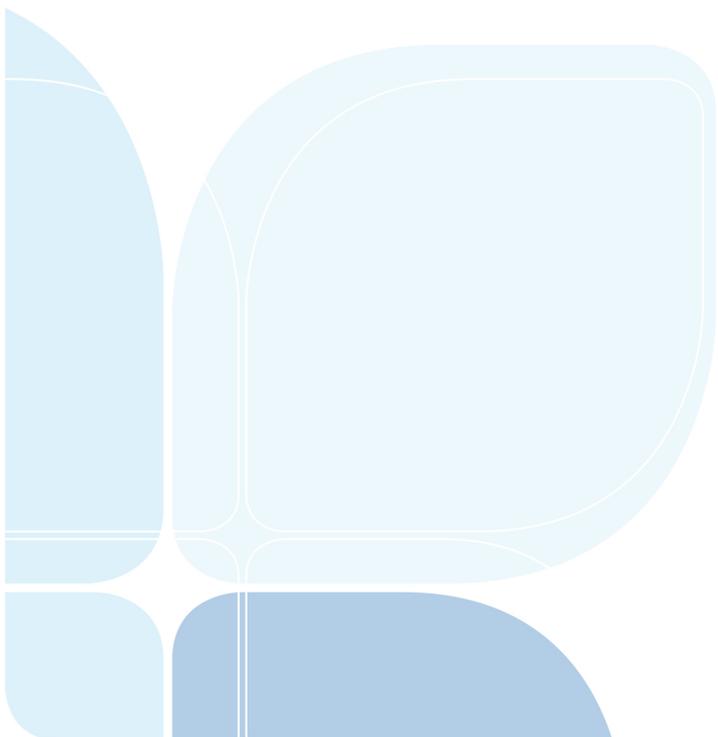




Greater Sydney Regional Weed Committee

New Weed Incursion Plan 2017 - 2022



Version: August 2019

Published by Greater Sydney Local Land Services

Greater Sydney Regional Weed Committee New Weed Incursion Plan 2019-2022

© State of New South Wales through Local Land Services, 2019.

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing. However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of Local Land Services or the user's independent adviser.

TABLE OF CONTENTS

TABLE OF CONTENTS	2
List of abbreviations	3
1. INTRODUCTION	4
1.1 Background.....	4
1.2 Objectives, scope and limitations of the Plan.....	4
2. WHAT IS A NEW WEED INCURSION?	5
3. HOW ARE NEW WEED INCURSIONS FIRST DETECTED?	5
4. WHAT TO DO IF YOU FIND A NEW WEED INCURSION.....	6
4.1 New incursion - State Prevention species	6
4.2 New incursion - State Eradication and Regional Prevention, Eradication and Containment species	7
4.3 Incursions of 'new' weed species	10
5. STAND DOWN	11
APPENDIX 1 NEW WEED INCURSION REPORT.....	12
APPENDIX 2 "SEEN THIS PLANT?" WEED ALERT TEMPLATE	14
APPENDIX 3 Principles underpinning weed management.....	16
APPENDIX 4 How to collect and prepare plant specimens for identification	17

List of abbreviations

GS RSWMP	Greater Sydney Regional Strategic Weed Management Plan
LCA	Local Control Authority
NSW DPI	NSW Department of Primary Industries
WAP	Weeds Action Program
NWIP	(Greater Sydney Regional Weed Committee) New Weed Incursion Plan
ISO	Invasive Species Officer
RC	Regional (Weed) Coordinator
GS RWC	Greater Sydney Regional Weed Committee
WIDX	Weeds Information Database (External)
WIT	Weed Incursion Team
WRA	Weed Risk Assessment

1. INTRODUCTION

1.1 Background

Hundreds of invasive plant species have been recorded in the Greater Sydney Region, many of which have become widespread since first arriving. A number of new species have been detected recently and there is always the potential for more new weeds to be found.

Managing weeds once they establish and become widespread is neither cost-effective, nor efficient. As Figure 1 shows, the best returns on investment are gained when weed species are prevented from entering an area or eradicated while there are few plants restricted to a small area.

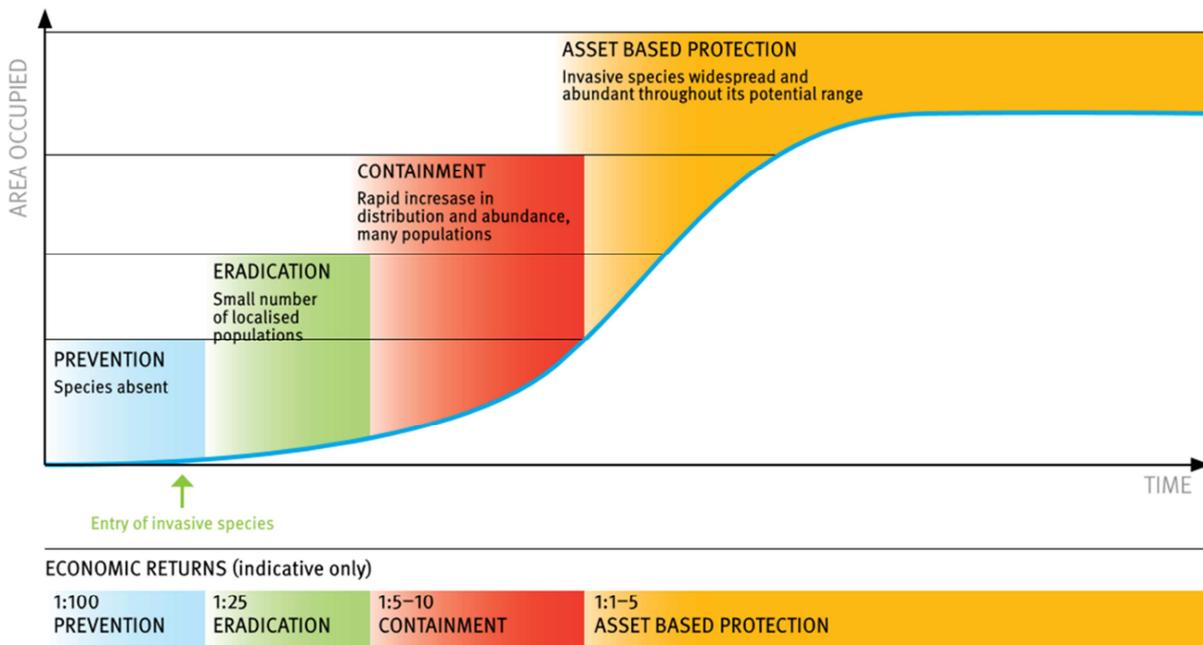


Figure 1 Generalised invasion curve showing actions appropriate to each stage

The Greater Sydney Regional Weed Committee New Weed Incursion Plan (the Plan) has been developed as an operational plan that provides a step-by-step guide for handling responses to new weed incursions. It sits within the framework of legislation, strategies and plans which collectively provide for a coordinated weed management system for the Greater Sydney Region. The principles underpinning weed management are identified in Appendix 3

1.2 Objectives, scope and limitations of the Plan

The objectives of the Plan are to:

- **Prevent** new weed incursions in the region from establishing.
- **Support** the reporting of new weed incursions in the region and state.
- **Assess** the potential impact of newly arrived weed species on the environment, economy and community.
- **Determine** the appropriate response to new weed incursions based on risk.
- **Respond** effectively to new weed incursions in the region.
- **Monitor, report and evaluate** the type and number of responses to high-risk weed incursions and the effectiveness of on-ground management and eradication programs.

This Plan is for managing the response to new incursions of species that have a management objective of state eradication, regional prevention, regional eradication, regional containment (exclusion zone only) and for managing the response to new weed species that pose a demonstrable risk to the region.

It is beyond the scope of this Plan to address the management response to state prevention species. New weed incursions of those species will be managed by the NSW DPI.

2. WHAT IS A NEW WEED INCURSION?

The definition of a new weed incursion is:

“Isolated population/s of invasive species recently detected in the region for the first time. A weed that has shown up in an area for the first time, where it now exists beyond what was its known extent.”

Two possible scenarios for new incursions can occur:

- i. Incursion of a new species in the region (these are the highest priority for response)

In this scenario, the species has not been previously recorded in the Greater Sydney region. The plant may be newly arrived or may have been present at a site for a number of years but only recently detected.

- ii. New incursion of an existing species

In this scenario, there are records for this species in a few other locations in other parts of the region and it has now appeared in a new part of the region.

Alternatively, a priority species has now escaped beyond the nominated containment line.

3. HOW ARE NEW WEED INCURSIONS FIRST DETECTED?

New weed incursions are usually found by:

- Local and state government agency staff during property inspection programs on either public land, private land or both;
- Local and state government agency staff during surveillance of high risk pathways and sites;
- Bushcare volunteers, bush regeneration professionals, concerned members of the public etc that have capacity to identify weeds as a result of training days/field days/identification resources.

The process of preventing the establishment of new weed species is reliant on two main activities: timely detection of new infestations and effective control program once detected. Early detection is essential as the chances of conducting a successful control program on a new weed incursion, decreases over time. To achieve both of these elements, the NWIP relies on the implementation of the High Risk Pathways and Sites Plan and the Regional Inspection Program by public land managers.

4. WHAT TO DO IF YOU FIND A NEW WEED INCURSION

Response to a new weed incursion begins with the initial detection of a suspect weed. Any person can report a suspected detection or provide a specimen to the biosecurity or weed officer of a LCA.

The biosecurity risk associated with the weed species determines the response that is required. This risk can only be calculated by applying the NSW Weed Risk Management System, an internationally recognised risk assessment process. More information about this system is available at <https://www.dpi.nsw.gov.au/biosecurity/weeds/strategy/nsw-weed-risk-management-system/background-information>

While most new weed incursions are localised and can therefore be managed by the relevant Local Control Authority (LCA), there are occasions where other agencies and stakeholders will need to have oversight over the management response. The NSW Department of Primary Industries will coordinate the response to new incursions of any weed species that are listed as Prohibited Matter in Schedule 2 of the Biosecurity Act, addressed briefly in Section 4.1. The Greater Sydney Regional Weed Committee (GS RWC) needs to be informed about new incursions of some regional priority weed species (see Section 4.2) and of newly arrived weed species (see Section 4.3). In situations where the incursion is beyond the scope of the LCA, the response to a new weed incursion may potentially be a complex undertaking that requires mobilisation and co-ordination of a diverse team of people and resources. In this type of event, Greater Sydney Local Land Services will be able to provide a coordination role and/or seek assistance from other local governments or Local Land Services regions.

4.1 New incursion - State Prevention species

These are weeds not known to be present in the state. The risk posed by these species is significant. They are all Prohibited Matter listed under Schedule 2 of the Biosecurity Act.

If you discover a new weed incursion of any species listed in Table 1, it is imperative that you:

1. Complete the report at <https://widx.dpi.nsw.gov.au/WIDX/Report.cshtml>
2. Complete as many fields as possible in the New Weed Incursion Report in Appendix 1.
3. Send the completed report to the GS Regional Weed Coordinator (ph. 4724 2153) or anthony.schofield@lfs.nsw.gov.au and to the NSW DPI Invasive Species Officer for the GS region – 6640 1648 or rod.ensbey@dpi.nsw.gov.au

NSW DPI will guide your organisation on the process that must be followed.

State Priority Weed Objective – PREVENTION:

All species of vascular plant (Tracheophyta)
Gamba grass - <i>Andropogon gayanus</i>
Pond apple - <i>Annona glabra</i>
Bridal veil creeper - <i>Asparagus declinatus</i>
Kochia - <i>Bassia scoparia</i> (excluding subsp. <i>trichophylla</i>)
Spotted knapweed - <i>Centaurea stoebe</i> subsp. <i>australis</i>
Black knapweed - <i>Centaurea x moncktonii</i>
Siam weed - <i>Chromolaena odorata</i>
Koster's curse - <i>Clidemia hirta</i>
Rubber vine - <i>Cryptostegia grandiflora</i>
Anchored water hyacinth - <i>Eichhornia azurea</i>
Hawkweed - <i>Hieracium</i> spp (all species)
Hydrocotyl/Water pennywort - <i>Hydrocotyle ranunculoides</i>
Lagarosiphon - <i>Lagarosiphon major</i>
Frogbit / Spongeplant - <i>Limnobium</i> spp. (all species)

State Priority Weed Objective – PREVENTION (cont...)
Yellow burrhead - <i>Limnocharis flava</i>
Miconia - <i>Miconia</i> spp. (all species)
Mikania vine - <i>Mikania micrantha</i>
Mimosa – <i>Mimosa pigra</i>
Eurasian water milfoil – <i>Myriophyllum spicatum</i>
Mexican feather grass – <i>Nassella tenuissima</i> (synonym <i>Stipa tenuissima</i>)
Broomrape – <i>Orobanche</i> spp. (all species except the native <i>O. cernua</i> var. <i>Australiana</i> and <i>O. minor</i>)
Water soldier – <i>Stratiotes aloides</i>
Witchweed – <i>Striga</i> spp. (except the native <i>S. parviflora</i>)
Water caltrop – <i>Trapa</i> spp. (all species)
Karoo acacia – <i>Vachellia karroo</i> (synonym <i>Acacia karroo</i>)
Prickly acacia – <i>Vachellia nilotica</i> (synonym <i>Acacia nilotica</i>)
Parthenium Weed – <i>Parthenium hysterophorus</i>

Table 1: State Prevention species (Source: pages 55 and 56 of the GS RSWMP).

4.2 New incursion - State Eradication and Regional Prevention, Eradication and Containment species

Species with a State Eradication target (Table 2) are present in limited distribution and abundance in some parts of the state. They have been assessed as presenting a significant biosecurity risk.

Elimination of the biosecurity risk posed by these weeds is a reasonably practical objective. Control Orders are in place for all three species across all of NSW.

State Priority Weed Objective – ERADICATION:
Boneseed - <i>Chrysanthemoides monilifera</i> subspecies <i>monilifera</i>
Chinese violet – <i>Asystasia gangetica</i>
Parkinsonia – <i>Parkinsonia aculeata</i>
Tropical Soda Apple – <i>Solanum vilarium</i>

Table 2: State Eradication weeds (Source: pages 57-59 of the GS RSWMP)

Species with a Regional Prevention target (Table 3) are not currently in the region or are only known to appear in one confined location. They have been assessed as presenting a significant biosecurity risk if they ever enter the Greater Sydney region and become established. Prevention of the biosecurity risk posed by these weeds is a reasonably practical objective.

Regional Priority Weed Objective – PREVENTION:
Coral creeper - <i>Barleria repens</i>
East Indian hygrophila - <i>Hygrophila polysperma</i>
Giant devil's fig - <i>Solanum chrysotrichum</i>
Giant rats tail grass - <i>Sporobolus pyramidalis</i>
Hymenachne - <i>Hymenachne amplexicaulis</i>
Nodding thistle - <i>Carduus nutans</i>
Spanish broom - <i>Spartium junceum</i>
Water lettuce - <i>Pistia stratiotes</i>
Water star grass - <i>Heteranthera zosterifolia</i>
White blackberry / Mysore raspberry - <i>Rubus niveus</i>

Table 3: Regional prevention species (Source: page 63 of the GS RSWMP)

Species with a Regional Eradication target (Table 4) are present in limited distribution and abundance in Greater Sydney. Elimination of the biosecurity risk posed by these weeds is a reasonably practical objective.

Regional Priority Weed Objective – ERADICATION:

Black Willow – <i>Salix nigra</i>
Chinese knotweed – <i>Persicaria chinensis</i>
Climbing asparagus – <i>Asparagus africanus</i>
Glory Lily – <i>Gloriosa superba</i>
Grey willow – <i>Salix cinerea</i>
Groundsel bush – <i>Baccharis halimifolia</i>
Hygrophila – <i>Hygrophila costata</i>
Kei apple – <i>Dovyalis caffra</i>
Kidney Leaf Mud Plantain – <i>Heteranthera reniformis</i>
Kudzu – <i>Pueria lobata</i>
Leaf Cactus – <i>Pereskia aculeata</i>
Ming fern – <i>Caesalpinia decapetala</i>
Sicilian Sea Lavender – <i>Limonium hyblaenum</i>
Sicklethorn – <i>Paederia foetida</i>

Regional prevention species (Source: pages 64-66 of the GS RSWMP)

Species with a Regional Containment target (Table 5) are widely distributed in the region. While broad scale elimination is not practicable, minimization of the biosecurity risk posed by these weeds is reasonably practicable.

Regional Priority Weed Objective – CONTAINMENT:	EXCLUSION ZONE
African Olive – <i>Olea europaea subspecies cuspidata</i>	Blue Mountains LGA, Penrith LGA west of the Nepean River
Alligator Weed – <i>Alternanthera philoxeroides</i>	Blue Mountains LGA
Asparagus fern – <i>Asparagus virgatus</i>	Whole of region except Central Coast LGA
Holly-leaved Senecio – <i>Senecio glastifolius</i>	Whole of region except for Royal National Park
Horsetails – <i>Equisetum spp.</i>	Whole of region except Northern Beaches LGA
Salvinia – <i>Salvinia molesta</i>	Whole of region except the Georges and Hawkesbury-Nepean Rivers and tributaries
Sea spurge – <i>Euphorbia paralias</i>	Whole of region except Sutherland Shire LGA
Senegal Tea – <i>Gymnocoronis spilanthoides</i>	Whole of region except Central Coast LGA, Royal National Park and the Hawkesbury-Nepean River and its tributaries
Serrated tussock – <i>Nassella trichotoma</i>	Whole of region except Camden and Wollondilly Shire LGAs
Tiger Pear – <i>Opuntia aurantiaca</i>	Whole of region except Blacktown and Wollondilly LGAs
Water Poppy – <i>Hydrocleys nymphoides</i>	Whole of region excluding Hacking River catchment

The GS RWC needs to be made aware if a new incursion of any of the state eradication, regional prevention, regional eradication species or regional containment species (exclusion zone only) listed in Tables 2-5 above is found. The following process is to be followed:

ACTION	NOTES
LCA to contain spread	Erect booms/exclusion fencing or bag seeds to contain spread until control arrangements can be made, if required.
LCA to verify species	See Appendix 4 for information on how to prepare a specimen and send it to the NSW Botanical Information Service (herbarium)
LCA to complete New Weed Incursion Report	See Appendix 1. Send to GS Regional Weed Coordinator anthony.schofield@lrs.nsw.gov.au
LCA to delimit and map the extent of the infestation	The aim of delimitation is to complete a detailed scoping of the incident to define the extent of the new weed incursion. This in-turn will provide the basis for decisions about the type of response required. Key issues to be addressed during delimitation include whether the incursion can be effectively contained and eradicated and establishing the potential for the incursion to spread rapidly and lead to significant negative impacts on the economy, environment and/or community. See https://www.environment.vic.gov.au/_data/assets/word_doc/0022/49180/WESI-Guide-2ndEd-04_delimiting-survey_ACCESS.docx
LCA to develop management response.	Needs to identify how compliance with General Biosecurity Duty for this species will be met as expressed in the GS RSWMP.
LCA to inform landholders	The Weed Officer informs the landholder of the weed incursion and the process that will be taken to manage the incursion, including any landholder obligations.
RC to notify all relevant land managers and neighbouring regions.	Send New Weed Incursion Report. Include any plans to quarantine areas and any potential impacts to stakeholders.
RC to present New Weed Incursion Report to GS RWC	
RC to update the GS RWC about status of incursions.	These will be collated in a table and reported to the GS RWC at quarterly meetings.
LCA to report all inspections and control to the Biosecurity Information System	
LCA to develop local communication/media release	See Appendix 2 for Seen This Plant? template Also available at https://docs.google.com/presentation/d/10LBAfauzo5R6HRfYvhISpm_OkTsVG43qMO1tFBogTdA/edit Contact weed.resource@dpi.nsw.gov.au if you have any trouble accessing the Google Drive.
WIT established if required	A Weed Incursion Team (WIT) may be established to co-ordinate the response to the new incursion on behalf of the GS RWC. Functions of the WIT include planning, operations and communications. Members of the WIT are to be determined on a needs basis, but should include the LCA Weed Officer, GS RWC Chair or delegate and the Regional Weed Coordinator.

4.3 Incursions of 'new' weed species

ACTION	NOTES
LCA to contain spread	Erect booms/ exclusion fencing or bag seed heads. Wash down vehicles, clothing and equipment. Restrict the movement of vehicles, equipment, plant material, stock and products onto and off the affected site.
LCA to verify species	See Appendix 4 for information on how to collect and press a sample and send it to the NSW Botanical Information Service (herbarium)
LCA to check for existing records in the GS region	http://avh.chah.org.au/ http://www.ala.org.au/
LCA to delimit and map the extent of the infestation	The aim of delimitation is to complete a detailed scoping of the incident to define the extent of the new weed incursion. This in-turn will provide the basis for decisions about the type of response required. Key issues to be addressed during delimitation include whether the incursion can be effectively contained and eradicated and establishing the potential for the incursion to spread rapidly and lead to significant negative impacts on the economy, environment and/or community. See https://www.environment.vic.gov.au/_data/assets/word_doc/0022/49180/WESI-Guide-2ndEd-04_delimiting-survey_ACCESS.docx
LCA to complete WRA	See https://widx.dpi.nsw.gov.au/WRM/Default.cshtml User guide at https://extranet.dpi.nsw.gov.au/weeds/widx
LCA to complete New Weed Incursion Report	See Appendix 1 Send to GS Regional Weed Coordinator (4724 2153) or anthony.schofield@lrs.nsw.gov.au
RC to seek supporting information from region	See Appendix 2 for Seen This Plant? template Also available at https://docs.google.com/presentation/d/10LBAfauzo5R6HRfYvhISPm_OkTsVG43qMO1tFBogTdA/edit Contact weed.resource@dpi.nsw.gov.au if you have any trouble accessing the Google Drive
LCA to develop appropriate management response.	Must be proportionate to outcome of WRA. Seek expert advice. Consult with RC and ISO.

Steps below depend on WRA outcome and agreed management response.

LCA to inform affected landholders	The Weed Officer informs the landholder of the weed incursion and the process that will be taken to manage the incursion, including any landholder obligations. include any plans to quarantine property/s and any potential impacts to the property owner/s.
LCA to secure adequate resources	Seek WAP Emergency Funds if required
RC to notify all relevant land managers and neighbouring regions.	Send New Weed Incursion Report. Include any plans to quarantine areas and any potential impacts to stakeholders.
RC to present New Weed Incursion Report to GS RWC	

RC to update the GS RWC about status of incursions.	These will be collated in a table and reported to the GS RWC at quarterly meetings.
LCA to report all inspections and control to the BIS	See https://extranet.dpi.nsw.gov.au/weeds/biosecurity/weeds-metadata-standard
LCA to develop local communication/media release	See Appendix 2 for Seen This Plant? template Also available at https://docs.google.com/presentation/d/10LBAfauzo5R6HRfYvhISpm_OkTsVG43gMO1tFBogTdA/edit Contact weed.resource@dpi.nsw.gov.au if you have any trouble accessing the Google Drive.
WIT established if required	A Weed Incursion Team (WIT) may be established to co-ordinate the response to the new incursion on behalf of the GS RWC. Functions of the WIT include planning, operations and communications. Members of the WIT are to be determined on a needs basis, but should include the LCA Weed Officer, GS RWC Chair or delegate and the Regional Weed Coordinator.

5. STAND DOWN

The stand down phase begins when either the eradication of the new weed incursion is confirmed, or it is considered no longer cost effective or otherwise possible to achieve.

1. LCA and RC/WIT to review and implement the exit strategy.
2. LCA and WIT to review any quarantine arrangements to define the weed incursion free zones. This will apply if the eradication is unsuccessful or the response is terminated prior to completion.
3. If eradication is successful GS RWC to advise relevant stakeholders including four subregional chairs, neighbouring Regional Weed Committees, Crown Lands (NSW DPI) and NPWS Regional Pest Management Officer.
4. LCA/GS RWC to organise a de-briefing workshop with the WIT and other operational staff. The de-brief should occur within a reasonable time frame after the exit strategy has been implemented to evaluate the response and review the New Weed Incursion Plan. Each phase of the operation should be examined and evaluated for suggested improvements to the New Weed Incursion Plan procedures. Regional Coordinator to prepare a report documenting the suggested improvements and submit to GS RWC.
5. GS RWC to review the NWIP following the outcomes of the incident debriefing meeting.
6. GS RWC to review the GS RSWMP as to whether to include species in Appendix 1.2 "Regional Priority Weeds", and consider the appropriate weed objective, outcomes to demonstrate compliance with the GBD, and Strategic responses for the listing.

APPENDIX 1 NEW WEED INCURSION REPORT

Suspected common name, suburb (LGA)

Date : (DD/MM/YYYY)

Status of weed in the GS RSWMP: (e.g. Regional Prevention)

Weed Risk Assessment Outcome: (e.g. Eradicate)

Date weed incursion discovered	<i>Date found or reported to LCA</i>
Address and land tenure of infestation site	
Common name	
Scientific name	
Size of infestation	<i>Ha or m2</i>
No. of plants	
Estimated density	
Botanical Identification Record No.	
Probable incursion pathway	<i>e.g. flying foxes, wind, flood</i>
Precautionary measures taken to prevent spread	<i>e.g. booms, exclusion fence, hygiene protocols</i>
Weed control method applied or planned	<i>e.g. hand pulling, herbicide name and application rate</i>
Planned monitoring and maintenance regime	
Local Control Authority	
Authorised officer responsible	

Insert photos of infestation

Insert map of infestation and delimitation zone (example on next page)

Completed by: LCA officer

Approved by: Regional Weed Coordinator

Date:

Map 1 Example map - Groundsel bush inspection area, 15 December 2017



Yellow = inspection area, Red = extend of spread of groundsel bush

APPENDIX 2 "SEEN THIS PLANT?" WEED ALERT TEMPLATE

Seen this plant?

Sea spurge

Euphorbia paralias

HUNTER VALLEY

No Space for Weeeeds



How does this weed affect us?
Sea spurge grows on beaches in thick patches along the dunes closest to the water. It spreads quickly and:

- stops the natural movement of sand
- changes the natural shape and structure of dunes

- ruins nesting areas for threatened shorebirds
- reduces the number of native plants
- limits access for walkers and beach users
- contains poisonous sap that can irritate skin and eyes.

Seen it? Call us:

Summer Bay Weeds Officer:
[02 1234 5678](tel:0212345678)

NSW Biosecurity Helpline:
[1800 680 244](tel:1800680244)

Help protect our land, plants and wildlife.
For control and biosecurity information visit NSW WeedWise: weeds.dpi.nsw.gov.au/seaspurge





HUNTER VALLEY
**No Space for
Weeeeds**



Where are you likely to find it?

In New South Wales it's commonly found on most beaches south of Nowra, anywhere from the high water mark to the rear sand dunes. Plants can grow on bare sand and around river mouths, rocky foreshores, rock shelves and coastal lakes. It can also be found in grasslands, heathland and scrublands near beaches.

What does it look like?

It's a small, blue-green shrub between 20 and 70 cm tall. It has fleshy leaves and small yellow-green flowers.

Stems are upright, fleshy, branched near the tips, several (usually less than ten), ooze a milky sap when damaged, die off after flowering and are replaced by new shoots from the roots. Leaves are small (5-30 mm long) and tightly packed along the stem. Flowers are small, cup-shaped and on the ends of stems. Fruit are capsule-shaped, 3-5 mm long, and 4.5-6 mm wide. Seeds are smooth, pale grey, oval or rounded, and 2.5-3.5 mm long. Roots are long-lived as a woody crown with a long, thicker single root down into the ground.

Seen it? Call us:

Summer Bay
Weeds Officer:

02 1234 5678

NSW Biosecurity
Helpline:

1800 680 244

Help protect our land, plants and wildlife.

For control and biosecurity information visit NSW
WeedWise: weeds.dpi.nsw.gov.au/seaspurge



APPENDIX 3 Principles underpinning weed management

Planning

- Invasive species issues are properly defined before developing or implementing any control strategy.
- Management decisions are based on the best available knowledge, while accepting the need for a precautionary approach where information is lacking.
- Management of invasive species is most cost-effective when new incursions are detected early and rapid responses are implemented.
- For established invasive species, a long-term strategy involving ongoing commitment and effort is required.
- Strategic management programs are developed in collaboration with an informed and skilled community and involve a cross-tenure planning approach.
- Sound policy and legislative frameworks are developed.

Effective Management

- Targeted, coordinated and integrated programs that complement national, state, regional and local strategies are most efficient and effective.
- An adaptive management approach incorporates monitoring of: outcomes, changing technology, knowledge and circumstances (e.g. changing land use and seasonal conditions).
- Priority is given to invasive species management where it will deliver the greatest benefits.

Decision Making

- Management decisions are underpinned and informed by risk management systems.
- Cost-effectiveness and target-specificity considerations are balanced.
- The variety of social and ethical values is recognised to facilitate community engagement.
- The inherent value of native species and natural ecosystems is highlighted, and the link between healthy ecosystems and their resilience to biosecurity threats is noted.
- Best practice approaches are adopted, which minimise adverse effects of management on public safety, off-target species, the environment and animal welfare.
- Integrated pest animal and weed management techniques are used where appropriate.

APPENDIX 4 How to collect and prepare plant specimens for identification

https://www.dpi.nsw.gov.au/_data/assets/pdf_file/0018/304326/Collecting-and-preparing-plant-specimens-for-identification.pdf

Collecting and preparing plant specimens for identification

**Andrew Storrie, Technical Specialist (Weeds),
Tamworth**

The key to accurate identification of plants is to supply the agronomist or botanist with good quality specimens and sufficient information about the plant, including details of the area from which it was collected and, if possible, supplementary photographs of the plant growing in its habitat (see figure 1).

Supplying inadequate information or poorly preserved and presented specimens often leads to plants not being identified or being misidentified.

Before collecting specimens, check with local authorities whether specimens may be collected. Collecting specimens from national parks or state forests in NSW requires a permit. Laws vary from state to state.

Always collect several sets of the same specimen so that, following correct identification, you can retain a specimen for later reference. When you send a specimen to a herbarium for identification, it won't be returned. Good quality specimens may be kept for herbaria reference collections.

Materials recommended for successful plant collecting

- A digging implement such as a mattock or spade to ease small plant specimens from the soil, leaving the roots and other underground organs intact; never just pull the plants from the soil;
- secateurs or a small saw for removing small branches from trees and shrubs;
- plastic bags, rubber bands and a portable cooler if the weather is hot, or non-gloss newspaper and a portable plant press;
- pencil or permanent marker and tie-on tags (jeweller's tags) (to record the name and collection number) to tie to individual specimens;
- notebook for recording details;
- camera for recording plants in-situ and their habitat;
- GPS for accurate location of collection site.

Collection details

Supply enough information about the size and habitat of the plant to help in identification. By completing the plant identification template at the end of this Primefact you will be providing sufficient detail.

What to collect

General

Many plants have similar characteristics and it is not possible to identify them from leaves alone. Therefore, it is important to supply representative portions of the plant for correct identification, particularly flowering parts and seedpods.



Figure 1: A well-prepared specimen of Acanthus mollis mounted and in a herbarium box. Large specimens can be dissectioned and mounted to show the main distinguishing characteristics. Many species require basal leaves, stem leaves and flowers for correct identification. Photo A. Storrie.

Identification of perennial species will often require bark or underground parts such as rhizomes or corms to be included.

For plants with separate male and female flowers collect both sets of flowers.

Record flower colour, as this may change when specimens are dried.

Submit multiple specimens of small (immature) plants as leaf shape may vary within a species.

Grasses, sedges and small plants

Include roots, basal leaves, flowers and fruits. Examples of basal leaves are the rosette leaves of brassicas. Always include, if present, underground parts such as rhizomes, corms, tubers, and bulbs.

Larger plants such as shrubs and trees

For shrubs collect a portion of stem that shows the branching pattern, preferably with flowers and fruits. If flowers and fruits are not present on the same stem collect several samples.

Eucalypts require collection of buds, fruits, juvenile and mature leaves plus a written description of the bark. Juvenile leaves are often on young plants, so keep this material separate.

Record the dimensions of the plant and, for trees, note the trunk diameter at a height of 1.2 metres.

Specimen preparation

All specimens should be free of soil. Gently wash the roots to remove wet soil. Hard-set soil may need to be soaked off to prevent damage to the roots.

Large plants such as tussock grasses and sedges can be carefully pried apart and a few tillers with seed heads can be kept for identification (see figure 2).

There are two methods of preparation depending on whether the specimens will be identified locally within a few days of collection or have to be either sent away or stored longer term.

Storage for a few days

1. Put plants or plant parts in a plastic bag with a few millilitres of water, with roots toward the bottom of the bag.
2. Tag plants with specimen number, date, collector and locality.
3. If the specimen is in sections give each sample the same number.
4. It is preferable to have a written label in the bag as, even if written with a waterproof pen, the writing on the bag will often rub off.
5. Tie off the top of the bag. This will maintain humidity and help keep the specimens fresh.
6. Keep the specimens out of the sun. Most specimens can be kept in a refrigerator for a few days. The main exception would be specimens with large, soft flowers.

Longer-term storage

Use this method when sending specimens for identification or storage in a collection.

1. Place the specimens between several sheets of A3 newspaper or folded broadsheet.
2. Arrange the samples so that leaflets/leaves and flowers can be clearly seen, i.e. not overlapping (figure 3).
3. Larger specimens can be bent into a zigzag to fit the sheet.
4. Multiple samples in newspaper can be laid upon each other. These are then placed between rigid boards with weights such as bricks or books supplying enough pressure to flatten them (see figure 4).
5. Change the newspaper daily for the first few days then weekly until the specimens are dry.

Fleshy or succulent specimens such as cacti may need to be frozen for a few days before pressing. This ruptures the plant cells and aids drying.

Aquatic plants should be gently washed then placed in 70% alcohol (30% water). Ethanol is preferred but methylated spirits is the second choice. Thin specimens of low mass (e.g. a single piece of cabomba or egeria) should be placed in alcohol overnight. Bulky specimens need to be placed in the ethanol or methylated spirits for one to two days. Remove from alcohol and place in a well-sealed plastic bag before mailing. Never post aquatic specimens without first treating them as described.



Figure 2: A mounted, large-grass specimen. Note the bending of the specimen to fit the page. This is done at the start of pressing. To prevent a loss of the seeds they are placed in a small plastic bag. Photo A. Storrie.



Figure 3: Small plants before pressing. Note how leaves are spread apart to give the correct plant shape. Photo A. Storrie.



Figure 4: This press consists of layers of cardboard and foam separating specimens in newspaper. These are then held between two frames with the use of simple tie-down straps. Photo A. Storrie.

Specimens should be individually tagged during drying to keep track of the collection details.

Sending specimens to the herbarium

1. Keep the specimens between sheets of newspaper.
2. Insert a completed plant identification sheet such as the one in this publication and place it all between two pieces of firm cardboard.
3. Attach a covering letter outlining your request for identification.

Send collection specimens and the completed form to one of these herbaria.

National Herbarium of New South Wales

Botanic Gardens Trust

Mrs Macquarie Road

SYDNEY NSW 2000

Phone: (02) 9231 8111

Fax: (02) 9251 4403

Website: www.rbgsyd.nsw.gov.au/science/nsw_herbarium

Australian National Herbarium

GPO Box 1600

CANBERRA ACT 2601

Phone: (02) 6246 5533

Fax: (02) 6246 5249

Website: www.cpbr.gov.au/cpbr/herbarium

For further plant collecting information see

www.anbg.gov.au/cpbr/herbarium/collecting