# Weeds of National Significance

WEEDS OF NATIONAL SIGNIFICANCE 2012

Australian Government

WoNS - a joint initiative of the Australian, State and Territory Governments.

Lantana
Madeira vine
Mesquite
Mimosa
Opuntioid cacti
Parkinsonia
Parthenium weed
Pond apple
Prickly acacia
Rubber vine
Sagittaria
Salvinia
Serrated tussock
Silverleaf nightshade
Willows
Water hyacinth

This publication is produced as part of the Weeds of National Significance initiative, a joint initiative between the Commonwealth of Australia and each of the Australian States and Territories



ISBN 978 0 9803249 3 8




Published by the Department of Agriculture, Fisheries and Forestry, Canberra, ACT .



This publication (and any material sourced from it) should be attributed as:
Australian Weeds Committee (2012), Weeds of National Significance 2012.
Department of Agriculture, Fisheries and Forestry, Canberra, ACT

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weeds of national significance (WoNS)

# INTRODUCTION

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## Introduction

The WoNS initiative coordinates national effort against 32 of Australia's worst invasive plants. These weeds cause negative impacts to many of Australia's natural and productive landscapes. Collaborative national action can help to reduce the impacts and prevent further spread of these weeds.

In 1999 all States and Territories agreed to 20 inaugural WoNS. The assessment process prioritised these weeds against their invasive characteristics and potential impacts. The assessment process and inaugural WoNS were fully endorsed by relevant ministers for the environment, primary industries and forestry across Australia.

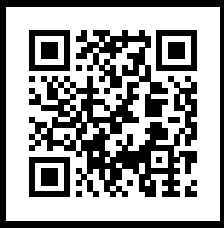
A national strategic plan for each WoNS prioritises actions to better manage the weed. Each plan is endorsed by the relevant ministerial council or standing committee, and the Australian Weeds Committee (AWC) oversees implementation. Coordination of these plans at a national level promotes consistent and efficient management across States and Territories, improves linkages between research and on-ground control, and encourages commitment from a wide range of stakeholders.

Implementation of the strategic plans is supported by national management committees, made up of government, industry and community representatives, and facilitated by a national coordinator.

In 2009, the National Resource Management Ministerial Council endorsed the continuation of WoNS, subject to funding availability and a transition to a rolling, rather than static list of species. This would allow phasing down (i.e. reduced levels of national coordination) of species that are being effectively managed and the potential to add new species to the list.

Concurrently, the AWC undertook a review of progress towards the 20 inaugural WoNS strategic plans. This review determined that the majority of national objectives from the plans had been achieved, and that a reduced level of national coordination could effectively progress any outstanding actions. The inaugural Plans were revised in 2012 and the level of national coordination for each of the original 20 WoNS has been reduced as appropriate (see pg 8).

Given the reduced need for national coordination of the original WoNS, the



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AWC identified the capacity to expand the WoNS list. This resulted in 12 additional weeds or suites of weeds being announced in April 2012 (see following section). These 12 are featured in this report.

The WoNS initiative benefits Australia by:

- encouraging a collaborative, national approach to controlling outlier infestations and reducing spread of core infestations
- identifying strategic priority areas for management of WoNS, based on robust national distribution mapping
- raising the profile of WoNS species and increasing awareness of their impacts
- increasing accessibility to weed information, including best management practices
- strengthening networks and discussion from national to local levels to increase the sharing of information, experiences, resources and regulatory consistency
- encouraging cross-tenure and community participation in holistic pest management
- increasing political understanding of the weed issues
- improving linkages between research and on-ground practitioners to improve the effectiveness of weed management strategies
- encouraging strategic use of resources for weed management from federal, state and local government, industry and community.

The focus on WoNS has led to changes in weed management across all states and territories to provide a consistent and more effective national effort.

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# SELECTION OF ADDITIONAL WEEDS OF NATIONAL SIGNIFICANCE


## Selection of additional Weeds of National Significance

Weeds of National Significance (WoNS) are high impact, established weeds for which targeted, strategic and nationally-coordinated co-investment will deliver long-term benefits across Australia. They are causing major economic, environmental and/or social and cultural impacts in a number of states/territories, and have strong potential for further spread.

Successful nomination as a WoNS species recognises a species as a priority weed threat to Australia. These weeds require coordinated and strategic management, along with shared stakeholder investment to develop and implement best practice to prevent, eradicate, contain and/or minimise its impacts across Australia.

The selection of an additional 12 WoNS was subject to technical and policy considerations in a process managed by the Australian Weeds Committee (AWC), summarised as follows:

- The Bureau of Rural Sciences (now the Australian Bureau of Agricultural and Resource Economics and Sciences – ABARES) reviewed best practice weed risk assessment, resulting in the report Methodology to prioritise Weeds of National Significance (WoNS) candidates (Lizzio et al. 2010). AWC endorsed this report for use in assessing new WoNS candidates.
- In recognition of ongoing resource commitments the AWC elected to consider fewer nominations for formal assessment than were considered in 1999. AWC jurisdictions consulted with their respective weed experts and nominated a total of 16 species as candidates for new WoNS.
- The AWC agreed that, where a genus or a number of species within a genus were nominated, only one representative species was required to be comprehensively assessed with respect to that nomination.
- ABARES undertook the technical assessment (which was later peer-reviewed by weed risk assessment technical experts) of the 16 nominations, using scientific information and data provided by nominating jurisdictions.

- The model selected by AWC to rank species was: Ranking = (Invasiveness + Potential for Spread) × (Impacts + Socioeconomic & Environmental Values), with equal weighting given to these four criteria.
- The AWC also subjected the 16 nominations to a further qualitative analysis of feasibility of control, using criteria derived from the National Environmental Biosecurity Response Agreement (NEBRA), using ABARES data where applicable.
- Finally, the AWC considered resource requirements for the WoNS initiative and potential for grouping species to achieve efficiencies, which resulted in 12 additional WoNS.

The 12 WoNS announced by AWC on 20 April 2012 are important new additions to Australia's WoNS list. The WoNS species affect southern and northern Australia, and impact on a diversity of primary industries, natural ecosystems, social amenity and cultural values.

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# WEEDS OF NATIONAL SIGNIFICANCE – PHASED APPROACH

## Weeds of National Significance – Phased Approach

In 2007, an independent review of the WoNS program concluded that the nationally strategic approach of WoNS was highly successful in leveraging consistent multi-jurisdictional activity on high priority weed species. This initial review was followed by a detailed review of the inaugural WoNS species by the Australian Weeds Committee (AWC) in 2009 (see previous section).

Following the reviews, the Natural Resource Management Ministerial Council endorsed a three-phased approach to national management of WoNS species. This 'phased approach' aims to provide the most cost-effective use of limited 'national coordination' resources.

The phased approach recognises a reduced need for national coordination ('phasing down') of WoNS species, and allows for further weed species to be nominated for consideration as additional WoNS. The AWC is implementing these reforms, and national coordination of the inaugural 20 WoNS species has already transitioned to Phase 2 or 3, depending on the species (see pages 8-11).

WoNS species move through three phases (Figure 1) as their national strategic plans are implemented, reviewed and revised to ensure substantial improvement in the management of the weeds by governments, industries, communities and landowners.

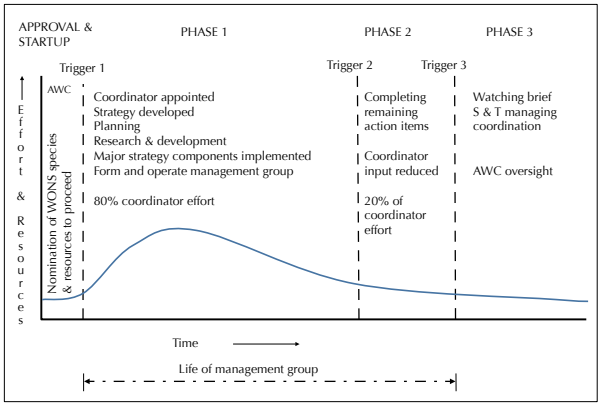



**Figure 1**
Australian Weeds Committee diagrammatic representation of effort and resource use at a national level when implementing a Weeds of National Significance strategic plan

Phases 1 and 2 are considered the 'start up' and 'ongoing' phases, where a large amount of effort is expended to develop foundational materials, establish strategic, coordinated control programs and establish and support a national network of committed partners to deliver the national strategic plan.

Phase 3 is a period of continued maintenance for WoNS actions, where the majority of nationally coordinated work has been undertaken. Oversight reverts to States and Territories for the coordinated implementation of a revised national WoNS strategic plans within their respective jurisdiction. By Phase 3, considerable prior co-investment into national coordination of a WoNS will have engaged relevant stakeholders in various actions to prevent the weed's spread, reduce impacts and build community capacity to manage the weed.

In Phase 3, States and Territories collaborate as required for cross-border and national actions, and report annually to the AWC on implementation of the revised strategic plans. Phase 3 WoNS are characterised by the following:

- Implementation of the revised strategic plan resides with those relevant jurisdictions that are affected by or potentially at risk from the WoNS species.
- Relevant jurisdictions report annually to the AWC on progress in implementing the revised national strategy.
- The WoNS does not have a government-funded national coordinator or national management group/taskforce.

There are several highly beneficial national actions that are critical to success of a WoNS revised strategic plan. Depending on resource constraints and jurisdictional priorities, all relevant AWC jurisdictions will commit resources to implement these.

Phase 3 priority strategic actions include:

- Maintain up to date distribution data and collate annually into a national map
- Conduct surveillance activities and control new WoNS outliers.
- Foster training in identification, awareness of impacts and best practice management options.
- Integrate national WoNS strategy objectives with regional and state policy and planning approaches.
- Facilitate strategic management of WoNS infestations.
- Distribute WoNS best practice manual and supporting publications.
- Maintain current legislation requirements (preventing sale, trade and movement as a minimum).
- Monitor work undertaken and progress towards completing implementation.

# ORIGINAL WoNS

**Alligator weed (*Alternanthera philoxeroides*)**
Alligator weed is an aggressive invader of waterways, wetlands and floodplains and grows both in water and on land. Current initiatives include control programs for priority outlier and urban backyard infestations, identification training and herbicide research. This WoNS will transition to Phase 3 in July 2013.

**Athel pine (*Tamarix aphylla*)**
National coordination and cooperation resulted in a significant increase in knowledge of the distribution of planted and weedy athel pine; awareness of its threat to semi-arid riparian areas and ongoing control programs in the majority of priority areas. Athel pine has been a phase 3 WoNS since 30 June 2012.

**Bitou bush (*Chrysanthemoides monilifera* subsp *rotundata*) and**

**Boneseed (*C. monilifera* subsp *monilifera*)**

Bitou bush and boneseed are highly invasive shrubs that degrade coastal and woodland ecosystems across southern and eastern Australia. Eradication (in WA) and national containment lines (in NSW and SA) are preventing further spread. Sustained, cross-tenure programs are reducing the density and impact of infestations. Continued work should defend containment lines and maintain long-term control programs to reduce impacts on biodiversity. Bitou bush, boneseed is phase 2 to June 2013.

**Blackberry (*Rubus fruticosus* agg.)**
Blackberry reduces the productivity of primary industries, competing for soil moisture and nutrients. Infestations also impact on biodiversity, displacing native species and, in some instances, reducing habitat for native fauna. On going priorities include containment zones and outlier control. Blackberry is a phase 3 WoNS.

**Bridal creeper (*Asparagus asparagoides*)**
Bridal creeper is an invasive vine that smothers native vegetation and forms dense root mats that impact soil condition and inhibit native plant germination. Collaborative national efforts include eradication in Queensland and Tasmania, containment of new and outlier infestations, and suppression of core infestations with the highly successful rust fungus biological control agent. Bridal creeper is a phase 2 weed to June 2013.


**Cabomba (*Cabomba caroliniana*)**
Cabomba, a submerged aquatic plant, forms dense underwater thickets that can displace native flora and fauna. Current priorities for cabomba include management of priority outlier sites, optimising herbicide performance and host specificity testing of potential biological control agents. This WoNS is likely to transition to phase 3 in July 2013.

**Chilean needle grass *(Nassella neesiana)***
Chilean needle grass is a vigorous perennial grassy weed, affecting agricultural, urban and natural systems in south-east Australia. Its large seed is easily spread by machines, equipment, stock and water, and can cause injury to stock. Identification skills and good hygiene practices are essential to help prevent further spread. This WoNS will transition to phase 3 in July 2013.

**Gorse (*Ulex europaeus*)**
Gorse is a prickly shrub that invades production lands and native vegetation in all jurisdictions except the NT and Qld. Twenty strategically placed *25 year gorse eradication memoranda of understanding* across five states, including for the whole of WA and much of Northern NSW provide for ongoing national management of gorse. This WoNS transitioned to phase 3 in early 2012.

**Lantana (*Lantana camara*)**
Lantana is a serious environmental and economic weed. Collaborative efforts to restrict spread and prioritise investment to protect key environmental assets have reduced its potential threat. Lantana transitioned to phase 3 management in July 2012; however continued effort is required to deliver the National Lantana Strategic plan.

**Mesquite (*Prosopis* spp.)**
Mesquite is a major weed threat to the arid and semi-arid rangelands of Australia. Collaborative efforts have substantially reduced the size, density and number of infestations. Continuing effort is needed to control outliers, contain core infestations and protect previous investments. This WoNS will transition to phase 3 in July 2013.

# ORIGINAL WoNS

**Mimosa (*Mimosa pigra*)**
Monitoring and treatment programs in the isolated Queensland and Western Australia infestations ensure that no mimosa plants survive to produce seed. Biocontrol agents, direct control of high priority infestations and natural dieback are utilised to minimise its spread in the Northern Territory. Mimosa has been a phase 3 WoNS since 30 June 2011.

**Hymenachne (*Hymenachne amplexicaulis*)**
Olive hymenachne, a semi-aquatic grass invades wetlands and waterways severely impacting on biodiversity. A catchment based national management approach is continuing and being reflected in local action. Surveillance and outlier control activities are priorities to prevent it fulfilling its potential distribution. This WoNS will transition to phase 3 in July 2013.

**Parkinsonia (*Parkinsonia aculeata*)**
Parkinsonia, a thorny shrub, forms dense impenetrable thickets along watercourses and floodplains. Catchment based control programs and research into biological agents including endemic pathogens is continuing. This WoNS will transition to phase 3 in July 2013.

**Parthenium weed (*Parthenium hysterophorus*)**
Parthenium weed poses a serious threat to agriculture and biodiversity. It invades disturbed areas and quickly establishes, outcompeting desirable pasture and other species. Surveillance and outlier control activities remain priorities. This WoNS will transition to phase 3 in July 2013.

**Pond apple (*Annona glabra*)**
Pond apple is a semi-deciduous woody tree that forms dense thickets capable of replacing whole ecosystems. It is continuing to be managed in Far North Queensland where it is having severe biodiversity impacts. Surveillance across coastal Northern Australia remains a priority. This is a phase 3 WoNS.


**Prickly acacia (*Acacia nilotica* spp. *indica*)**
Prickly acacia, a thorny tree native to India, invades native grassland ecosystems and severely impacts pasture production. Outlier management, containment and biological control studies are continuing priorities. This WoNS will transition to phase 3 in July 2013.

**Rubber vine (*Cryptostegia grandiflora*)**
Rubber vine invades creeks and rivers where it forms dense thickets that smother native vegetation. Survey and outlier control activities are continuing priorities in the Kimberley Western Australia, Northern Territory and Queensland. This WoNS will transition to phase 3 in July 2013.

**Salvinia (*Salvinia molesta*)**
Salvinia is an aquatic fern that forms dense floating mats on the waters surface. Ongoing priorities for salvinia management include biological control release programs, outlier management and awareness programs to reduce its ornamental use. Salvinia transitioned to a Phase 3 WoNS in July 2011.

**Serrated tussock *(Nassella trichotoma)***
Serrated tussock is a vigorous, highly competitive, perennial grassy weed able to adapt to drier grassland areas. Significant infestations occur in NSW, ACT, Victoria and Tasmania. Established infestations require long-term commitment and dedication to integrated weed management practices, supported by an engaged community. Good hygiene practices and maintaining healthy soil and ground cover can help prevent the spread of this species. This WoNS will transition to phase 3 in July 2013.

**Willows except weeping willows, pussy willow and sterile pussy willow (*Salix* spp. Except *S. babylonica, S. X calodendron* and *S. X reichardtii*)**
Willows are an aggressive invader of Australia's rivers and wetlands, increasing erosion and flooding risk and reducing the quality and quantity of water. The control of outlier populations and high risk seeding willows remains a high priority. Willows are a phase 3 WoNS.

# African boxthorn

*Lycium ferocissimum*

## Current situation

African boxthorn is a densely branched, thorny shrub with small fleshy leaves, and flowers that are coloured white to lilac. Its small fruit start with a smooth green appearance and ripen into an orange-red berry.

The species is a native of South Africa. It was introduced to Australia in the mid 1800s and promoted as a hedge plant. It is now one of Australia's most widespread weeds, being found in all Australian jurisdictions except the Northern Territory.

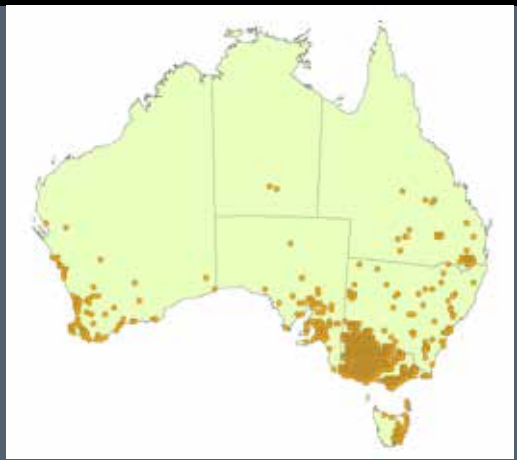
African boxthorn is naturalised in a broad range of Australian climatic situations ranging from semi-arid inland areas to high rainfall coastal and offshore environments.

C Magnussen

C Wilson

Key impacts of African boxthorn include displacement of native vegetation (reducing biodiversity and habitat), and creating impenetrable barriers for livestock access to pasture and water. The large thorns on boxthorn can also injure wildlife and livestock, and puncture tyres.

African boxthorn provides outstanding habitat for pests including starlings, foxes and rabbits. Its fruit are consumed by animals such as birds and foxes, and seed is spread in the landscape when excreted.




## Future priorities

African boxthorn is likely to have already reached its potential range in some parts of Australia (such as within much of NSW). However, in other parts of Australia (such as within SA), boxthorn is considered to have significant potential for expansion beyond its current distribution area.

Coastal areas and offshore islands located from WA, SA, through Bass Strait, and up to Lord Howe and Norfolk Islands, are subject to ongoing impacts of African boxthorn. The species is impacting on these as well as inland natural and production environments.

There is currently limited consistency between Australian states and territories on African boxthorn related information and management knowledge.

Some key future priorities for national coordination of African boxthorn include:

- Production and distribution of African boxthorn national best practice management advice
- Identifying and mapping the extent of existing infestations nationwide, determining areas under potential threat and promoting active surveillance and rapid response

B Worboys

- Identify and prioritise natural, production and cultural heritage assets at threat from African boxthorn
- Promote development of regional and/or local weed management plans consistent with the WoNS African Boxthorn Strategic Plan

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# Asparagus weeds

*Asparagus aethiopicus*
*A. africanus*
*A. asparagoides* Western Cape form
*A. declinatus*
*A. plumosus*
*A. scandens*

**Excludes**
*A. officinalis* and *A. racemosus*

## Current situation

Asparagus weeds are aggressive vines or scramblers that invade sub-tropical and temperate bushland and coastal ecosystems of Australia. In 2012, six asparagus weeds were listed as WoNS: Ground asparagus (*Asparagus aethiopicus*), climbing asparagus (*A. africanus*), Western Cape bridal creeper (*A. asparagoides* Western Cape form), bridal veil (*A. declinatus*), climbing asparagus fern (*A. plumosus*) and asparagus fern (*A. scandens*). Bridal creeper, *A. asparagoides,* is also a WoNS (see page 8).

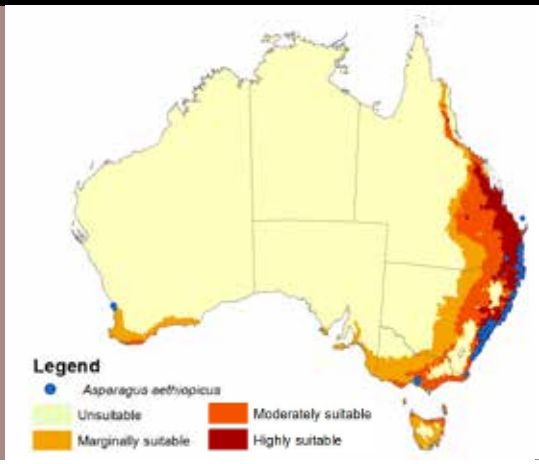
These weeds were introduced from South Africa in the 1800's, primarily for ornamental purposes. The fleshy fruits are spread by birds, and plants also spread vegetatively by rhizomes, which are often dumped in garden waste. Seedlings establish readily in undisturbed bushland, and plants survive in a range of habitats and climatic conditions.

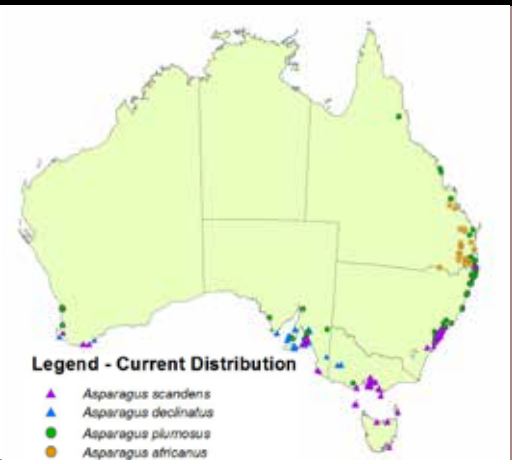
ground asparagus *(Asparagus aethiopicus)* H Cherry

bridal veil *(A. declinatus)* Biosecurity SA

Asparagus weeds produce dense, vigorous thickets of foliage that smother native plants. They can form monocultures, displace native vegetation and alter native ecosystems. Below ground, asparagus weeds form extensive root mats that can impede germination and growth of native seedlings.

Asparagus weeds can be difficult to control. Successful management requires long-term commitment. Restoration is often necessary because root mats can persist and continue to cause impacts long after plants are killed. Control of new outbreaks should be a priority to ensure extensive root mats do not develop. Climate modelling indicates that all six asparagus weeds can spread further across temperate southern Australia or sub-tropical eastern Australia.




## Future priorities

- Encourage research to clarify taxonomic status of asparagus species
- Update national mapping data and refine potential distribution maps
- Establish a National Invasive Vines and Scramblers Taskforce (NIVaST), together with Madeira vine and cat's claw creeper WoNS
- Develop identification resources and best practice tools, including an asparagus weeds best practice manual
- Refine and develop control options for asparagus weeds, including investigation of biological control
- Foster partnerships to enable strategic, collaborative and holistic management of asparagus and other vine weeds.

Western Cape bridal creeper
*(A. asparagoides Western Cape form)* Biosecurity SA

climbing asparagus fern *(A. plumosus)* S Navie

asparagus fern *(A. scandens)* S Potter

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# Bellyache bush

*Jatropha gossypiifolia*

## Current Situation

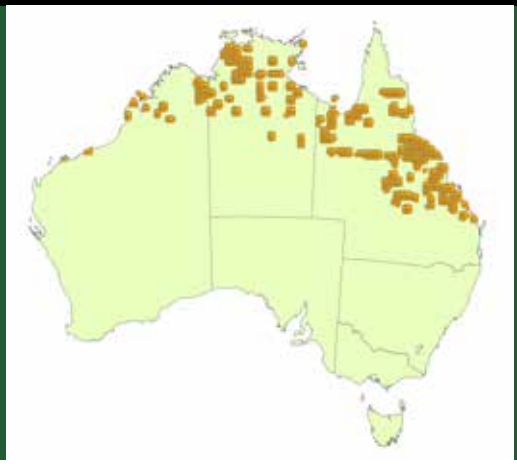
Bellyache bush (*Jatropha gossypiifolia*) is an invasive shrub that was introduced into Australia for ornamental and medicinal purposes. It now infests substantial areas of the wet/dry tropics of Queensland, the Northern Territory and Western Australia and has the potential to further invade vast areas of our tropical savannas.

Bellyache bush forms dense thickets, particularly in riparian areas, excluding pasture and native vegetation. It can rapidly take over productive grazing land and reduce biodiversity. In addition, most parts of the plant are also highly toxic to both animals and humans with significant stock losses attributed to this weed.

The most significant vectors of long distance dispersal of this weed are water and man. Large new infestations can rapidly arise and, once established, the control costs are high. Early detection and control is therefore required. In addition, prevention of spread locally is difficult as the seeds are exploded from the ripe capsules resulting in rapidly expanding infestations.

Community driven and agency supported control of, and research into, bellyache bush management has taken place over the past 20 years, particularly in north Queensland and the Northern Territory. This work resulted in 2009 in production of a best practice management manual that provides control options and case studies from across Australia. The current national program has continued to foster consistent management through distribution of this manual and other awareness material.

Declaration as a WoNS in April 2012 has led to a partnership between the three states/




territory; regional NRM bodies; industry; community groups and landholders to prepare a draft strategic plan which was made available for public comment.

Work has commenced to establish bellyache bush management targets for each catchment. These will be used to develop a national map of priority management zones.

Recent research initiatives through Biosecurity Queensland and NRETAS have included continuing investigations for biological control agents; new control techniques such as aerial spraying and the use of splatter guns; and the efficacy of integrated strategies.

## Future priorities

Priority actions for the national bellyache bush program include:

- Delimitation of the current extent and distribution;
- Completion of the catchment-based management system;
- Increase in coordinated education, awareness and extension; and
- Further development of integrated weed management methods including biocontrol.

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# Brooms

Scotch *Cytisus scoparius*
Montpellier *Genista monspessulana*
Flax-leaf *Genista linifolia*

## Current situation

Scotch broom (or English broom), Montpellier broom (or Cape broom), and flax-leaf broom are shrubs in the pea family with showy, yellow flowers. These brooms are widespread across southern Australia, where they invade native vegetation, plantation and pastoral systems, forming dense infestations that cause significant environmental and economic impacts.

Brooms outcompete desirable plants and dominate native ecosystems. They grow quickly, produce large amounts of long-lived seed, tolerate a range of environmental conditions, and increase soil nitrogen, which in turn forms ideal conditions for broom regeneration. Brooms were commonly grown for ornamental purposes and have spread from plantings.

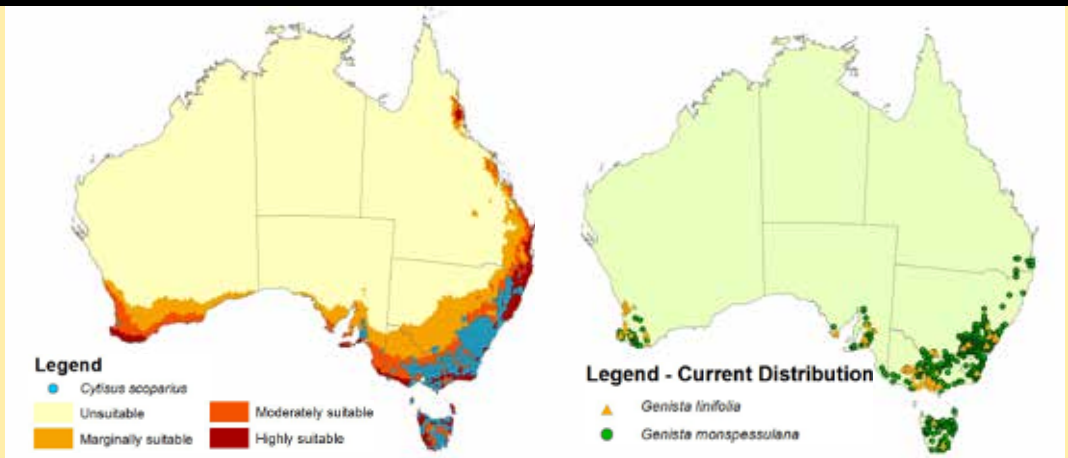
Scotch broom or English broom *(Cytisus scoparius)* M Baker

Scotch broom or English broom *(Cytisus scoparius)* H Cherry

The small seeds are spread long distances by water, animals and humans.

Brooms re-sprout or establish rapidly after disturbance, such as fire or grazing, but can also invade relatively undisturbed areas. If not controlled, brooms can modify native ecosystems by increasing fire frequency and intensity; changing vegetation structure; altering soil chemistry and providing harbour for invasive animals.

There are effective control measures for brooms, however due to their ability to rapidly re-establish from a persistent seedbank, intensive follow up and site restoration is required. In addition to chemical and mechanical controls, several insects that feed exclusively on broom plants or their seeds have been introduced to Australia as biological control agents. Integrated management using biological, chemical and mechanical controls can effectively reduce the impact and spread of brooms.




## Future priorities

- Develop identification resources and best practice tools, including a brooms best practice management manual
- Update national mapping data and refine potential distribution maps
- Refine and develop control options for brooms, including further support for biological control programs
- Establish a National Brooms Management Group to identify national priorities for action and foster partnerships to enable strategic, collaborative broom management.

flax-leaf broom *(Genista linifolia)* M Baker

Montpellier broom or cape broom *(Genista monspessulana)* H Cherry

Montpellier broom or cape broom *(Genista monspessulana)* M Baker

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# Cat's claw creeper

*Dolichandra unguis-cati*

## Current situation

Cat's claw creeper (until recently classified as *Macfadyena unguis-cati*) is a vigorous, perennial vine native to central and South America, and the West Indies. It is one of east-coast Australia's worst environmental weeds and may have the potential to spread into all States and Territories of Australia.

Cat's claw creeper was introduced to Australia as a garden plant in the 1860s and is now prevalent in tropical and subtropical regions of Queensland and New South Wales – particularly within riparian (river-bank) systems and rainforests. Its distribution in other countries suggests that drier and cooler regions may also be at risk.

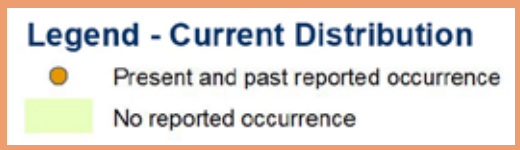
Cat's claw creeper is a particular threat because it is able to invade intact, shaded environments, opening them up to invasion by other weedy species. This can lead to further degradation in the structure and composition of the native plant community.

Cat's claw creeper infestations along the Upper Clarence River, NSW L Smith

Cat's claw creeper leaves and three pronged 'cat's claw' tendrils S. Navie

Management of cat's claw creeper is extremely challenging. It seeds prolifically and is spread by wind, water and people. Once established it is difficult to control because of persistent subterranean tubers and the challenges associated with managing a climbing vine in amongst complex and sensitive natural environments. Public awareness levels are also low and urban plantings provide an ongoing seed source.

Significant benefits can be gained through coordinated management of cat's claw creeper, including the development and promotion of best practice management approaches and establishment of protocols to ensure spread is restricted.




## Future priorities

- Establish a National Invasive Vines and Scramblers Taskforce (NIVaST), in conjunction with Madeira vine and asparagus WoNS
- Update national mapping data and refine potential distribution maps
- Identify and map national strategic management zones
- Develop and implement an invasive vines and scramblers research priority framework and communications plan
- Develop extension resources, including an invasive vines best practice manual
- Foster partnerships to enable strategic, cross-tenure, collaborative management of cat's claw creeper.

## Contact

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Host agency: Department of Agriculture, Fisheries and Forestry, Queensland

Volunteers laboriously manage cat's claw creeper along Cabbage Tree Creek in Brisbane. M Scattini

# Fireweed

*Senecio madagascariensis*

## Current situation

Fireweed, a daisy-like plant with bright yellow flowers, is a serious pasture weed of the east coast of Australia. Native to South Africa, and Madagascar, fireweed can easily be confused with native plants in the same genus. It is able to grow on most soil types and in most aspects.

Fireweed seeds prolifically and grows to maturity quickly, germination to flowering and seed set can occur between six to 10 weeks. The seeds are small and can germinate immediately after dispersal. Seeds can spread quickly and easily by wind, livestock and machinery. Due to the plant's rapid life cycle there can be up to four generations of fireweed per growing season, making long-term eradication very difficult.

Close-up of flower

General growth habit

Fireweed plants contain pyrrolizidine alkaloids that are toxic to livestock, causing liver damage and ill-thrift (loss of weight and condition). Horses and cattle are most affected, while goats and sheep seem better able to tolerate the toxin.

Long-term management of fireweed requires a thorough and systematic management program, using a variety of appropriate control and agronomic approaches. Once established, fireweed is extremely difficult to eradicate. Dedication, persistence and ongoing follow up treatments are essential for long-term management. Herbicide rotation is also good practice to lessen the likelihood of herbicide resistance.


## Future priorities

Widespread fireweed infestations occur in some coastal areas, where management aims to incorporate good agronomic and weed hygiene practices into regular activities. In areas where fireweed is increasing its range or has the potential to spread, greater emphasis needs to be placed on identification, early detection and good pasture and integrated weed management. A coordinated approach to fireweed management will focus on the following priorities:

- Increase awareness and identification of fireweed to assist early detection and control of outlier infestations
- Prioritise pathways of spread, identify priority and high risk regions
- Review, refine and promote best practice management approaches and appropriately targeted extension materials, at both property and landscape scale
- Promotion of integrated weed management and agronomic practices to build resilient pastures/ground cover
- Collation of distribution data and mapping to determine national management objectives (at various scales).

Pasture infestation

## Contact

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Host agency: NSW Department of Primary Industries

# Gamba grass

*Andropogon gayanus*

## Current situation

Gamba grass, a large perennial tussock grass, is a major threat to the tropical savannas of Northern Australia. Native to Africa, it was planted for pasture improvement until its invasive traits and impacts were recognised.

While gamba grass can provide some pasture production benefits if well managed, infestations have a major impact on the environment, property management and social and cultural assets. The high biomass of gamba grass can fuel intense bushfires leading to loss of tree cover. Gamba grass fires can also pose a threat to people and property; cause a decline in the diversity and abundance of native wildlife; modify soil hydrology; and, reduce soil nitrogen levels.

It is a major weed in the Northern Territory with infestations primarily in the Darwin and Katherine regions — with 1 to 1.5 million ha affected. In Queensland, it affects at least 18 000 ha in Cape York Peninsula, with additional populations scattered across coastal and sub-coastal North Queensland. A small number of populations exist in the Kimberley region of Western Australia.

Gamba grass increases fire risk and impacts S Setterfield

Property, community, local government and agency based control efforts are being complemented by planning and mapping initiatives in Queensland and the Northern Territory. Meanwhile, an eradication program has commenced in Western Australia.


## Future priorities

While widespread infestations occur in some areas, gamba grass has only invaded a small proportion of its potential range in Australia. A coordinated approach to gamba grass management is required in conjunction with the following priorities:

- Improve awareness and identification of gamba grass for the detection and control of outlier infestations
- Identify, prioritise and protect cultural and environmental assets threatened by gamba grass infestations and associated fires
- Develop regional, catchment and local management plans
- Review, refine and promote best practice management methodologies
- Collation of distribution data and mapping to determine management objectives at various scales

## Contact

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Gamba grass infestation S Setterfield

# Madeira vine

*Anredera cordifolia*

## Current situation

Madeira vine is a semi-succulent climbing vine that was introduced from South America as a horticultural species. It typically invades riparian (river-bank) vegetation, the edges of rainforests, tall open forests and damp sclerophyll forests. In Australia, Madeira vine is usually considered a tropical and subtropical species, however its world-wide distribution also includes mild temperate climates and it has the potential to extend its range into most states and territories.

Madeira vine grows rapidly and will smother and collapse native vegetation. This changes the structure and function of the environment it has invaded, with devastating consequences for the native species. Because of this, Madeira vine was ranked as the worst of the environmental weeds affecting New South Wales.

Management of Madeira vine is extremely challenging. It reproduces prolifically via asexual tubers and is difficult and costly to control. It is also prevalent in many urban areas, where spread through improper green waste management has become an issue.

Effective management of Madeira vine in Australia will require a coordinated effort and relies on improved knowledge of the species and its vulnerabilities, as well as good community awareness and involvement.

Madeira vine smothering native vegetation along a waterway in Southeast Queensland. S Navie


## Future priorities

- Establish a National Invasive Vines and Scramblers Taskforce (NIVaST), in conjunction with cat's claw creeper and asparagus WoNS
- Update national mapping data and refine potential distribution maps
- Identify and map national strategic management zones
- Develop and implement an invasive vines and scramblers research priority framework and communications plan
- Develop extension resources, including an invasive vines best practice manual
- Foster partnerships to enable strategic, cross-tenure, collaborative management of Madeira vine

Clusters of aerial a-sexual reproductive tubers S Navie

## Contact

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Host agency: Department of Agriculture, Fisheries & Forestry, Queensland

# Opuntioid cacti

*Austrocylindropuntia*
*Cylindropuntia*
*Opuntia* spp.

## Current situation

Opuntioid cacti are highly invasive plants from three genera: *Austrocylindropuntia*; *Cylindropuntia;* and *Opuntia*. Originating from the Americas, multiple species were introduced to Australia to support cochineal dye production, for stock fodder or planted as garden ornamentals or hedges.

There are now at least 27 species of opuntioid cacti that have naturalised throughout Australia, with infestations present in the Gascoyne and Goldfields regions of Western Australia; Central Australia; South Australia; Victoria; New South Wales; and throughout Queensland. Some species, such as the edible Indian fig and common prickly pear, are commonly found in backyards and peri-urban areas. More concerning, however, is the occurrence of species in remote and sparsely populated rangeland areas.

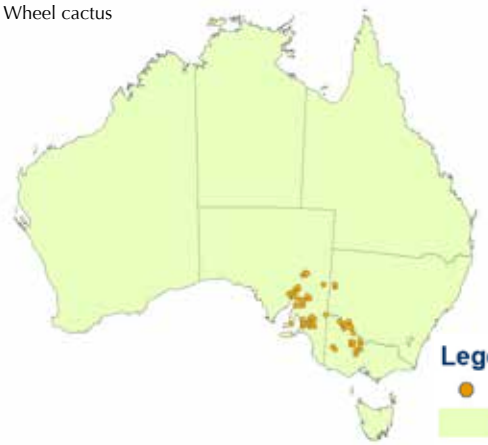
*O. stricta* Flinders Ranges

*O. robusta*

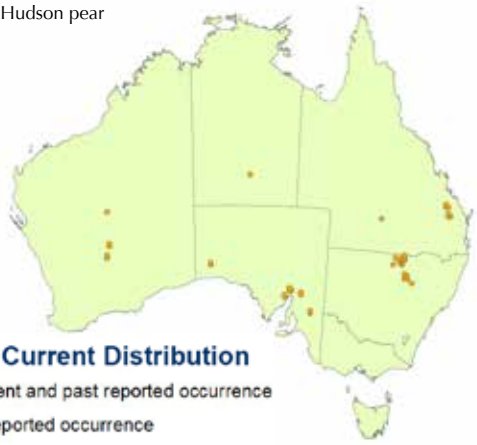
Opuntioid cacti present a threat to grazing industries through their ability to form dense infestations that can reduce access to feed and hinder mustering activities. Their spiny habit can injure stock, damage fleeces and hides and affect the safe handling of affected animals for shearing purposes.

The risk of spine injury also applies to native wildlife, either through impalement or the lodgement of spiny segments in limbs, hides and mouths, leading to immobilisation and a painful death. Dense infestations of cacti can impede movement of native wildlife through corridors and limit access to refuges. Competition from opuntioids can also limit the growth of native vegetation, including small shrubs and groundcovers.

Wheel cactus



Hudson pear




## Future priorities

Community and industry partnerships are contributing to integrated management of opuntioid cacti at the local and regional level, with active control programs in place throughout the weeds' current range. A nationally coordinated program will focus on the following priority areas:

- Refine species' distribution, including high risk areas at risk of future invasion;
- Improve understanding of opuntioid weed biology, ecology and taxonomy to inform risk management and strategic control programs;
- Provide training and resources to improve species' identification;
- Collate and distribute information on best practice management techniques;
- Control of priority sites, including new infestations, outliers and containment approaches to reduce further spread; and
- Promote further research into biological control agents for control of core infestations.

*C. spinosior*

*C. imbracata* with cactoblastis

## Contact

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Host agency: Department of Primary Industries & Regions, South Australia

# Sagittaria

*Sagittaria platyphylla*

## Current situation

Sagittaria, an emergent aquatic plant native to the southern areas of North America, was introduced as an ornamental pond plant. Mature plants grow up to one metre tall with each capable of producing up to 20,000 seeds, which are mostly dispersed by water.

Sagittaria can form dense monocultures in water up to one metre deep. Dense infestations can block irrigation channels and drains, leading to restricted flows and trapping of slit. It chokes wetlands and waterways, which adversely affects aquatic biodiversity. Infestations also impact on recreational activities and reduce visual amenity of waterways. Sagittaria is also a very difficult and expensive plant to control due to its resistance to herbicide treatments and persistent seed bank.

Naturalised infestations are present in New South Wales, Queensland, South Australia, Victoria and Western Australia. It has become a major aquatic weed in the Southern areas of the Murray Darling Basin where it impacts on a number of irrigation districts and wetlands.

Several key initiatives have been implemented in response to the sagittaria threat. A biological control feasibility study has been completed and efforts have commenced to find potential agents in the plants native range. Herbicide trials aim to identify more effective herbicides for irrigation systems. A sagittaria containment program along the River Murray aims to prevent further downstream spread to other irrigation districts and wetlands.

Ward


## Future priorities

Although widespread in some regions sagittaria still only occupies a small percentage of its potential range. A coordinated national approach to sagittaria management is required to help prevent further spread, reduce impacts of existing infestations and increase capacity to manage the weed. Key priorities include:

- Identify and where feasible manage pathways of spread
- Improve capacity of weed and waterway managers to identify sagittaria in regions at threat of invasion
- Develop strategic control programs for outlier infestations at high risk of further spread or where infestations threaten key economic or ecological assets

R Gledhill

- Continue research to improve understanding of sagittaria ecology and develop improved chemical and biological control options
- Collate distribution data to determine management objectives from a regional to national level

## Contact

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Host agency: NSW Department of Primary Industries

# Silverleaf nightshade

*Solanum elaeagnifolium*

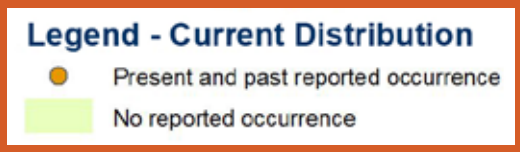
## Current situation

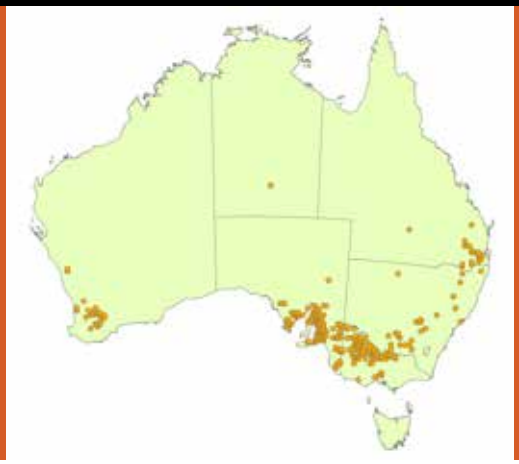
Silverleaf nightshade is a perennial weed that is native to the Americas and is one of the world's worst agricultural weeds. It infests over 350,000 ha throughout mainland temperate Australia and is still spreading. It has the potential to infest the majority of productive arable cropping and grazing regions of NSW, SA, Vic and WA. Sheep are the most important vector, and should be quarantined on a new farm for at least 14 days to prevent new infestations. Root and shoot fragments also spread infestations. Upright stems grow to 60cm tall during late spring to autumn. Flowers are purple (occasionally white), and round, green berries ripen to orange-brown.

Immature green berries with distinctive dark green stripes – these mature to a yellow-brown colour R Stanton

Isolated plants with ripe berries are easily seen during summer, and should be eradicated R Stanton

Prevention, early detection and eradication are by far the best management strategies. Once established, there are no practical methods available to destroy large infestations. It is a competitive, tenacious, drought-tolerant weed that has a deep (3 to 4 m) and resilient root system. Once established it has a chronic and debilitating effect on farm productivity, often reducing crop and pasture yields by 20 to 40%. Herbicides used in cropping systems give only short-term control of shoots, which re-grow quickly. Cultivation, mowing and burning are ineffective, and competitive crops and pastures give only limited control. There are currently no biological control agents established in Australia, although progress has been made in South Africa.



## Future priorities

Although silverleaf nightshade has a wide-spread distribution, it currently only infests a small proportion of threatened productive farm land. The challenge for all Australians affected by this weed is to join a coordinated effort guided by the national strategic plan for silverleaf nightshade. This plan aims to:

- Minimise the rate of spread and impact – using surveillance, early detection and eradication.
- Map current and potential distribution.
- Identify and manage key invasion pathways, such as livestock.
- Manage established infestations to reduce annual crop and pasture losses, and reduce spread from seeds and root/shoot fragments.

Large, established infestations severely reduce crop and pasture productivity, and cannot be eradicated R Stanton

- Encourage research to contribute to better management options, including biological control.
- Improve silverleaf nightshade stakeholder awareness, knowledge and capability.

## Contact

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Host agency: Department of Primary Industries & Regions, South Australia

# Water hyacinth

*Eichhornia crassipes*

## Current situation

Water hyacinth, a free floating aquatic plant native to South America, was introduced as an ornamental pond plant in the late 1800's. Under favourable conditions plants can double in size in as little as eight days and seeds can remain viable for up to 20 years.

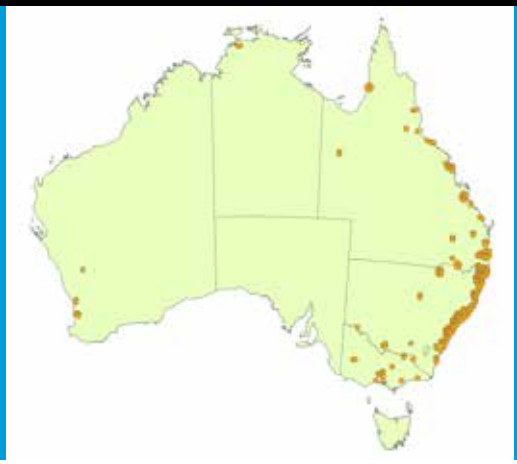
The plant best grows in slow moving or ponded water bodies where it can form dense and impenetrable floating mats on the waters surface. These mats deplete dissolved oxygen levels, displace native vegetation, reduce fish stocks and prevent birds and other water life from using the water. Infestations can also reduce aesthetics of waterways, impede recreational activities and cause considerable damage during flood events.

Due to the plants high transpiration rates water losses from a water body with dense infestations can be up to three times higher than natural evaporation.

The vast majority of naturalised infestations in Australia are present along the east coast from Cape York to southern New South Wales. Outlier infestations are present in Victoria, Western Australia and the Murray Darling Basin. Water hyacinth is well suited to tropical and temperate climates so its potential range includes permanent water bodies across nearly the entire mainland Australia.

Despite a nationwide ban on sale the plant remains a popular ornamental plant amongst pond plant owners. These ornamental plantings pose the greatest risk of creating new infestations.

Mary River Barrage P Moran




## Future priorities

Water hyacinth only occupies a small percentage of its potential range in Australia. A coordinated national approach to water hyacinth management is required to help prevent further spread, reduce impacts of existing infestations and increase capacity to manage the weed. Key priorities include:

- Improve awareness of the impacts of water hyacinth amongst key target audiences to help reduce its ornamental use
- Develop strategic control programs for outlier infestations at high risk of further spread or where infestations threaten key economic or ecological assets
- Investigate potential biological control agents and potential integrated management strategies

A Petroeschevsky

- Develop a water hyacinth best practice resource tool
- Collation of distribution data to determine management objectives from a regional to national level

## Contact

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Host agency: NSW Department of Primary Industries

# CONTACT DETAILS FOR STATE / TERRITORIES

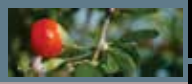
relating to all WoNS


| | Department | Phone | Website |
|---|---|---|---|
| **National** | Australian Pesticides and Veterinary Medicines Authority | 02 6210 4701 | www.apvma.gov.au |
| **ACT** | Department of the Environment and Sustainable Development | 13 22 81 | www.environment.act.gov.au |
| **NSW** | Department of Primary Industries | 1800 680 244 | www.dpi.nsw.gov.au |
| **NT** | Department of Natural Resources, Environment, the Arts and Sport | 08 8999 4567 | www.nt.gov.au |
| **QLD** | Department of Agriculture, Fisheries and Forestry | 13 25 23 | www.daff.qld.gov.au |
| **SA** | Department of Primary Industries and Regions, SA | 08 8303 9620 | www.pir.sa.gov.au |
| **TAS** | Department of Primary Industries, Parks, Water and Environment | 1300 368 550 | www.dpipwe.tas.gov.au |
| **VIC** | Department of Primary Industries | 13 61 86 | www.dpi.vic.gov.au |
| **WA** | Department of Agriculture and Food | 08 9368 3333 | www.agric.wa.gov.au |

Australian Government



Department of
Primary Industries



African boxthorn


Asparagus weeds


Alligator weed


Athel pine


Bellyache bush


Bitou bush / Boneseed


Blackberry


Bridal creeper


Brooms


Cabomba


Chilean needle grass


Cat's claw creeper


Fireweed


Gamba grass


Gorse


Hymenachne