

MyPestGuide®

What happens when people report weeds?

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2023 WA Weeds Symposium,
ID & Drone Workshop, 11-12 October 2023, CSIRO, Perth

- Thank you for the invitation to present to members of the Society.
- Hi everyone, my name is Laura Fagan and I am a development officer in DPIRD's Pest Analytics & Surveillance team located at Nash Street, in Perth, WA.
- I studied ecology and entomology in Canada then married a Kiwi and moved to NZ and spent 10 years working there across each of the CRIs on biosecurity and ag-environment entomology projects. Next year I'll have reached my 10-year milestone with DPIRD.....and I do not know how to drive a drone.

Outline



Weed surveillance in WA



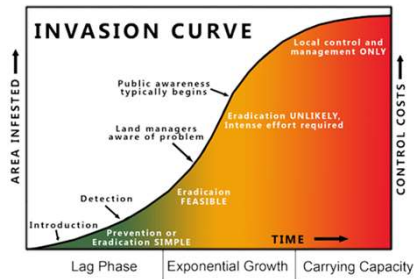
MyPestGuide® Reporter App



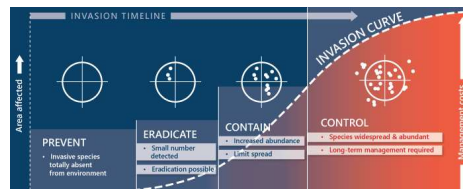
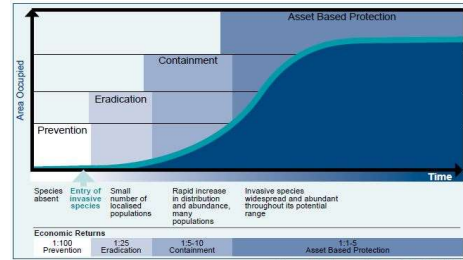
Lessons learned from the invasion curve

This afternoon I'll give a brief introduction about DPIRD's weed surveillance, talk about what happens when people report weeds using MPG and lessons learned about applying principles of the invasion curve in our biosecurity work.

Reporting weeds is important

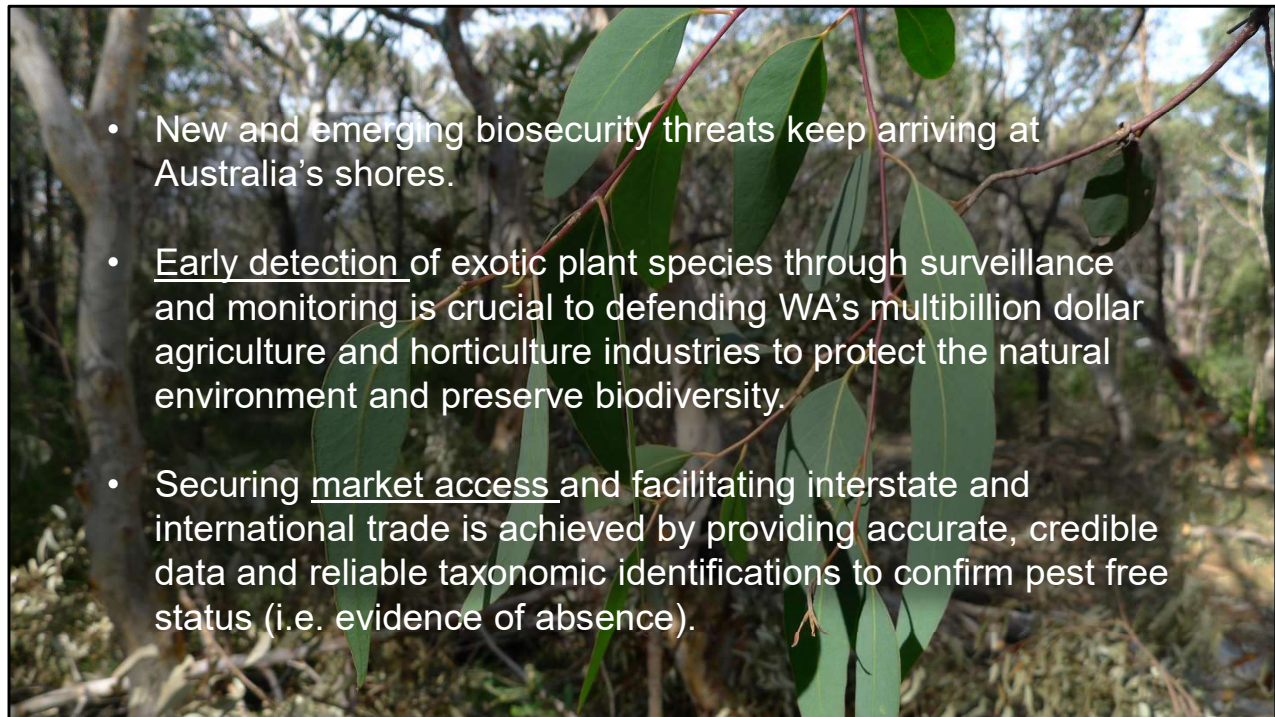


The earlier we find a weed, the earlier we can act to protect our properties, local regions, and the Western Australian environment



Earlier talks emphasized how it becomes increasingly difficult and expensive to eradicate weeds once they become established, and requires substantially more resources.

If we follow the principles of the invasion curve, preventing the entry, spread and establishment of weeds should ultimately protect our most valuable assets.



- New and emerging biosecurity threats keep arriving at Australia's shores.
- Early detection of exotic plant species through surveillance and monitoring is crucial to defending WA's multibillion dollar agriculture and horticulture industries to protect the natural environment and preserve biodiversity.
- Securing market access and facilitating interstate and international trade is achieved by providing accurate, credible data and reliable taxonomic identifications to confirm pest free status (i.e. evidence of absence).

Our aim is to improve continuity and collaboration across the biosecurity system to keep weeds out of Australia or to stop them from establishing.

Detecting priority weeds and mapping their pathways of introduction and spread will contribute to a better biosecurity system.

But what's driving us to maintain and improve the system in the first place?

Maintaining market access is crucial for our domestic and international trade as it could otherwise result in severe economic losses for many Australians.

So, markets and profit are a major driver to consider when protecting our agriculture and environment from harmful weeds.

Another driver is our own psychology.

If an individual, company or community's motivation to spare effort trumps their motivation to do the right thing, then we might not achieve our aim to improve continuity and collaboration across the biosecurity system and/or prevent weeds from entering Australia.



Prevention takes less effort, as the invasion curve shows us. Prevention is also the most effective methods for dealing with weeds, in particular.

Our Stakeholders

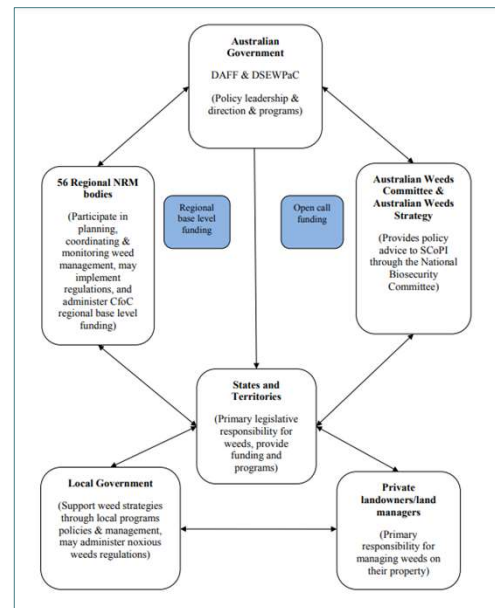


RURAL INDUSTRIES
Research & Development Corporation

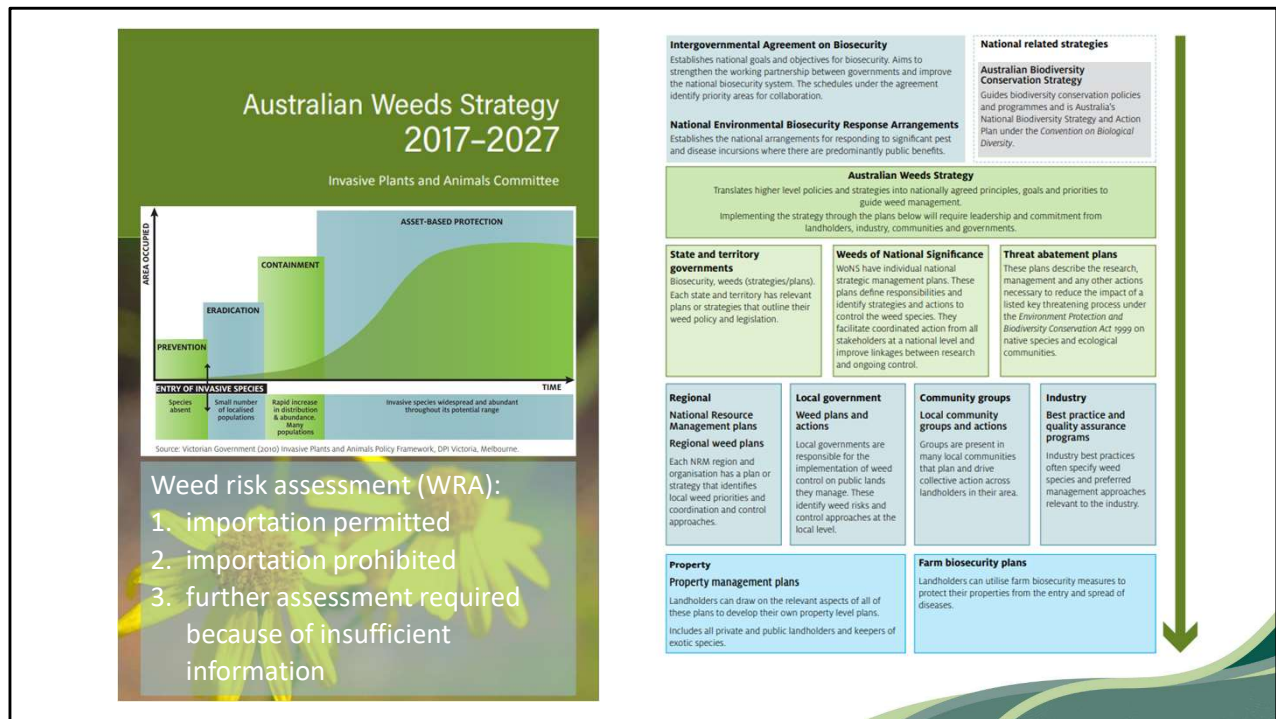
Who's Involved with Weeds?

A social network analysis of funding and information networks for weed management

**LEADING THE SEARCH
FOR WEED SOLUTIONS**



Understanding who are stakeholders are, what drives them to invest in markets, what level of risk people are willing to take to make a profit, and how people choose to track and manage risks are equally important to support our biosecurity efforts.



The Australian Commonwealth prevents new weeds from entering Australia through a formal Weed Risk Assessment process (WRA). Allocating any new species to one of these three categories before being imported into Australia:

1. permitted
2. prohibited
3. further assessment required

This process reduces the rate of deliberate introductions of weeds into Australia, but it doesn't completely prevent the introduction or spread of weeds entirely.

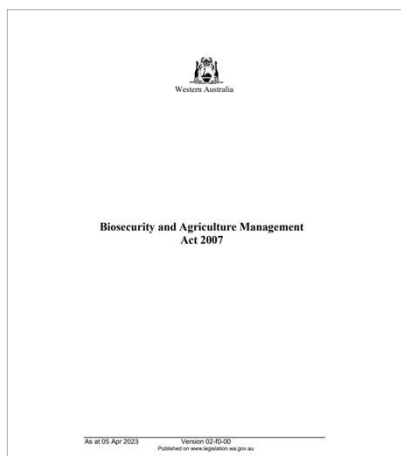
DPIRD, Western Australia aims to:

- Minimise the risk that new weeds will be introduced into Australia or WA
- Reduce the probability that weeds already present will spread to other parts of WA
- Maximise the capacity of surrounding habitat to resist the proliferation of weeds where weeds are present.

The State also aims to:

- Minimise the risk that new weeds will be introduced into Australia or WA;
- Reduce the probability that weeds already present will spread to other parts of WA;
- And, maximise the capacity of surrounding habitat to resist the proliferation of weeds where weeds are present.

BAM Act 2007



Legal status

Each listed organism is declared under the Biosecurity Management act with certain legal requirements:

Declared Pest, Prohibited - s12

Prohibited organisms are declared pests by virtue of section 22(1), and may only be imported and kept subject to permits. Permit conditions applicable to some species may only be appropriate or available to research organisations or similarly secure institutions.

Priority

Declared Pest - s22(2)

Declared pests must satisfy any applicable import requirements when imported, and may be subject to an import permit if they are potential carriers of high-risk organisms. They may also be subject to control and keeping requirements once within Western Australia.

Priority

Unlisted - s14

If you are considering importing an unlisted organism/s you will need to submit the name/s for assessment, as unlisted organisms are automatically prohibited entry into WA.

Permitted - s11

Permitted organisms must satisfy any applicable import requirements when imported. They may be subject to an import permit if they are potential carriers of high-risk organisms.

Permitted, Requires Permit - r73

Regulation 73 permitted organisms may only be imported subject to an import permit. These organisms may be subject to restriction under legislation other than the Biosecurity and Agriculture Management Act 2007. Permit conditions applicable to some species may only be appropriate or available to research organisations or similarly secure institutions.

Control conditions

Declared pests can be assigned to a C1, C2 or C3 control category under the Biosecurity and Agriculture Management Regulations 2013. Prohibited organisms can be assigned to a C1 or C2 control category, the control categories are:

C1 Exclusion

Organisms which should be excluded from part or all of Western Australia.

C3 Management

Organisms that should have some form of management applied that will alleviate the harmful impact of the organism, reduce the numbers or distribution of the organism or prevent or contain the spread of the organism.

C2 Eradication

Organisms which should be eradicated from part or all of Western Australia.

Unassigned

Unassigned: Declared pests that are recognised as having a harmful impact under certain circumstances, where their subsequent control requirements are determined by a Plan or other legislative arrangements under the Act.

To prevent the entry of weeds DPIRD regulates harmful pests under the [Biosecurity and Agriculture Management Act 2007](#) . For plants, we assess and assign a pest status as: Permitted (s 11, Prohibited (s 12) or Declared Pest (s22(2)) and includes control or keeping categories for each.

Is it a Quarantine Pest?

Quarantine pest = A pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled (ISPM 5).

Pest status in WA informs:

- Status as declared under BAM Act 2007
- A response to an exotic pest detection in other states
- Claims for area freedom and/or official control status to support market access

Western Australian Organism List (WAOL)

- Requires justification the pest status = a quarantine pest (or not)
- Is used for recommendations by the Minister for any gazettals
- Public portal for all declared pest information related to:
 - Permitted (s11),
 - Declared Pest Prohibited (s12) or
 - Declared Pest (s22(2)) under the BAM Act 2007

All declared pests are listed in WAOL. Information about the area(s) a plant is declared and the control and keeping categories it has been assigned in WA is available for everyone to view online.

32 Weeds of National Significance (WoNS)

- African boxthorn
- Alligator weed
- Asparagus weeds
- Athel pine
- Bellyache bush
- Bitou bush / boneseed
- Blackberry
- Bridal creeper
- Brooms
- Cabomba
- Cat's claw creeper
- Chilean needle grass
- Fireweed
- Gorse
- Gamba grass
- Hymenachne
- Lantana
- Madeira vine
- Mesquite
- Mimosa
- Opuntoid cacti (Prickly pear)
- Parkinsonia
- Parthenium weed
- Pond apple
- Prickly acacia
- Sagittaria
- Salvinia
- Silverleaf nightshade
- Water hyacinth
- Rubber vine
- Serrated tussock
- Willow



“the worst weeds in Australia”

In Western Australia many Weeds of National Significance are also declared weeds.

Under the National Weeds Strategy, these are the 32 introduced plants regarded as the worst weeds in Australia because of their invasiveness, potential for spread, and economic and environmental impacts.

To prevent weeds requires early detection and identification of the plant species.

28 National Environmental Alert Weeds



- Barleria
- Blue hound's tongue
- Cane needle grass
- Chinese rain tree
- Chinese violet
- Cutch tree
- Cyperus
- False yellowhead
- Garden geranium
- Heather
- Holly leaved senecio
- Horsetail species
- Karroo thorn
- Kochia
- Lagarosiphon
- Laurel clock vine
- Leaf cactus
- Lobed needle grass
- Orange hawkweed
- Praxelis
- Rosewood
- Senegal tea plant
- Siam weed
- Subterranean cape sedge
- Uruguayan rice grass
- White Spanish broom
- White weeping broom
- Yellow soldier

Awareness of species that could become a problem ('emerging weeds') is also an important step in the early detection of weed infestations.

Under the same strategy, 28 non-native plant species in the early stages of establishment are considered a significant threat to biodiversity needing immediate management.

Weeds and Freshwater Algae

Common Name(s)	Species Name
Asiatic sand sedge	<i>Carex kobomugi</i>
Black sage	<i>Cordia curassavica</i>
Black swallow-wort	<i>Vincetoxicum nigrum</i>
Brittle naiad	<i>Najas minor</i>
Cane tibouchina	<i>Tibouchina herbacea</i>
*Didymo	<i>Didymosphenia geminata</i>
Halogeton	<i>Halogeton glomeratus</i>
Karoo thorn	<i>Vachellia karoo</i>
Lagariosiphon	<i>Lagariosiphon major</i>
Leafy spurge	<i>Euphorbia esula</i>
*Manchurian wildrice	<i>Zizania latifolia</i>
*Mikania	<i>Mikania micrantha</i>
*Mouse-ear hawkweed	<i>Pilosella officinarum</i>
Nepalese browntop	<i>Microstegium vimineum</i>
Portuguese broom	<i>Cytisus striatus</i>
Slangbos	<i>Seriphium plumosum</i>
South African ragwort	<i>Senecio inaequidens</i>
*Spiked pepper	<i>Piper aduncum</i>
Water primrose	<i>Ludwigia grandiflora</i>
Wiregrass	<i>Ventenata dubia</i>

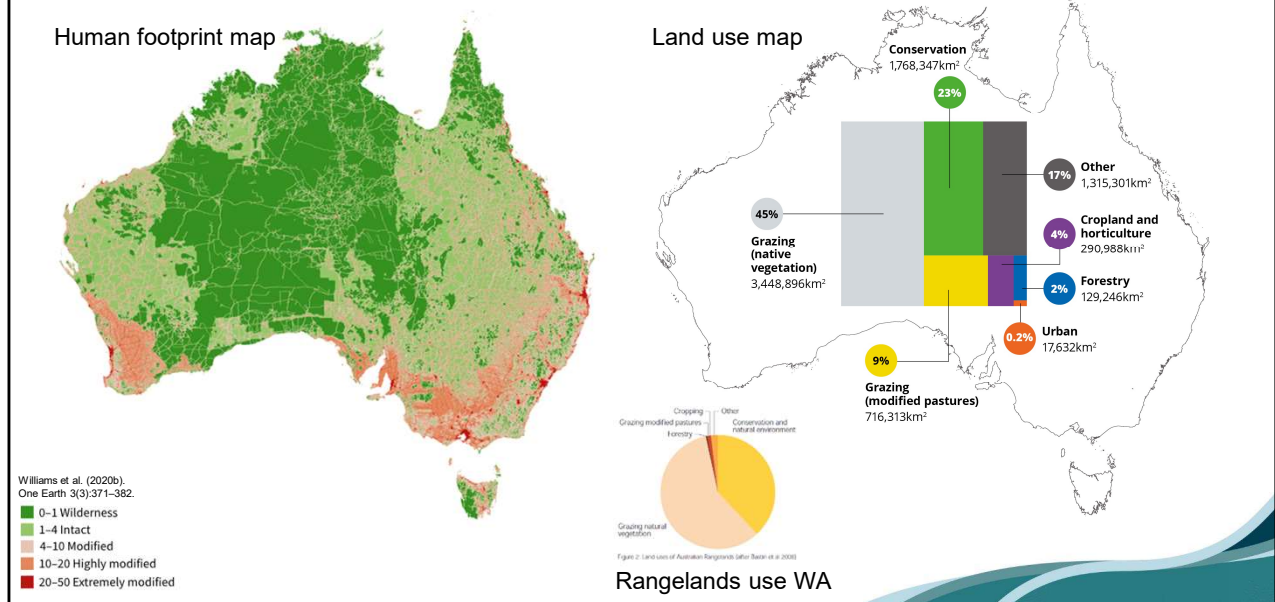
National Priority List of Exotic Environmental Pests, Weeds and Diseases (EEPL)

168 exotic species of significant environmental and social amenity risk to Australia; categorised into one of 8 biological groups; Each group contains 17 – 24 entries that are either a single species, a genus, or a small set of closely related species.

*Denotes higher risk species

Yet another list of exotic species of significant environmental and social amenity risk to Australia was recently released that will also need to be considered in our diagnostic & surveillance programmes.

So, what's the problem?



Locating weeds rapidly requires a massive surveillance effort and a very broad level of botanical knowledge to be effective.....and WA is BIG!

- There are many weed species and unknown plant species.
- We have limited skilled human resources, and
- We have limited financial resources available.

DPIRD's Frontline

Pest and Disease Information Services (PaDIS)

- Public hotline for everything biosecurity and more
- First point of contact for information about all pests, weeds & diseases

MyPestGuide® system

- Reporter app + industry field guides e.g. Crops | Grapes | Trees | Diseases plus a scouting tool for agronomists.
- Community website for online reporting and report management
- Administrative portal for the triaging of reports by experts
- Database and connected systems e.g. WAOL, MAX

Biosecurity Officers

- BAM Act 2007

To close the gap between known and unknown weed distributions in WA we encourage the public to participate in general surveillance.

This allows us to overcome the large spatial hurdle. In addition, we provide a free weed identification service and a hotline manned by our PADIS frontline staff who funnel weed reports to key diagnostic staff, biosecurity officers or compliance team for follow up.



Raising awareness

Declared plants in the rangeland regions of Western Australia

Page last updated: Tuesday, 14 June 2022 - 10:03am

The plants identified here have the potential to cause significant damage to Western Australia's pastoral industry and to the unique biodiversity of the rangelands. We ask that anyone seeing these plants in the rangelands contact the nearest DPIRD office and report the location. Department officers will then work with local people to eradicate these plants.

Declared plants of the Western Australian rangelands

Plant image (click to expand)	Species information page	Legal status page
	Bathurst burr (<i>Xanthium spinosum</i>)	Legal status: Declared Pest – s22(2)
	Indian jujube (<i>Ziziphus mauritiana</i>)	Legal status: Declared Pest – s22(2)

Biosecurity alert: Pokeweed

Page last updated: Monday, 31 July 2023 - 3:58pm

Pokeweed (*Phytolacca americana*) is a declared plant that is toxic to both humans and livestock. It is also an environmental weed, and can impact agricultural produce.

The weed was found in December 2018 in the Balingup area, in the South West of Western Australia but has not previously been recorded in Western Australia. A surveillance and eradication program is underway.



Have you seen this plant?

This plant - seeds, berries and leaves - is toxic to humans and livestock. It is also an environmental weed, and can impact agricultural produce.

Pine cone cactus: declared pest

Page last updated: Tuesday, 17 May 2022 - 5:31pm

Pine cone cactus (*Tephrocactus articulatus*) is a declared pest in Western Australia (WA). This article describes the nature of the plant with links to requirements land owners/occupiers must adhere to, and how to detect and report it.



African club moss: declared pest

Page last updated: Tuesday, 6 October 2020 - 12:56pm

African clubmoss (*Selaginella kraussiana*), also known as *Selaginella*, or spreading clubmoss, is an invasive fern ally that forms extensive dense carpets in damp sites.

Despite being an attractive garden ground cover, it disperses widely and quickly, invading forest floors and the trunks of other plants, inhibiting the establishment of native plant seedlings.



one cactus

oid cactus which is invasive in South Africa, rangelands, seasonal forests, and Western Cape. It is found in the southwest of WA.

We create webpage content about weed control, crop weeds, regulated/declared plants and herbicides to improve weed awareness.

Creating online content has increased over the years following the shift towards more social media and our work too has become more digital.



In 2015 DPIRD built and released a free image reporting tool called MyPestGuide® Reporter to encourage the community to report pests and undertake their own surveillance.

DPIRD utilises the information collected by the public to locate potential exotic pests so industry and government can have more time to prepare for an eradication response and to let the public assist in delimiting surveillance where resources are limited.

MyPestGuide® Reporter is now the nationally recognised general surveillance tool for public reporting.

It's important to report zeros
Inference adds value to every report



Credit: ID406817_MyPestGuide®



Credit: ID410390_MyPestGuide®



Credit: : ID55619_MyPestGuide®, 2018

Eradicated

Inkweed reports infer we don't have pokeweed.
So, reporting all species provides important data!

One of the public messages we try to convey, is that everyone can help verify the absence of new weeds simply by reporting any similar-looking plants, such as inkweed, which provides data inferring the absence of exotic pokeweed.

The inference data helps to rule out the exotic weeds existing in the same location and habitat which pose a problem to our industries by preventing trade or access to certain markets, as mentioned earlier.

The prohibited C1 weed, *Phytolacca americana*, better known as Pokeweed was detected in 2018 in the Balingup pine plantation. DPIRD Biosecurity Officers quickly removed the weeds together with Forest Products Commission staff.

Inkweed, similarly competes for space and nutrients in pioneer plant communities. It can temporarily inhibit the establishment of seedlings of native plant species. Normally it is followed by native species, but it can also be followed by vines or other weeds and similarly invades heavily disturbed areas.

Inkweed then is an inference weed, helping to confirm the continued absence of exotic pokeweed .

With the data gained we are now at a stage of documenting reports of common or benign weeds to statistically determine the probability of other weeds being present and rule out exotic or sleeper weeds that might exist in the same location and pose a problem to our natural assets.

A collaborative approach

Targeted surveillance



Relies heavily on trained personnel and technology

Expensive

General surveillance



Relies heavily on community and industry engagement

Irregular



Our department's biosecurity surveillance has significantly improved by combining general surveillance done by the public using MyPestGuide® Reporter with targeted surveys performed by biosecurity officers.

To handle the increased number of incoming reports and images we had to build a simple yet effective surveillance and diagnostic system to administer the incoming reports and support the many specialists who identify

the images and respond to reporters within a hierarchical biosecurity system designed for emergency management and response.

The incoming biosecurity intelligence combined with the new MyPestGuide system resulted in a more effective collaborative approach to doing biosecurity, greatly expanding our biosecurity surveillance network with people from all walks of life.

Report pests using the MyPestGuide® Reporter app



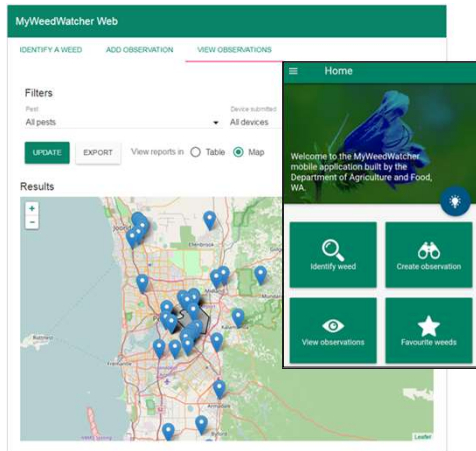
To download the app:
Open Google Play or Apple Store
and search for:
mypestguide



Here is a short video on how to use the free app.

- Any organism can be reported for experts to ID
- Up to 4 images can be loaded
- Personal details are saved and kept private and secure.
- It works outside of mobile or Wi-Fi range and saves reports to the device
- The GPS info is collected in the field and used to map and relocate exotic organisms.
- For fun reports can be shared on social media if these are installed on your mobile device.

MyWeedWatcher = MyPestGuide®



- Learn more about weeds - receive weed identifications and control advice from experts.
- Declared weeds and 'weeds of interest' are given priority.
- Shared reports let others view local weeds in the community.
- Reports help to prove both the presence and *absence* of weeds in the field.
- Record your observations and keep them in your back pocket to monitor and control pests.
- It helps a community team up with local biosecurity groups and DPIRD to undertake weed monitoring and surveillance in any area.

Previously, landholders and community groups may have recorded weed observations in MyWeedWatcher. DPIRD amalgamated MyWeedWatcher into the MyPestGuide system to build a single source of weed data and make maintenance and ongoing surveillance programmes cost less.

When making a weed report users should select MyWeedWatcher from the drop-down list of projects in the MyPestGuide® Reporter app to direct the report to a botanist.

MyPestGuide® surveillance system

Free MyPestGuide® Reporter tool

Experts verify incoming data to improve early detection of pests.

Pest data is analysed to deliver a probability of area freedom.

Works with the online community portal and links field guides to educate and inform people about pests.

Share with social media

The mobile app operates alongside the community website.

By using the MyPestGuide® Reporter app and online surveillance system, information is collected in a consistent manner and the data is saved into a secure database.

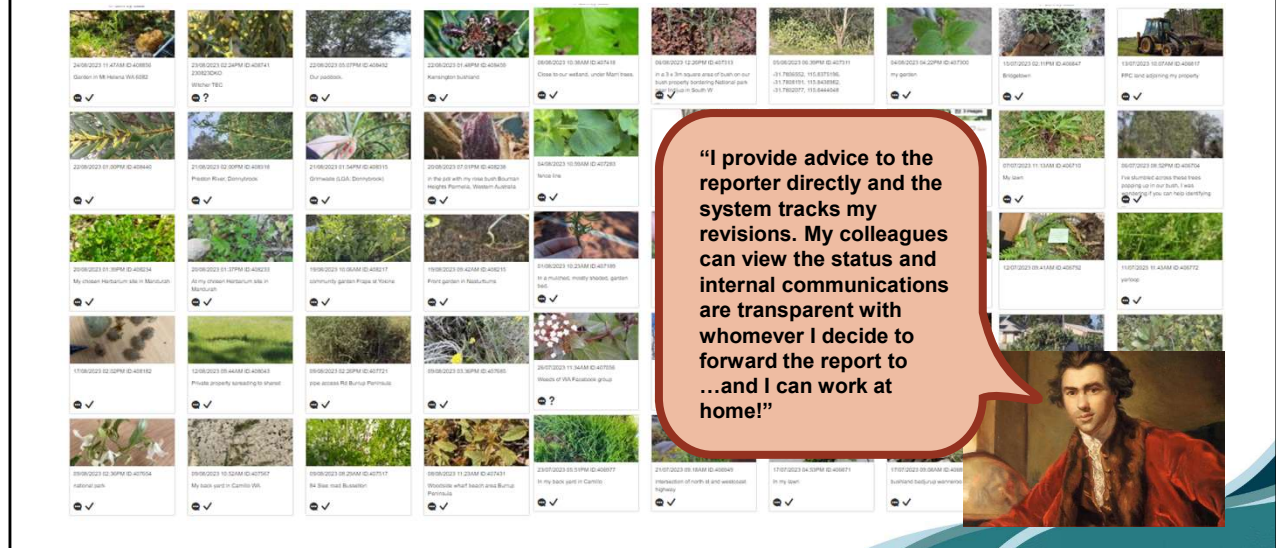
In addition, users of the system can view personal reports, share reports, view shared community reports and view pest distributions using the online map.

Shared information can be used in PR materials to inform the public/industry of a weed's distribution or spread.

Community, industry or research groups can set up their own project to collect data for various purposes. Data can be shared within a project team and project datasets can be downloaded to a CSV file for analyses which can be consolidated to support our national biosecurity priorities.

When project administrators and diagnostician log into the community portal to manage incoming reports the system provides them with an easy platform to ID organisms, provide a level of confidence for each ID, track report activity, forward reports to a colleague to seek an opinion, clarification, or advice about control options to give to the reporter.

MyPestGuide® Weed reports



Everyone in the MyPestGuide® reporting community will at some point have direct contact with an expert who might ask the reporter to assist with a diagnosis, collect further samples, take more images or contain the exotic species until a Biosecurity Officer can arrive on the scene to prevent further spread while the ID is being confirmed.

The expert and reporter can have a 2-way conversation about the organism via the portal from anywhere in the world.

In addition to the ID, reporters are provided educational material, links about the organism and relevant biosecurity actions to take, thanked for doing their bit to protect Australia and asked to submit other interesting observations.

This approach has created a positive relationship between the public and diagnostic experts resulting in repeat surveillance reports by the same individuals.

Narrow Leaf Cotton Bush (*Gomphocarpus fruticosus*)

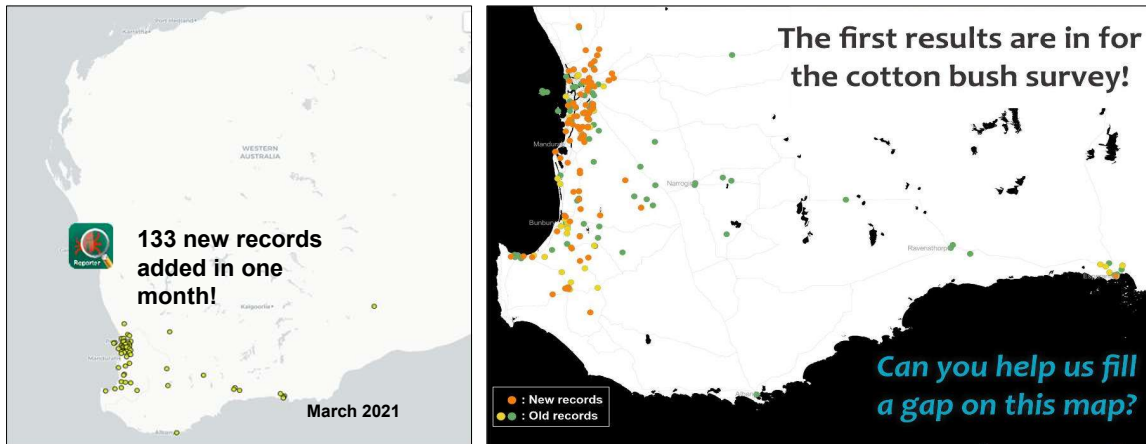
- Declared pest s22 (2), C3 manage
- Poisonous to livestock and humans
- Reduces productivity of pastures.
- Can form dense thickets and competes with native plants.
- A common weed of grasslands, open woodlands and riparian areas.



An excellent example of how fostering this reporting network can help improve weed biosecurity surveillance was CSIRO's Narrow leaf cotton bush survey project.

- Started out as an RBG project
- Turned into a research project looking into biological control agents.
- Locations of known plants in WA were minimal

Narrow Leaf Cotton Bush (*Gomphocarpus fruticosus*)



Two new natural enemies found, one a possible new native seed bug, *Arocatus rusticus* (from Eastern states and not meant to be in WA) and a Phytoplasma causing phyllody which is a flattening of the stem.

- Required more 'eyes' to increase plant detections in order to sample more plants for agents
- MyPestGuide community was asked to take part.

Results showed how important the community is for increasing weed detections overall across WA in a timely manner.



The MyPestGuide® community!

As at 25 September 2023, the MyPestGuide project had a total of 100,222 downloads of MyPestGuide suite of apps (99,565), with a total of 409,712 MyPestGuide Reporter submissions (407,398) from 23,459 individual users (23,211).

MyPestGuide® Reporter remains DPIRD's most downloaded app with 59,264 downloads (58,730).

Pest Alerts (this month): 2

Table 1: Number of downloads for September 2023 from each of the app stores. Previous month's data () .

Android downloads	iOS downloads
4655 MPG Crops (4650)	10,626 MPG Crops (10,599)
9260 MPG Diseases (9237)	6505 MPG Diseases (6467)
1938 MPG Grapes (1935)	3947 MPG Grapes (3938)
432 MPG CropScout (432)	3595 MPG CropScout (3577)
31,874 MPG Reporter (31,681)	27,390 MPG Reporter (27,049)

All reports come from the public, industry or government staff.

We now have over 20,000 citizens who make up part of our early detection network, making MyPestGuide Reporter DPIRD's most downloaded app for 8 years running.

MyPestGuide® Triage capacity for delivering quality plant diagnostics

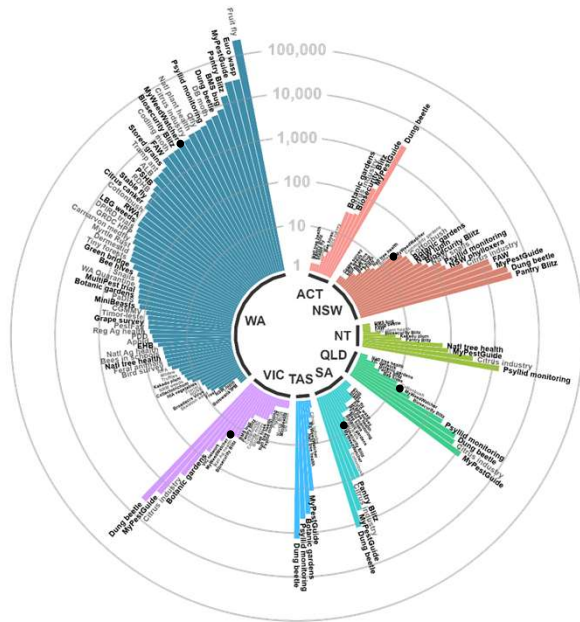
State / Territory	All Projects (Average/month)	MyPestGuide® (MWW Average/month)
NT	0	0
TAS	2	0
ACT	0	0
SA	6	0
QLD	14	1
NSW	20	3
VIC	17	4
WA	336	64

All projects tend to be managed by an independent group such as a local council or shire. New projects are set up for handling specific emergency pest responses when requiring targeted surveillance.

To provide quality feedback and advise the public requires knowledgeable staff. The effort involved for triage officers or diagnosticians working within each MPG State or Territory teams varies, as does their output (which is my next slide).

The advantages to experts is that they gain insight on behavioural or symptomatic changes of species across seasons, they build a visual in their mind of how climate change might be impacting weed invasiveness, or they might see new trends when reviewing multiple reports over time.

State & Territory reporting



- denotes MyWeedWatcher reports

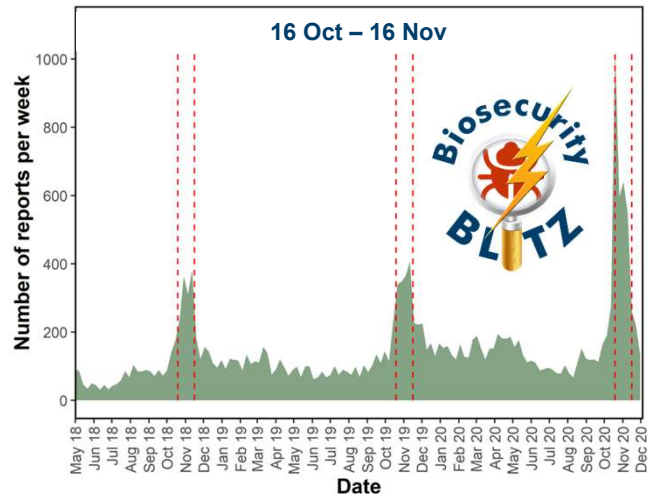
Total number of reports
(Aug 2014 - Sep 2023)

Reporting output has increased in all states and territories.

As expected, the level of weed reporting varies between states, and the projects between states also varies.

Some state have greater levels of weed reporting which means greater engagement or better resourcing, or both.

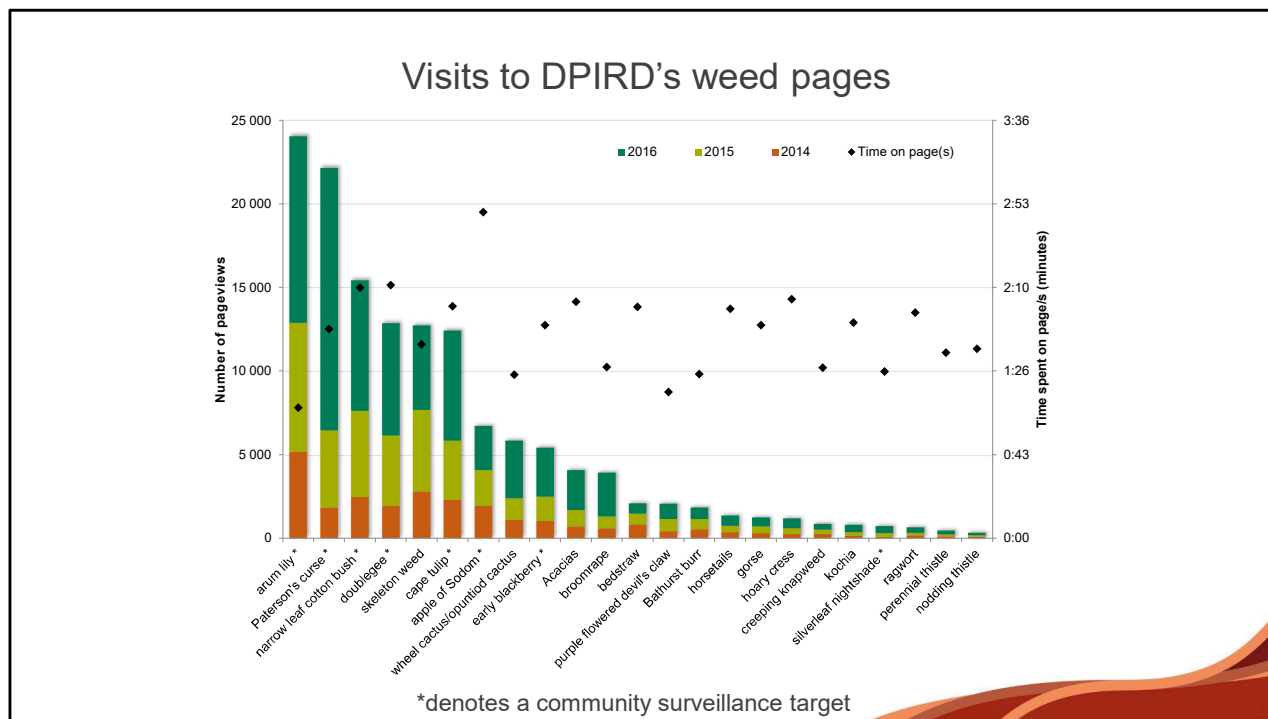
Community engagement



**Register today for the next
Biosecurity Blitz 2023!**

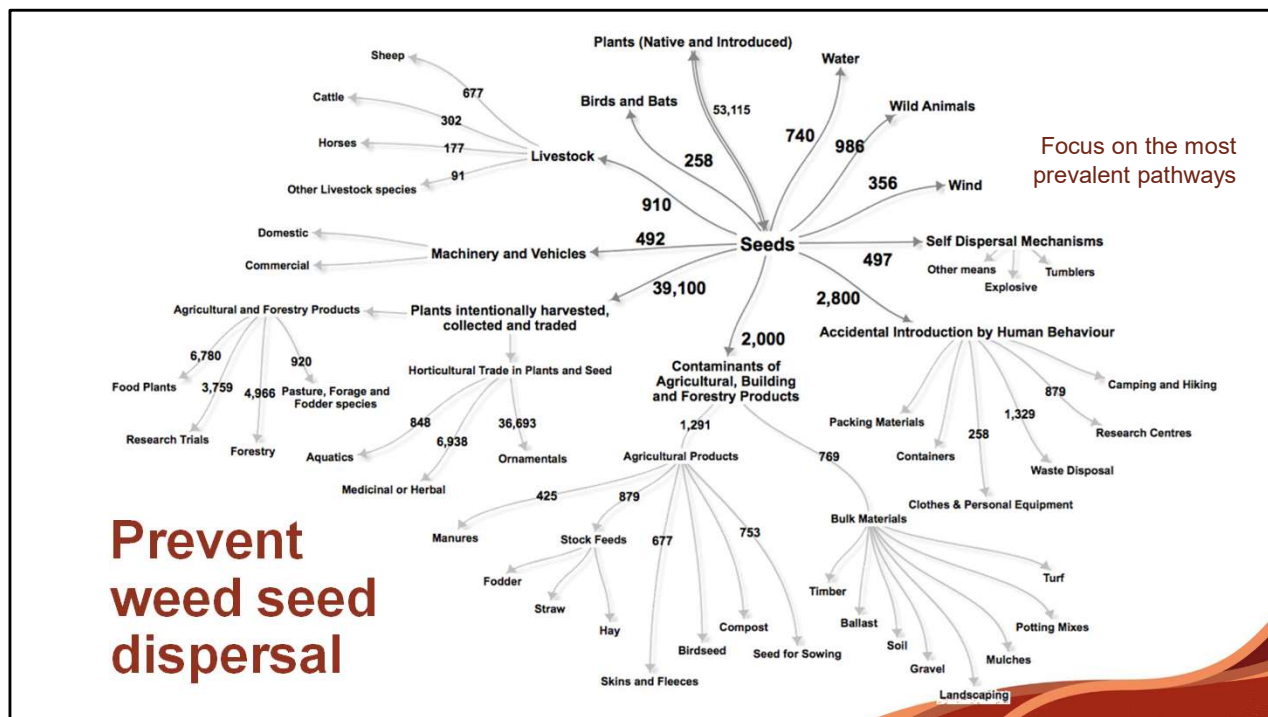
If we look at weekly patterns of reporting, it is obvious, after multiple years of biosecurity blitz campaigns, that mixing both types of targeted and general surveillance into a communications strategy is a very effective way to foster diagnostic collaborations and build public trust.

This year's blitz is all about reporting what you find in your backyard.



Earlier research showed us that the weed community (at least in the SW of WA) is generally interested in C3 managed weeds which are already known to them e.g. Paterson's curse, arum lily, narrow leaf cotton bush, doublegee and cape tulips.

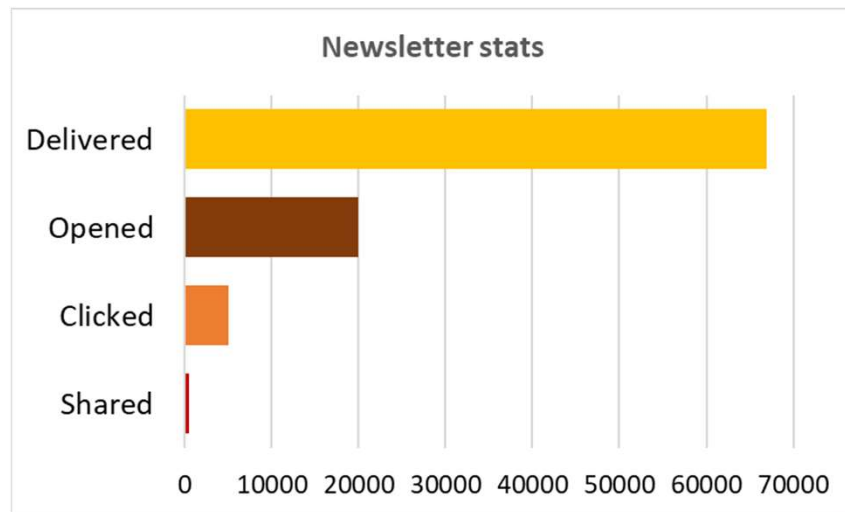
To get more C1 and C2 weed detections we ask the public to look for inference weeds and focus surveillance effort in areas where the prevalent dispersal pathways which spread weeds are known to us.



Areas where new weeds are likely to establish initially have been identified so to prevent new weed problems we are focusing community engagement effort with key stakeholders linked to each of these seed dispersal pathways.

We're also developing more awareness materials and advice for individual property owners to self-manage weed risks during their day-to-day running of operations.

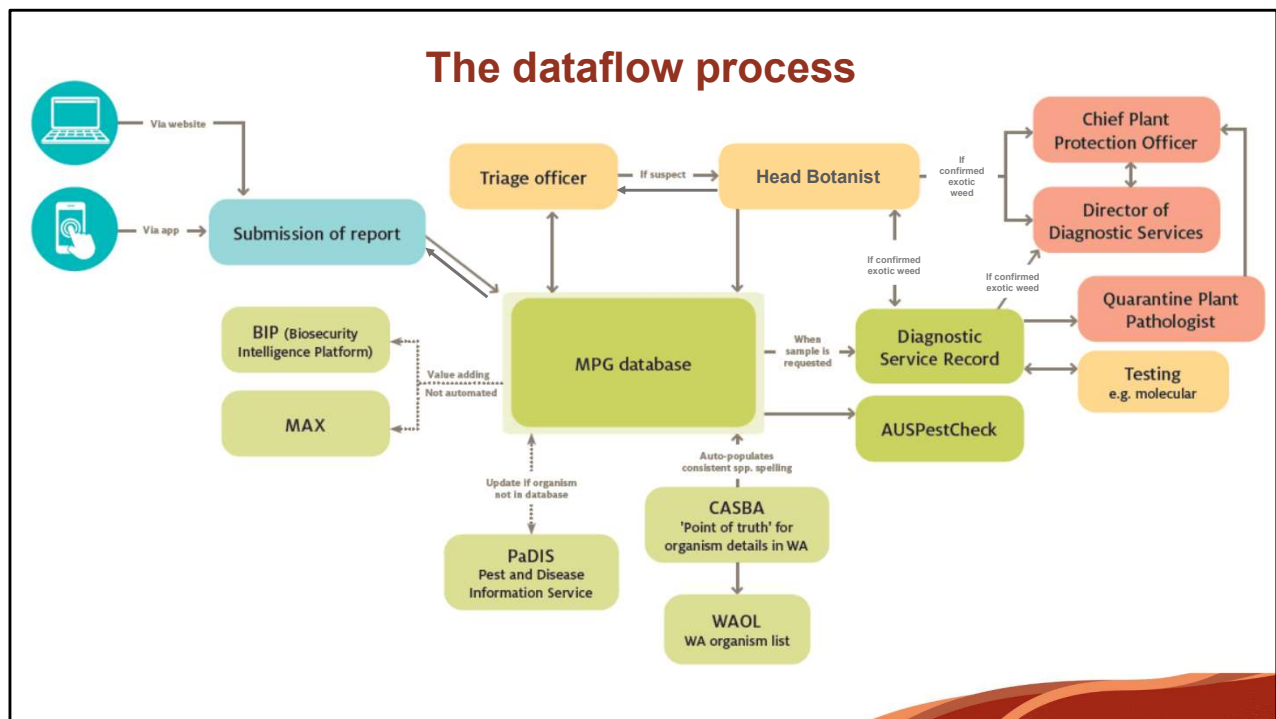
To get a good result you need to send a lot of reminders!



The effort though to maintain this level of engagement for a small WA team is really high, so a combined effort where we work together with weed industry stakeholders and Society's like yourselves to achieve similar results will be necessary to increase and add value to future weed management data.



During the blitz campaigns, and now more regularly, we have been picking up several non-compliance issues to do with weeds. So, to get in front of the invasion curve, DPIRD is now monitoring the sale and trade of plants and working closely with the compliance teams to stop the illegal trading of weeds and shut down trade of declared pests pre-border, where possible.



When reports are submitted by the public or biosecurity officers they all go through a triage process before being verified by an expert to reduce any possible risks to industry market access before being mapped on the public website where everyone in the reporting community can learn more about weeds.

In instances where an exotic weed is found, the Triage Officer and Botanist can alert the Plant Managers and/or Chief Plant Biosecurity Officer (CPBO) in the corresponding state the weed was reported within the MyPestGuide system. Once the new exotic weed occurrence is confirmed, the CPBO can action the appropriate emergency management measures to contain and eradicate the pest, where possible.

Weeds within biosecurity areas

MyPestGuide

- Maintain MPG apps/website
- Support MPG users
- Triage, identify and respond to MPG reports
- New app development (MPG Trees)
- General surveillance

Pest Risk Analysis

- Data for evidence of presence/absence
- Support for area freedom - inference of absence
- Declared Pest Webpages (promote General surveillance)

Surveillance

- Awareness of high priority pests
- How to report
- Engagement in surveillance activities - Blitzes etc.
- Collection of general surveillance data for early detection and inference of absence
- MPG Reporter for DPIRD surveillance activities

Policy & Market Access

- Awareness of movement conditions
- Awareness on how to apply for import permits
- Awareness of BAM Act in relation to PB
- Promotion of 'successes'

CPBO

- Alerts of new pest detections
- Promote Plant Biosecurity activities

Pest Analytics

- Analysis of Blitz results
- Analysis of reporter demographics
- Communication of analytics work

Animal Biosecurity Invasive Species Risk Analysts

Diagnostics (DOLs)

- Liaise on public samples submitted from MyPestGuide

Emergency Response

- Public reporting
- Awareness material

DPIRD & Biosecurity Communications

- Templates for routine communications relating to biosecurity
- Key messages for plant biosecurity

Systems CASBA/WAOL MAX

Engagement Activities (Focus on community reporting)

- Field days/Expos
- Blitzes/surveillance campaigns
- Webinars/Presentations

Webpages/Printed Materials

- Declared pest pages
- MPG pages
- Factsheets

MyPestGuide and Community Engagement Team Activities/Outputs

Input into other Biosecurity areas

EXPERTS
TRAINING
SUPPORT
DATA
MANAGER
OFFICERS

Weeds are treated slightly different within DPIRD's biosecurity areas. Weeds are managed by the Invasive Species section. Triage Officers advise the Regional Coordinators via the reporting system of any suspect weeds. A biosecurity officer is assigned to the weed problem and the information flows back into the system following the same biosecurity hierarchy it went out, ending up at the Triage Officer again who updates the person who made the original field report.

Collect targeted samples
 Report traps or locations
 Uploads to MAX system

I am reporting a Location/Trap ID
 ABC30082022
 Please ensure this code is written or printed on the trap

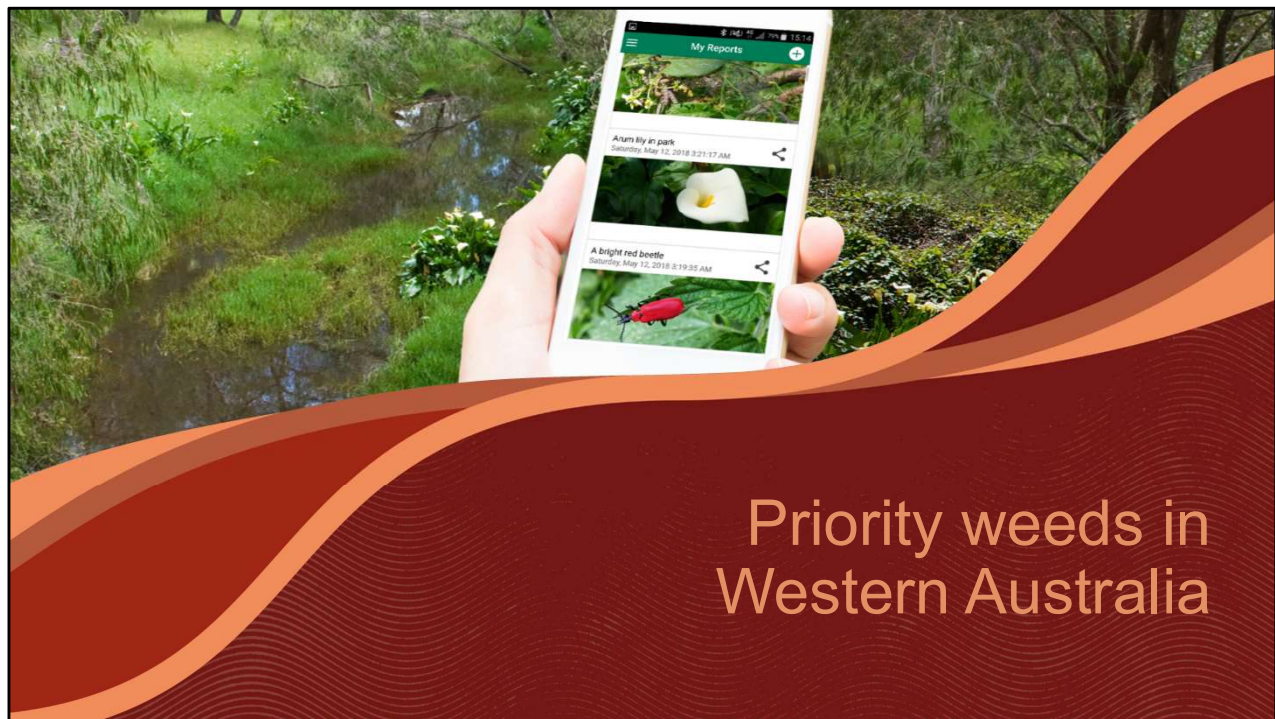
I am sending a sample
 30082022ABC
 Please write the above Sample ID (date/field) on container, package securely to minimise the biosecurity risk and send to the address on the next page.



We can track field reports and any samples collected using the sample and/or trap codes generated for each report in the app, ensuring traceability of samples through the diagnostic and accredited lab process once they arrive at DPIRD.

MyPestGuide has been used to support incident management in multiple ways and its use in response over the years has shown how flexible the tool is at collecting both general and targeted surveillance data.

It has also shown us how quickly a well-informed and well-prepared reporting community is at delimiting a weed infestation, and how much better off that community and impacted stakeholders are at dealing with the recovery phase of a response.



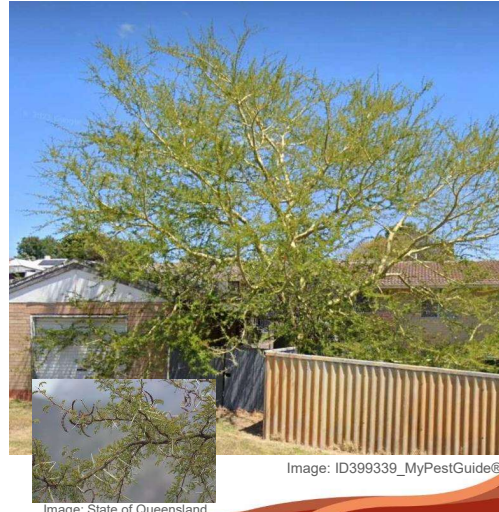
Priority weeds in Western Australia

So what weeds have the community reported to us?

Priority Weeds in Western Australia

Karoo acacia (*Vachellia karroo*), Declared Pest Prohibited – s12, C1 Exclusion

- Karoo trees start producing fruit within 2 years.
- Large trees can produce up to 19,000 seeds per year.
- Seeds can remain viable in the soil for at least 7 years.
- Germination is improved by fire, weathering and passing through an animal's gut.
- The seeds can spread long distances in the droppings of animals,
- Straight, white, dark-tipped, paired thorns, usually up to 100 mm long although occasionally as long as 250 mm



The most recent category 1 (C1) weed detected in WA was Karro acacia (*Vachellia karroo* (Hayne) Banfi & Galasso).

This weed was found in a city suburb on a property in Bayswater in early January 2023.

Experts agree it would be an absolute menace if it was established in WA as it can become a large tree with huge V-shaped thorns.

DPIRD officers have since removed the tree and chipped it on site.

We will continue to monitor the site closely with the homeowner to treat emergent seeds on the infested property along with other stakeholders nearby to minimise the spread and impact of this weed on businesses and natural environment.

Priority Weeds in Western Australia

Opuntia robusta

Wheel cactus
Declared Pest Prohibited-s12, C1 Prohibited



Image: DPIRD

Can form dense populations on pastoral and agricultural land. Spines can damage lips and tongues of stock if eaten. Dense thickets impede stock movement and provide habitat for other pest organisms.

Eichhornia crassipes

Water hyacinth
Declared Pest Prohibited-s12, C2 Eradication/Prohibited



Image: ID63631_MyPestGuide®

One of the world's worst weeds. It obstructs waterways, reduces fish production, harbours mosquitoes, and severely disrupts life in communities along rivers and lakes.

Other priority weeds reported include:

Wheel Cactus (*Opuntia robusta*) which is an invasive species is known mainly from the shire of Merredin in Western Australia.

- Fragments will root and produce new plants.
- The fruits are eaten and seeds distributed by animals in their droppings.
- It impacts land productivity and can cause injury to humans and other animals.

Water Hyacinth (*Eichhornia crassipes*) is an aquatic herb with broad, glossy green leaves and showy, blue to mauve flowers.

- It is one of the world's worst weeds, being particularly serious in slow-flowing or stagnant freshwater in tropical and subtropical areas.
- It is a declared noxious plant (WoNS) in all states and territories
- It has also been identified as a target for biological control as it has shown to be effective in some tropical regions.
- Management requires integrated control programs and monitoring to prevent further spread.
- In Western Australia, it used to cover Lake Monger in 1947 and was eradicated, but has since invaded other freshwater lakes and swamps in the Perth region.
- And...It continues to be traded online.

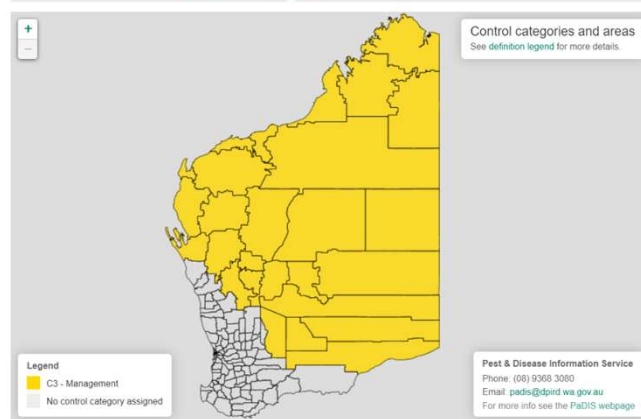
Priority Weeds in Western Australia

Opuntia ficus-indica (L.) Mill.

Prickly pear or Indian fig

Declared Pest – s22(2), C3 Manage

Control / Keeping categories [View list](#) [View map](#)



Credit: ID406460_MyPestGuide®

- In WA it is widely cultivated for its fruit.
- A decision was made to change its declaration status to C3 outside the southwest land division, so it is allowed to be sold within the southwest land division but not in the shires where it is declared.

Opuntia ficus-indica (Caryophyllales: Cactaceae) was made a Declared Pest (C3 whole of WA) at the time the opuntioid cacti were named Weeds of National Significance (WoNS).

Opuntia ficus-indica however is not a WoNS. You can see the shires where it is a declared weed on the map.

Landowners and neighbours must manage it together in these areas.

Priority Weeds in Western Australia

Andropogon gayanus Kunth

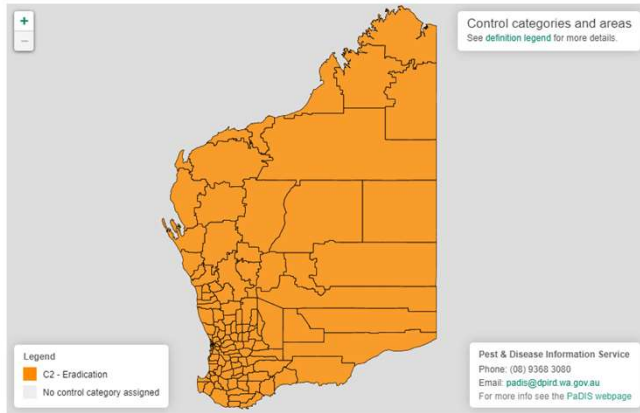
Gamba grass

Declared Pest – s22(2), C2 Eradication

High Priority



Credit: Tracey Vinnicombe, DPIRD



- A serious threat to savannas of northern Australia including the Kimberley.
- One known infestation in WA - on a cattle station in the East Kimberley.
- Has been under an eradication program for several years to reduce spread and impact.
- Also a weed in South America.
- A Weed of National Significance (WoNS).

For declared plant species known to be present in WA, there is also a high priority response list developed through expert panels and economic analysis.

Gambas grass is at the top of this list, follow by 14 other weeds that can establish widely, and if so cause the most undesirable impacts in WA. It has been under an eradication programme for some years in the north.

Priority Weeds in Western Australia

Phytolacca americana L.

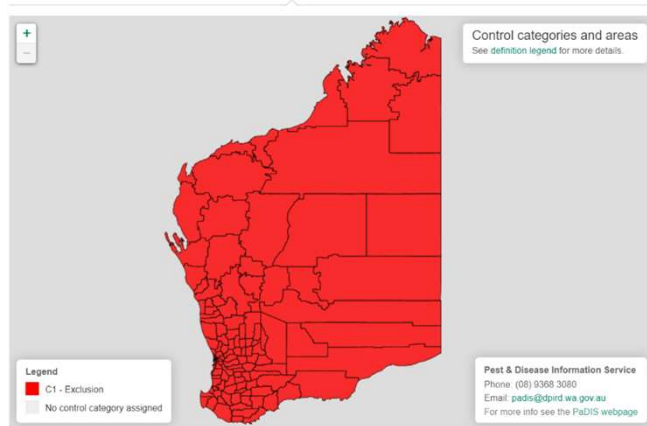
Pokeweed

Declared pest, Prohibited - s12, C1 Exclusion

Control / Keeping categories

[View list](#)

[View map](#)



Credit: ID55619_MyPestGuide®

- All parts, especially the root, contain numerous saponins and oxalates therefore toxic to humans and livestock when ingested raw or improperly prepared.
- Found in disturbed areas, along roadsides and in gardens.
- Birds are unaffected by the natural chemicals thus disperse the seeds.

As mentioned earlier, Pokeweed (*Phytolacca americana*) is a C1 declared weed and must be eradicated if found.

It is toxic to both humans and livestock so it is one of Western Australia's highest priorities for eradication.

It is also an environmental weed, and can impact agricultural activities where it can contaminate produce.

Priority Aquatic Weeds in Western Australia

The following aquatic plants are declared weeds in WA and plants must be reported to DPIRD for eradication:

- [Leafy elodea \(*Egeria densa*\)](#) – Present in WA, C2 Eradication, Prohibited s12
- [Hydrocotyl \(*Hydrocotyle ranunculoides*\)](#) – Present in WA, C3 Management, Prohibited s22(2)
- [Parrot's feather \(*Myriophyllum aquaticum*\)](#) – Present in WA, C3 Management, Prohibited s22(2)
- [Sagittaria \(*Sagittaria platyphylla*\)](#) – Present in WA, C3 Management, Prohibited s22(2)
- [Salvinia \(*Salvinia molesta*\)](#) – Present in WA, C2 Eradication, Prohibited s12
- [Senegal tea \(*Gymnocoronis spilanthoides*\)](#) – Absent in WA, C1 Exclusion, Prohibited s12
- [Water hyacinth \(*Eichhornia crassipes*\)](#) - Present in WA, C2 Eradication, Prohibited s12
- [Water lettuce \(*Pistia stratiotes*\)](#) - Present in WA, C2 Eradication, Prohibited s12



Other priority weeds include many aquatic plants. Those listed are now banned from sale in nurseries however they continue to be mistakenly sold at weekend markets, backyard sales and online websites and purchased by people unaware of the invasive nature of the plant.

Priority Aquatic Weeds in Western Australia

***Riccia fluitans*, C1 Prohibited
(Marchantiales: Ricciaceae)**



Image: Sandy Lloyd, MyPestGuide®

***Phyllanthus fluitans*, No status
(Malpighiales: Phyllanthaceae)**



Image: Sandy Lloyd, MyPestGuide®

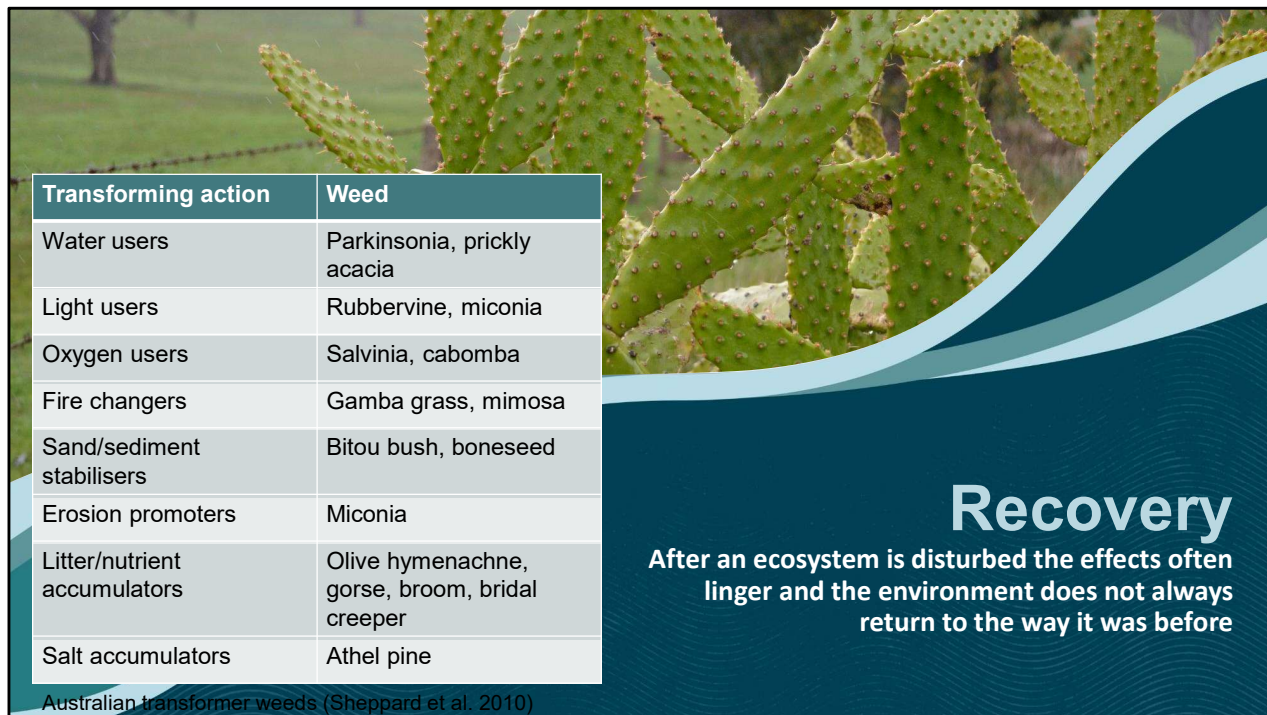
For example, eleven ads of *Phyllanthus fluitans*, have been reported from 2018-2021.

This plant is not listed on WAOL, is likely to be invasive in waterways and has been undergoing assessment by DPIRD since 2017ish.

Riccia fluitans is another aquatic plant that has been detected that should not occur in WA. This is a liverwort or non-vascular “bryophyte” plant (e.g. lacking water conducting cells, reproducing by alternating generations, and conducting photosynthesis in the haploid generation).

Unlike most aquatic bryophytes which are indicators of clean, well-oxygenated and fast-flowing water systems, *Riccia fluitans* is common to turbid, slow-moving streams and ponds, including those affected by eutrophication.

This species occurs in all major continents of the world and is recognized for its aromatic volatile oils stored in specialized organelles, which likely help protect it against predation.



Transforming action	Weed
Water users	Parkinsonia, prickly acacia
Light users	Rubbervine, miconia
Oxygen users	Salvinia, cabomba
Fire changers	Gamba grass, mimosa
Sand/sediment stabilisers	Bitou bush, boneseed
Erosion promoters	Miconia
Litter/nutrient accumulators	Olive hymenachne, gorse, broom, bridal creeper
Salt accumulators	Athel pine

Recovery

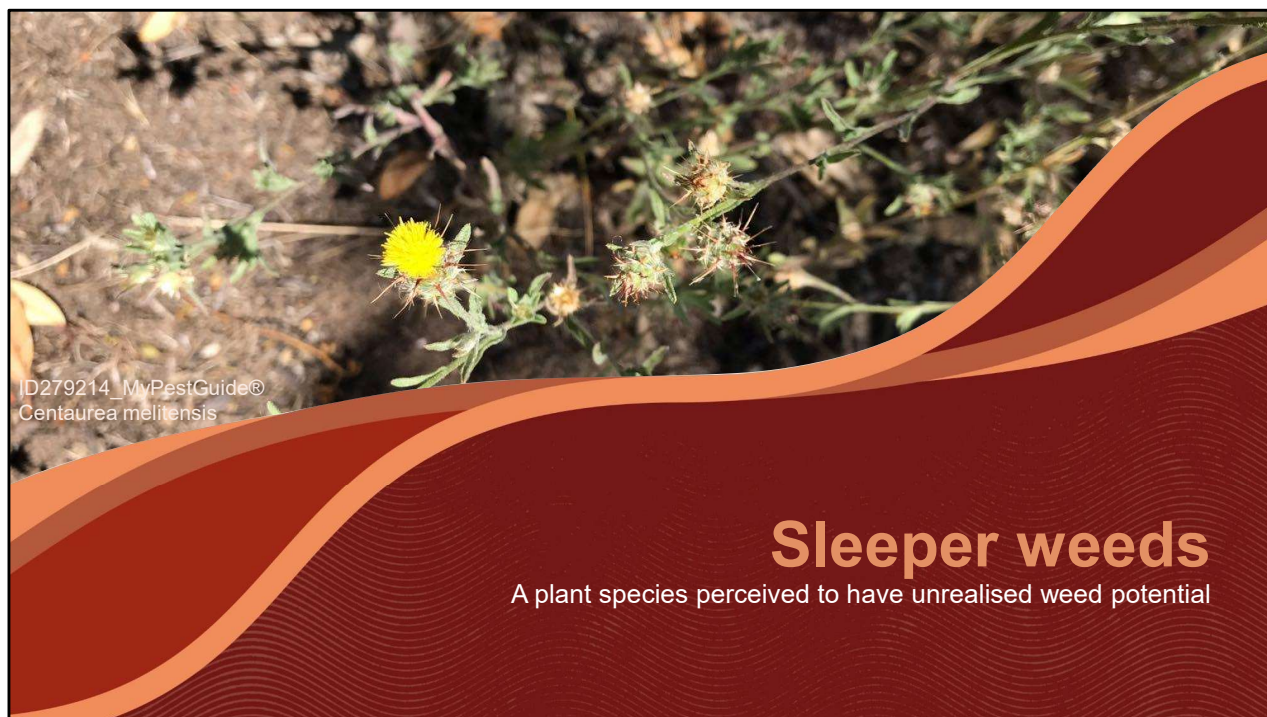
After an ecosystem is disturbed the effects often linger and the environment does not always return to the way it was before

Australian transformer weeds (Sheppard et al. 2010)

The early detection of transformer weeds will be important for us to manage during the recovery of local areas in the future as disturbance events increase.

Transformer weeds are invasive plants that radically alter the composition, structure and / or composition, processes and functions of an ecosystem. Bridal creeper and blackberry are sometimes considered to be transformer weeds by landowners in WA.

Buffel grass (*Cenchrus ciliaris*) was one of the first examples I observed. It is an introduced pasture grass that has significant value as a perennial fodder crop, but it is also as a 'transformer' species with the ability to significantly degrade the character or condition of natural ecosystems.



Some weeds are at the early stages of invasion in Australia and are expected to become widespread over the coming years.

These sleeper weeds may appear benign for many years until disturbances such as fire, flood, drought or climate change promote their spread and establishment. Most state and territory legislation now captures species that pose a high risk.

Garden waste weeds

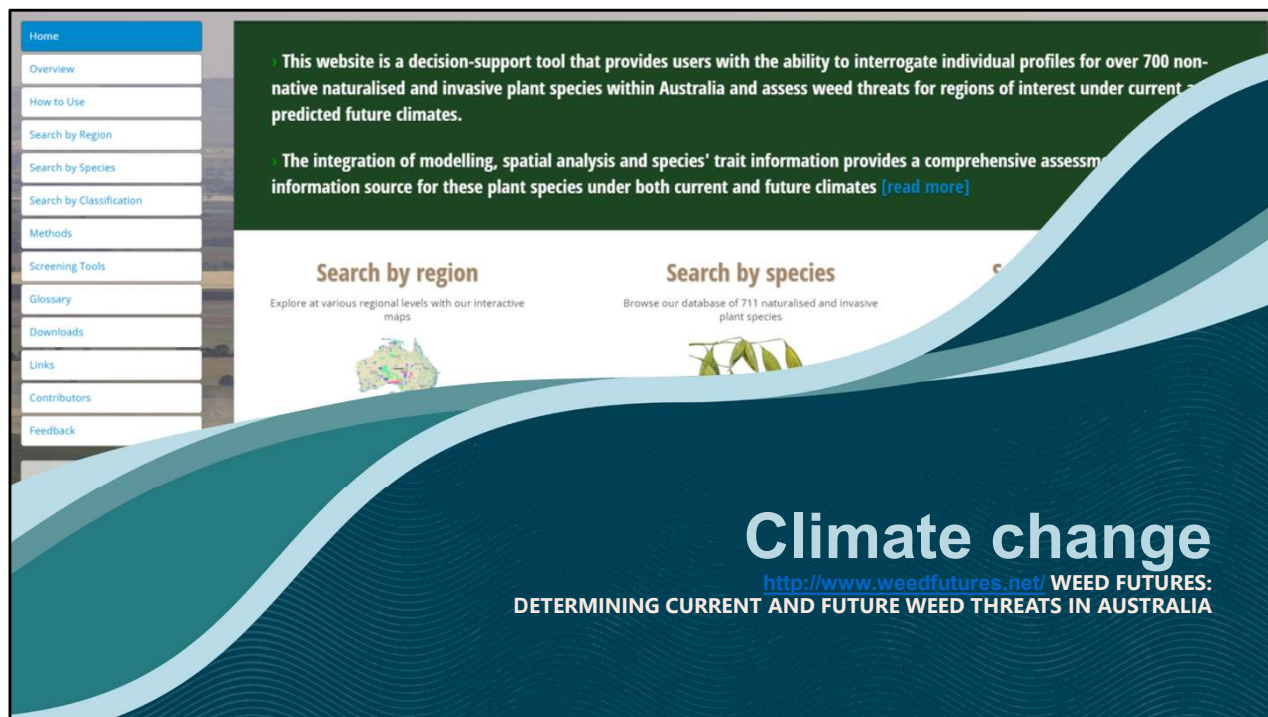
Tulbaghia violacea, Permitted



Credit: ID395290_MyPestGuide®

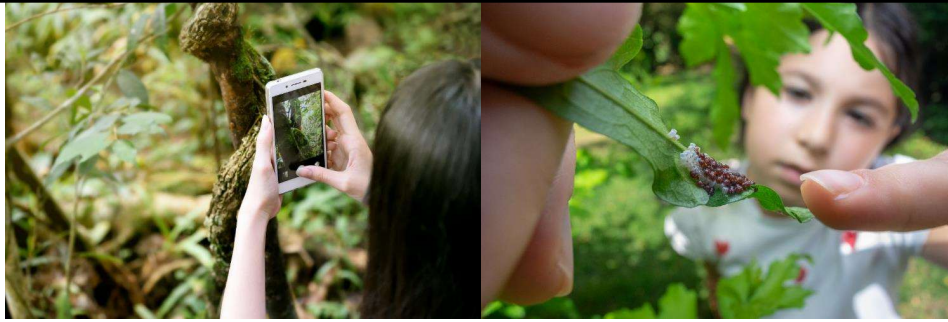
But some sleeper weeds could be the plants people have been dumped out with the garden waste or neglected crops.

These sources often harbour weeds which are being reported more often by the public, for example this report of ***Tulbaghia violacea*** was found in the wild in WA for the first time. Range extensions of pests tend to be the first observable tick on a path up instead of in front of the invasion curve.



Everyone in this room will likely agree that climate change will influence the distribution and abundance of weeds and the options available for managing them. Temperatures, and the frequency of extreme events such as floods and droughts, are expected to increase. Rainfall is expected to increase in northern Australia but decrease in southern Australia.

Decision support tools are being improved by the addition of AI – which is likely to assist our efforts to prioritise and ID plants - but it still comes down to markets and trade.....



Reporting weeds and unfamiliar organisms is important



In summary, if we really want to protect our assets, focus on weed prevention....find a dispersal pathway, and stick to it.

What you can do...

- Take part in diagnostic and surveillance events
- Verify and check your own reports then share socially
- Lend your expert skills and knowledge
- Mentor a younger generation, including me!
- Restore your backyard with native plants
- Help a neighbour restore their backyard
- Write to MPs and outline your expectations
- Make present/absent weed reports
- Be bios⁰⁰curity aware

We're here to help!

MyPestGuide®



Then grow stronger relationships and work towards enabling Australia's plant industries, Traditional Owners and other experts to support one another and engage with each of their stakeholders, including their communities, at all levels.

Thank you

dpird.wa.gov.au    



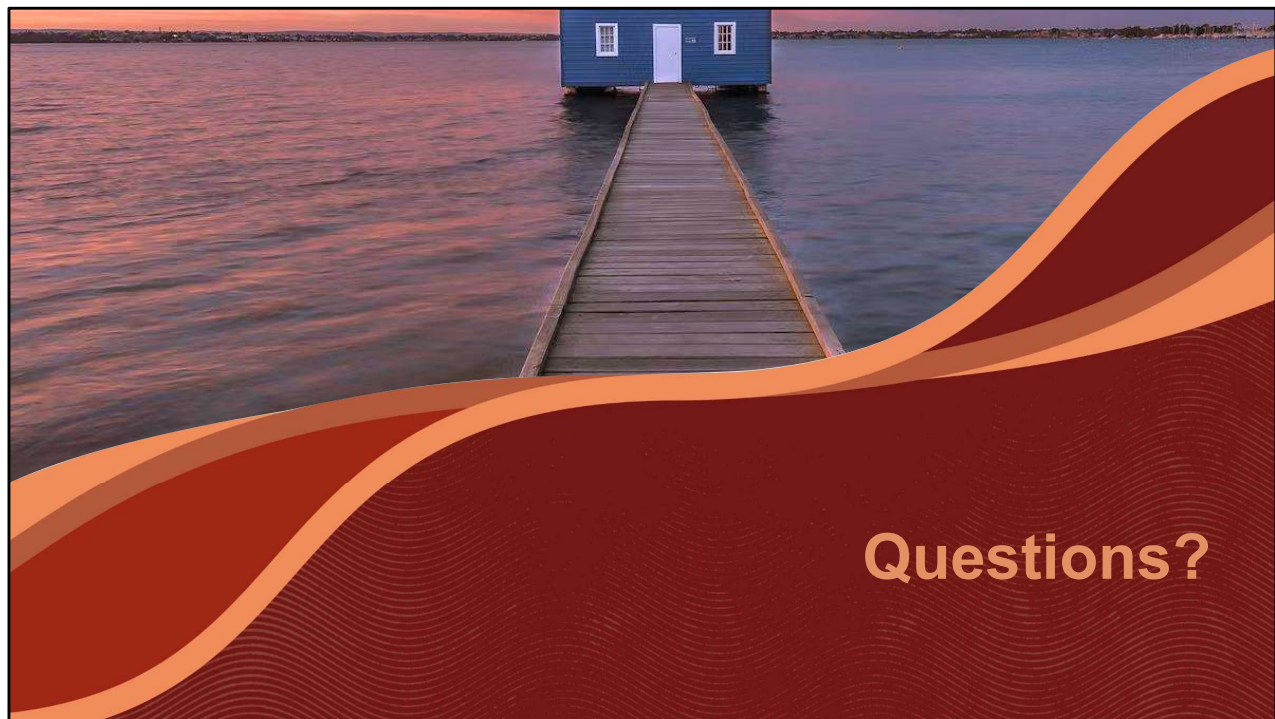
Bringing everyone
together who is
interested in weed
management

Important disclaimer

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Thank you all for listening and taking the time to attend my presentation. Any questions?



Questions?



Department of
Primary Industries and
Regional Development

Acknowledgement of Country

We acknowledge the Whadjuk Noongar people in Western Australia as the Traditional Owners of the land we're meeting on today and pay our respect to their Elders past, present and future.

I would like to acknowledge the Whadjuk Noongar people in Western Australia as the Traditional Owners of the land we're meeting on today and pay my respect to their Elders past, present and future.

What is a weed and why should I care?



- An invasive plant
- A plant that requires some form of action to reduce its effect on the environment.
- A plant that colonizes and persists in an ecosystem which it did not previously exist.

Extra