



Newsletter of the Weed Society of Victoria Inc.

volume 29 issue 1 2018

# Weedscene

## Focus on Risk Assessment

In this issue of Weedscene, the focus is on risk assessment. Our regular series on Invasive Plants PhD Research Projects features Jackie Steel's work on refining the risk assessment process undertaken prior to the release of biocontrol agents into the environment. Then there are articles featuring the products of biocontrol risk assessment – the biocontrol agents. Rae Kwong provides information on the biological control of the serious aquatic weed *Sagittaria*, including mention of the stringent host specificity testing – the vital work undertaken to mitigate risk.

There is an update on the interactive Biocontrol Hub within the Atlas of Living Australia website, developed by WSV President Greg Lefoe (who also features in a gorse biocontrol report – see *In the Media* page 11). This online resource allows the collection and mapping of citizen science data, includes information on all current and past biocontrol projects, and provides extension materials and advice.

A European study has recently developed a minimum standards framework for risk assessment of invasive alien species, through a workshopped consensus process undertaken by a team of experts. The aim is to ensure there is a thorough and systematic approach to risk assessment protocols. There is a summary of the *Journal of Applied Ecology* article on page 9 in this issue of Weedscene.

Risk assessment underpins biosecurity. Within the last few years, the Australian Government has reviewed the nation's biosecurity system with input from public consultation, and has enacted new legislation. This issue of Weedscene reports on invitations to upcoming biosecurity events which facilitate communication between stakeholders and government (see *Biosecurity Roundtable Information for 2018* pages 6–7). These events are coordinated by the National Biosecurity Committee and co-hosted by the Australian Government DAWR and Victorian Government DEDJTR.

*In the Media* (page 10) reports on the recent launch of the Global Register of Introduced and Invasive Species. Developed by the International Union for Conservation of Nature (IUCN) Species Survival Commission (SSC) Invasive Species Specialist Group (ISSG), this initiative is the first country-wise database of naturalised introduced and invasive species. It provides a global system for monitoring trends in biological invasions that affect the environment, and supports national governments to prioritise actions and manage pathways to prevent introduction and establishment of invasive species – a risk assessment platform.

Also on the topic of risk assessment, the January 2018 issue of Friends of WESI Update (Weeds at the Early Stage of Invasion) is a project run by the Victorian Department of Environment, Land, Water and Planning) reports on the recently revised Environmental Weed Advisory List (see *In the Media* page 11). This list provides risk scores to help prioritise weed management activities for land managers. The new list includes about 1780 potential and early invader weeds, a 260% increase in species since the 2008–2009 advisory list was issued – an indication of the concern about the risks posed by weeds and alertness for new invaders.

And on a sad note, invasive species denialism has become a 'thing', much like climate science denialism. A 2017 article\* in the journal *Biological Invasions* discusses the exponential rise of discourse in mainstream popular press and journals devoid of expert peer review, claiming that the risks posed by non-native species and the field of invasion biology is biased, uninformative and pseudoscientific. As concluded in the article, 'this burgeoning phenomenon could impede development and implementation of policies designed to safeguard against invasive species spread and impact'.

\* Ricciardi, A. and Ryan, R. *Biological Invasions* (2017). <https://doi.org/10.1007/s10530-017-1561-7>.

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## WSV Membership Rates 2017–18

Pay for 1, 3 or 5 years

Concession*	\$20
Ordinary	\$60
Corporate	\$140

\* Students and Pensioners

WSV is not registered to collect GST

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**COVER PHOTO:** Biocontrol weevils on *Sagittaria platyphylla*  
(courtesy Rae Kwong)

## Joining the Weed Society of Victoria

The benefits of membership to WSV include:

- Weedscene: newsletter packed full of information
- eWeedscene: regular electronic bulletin on weed news and events
- Discounts to WSV seminars, workshops, conferences and other events
- Opportunities to network with others.

To apply for membership, download and print the membership application form from the WSV website, [www.wsvic.org.au](http://www.wsvic.org.au), complete the details and mail to the WSV Secretary.

**Weedscene** Newsletter of the Weed Society of Victoria Inc.

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*Want to receive Weedscene as a PDF? Contact the Secretary.*

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- Logo and sponsor name on the Society's website
- One promotional article in 'Weedscene' per year (subject to ed. control)
- One free membership per year (optional)

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■ One sixth page	56 mm wide × 128 mm high	\$50
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# Invasive Plants PhD Research Projects

*This is the tenth in our series on invasive plants research projects being undertaken by PhD candidates in Victoria.*

Assessing the physiological, ecological and climatic limits of *Listronotus sordidus* (crown-boring weevil) for its suitability as a biological control agent for the weed *Sagittaria platyphylla* in south-eastern Australia

Jackie Steel's supervisors are Dr Mallik Malipatil, Associate Professor, School of Applied Systems Biology, La Trobe University and Principal Research Scientist (Biosystematics), Agriculture Victoria, and Dr Raelene Kwong, Senior Research Scientist, Agriculture Victoria.

Globally, hundreds of insect species have been introduced to countries outside their native range to provide effective, sustainable biocontrol of weeds without the need for herbicides. Almost all of these insects have remained on their weedy plant hosts without affecting other plant species. However, biocontrol could pose an unacceptable risk if native plants or crop species are suitable as alternate hosts for the insect.

The highly stringent laboratory techniques now used to determine the host range of potential biocontrol agents have effectively eliminated the risk of releasing an unsafe agent. However, the quarantine conditions under which these tests must be carried out are known to result in insect behaviours that are not observed in the field and that can lead to an overestimation of the actual range of plant species that would

be suitable hosts. The tests are arguably too conservative and result in the rejection of many possible good biocontrol agents, leading to missed opportunities for sustainable and effective weed control.

My PhD research aims to utilise techniques applied to insect-plant interaction research to improve traditional host-specificity testing methods and to more realistically determine which plant species might be utilised by biocontrol insects released into the Australian environment. A higher acceptance rate of biocontrol agents, without increasing the risk of unintended damage to non-target plants, will lead to improved weed control in both native vegetation and agricultural environments, as well as a reduction in the use of herbicides.

I am using a North American weevil as a model system to assess its host preference against the aquatic weed, delta arrowhead, in comparison to other closely-related ornamental and Australian native species. An effective biocontrol agent would prevent this highly-invasive weed from outcompeting native wetland species and would improve the delivery of water to irrigated agriculture in south-eastern Australia.

More broadly, biocontrol research provides valuable tools for studying insect-plant interactions that are not possible where insects are studied in their native or invaded ranges. This research often brings together insect herbivores with a new suite of plant species that are closely-related to their natural hosts (from the same genus or family), but that have been evolving in geographic isolation for millions of years. Using techniques from insect-plant interactions to study these unique systems will deepen our understanding of the evolution of plant defences and the insect behaviours that can overcome them.



Jackie Steel conducts her research under strict quarantine at the AgriBio Centre for AgriBioscience on La Trobe University's Bundoora campus

*This project is supported by Agriculture Victoria, AgriFutures Australia and irrigation agencies, through funding from the Australian Government Department of Agriculture and Water Resources as part of its Rural R&D for Profit program.*



# Biological Control Research and Risk Assessment

The following article was provided by Rae Kwong (Senior Research Scientist, Invertebrate and Weed Sciences, Agriculture Victoria Research Division). The information and photos are published as a flyer by Agriculture Victoria. A PhD Student article on Rae's research into biocontrol of *Sagittaria platyphylla* was published in Weedscape Volume 28 Issue 3 2017.

## Biological Control of *Sagittaria*

**The problem:** *Sagittaria platyphylla* (sagittaria, delta arrowhead), is a serious aquatic weed of irrigation channels, drains, creeks and wetlands. It forms dense and extensive thickets, which increase siltation and impede water flow. Despite intensive herbicide control programs, sagittaria continues to be an ongoing issue due to the ability of plants to regrow from tubers and submersed rosettes. *Sagittaria* produces copious amounts of seed which disperse downstream and can remain dormant in the mud for several years.

**Phase 1:** The Victorian Government initiated a biocontrol program against both *S. platyphylla* (sagittaria) and *S. calycina* (delta arrowhead) in 2009/10 to identify natural enemies from the weeds' native range in the southern USA. Three weevil species show great promise due to their impact on seed and tuber viability and plant survival.

- The larvae of the **crown-boring weevil**, *Listronotus sordidus*, feed within the root crowns causing plants to turn yellow, collapse and die within three weeks. It takes less than three larvae to destroy a plant. Females can lay over 100 eggs during the growing season. If released into Australia, the crown-boring weevil would increase plant mortality and reduce the density of sagittaria populations.



Some related plant species used in quarantine for testing the host preference of the sagittaria weevils. Left to right: *Alisma lancifolia* (exotic), *Sagittaria platyphylla* (weed) and *Alisma plantago-aquatica* (native). (Photo courtesy Rae Kwong)



Sagittaria crown-boring weevil, *Listronotus sordidus*  
(Photo courtesy Rae Kwong)

- The larvae of the **fruit-feeding weevil**, *Listronotus appendiculatus*, feed on developing fruiting heads. Weevils reach high densities causing significant losses in seed output and viability. If released into Australia, the fruit-feeding weevil would help reduce sagittaria and arrowhead spread and seedling recruitment.
- The larvae of the **tuber-feeding weevil**, *Listronotus frontalis*, feed within the sagittaria tubers. Each larva can consume up to three tubers as it grows. If released into Australia, the tuber-feeding weevil would reduce tuber viability.

## Sagittaria Biocontrol Agent Risk Assessment

**Phase 2:** Prior to release into Australia, the biocontrol agents must undergo stringent testing to ensure they do not attack native and/or economically-important plant species. Referred



Sagittaria fruit-feeding (left) and crown-boring (right) weevils  
(Photo courtesy Rae Kwong)

to as host specificity testing, this research provides critical information used by the Australian Government to assess the safety of proposed biological control agents.

The sagittaria fruit-feeding, crown-boring and tuber-feeding weevils have all now been imported from the USA into the insect quarantine facility at AgriBio, Centre for AgriBioscience in Bundoora, Melbourne. Host specificity testing has commenced on the fruit-feeding and crown-boring weevils, while the tuber-feeding weevil was imported only recently (December 2016).

The weevils will be exposed to a selection of Australian native and ornamental plant species closely related to the two weedy sagittaria species. A range of tests will be conducted to see if the weevils can feed, lay eggs and develop from larval stages to adults on the test species.



A tuber-feeding weevil larva inside a *Sagittaria platyphylla* tuber (Photo courtesy Rae Kwong)

### Future Directions (2017 to 2020)

- Complete host specificity testing of the three sagittaria agents in AgriBio's quarantine facility.
- Undertake genetic studies and bioclimatic modelling to determine the ecological host range of the crown-boring weevil.
- Pending approval for release by the Australian Government, undertake a mass rearing and release program.

### For further information, please contact:

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rae.kwong@ecodev.vic.gov.au  
Mob. 0409 965 471

This project is supported by the Victorian Government Department of Economic Development, Jobs, Transport and Resources (DEDJTR), AgriFutures Australia (formerly Rural Industries Research and Development Corporation) and irrigation agencies, through funding from the Australian Government Department of Agriculture and Water Resources as part of its Rural R&D for Profit program.

## 21st Australasian Weeds Conference Update



Kim Hignell, President of the Weeds Society of New South Wales (organisers of the 21st Australasian Weeds Conference), recently announced the topics for discussion at the 9–12 September 2018 event.

### New Technologies in Weed Management

Innovative advances in technology, including new ways of modelling, communication, surveillance and detection, are changing the weed management landscape rapidly. We'll discuss the latest technologies that can help weed managers save money, time and energy.

### Biological, Mechanical and Chemical Weed Control and Research

We'll discuss applied management findings and discuss best practice use of control tools and technologies. We'll also learn about weed management research that is currently underway, and investigate knowledge gaps that require new research.

### Herbicide Resistance

Herbicide resistance is an ongoing challenge. We will look at new cases of weed resistance, explore our understanding of what makes plants resistant, and discuss the latest and best management practices for managing or delaying herbicide resistance in weeds.

### Weeds of Crops and Pastures

Weeds cost primary producers precious dollars by reducing agricultural productivity. Speakers will look at ways of managing crop and pasture weeds using a combination of chemical and non-chemical methods, and explore new and existing management practices.

### Environmental Weeds and Weeds of National Significance

Worldwide, weeds cause serious impacts to the environment and social well-being. Speakers will discuss new and emerging weeds, strategic management for prevention, eradication, containment and asset protection, and best practice control solutions.

# Biosecurity Roundtable Information for 2018

This information has been provided by the Department of Agriculture and Water Resources. For an indication of what happens at these roundtable meetings, please see the Environmental Biosecurity Forum article on page 7 in Weedscape 28 Issue 3 2017.

## Environmental Biosecurity Roundtable, Canberra

Date: Thursday, 3 May 2018

Time: 9:00 am – 4:00 pm

Venue: Songlines Conference Centre

Department of Agriculture and Water Resources, 7 London Circuit, Canberra ACT

Two Environmental Biosecurity Roundtables will be hosted by the Department of Agriculture and Water Resources and the Department of the Environment and Energy in 2018. Please save the date for the second environmental biosecurity roundtable planned for 26 September 2018. Location and details will be sent when finalised.

## Background and Purpose

The Department of Agriculture and Water Resources and the Department of the Environment and Energy undertake a range of environmental biosecurity work in collaboration with state and territory governments, industry, non-government, environmental conservation organisations and communities. The environmental biosecurity roundtables are an opportunity for you to talk about environmental biosecurity issues directly with Australian and state/territory government representatives and a wide range of environmental and community organisations.

## Registration

Please register for the 3 May Environmental Biosecurity Roundtable at: [www.eventbrite.com.au/e/environmental-biosecurity-roundtable-tickets-42480690890](http://www.eventbrite.com.au/e/environmental-biosecurity-roundtable-tickets-42480690890)

Once registered, you will receive email confirmation from Eventbrite and updates from the secretariat, including the agenda which will be finalised closer to the date.

## Call For Nominations

We again invite you to nominate relevant agenda items or speakers to present at the 3 May Environmental Biosecurity Roundtable. Please include your nomination in the Eventbrite registration form.

Alternatively you may email your nomination to the Biosecurity Roundtable Secretariat.

## Roundtable Alignment with the Environment and Invasives Committee (EIC) Meetings

As agreed by the National Biosecurity Committee, the former Invasive Plants and Animals Committee has now formally transitioned to the EIC. The EIC will take on the previous IPAC's responsibilities and additionally provide policy leadership for environmental biosecurity and a range of invertebrate pests.

At the 16 November 2017 Environmental Biosecurity Roundtable participants indicated support for aligning the environmental biosecurity roundtables and the meetings of the EIC. We are pleased to announce this will occur for the first environmental biosecurity roundtable of 2018. The EIC will consider the best way to formalise this linkage at its 2 May meeting and will attend the 3 May roundtable to engage with participants.

If you would like a copy of the EIC's terms of reference, please email the EIC secretariat at [EIC@agriculture.gov.au](mailto:EIC@agriculture.gov.au).

## 2017 Meeting Summaries and Minutes

Meeting summaries and minutes from the 2017 Canberra and Sydney Environmental Biosecurity Roundtables are available on the Department of Agriculture and Water Resources website.

## NBC State and Territory Biosecurity Roundtables and National Biosecurity Forum

The dates for the 2018 NBC state and territory biosecurity roundtables and National Biosecurity Forum are:

South Australia – 11 April 2018

Tasmania – 7 June 2018

Western Australia – 4 July 2018

Victoria – 2 August 2018

New South Wales – 30 August 2018

Queensland – 10 October 2018

Northern Territory – 31 October 2018

National Biosecurity Forum (held in Canberra) – 22 November 2018.

You are invited to attend the 2018 Victoria Biosecurity Roundtable, Melbourne on Thursday 2 August 2018. This event is presented by the National Biosecurity Committee, and co-hosted by the Australian Government Department of Agriculture and Water Resources and the Victorian Government Department of Economic Development, Jobs, Transport and Resources.



These events are an opportunity for you to talk about biosecurity issues directly with Australian and state/territory government representatives, a wide range of industry members and producers and environmental and community groups.

This year the theme for the events is Preparedness and Response, and activities on the day are designed to seek participants' input on:

- preparedness and response arrangements across the continuum;
- gaps and possible solutions;
- roles and responsibilities in preparedness and response;
- trusted sources of information on biosecurity;
- successes and lessons learned.

Please register for the **Victoria Biosecurity Roundtable** at: [www.eventbrite.com.au/e/2018-victoria-nbc-biosecurity-roundtable-tickets-42619361658](http://www.eventbrite.com.au/e/2018-victoria-nbc-biosecurity-roundtable-tickets-42619361658)

Invitations for the National Biosecurity Forum will be sent in the coming months. If you would like to register your interest, please email [biosecurityroundtable@agriculture.gov.au](mailto:biosecurityroundtable@agriculture.gov.au).

Philippe Frost and Rachel Anderson  
Biosecurity Roundtable Secretariat  
Department of Agriculture and Water Resources  
[biosecurityroundtable@agriculture.gov.au](mailto:biosecurityroundtable@agriculture.gov.au)  
1800 068 468

### National Biosecurity Statement

The Department of Agriculture and Water Resources would like to invite you to participate in the development of the National Biosecurity Statement. The National Biosecurity Statement will affirm the commitment of all parties to an effective biosecurity system and collaborative action in preventing, preparing for and responding to national biosecurity risks. Biosecurity is a shared responsibility among all system participants and the department welcomes your contribution.

Where: ParkRoyal Hotel, Melbourne Airport  
When: Thursday 22 March 2018, 9:00 am – 4:00 pm

Please register for the National Biosecurity Statement workshop at:  
[www.eventbrite.com.au/e/national-biosecurity-statement-workshop-tickets-43323926029](http://www.eventbrite.com.au/e/national-biosecurity-statement-workshop-tickets-43323926029)  
Contact [biosecurityconsultation@agriculture.gov.au](mailto:biosecurityconsultation@agriculture.gov.au) should you have any enquiries.

Biosecurity Consultation Team  
Department of Agriculture and Water Resources  
1800 068 468

# Volunteers Wanted

## One Hour of Your Time

Ben Kozel

I am seeking fieldwork volunteers for a Masters Research Project that aims to define the relationship between the detectability of invasive hawkweed species (*Hieracium* spp.), and the size of the clusters they form.

The work will involve undertaking a one-hour search for orange hawkweed and king devil hawkweed mimics placed randomly over a 12 hectare site in Royal Park, Parkville. No experience in conducting flora surveys is required. Nor is any prior knowledge of hawkweed required – brief training on their appearance will be provided. Refreshments will also be provided.

Time slots are available for Tuesday 6 March, Wednesday 7 March, Saturday 17 March, and Sunday 18 March. For more details, and to arrange a search time, contact Ben Kozel at [b.kozel@student.unimelb.edu.au](mailto:b.kozel@student.unimelb.edu.au) or on 0416 336 579.



(Source: Rob Richardson, [weedinfo.com.au](http://weedinfo.com.au))



(Source: By Konstantin Ryabitsev from Montréal, Canada (Flickr) [CC BY-SA 2.0 (<https://creativecommons.org/licenses/by-sa/2.0/>)], via Wikimedia Commons)

# Australian Biocontrol Hub

The project is supported by the Atlas of Living Australia, and is funded by Agriculture Victoria, Meat and Livestock Australia and the Australian Government Department of Agriculture and Water Resources as part of its Rural R&D for Profit program.

Classical biological control (or biocontrol) uses specialised natural enemies, usually insects, mites and fungi (called biocontrol agents), to help control invasive species. Biocontrol can play an important role in managing widespread weeds such as gorse, thistles and Paterson's curse. Farmers, natural resource managers, community volunteers and others contribute to biocontrol efforts by releasing biocontrol agents, monitoring biocontrol agent release sites, and recording field observations of agents as they spread across the landscape.

However, significant barriers can prevent biocontrol agent information and data being captured, shared and used by others. Maintaining and accessing long-term monitoring data is particularly difficult. To address these barriers, Agriculture Victoria and the Atlas of Living Australia (ALA) have developed an on-line resource and smartphone app to support weed biological control efforts across Australia. The Australian Biocontrol Hub will replace an earlier pilot project (the Biocontrol portal), and provide more content, resources, and free access to the ALA's powerful mapping and spatial analysis tools.

The Atlas of Living Australia is a national on-line biodiversity database that contains tens of millions of user-submitted species occurrence records from field observations, collections and surveys. This resource has tremendous potential for biocontrol, as anyone is able to:

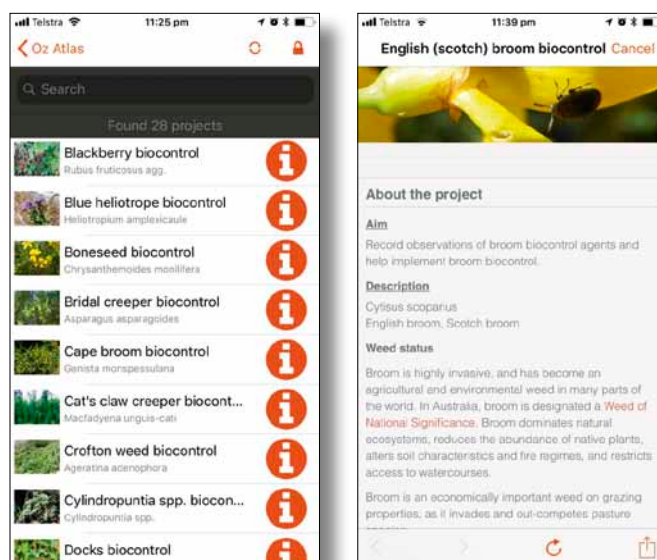
- record biocontrol agent release and establishment data;
- capture observations of biocontrol agent spread;
- ensure biocontrol agent distribution data is readily accessible, and;
- access biocontrol information and references to support local biocontrol efforts.

A custom-made Biocontrol Hub app for Apple and Android phones facilitates the collection of data from the field, and makes the resources on the ALA readily available on your smartphone.

To learn more, and to participate in one of the many weed biocontrol projects, go to <https://biocollect.ala.org.au/biocontrolhub>, and click on the 'Go to biocontrol projects' button on the Hub home-page.

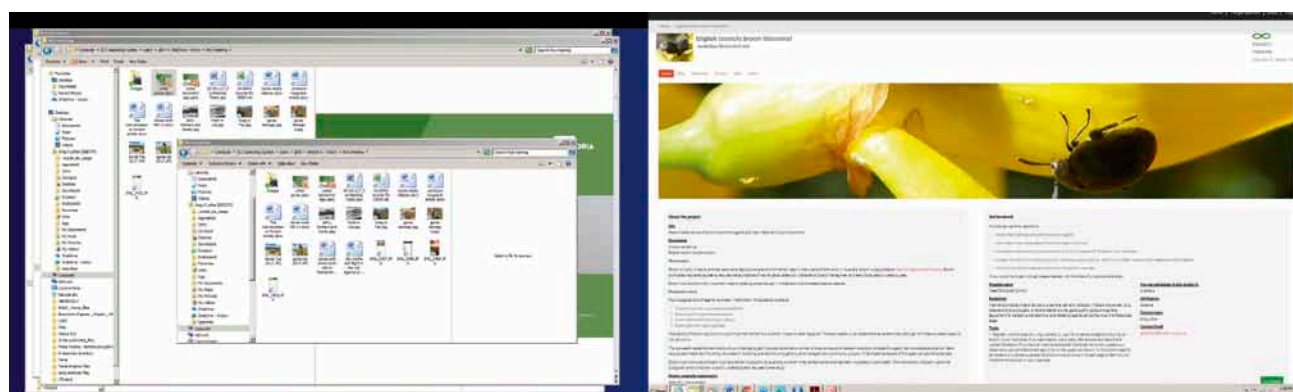
To download the Biocontrol Hub app:  
go to Google Play: <https://play.google.com/store/apps/details?id=au.org.ala.biocontrolhub&hl=en>

or go to the App Store:  
<https://itunes.apple.com/us/app/biocontrol-hub/id1294139917?mt=8>



The Biocontrol Hub app includes information on 28 weed biocontrol projects

Each project contains information on the biocontrol agents that have been released



An example of one of the 28 weed biocontrol projects accessible on the Biocontrol Hub



# Risk Assessment Framework for Alien Species

The following is a summary of a recently published article\* in the *Journal of Applied Ecology*. The European Union funded study developed a standards framework for risk assessment of alien species through a consensus process undertaken by workshoping experts.

\*Roy, H.E., Rabitsch, W., Scalera, R., *et al.* Developing a framework of minimum standards for the risk assessment of alien species. *J. Appl. Ecol.* 2018; 55: 526-538.

This article is available online free of charge. Article access: <https://doi.org/10.1111/1365-2664.13025>.

## Minimum Standards Derived by Consensus

The 14 minimum standards finally agreed upon are as follows:

### 1. Description (taxonomy, invasion history, distribution range (native and introduced), geographic scope, socio-economic benefits)

This ensures that decision-makers have ready access to basic descriptive information.

### 2. Likelihood of introduction, establishment, spread and impact

The four main components of alien species risk assessments are usually expressed as 'likelihood', although impact can be expressed as both 'likelihood' and 'magnitude' of detrimental effect. Assessment should make use of best available evidence but must also document where information may be lacking.

### 3. Description of the current and potential distribution, spread and impact

Current and potential distribution within the invaded range with information on spread capacity and the magnitude of impact – expands on the previous minimum standards.

### 4. Pathways and vectors of introduction and spread, both intentional and unintentional

Requires clearly defined and sufficiently comprehensive information on the mode of introduction and all pathways of entry and spread.

### 5. Assessment of environmental impacts with respect to biodiversity (and ecosystem) patterns and processes

Assessment of negative effects on biodiversity (genetic and species) and on the structure and function (processes) of natural or semi-natural ecosystems (e.g. habitat diversity and complexity, succession, food web dynamics, nutrient and energy cycles).

### 6. Assessment of adverse impacts with respect to ecosystem services

Ecosystem services includes processes such as the regulation and stabilisation of climate, water flow and nutrient cycling, as well as other processes in natural systems. To meet the minimum standard for impact on ecosystem services, assessment may be qualitative and descriptive, as empirical evidence on impacts to ecosystem services is often lacking. The Common International Classification of Ecosystem Services (<http://cices.eu/>) is still a work in progress but is commonly endorsed as the preferred classification system.

### 7. Assessment of adverse socio-economic impacts

This should cover a range of possible and potential socio-economic consequences, encompassing relevant economic sectors (including agriculture, forestry, animal production, tourism), infrastructure (roads, dams, energy, etc.), and aspects of human health (including injuries; transmission and contamination with pathogens or parasites, as well as secondary plant compounds such as toxins or allergens; bioaccumulation of noxious substances) and human well-being (such as noise, and restrictions in accessibility and aesthetic value to areas of recreational, natural or cultural heritage).

### 8. Status (threatened or protected) of species or habitat under threat

Impact on threatened species or habitats may be more critical than on species and habitats of 'least concern' because they are likely to be less resilient to biological invasions. However, common species or habitats may eventually also become endangered when impacted by invasive alien species. This highlights the importance of regular review of risk assessments.

### 9. Possible effects of climate change in the foreseeable future

At the time of assessment, alien species may be in early establishment so it is essential to consider not only the current situation but also predictable changes within clearly defined, appropriate timescales into the future. Future factors such as climate change may alter patterns of human transport and may provide or prolong the optimal climatic conditions for successful colonisation of invasive alien species, potentially increasing the rate of spread and extent of suitable areas. Extreme weather events which may be associated with climate change may offer new opportunities for spread and colonisation.

continued on page 10/...

### 10. Data limitations

The best available evidence should be used at all times. However, it is essential that risk assessment can proceed even if information may be lacking on some species. Sources of information need to be accompanied by a statement of the assessor's confidence in the quality and reliability of the information, and it is critical that risk assessments are regularly reviewed and revised as appropriate.

### 11. Information sources

Well documented information sources, supported with references to the scientific literature (peer-reviewed publications) should be used in risk assessments. Other sources, such as 'grey literature' and expert opinion, may need to be used if the former is lacking. Confidence levels should be assigned to any information sources used.

### 12. Summary of the different components of the risk assessment in a consistent and interpretable form and an overall summary

The protocols used and the system summarising risks should be consistent and unambiguous, with clear interpretation guidance or definitions of the summaries provided for each component of the risk assessment, so that decision-makers can rapidly refer to what they require.

### 13. Uncertainty (confidence)

There may be a lack of information and a high degree of uncertainty surrounding risk assessment for many invasive alien species due to paucity of previous research in the species' native and introduced ranges. Information may be available but may not be in a form that is easily interpreted to inform the risk assessment process. Therefore, it is essential that the risk assessments are accompanied by an uncertainty ranking (e.g. certainty or confidence level). The Intergovernmental Panel on Climate Change provides a framework for the consistent treatment of uncertainties – confidence is considered to be a function of evidence and agreement.

### 14. Quality assurance

There are many possible approaches, from peer review of the risk assessment, to review by a panel of experts. Multiple expert opinions and associated confidence levels provides the means of assuring the quality of risk assessments.

## In the Media

### New Global Register of Invasive Species

The Global Register of Invasive Species (GRIS) was developed by the International Union for Conservation of Nature (IUCN) Species Survival Commission (SSC) Invasive Species Specialist Group (ISSG) in 2006. The conceptual prototype has been expanded through the development of the Global Register of Introduced and Invasive Species (GRIIS). It compiles annotated and verified country-wise inventories of introduced and invasive species, with six-monthly information updates, to support national governments. Database access: [www.griis.org/](http://www.griis.org/). The journal *Scientific Data* recently published an article describing the development of GRIIS. Access: [www.nature.com/articles/sdata2017202](http://www.nature.com/articles/sdata2017202)

### Serrated Tussock in the News

The New England Weeds Authority is getting the message out about the benefits of timely control of serrated tussock. Several NSW rural media outlets, including Armidale Express, Inverell Times, Moree Champion and Northern Daily Leader, ran articles on the favourable season this year for the major pasture weed.

### Delay in Tasmania's Biosecurity Legislation

Early in 2017, the Tasmanian Government initiated an upgrade of biosecurity legislation which brings together seven separate laws, in order to reduce duplication and enable better management of pests, weeds and diseases. However, industry groups and the Greens have expressed frustration in delays in finalising the biosecurity bill. [www.examiner.com.au/story/5089295/tasmanias-biosecurity-laws-upgrades-delayed-for-more-consultation/?cs=95](http://www.examiner.com.au/story/5089295/tasmanias-biosecurity-laws-upgrades-delayed-for-more-consultation/?cs=95)

### Weeds for Weed Control

New research on essential oils for use as natural herbicides has recently been published in the international weed biology journal, *Weed Research*. Twenty members of the botanical family Asteraceae were tested for yield and efficacy. Essential oils derived from *Artemisia annua* and *Xanthium strumarium* (known as Noogoora burr or cocklebur in Australia) were found to totally inhibit weed germination and seem to be suitable as natural herbicides. Link to access: <http://onlinelibrary.wiley.com/doi/10.1111/wre.12266/full>

### Journal of Ecology Special Issue: Plant Invasions

The *Journal of Ecology* has recently published a weeds special feature: 'Long-term dynamics and impacts of plant invasions'. Sections include plant–herbivore interactions, aquatic plant ecology, plant–climate interactions, dispersal, invasion ecology, plant–soil interactions, and determinants of plant community diversity and structure. Link to access: <http://besjournals.onlinelibrary.wiley.com/hub/issue/10.1111/jec.2017.105.issue-6/?hootPostID=18d757e74cac9ffec25eb865e22bb2f5>

## Updated Environmental Weed Advisory List

The January 2018 issue of Friends of WESI Updates (Weeds at the Early Stage of Invasion) is a project run by the Victorian Department of Environment, Land, Water and Planning (DELWP)) reports on the recently revised Environmental Weed Advisory List. The list provides risk scores to help prioritise weed management activities for land managers. The new list includes about 1780 potential and early invader weeds – a 260% increase in species since the 2008–2009 advisory list was issued. The WESI update notes that the list can be used as a searchable spreadsheet, making it easier for local use, and will be made available soon. To subscribe to Friends of WESI Updates, contact DELWP Customer Service Centre on 136186, or email [customer.service@delwp.vic.gov.au](mailto:customer.service@delwp.vic.gov.au), or visit [www.delwp.vic.gov.au](http://www.delwp.vic.gov.au).

## New Weed Lab for UWA

Farm Weekly reports that the University of Western Australia received a \$1 million Grains Research and Development Corporation (GRDC) infrastructure grant to expand its weed research capacity and agronomic research facilities. UWA recently made the announcement about the development of a new state-of-the-art laboratory, as well as the appointment of a new director to lead the Australian Herbicide Resistance Initiative.

Access: [www.farmweekly.com.au/news/agriculture/general/news/uwa-lab-set-to-tackle-weeds/2756381.aspx](http://www.farmweekly.com.au/news/agriculture/general/news/uwa-lab-set-to-tackle-weeds/2756381.aspx)

## Gorse Biocontrol in the News

WIN News Ballarat recently reported on the biocontrol work of the Victorian Gorse Taskforce in and around Ballarat. WSV President Greg Lefoe discusses the most recent release of biocontrol moths in the area.

Video at: [www.facebook.com/WINNewsBallarat/videos/](http://www.facebook.com/WINNewsBallarat/videos/)

## Drones to Map Weeds

The journal *Weed Research* has published a free open access article on the use of unmanned aerial systems for mapping weeds in crops. While there is potential, the study highlights the difficulties and challenges involved in applying this automated technology at a large scale.

Access: <http://onlinelibrary.wiley.com/doi/10.1111/wre.12275/full>

## Art from Urban Weeds

A weed story with a difference, published in the Proceedings of the National Academy of Sciences of the United States of America. A New York artist sees her neighbourhood as a vibrant urban ecosystem and uses the resident invasive plants as a source of artists' pigment. She uses paints produced by traditional methods to describe the community of plants growing across about 25 vacant lots in Brooklyn, NY. She blends her unique colour palette with concepts like ecosystem services and experimental field design.

Access: [www.pnas.org/content/115/4/627](http://www.pnas.org/content/115/4/627)

# CAWS report



December 2017

By Ingrid Krockenberger

As mentioned in a postscript to the September report, the CAWS grant application to the Grains Research and Development Corporation (GRDC) for conference sponsorship has been successful in securing \$20,000 +GST each for the 21st and 22nd Australasian Weeds Conferences (AWC) in 2018 and 2020, respectively. Funding application to GRDC has been improved, with CAWS now being the applicant rather than the conference organising committee, and funding has been secured into the future which was the preferred option for GRDC as well as being better for CAWS.

CAWS President, Rachel Melland, noted that a sub-agreement has been signed between the Weed Society of New South Wales (the organisers of the 2018 AWC) and CAWS over GRDC funding obligations. The Weed Society of New South Wales reported that they were accepting abstracts for the AWC (closed on 12 February) and had already begun to receive some. Planning of conference field trips was to be finalised by the end of January.

Sue Hingston reported that about 11 people will meet early in 2018 to decide the future of the Tasmanian Weed Society. It was suggested that they use Survey Monkey to assess whether there are barriers that might be discouraging people from joining and participating in a state weed society. There is concern that disbanding the Tasmanian Weed Society will leave only 6 member societies in CAWS, which is the minimum membership for an incorporated society.

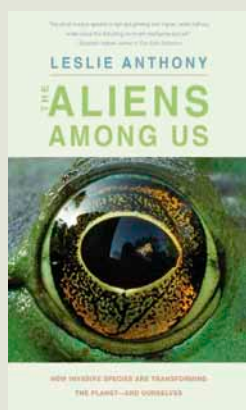
The Organisational Development Annual Action Plan and Communication & Advocacy Annual Action Plan were accepted for 2018. The CAWS Strategic Plan 2013-2018 is up for review early in 2018. CAWS Treasurer, Michael Widderick, has proposed a biennial financial plan which will coordinate better with the biennial AWC. Expenditure differs between conference and non-conference years, and annual expenditure is guided by the amount of profit from the biennial conferences.

Next meeting: 15 March 2018.

Ingrid Krockenberger and Brett McGenniskens are your CAWS delegates.



# New Publications



*For those interested in the complexities of species invasion and human response:*

**The Aliens Among Us: How Invasive Species Are Transforming the Planet—and Ourselves**

Author: Leslie Anthony

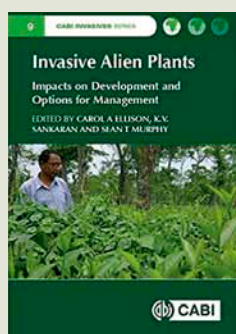
Published: October 2017

Hardcover ISBN: 9780300208900

Publisher: Yale University Press

A thoughtful, accessible look at the rapidly growing issue of invasive plants, animals and microbes around the globe with a focus on the scientific issues and ecological, health and other challenges.

From an award-winning adventure and science journalist comes an eye-opening exploration of a burgeoning environmental phenomenon and the science coalescing around it. Leslie Anthony leads readers on adventures physical and philosophical as he explores how and why invasive species are hijacking ecosystems around the globe. He weaves science, travel, history, and humour with diverse examples to chart and describe the phases of species invasion and human response. With tales of pythons in the Everglades, Asian carp and lamprey in the Great Lakes, Japanese knotweed seemingly everywhere, and the invasive organisms we don't see—pathogens and microbes such as the c—this book rivets attention on a new ecological reality.



*For those interested in research and policy frameworks on invasive plants in the Asia-Pacific region:*

**Invasive Alien Plants: Impacts on Development and Options for Management (CABI Invasives Series) 2nd edition**

Editors: Carol A. Ellison, K.V.

Sankaran, Sean T. Murphy

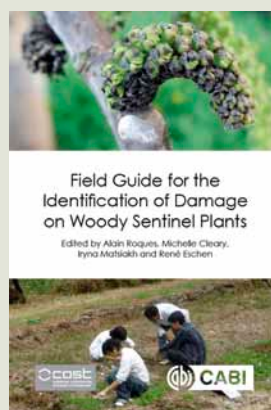
Published: November 2017

Hardcover ISBN: 9781780646275

Publisher: CABI

Invasive alien plants pose a major threat to agriculture, the natural environment and livelihoods worldwide and create challenges for development. This is especially the case for those who live and work in rural areas. This book, for the first time, brings together a wide range of invasive plant specialists from the Asia-Pacific region who share their experience in addressing the problem and delivering solutions. *Mikania micrantha* is used as a case study in the book as it exemplifies many of the issues that need to be addressed. This neotropical vine is a major weed across the tropical humid zones of the region, where it smothers agroforestry, home gardens, natural forests and plantation production systems.

The book emphasises the social and economic implications of plant invasion, and discusses direct impacts on livelihoods and biodiversity. It explains how various approaches to management including traditional



ecological knowledge and classical biological control can be keys to the delivery of sustainable solutions, focusing on experiences in India, Nepal, Papua New Guinea and China. The use of policy frameworks in biological control and other management measures are also described.

This book will be of value to management practitioners, researchers, students and officials in policy, quarantine, and agriculture departments who wish to understand the importance of alien plant invasions in their countries.

*For those interested in identifying the likely cause of damage to woody plants:*

**Field Guide for the Identification of Damage on Woody Sentinel Plants**

Editor: Rachael Russell

Published: 2017

eBook ISBN: 9781786394415

Free full text access: [https://](https://www.cabi.org/cabebooks/FullTextPDF/2017/20173265430.pdf)

[www.cabi.org/cabebooks/](https://www.cabi.org/cabebooks/FullTextPDF/2017/20173265430.pdf)

FullTextPDF/2017/20173265430.pdf

Publisher: CABI

This guide is intended as an aid for managers of sentinel plantings, botanical gardens or arboreta, as well as phytosanitary inspectors, who may have knowledge of common pests and diseases of woody plants, but may not know the likely cause of damage that they have not encountered before. It aims to provide a tentative identification of relatively broad groups of organisms and not definitive identification of the causal agents. There are chapters that explain how to use the guide, followed by keys (for different organs of conifer and broadleaf species) to guide the user to the relevant sections of the book. The largest part of the book is devoted to the description and illustration of damage types and typical causes of the observed damage. The last chapters provide instructions for taking and preserving samples for further identification by an expert, notification of relevant authorities, and a glossary.