knowledge about our native biota, particularly invertebrates and microbes, means that most invasive species impacts are not documented or monitored. Burgman and co-researchers say of fungi, “far less than about 10 per cent of species

¹ Department of Agriculture, Fisheries and Forestry: <http://www.daff.gov.au/natural-resources/invasive/weeds>

are scientifically documented” and it may be many years before the effects of the many new fungi arriving each year are felt in Australian ecosystems. “As a consequence, lists of potentially damaging invaders rarely make reference to fungi.”² The Australian Government has said: “The potential susceptibility of Australian native flora to exotic pests and diseases is largely untested although some serious exotic pests and diseases have been shown experimentally to be suited to native plants as hosts.”³ The impacts of even high-profile invasive species are often poorly known – development of the NSW threat abatement plan for biotou bush increased the number of known species at risk from six to 158.⁴

Predictability and timeframes: While impacts on cultivated species can be predicted with reasonable accuracy, there are high levels of uncertainty about impacts in the natural environment due to complex interactions, long timeframes (centuries) and lack of knowledge. Many impacts are facilitated by or synergistic with other threats, such as fragmentation and climate change. Invasive impacts in the natural environment may not be observed for decades due to lag effects, lack of monitoring or their insidious nature. A cow killed by a new pathogen is much more easily detected than a dead bird in a forest.

Management approaches and options: There are many more management options in relatively simple, delimited agricultural systems than there are in complex natural environments. For example, in response to myrtle rust, plant industries can use fungicides, breed resistant varieties or use tolerant species, none of which are options in the natural environment. Weeds cannot be controlled with broadacre mechanical or chemical methods in many natural situations.

Stakeholders and resources: There are commercial incentives for industry management of invasive species but environmental biosecurity relies on government and community investment for the public good. Commercial incentives and greater government spending also mean that industry biosecurity is much better resourced than environmental biosecurity. When funding cuts occur, environmental biosecurity suffers more than industry biosecurity. A multitude of stakeholders, often with conflicting agendas, make environmental biosecurity a more socially and politically challenging policy area than industry biosecurity. Some of the most damaging environmental invaders are ignored because of economic or social reasons that are rarely subject to cost-benefit analysis – many aquarium fish, pasture grasses and garden plants for example.

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, the precautionary principle is vital.
- Biosecurity policy units and advisory bodies need more ecologists and conservationists.

² Burgman M, Walshe T, Godden L, Martin P. (2009). Designing regulation for conservation and biosecurity. *Australasian Journal of Natural Resources Law and Policy* 13: 93-112.

³ Australian Government. (2008) Australia – Measures affecting the importation of apples from New Zealand (DS367) First Written Submission of Australia. Geneva, 18 July 2008.

⁴ Coutts-Smith A, Downey P. (2006) The Impact of Weeds on Threatened Biodiversity in NSW, Technical series no.11, CRC for Australian Weed Management Systems, Adelaide

- 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.
 - There is need for more funding for 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 much more preventive and ecologically defensive.
 - Environmental biosecurity needs meaningful involvement of community and environmental NGOs in policy development.
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