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ERNWAG &
WRNWAG

Riverina
(Lower Murray-Darling, Lachlan,
Murray & Murrumbidgee
Catchments)

Weeds Action Program
Implementation Manual
2010-2015

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Introduction

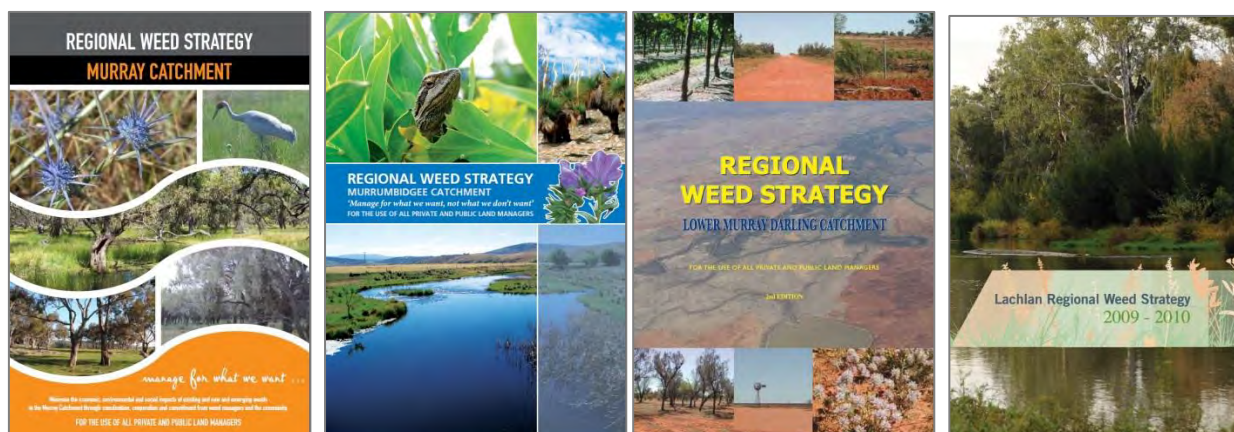
The *NSW Weeds Action Program (WAP)* is a NSW Government initiative to reduce the impact of weeds under the *NSW Invasive Species Plan (ISP)* 2008-2015. The *NSW WAP* replaces a range of noxious weed grant programs provided by the NSW Government. The WAP will target these funds directly at the weed outcomes in the ISP.

The NSW WAP demonstrates the Government's commitment to the NSW ISP and will:

- identify and manage high risk weed species and entry pathways;
- develop and implement early weed detection capabilities;
- assist in the timely detection of new weed incursions;
- affect a quick response to eradicate or contain new weeds;
- identify and prioritise weed management programs to where benefits are greatest;
- provide effective and targeted on-ground weed control;
- increase community acceptance of, and involvement in, effective weed management;
- integrate weed management into education programs;
- improve the knowledge base for weed management;
- monitor progress of the NSW Invasive Species Plan's implementation; and
- encourage the use of cost-sharing arrangements.



The regional component of the NSW WAP assists local control authorities (LCAs) and other stakeholders develop regional partnerships to effectively target weeds; identify and stop new weeds early; and increase community involvement in weed management. This is achieved through the development of various regional documents that will see implementation of 9 ISP objectives that link directly to our Regional Weed Strategies (RWS).



Our RWS can be downloaded from <http://www.riverinaweeds.org.au/> under documents.

27 agencies have signed a MoU that sets out the principles that the parties wish to adopt in undertaking the Riverina WAP. This includes the development of regional weed management programs and associated documents and the implementation of these programs and other associated projects undertaken individually or in collaboration by the councils.

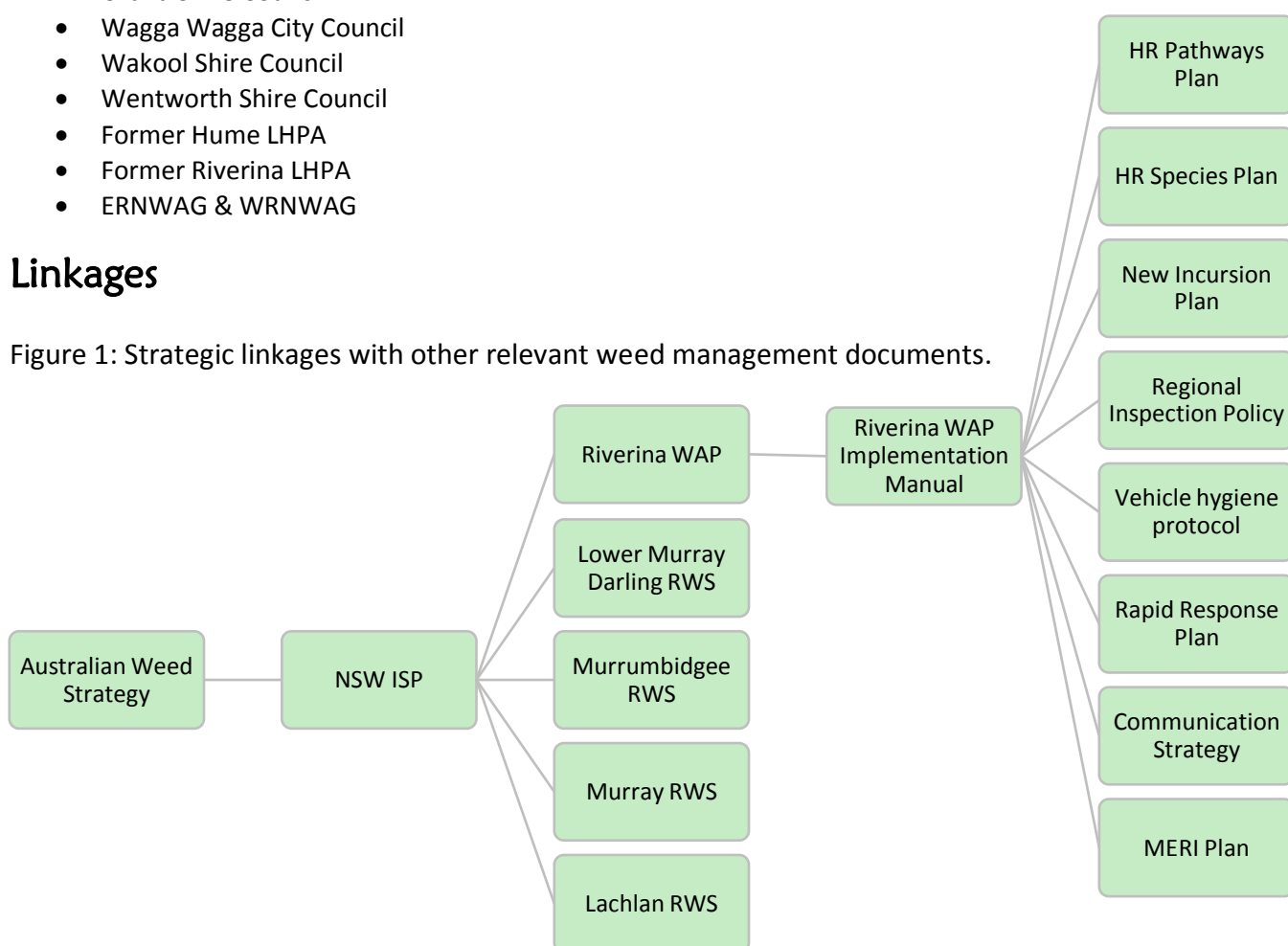
The purpose of this manual is to collate all WAP documentation into one resource that will guide weed managers of the Riverina to ensure measurable outcomes of the WAP are achieved.

The following agencies are signatories to the Riverina WAP:

- Albury City Council
- Balranald Shire Council
- Carrathool Shire Council
- Central Murray County Council (Berrigan, Conargo, Deniliquin, Murray Shires)
- Cootamundra Shire Council
- Corowa Shire Council
- Greater Hume Shire Council
- Griffith City Council
- Gundagai Shire Council
- Hay Shire Council
- Jerilderie Shire Council
- Leeton Shire Council
- Lockhart Shire Council
- Murrumbidgee Shire Council
- Narrandera Shire Council
- Riverina Eastern Noxious Weeds Authority (Coolamon, Junee, Temora)
- Tumbarumba Shire Council
- Tumut Shire Council
- Urana Shire Council
- Wagga Wagga City Council
- Wakool Shire Council
- Wentworth Shire Council
- Former Hume LHPA
- Former Riverina LHPA
- ERNWAG & WRNWAG

Linkages

Figure 1: Strategic linkages with other relevant weed management documents.



Area of operation

The Eastern Riverina Noxious Weeds Advisory Group (ERNWAG) and Western Riverina Noxious Weeds Advisory Group (WRNWAG) vision is to “*Minimise the economic, environmental and social impacts of existing and new and emerging weeds in the Murray, Murrumbidgee and Lower Murray Darling Catchments through coordination, cooperation and commitment from weed managers and the community*”.



Figure 2: Area of operation.

ISP Goal 1: Exclude

WAP 1.1.2 High Risk Pathways Management Plan

NSW Invasive Species Plan. Goal 1: Exclude	
Prevent the establishment of new invasive species	1.1 High risk species and pathways are identified and managed

Regional Weed Strategy. Aim: Preventative Weed Management	
No new weeds naturalised over the life of the RWS	1.1.7 Identify and survey high risk areas where potential new weeds may be introduced

The purpose of this plan is to prevent new weeds from establishing in the Riverina and reduce existing weeds from spreading via high risk (HR) pathways.

Pathways	The means by which a weed moves e.g. wind, water, animals and by humans.
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As defined in the NSW Invasive Species Plan 2008-2015

According to the final report of the *Pathway risk analysis for weed spread within Australia*, the sources and pathways that currently pose the greatest impact risk are “Trade in Fodder, Ornamental plants and Aquarium plants, contamination of Agricultural produce and Machinery and vehicles and natural Water movement”.

HR pathways that travel through the Riverina (but are not limited to): Machinery, vehicles, headers, slashers, boats, water, plants and animals. HR routes have been identified across the Riverina. We hope to inspect where **HR pathways** have been if we are unable to intercept them on the following routes:

HR Pathway	Route the vector travels	
Machinery / slashers / vehicles / headers	Roads	Roads (freeways, highways, local, unsealed roads etc)
Water / Boat / Trailer	Watercourses	Rivers / Creeks / Irrigation channels
Trains / Vehicles / Animals / Humans	Infrastructure Lines	Railway corridors / Telephone lines / Power lines / Gas lines

HR sites identified:

Landscape / gravel suppliers	Pet shop/aquarium suppliers
Saleyards	Lakes/reservoirs/dams
Airports	Wetlands/billabongs/marsh areas
Rest areas	Travelling Stock Routes / Reserves
Bridge crossings / boat ramps	Public recreation areas – with high volumes of non local traffic
Nursery and garden industry retailers (including interstate retailers & suppliers)	

HR pathways & sites have been identified by Riverina Local Control Authorities (LCAs) and prioritised according to previous incursions and potential risk, using the following definitions.

Prioritising HR pathways and sites:

High priority pathways & sites	Historically new incursions have <u>frequently</u> been found along this pathway or at this site AND/OR in the LCAs opinion, <u>potential</u> for a new incursion to occur here in the future is <u>high</u> .
Medium priority pathways & sites	Historically new incursions have <u>occasionally</u> been found along this pathway or at this site AND/OR in the LCAs opinion, <u>potential</u> for a new incursion to occur here in the future is <u>medium</u> .
Low priority pathways & sites	Historically new incursions have <u>rarely</u> been found along this pathway or at this site AND/OR in the LCAs opinion, <u>potential</u> for a new incursion to occur here in the future is <u>low</u> .

Management response required at each identified HR pathway and site:

High frequency of inspections	HR pathways & sites inspected 3 or more times per annum
Medium frequency of inspections	HR pathways & sites inspected 1-2 times per annum
Low frequency of inspections	HR pathways & sites inspected annually at the discretion of the LCA

The individual stakeholder results are detailed in a separate list (WAP 1.1.1) to be updated as new pathways and sites are identified; and or amended as sites are no longer deemed to be HR.

Regional Action Plan:

OBJECTIVES	ACTIONS	PERFORMANCE INDICATORS	WHO'S RESPONSIBLE
1. Identify and document HR pathways & sites in the Riverina	1. Develop a survey to identify & document all HR pathways & sites	Survey developed	RNWPO
	2. Distribute survey to all LCAs & LHPAs to identify & document all HR pathways & sites	Spreadsheet circulated to LCAs & LHPAs	RNWPO, LCAs, LHPAs
	3. Collate data gathered from spreadsheet into a regional list of HR pathways & sites – working document	WAP 1.1.1 HR pathways and sites identified. List updated as new pathways & sites are identified	RNWPO
	4. Develop maps to better display identified HR pathways & sites	Maps developed & updated as needed	RNWPO
2. Reduce the spread of weeds along HR pathways	1. Implement Riverina inspection policy that ensures consistency for effective weed management & standardised enforcement	WAP 1.2.3 Riverina inspection policy being implemented	RNWPO, LCAs
	2. Implement Rapid Response Plan that ensures a consistent approach to the management of new incursions of HR species	WAP 2.2.1 Rapid response plan being implemented	RNWPO, LCAs, LHPAs

	3. Implement New Incursion Plan – HR Species that ensures a consistent approach and response to the surveillance, identification and management of all HR species	WAP 1.2.2 NIP – HR species being implemented	RNWPO, LCAs, LHPAs
	4. HR private property (pp) inspections carried out (# of properties) 2.1.1.1	8806 HR pp inspected under the Riverina WAP by 30/06/2015	all Riverina WAP participants
	5. HR roadside inspections carried out (in kms) 2.1.1.2	118233.95kms of HR roadsides inspected by 30/06/2015	all Riverina WAP participants
	6. Implement a targeted inspection program on and with retail outlets (# of nurseries inspected) 2.1.1.3	1100 retail outlets inspected by 30/06/2015	all Riverina WAP participants
	7. HR waterway inspections carried out (in kms) 2.1.1.4	22795kms of HR waterways inspected by 30/06/2015	all Riverina WAP participants
	8. Stock yard inspections carried out (# of stock yards) 2.1.1.5	360 stock yards inspected by 30/06/2015	all Riverina WAP participants
	9. HR reserve inspections carried out (in hectares) 2.1.1.6	535243ha of HR reserves inspected by 30/06/2015	all Riverina WAP participants
	10. Undertake targeted inspection program on soil, gravel and fill distribution points (# inspected) 2.1.1.12	2095 soil, gravel and fill distribution points inspected by 30/06/2015	all Riverina WAP participants
	11. Install Red Guide Posts along roadsides to identify weed locations & avoid further spread along our HR routes.	Red guide posts installed as HR species are detected along our roadsides.	LCAs, LHPAs, RMS
	12. Report notifiable weeds to NSW DPI using notifiable weeds reporting form	Notifiable weed reporting form submitted to NSW DPI as Class 1, 2 or 5 weeds are detected.	LCAs
	13. Implement MERI plan	WAP 4.6.1 MERI Plan being implemented	RNWPO, LCAs, LHPAs
3. Ensure stakeholders are aware of HR pathways	1. Implement communication strategy that outlines major communication, extension, training & education activities	WAP 4.3.1 Communication Plan and WAP 2.1.1.9 Vehicle hygiene protocol being implemented	RNWPO, LCAs, LHPAs

Sindel, B. Meulen, A. Coleman, M & Reeve, I. (2009) *Pathway risk analysis for weed spread within Australia*. Land & Water Australia.

Endorsed by:

ERNWAG

On

17th October 2013

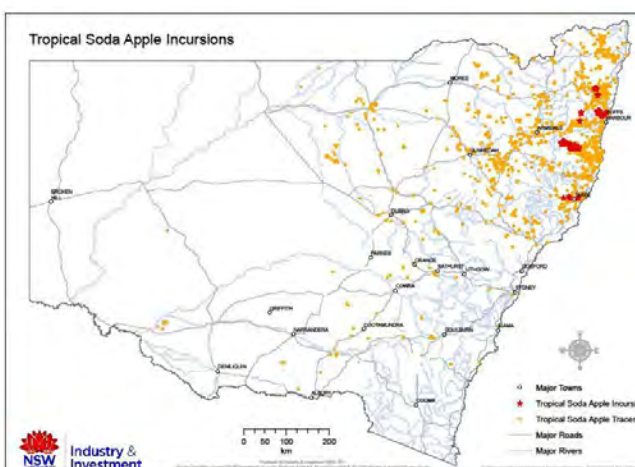
WRNWAG

On

15th October 2013

Case Study: April 2011 – Tropical Soda Apple Greater Hume Shire Council

Summary – Greater Hume Shire Councils (GHSC) Senior Weeds Inspector (SWI) found the first reported Tropical Soda Apple (TSA) plant in the Riverina on the 6th April 2011. The property was targeted for an inspection as a result of a pathways analysis undertaken by NSW DPI (formerly known as I&I NSW) using the National Livestock Identification Scheme (NLIS). The map below highlights incursions (red dots) and traces (yellow dots). The traces led the SWI to the new incursion. 3 plants (1 in seed) were located in the holding paddocks where new stock bought in and emptied out. 1,200kms from the original infestation!



Kempsey
and
surrounding
areas

Origin of TSA – Tropical soda apple was first identified in Australia in the Kempsey area on the Mid North Coast of New South Wales (NSW) in August 2010. However, this weed is believed to have been present in this area for a number of years. The current extent of that infestation is about 50 ha. Subsequent surveys have identified other smaller infestations in surrounding areas, including Wingham and Grafton.



NLIS

As part of the combined NSW Government and Local Government response to TSA, a pathway analysis was undertaken by I&I NSW. It was established that cattle movement is a significant source of new infestations of TSA. Consequently, I&I NSW conducted a trace of cattle movements from known infestation sites using the NLIS to determine incursion pathways. This resulted in 7411 properties of interest being identified – covering a total of 53 Local Control Authorities in NSW.



Greater
Hume Shire
Council

GHSC received correspondence from I&I NSW (9th March 2011) listing several properties of interest identified through the pathways analysis. The SWI scheduled inspections at all properties and found 3 TSA plants (1 in seed) in the holding paddocks of the last property inspected! All plants have been manually removed.

Outcome: A potentially major environmental threat and economic disaster has been averted

WAP 1.2.1 High Risk Species

NSW Invasive Species Plan. Goal 1: Exclude	
Prevent the establishment of new invasive species	1.2 Lists of high risk species
Regional Weed Strategy. Aim: Preventative Weed Management	
No new weeds naturalised over the life of the RWS	Priority weed lists in each RWS

Due to many species lists existing in several documents, it was determined that a collated high risk species list would be beneficial to the region as a quick reference.

High risk species	All Class 1 & 2 weeds and Category A & B weeds in a CMA subregion
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Weeds of concern were identified by stakeholders during our Regional Weed Strategy (RWS) consultations (held 2003 - 2008) in each catchment. The complete list of weeds identified (including noxious weeds, environmental weeds, WoNS and alert list weeds) is located in the appendix of each RWS. In order to use available resources most effectively, weeds were then ranked using the prioritisation process (also in the appendix of each RWS). This process recognises that the most cost effective way to manage weeds is to target them in the following priority:

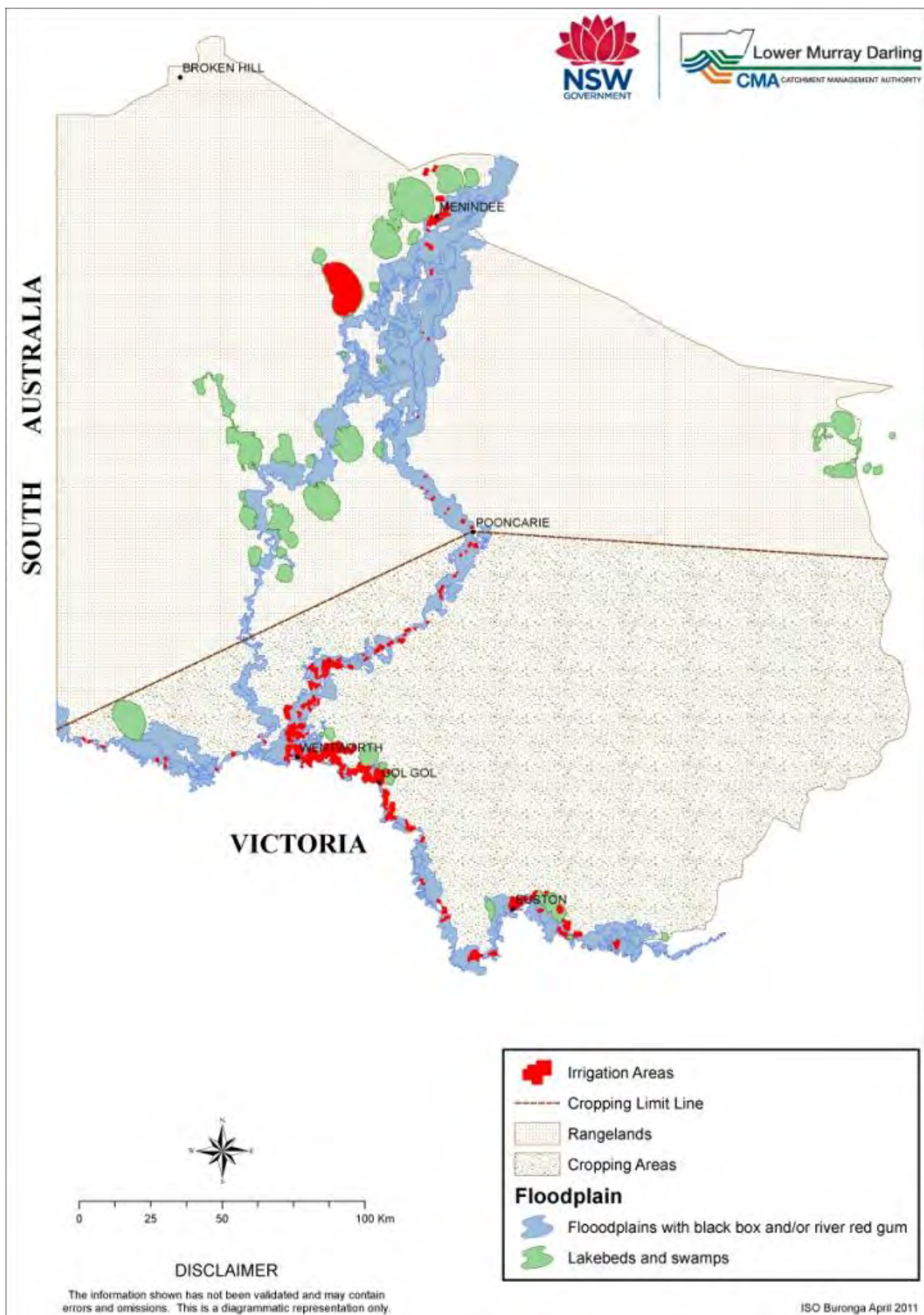
- To prevent the establishment and spread of emerging weed problems (Category A)
- Contain infestations with limited and moderate distribution (Category B and C)
- Manage widespread weed problems (Category D).

It is impractical to have one priority list of weeds across the entire Riverina region because of large variations in rainfall, topography, landuse and vegetation communities. During the stakeholder consultations, each catchment was split up into agreed subregions for the purpose of weed ranking.

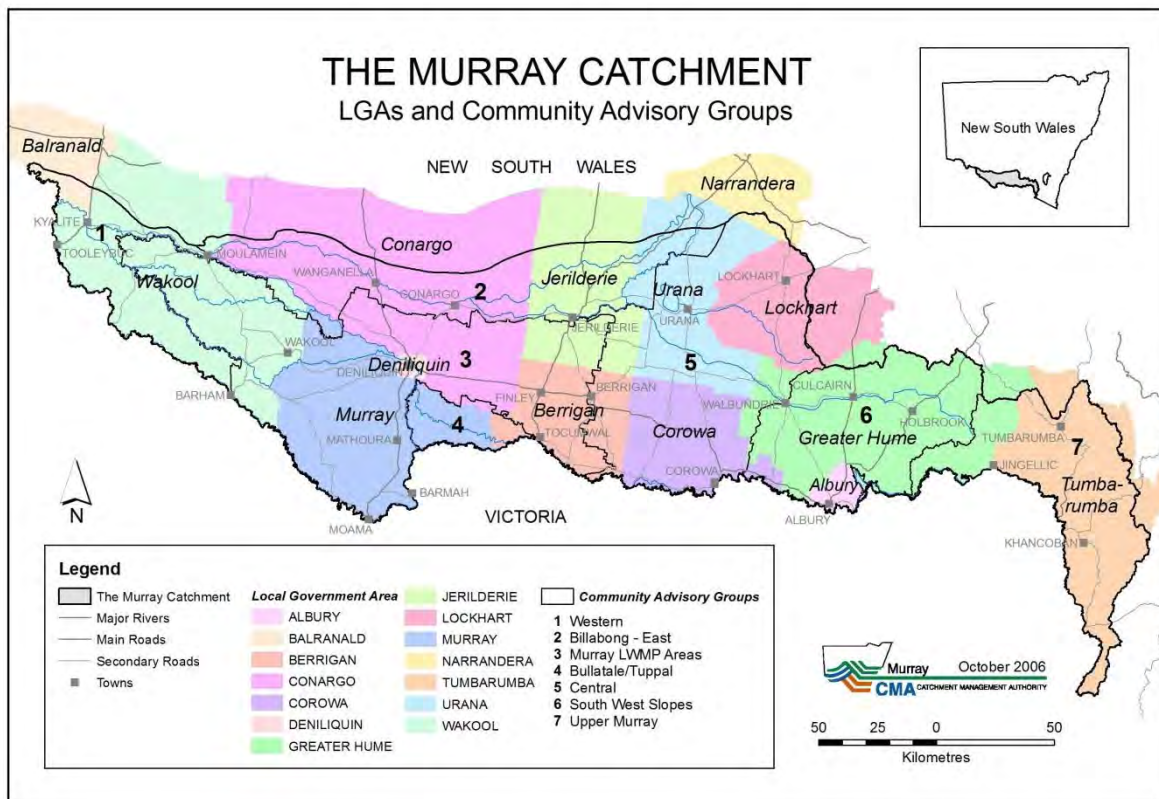
Lachlan Catchment subregions: the lower Lachlan, mid Lachlan and upper Lachlan.



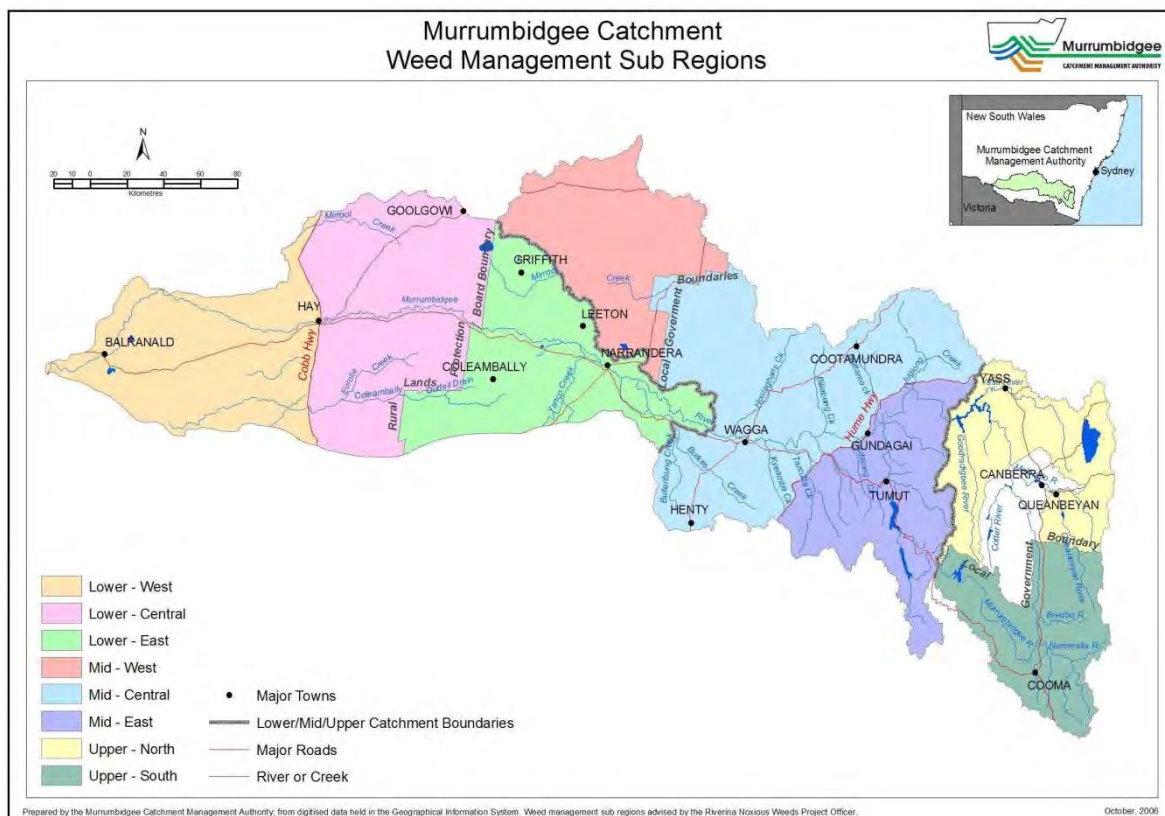
Lower Murray Darling Catchment subregions: Riparian areas (Floodplain), Horticultural (Irrigation areas), Rangelands & Cropping.



Murray Catchment subregions: Western; Billabong–East; Murray LWMP areas; Bullatale / Tuppal; Central; South West Slopes; and Upper Murray.



Murrumbidgee Catchment subregions: Lower west, Lower central, Lower east, Mid west, Mid central and Mid east.



High Risk Species: All Class 1 & 2 weeds and Category A & B weeds in a CMA subregion

Class 1 & 2 noxious weeds of the Riverina region as per Order 28 – 30/09/2011	
Alligator weed	<i>Alternanthera philoxeroides</i>
Anchored water hyacinth	<i>Eichhornia azurea</i>
Black knapweed	<i>Centaurea nigra</i>
Black willow	<i>Salix nigra</i>
Boneseed	<i>Chrysanthemoides monilifera</i> subsp <i>monilifera</i>
Broomrapes	<i>Orobanch</i> spp except the native <i>O. Cernua</i> variety <i>13australiana</i> and <i>O. Minor</i>
Cape broom	<i>Genista monspessulana</i> *
Chinese violet	<i>Asystasia gangetica</i> subspecies <i>micrantha</i>
Eurasian water milfoil	<i>Myriophyllum spicatum</i>
Gorse	<i>Ulex europaeus</i> #
Hawkweed	<i>Hieracium</i> species
Heteranthera/kidneyleaf mud plaitain	<i>Heteranthera reniformis</i>
Horsetail	<i>Equisetum</i> spp
Hydrocotyl/Water pennywort	<i>Hydrocotyle ranunculoides</i>
Hymenachne	<i>Hymenachne amplexicaulis</i> and hybrids
Karoo thorn	<i>Acacia karroo</i>
Kochia	<i>Bassia scoparia</i> except <i>B.scoparia</i> subsp <i>trichophylla</i>
Koster's curse/Clidemia	<i>Clidemia hirta</i>
Lagarosiphon	<i>Lagarosiphon major</i>
Mesquite	<i>Prosopis</i> spp
Mexican feather grass	<i>Nassella tenuissima</i>
Miconia	<i>Miconia</i> spp
Mikania	<i>Mikania micrantha</i>
Mimosa	<i>Mimosa pigra</i>
Parkinsonia	<i>Parkinsonia aculeata</i>
Parthenium weed	<i>Parthenium hysterophorus</i>
Pond apple	<i>Annona glabra</i>
Prickly acacia	<i>Acacia nilotica</i>
Rubbervine	<i>Cryptostegia grandiflora</i>
Salvinia	<i>Salvinia molesta</i>
Senegal tea plant	<i>Gymnocoronis spilanthoides</i>
Siam weed	<i>Chromolaena odorata</i>
Spotted knapweed	<i>Centaurea stoebe</i> subsp <i>micranthos</i>
Tropical soda apple	<i>Solanum viarum</i>
Water caltrop	<i>Trapa</i> spp
Water hyacinth	<i>Eichhornia crassipes</i>
Water lettuce	<i>Pistia stratiotes</i>
Water soldier	<i>Stratiotes aloides</i>
Witchweed	<i>Striga</i> spp excl native spp & <i>Striga parviflora</i>
Yellow burrhead	<i>Limnocharis flava</i>

declared in Albury City, Corowa Shire, Greater Hume Shire, Gundagai Shire, Junee Shire, Tumbarumba Shire, Tumut Shire and Wagga Wagga City Councils only.

* not declared in Albury City, Bland Shire, Greater Hume Shire, Gundagai Shire, Tumbarumba and Tumut Shire Councils.

Lachlan RWS – as adapted from LRWMP High Risk Species list.

Category A & B Weeds – please refer to the RWS to check status per sub region			
Alligator weed	<i>Alternanthera philoxeroides</i>	Blackberry	<i>Rubus fruticosus (agg.sp)</i>
Blue heliotrope	<i>Heliotropium amplexicaule</i>	Boneseed	<i>Chrysanthemoides monilifera</i>
Bridal creeper	<i>Asparagus asparagoides</i>	Cape Broom	<i>Genista monspessulana</i>
Chilean needle grass	<i>Nassella neesiana</i>	Coolatai grass	<i>Hyparrhenia hirta</i>
Fireweed	<i>Senecio madagascariensis</i>	Golden dodder	<i>Cuscuta campestris</i>
Gorse	<i>Ulex europaeus</i>	Lippia	<i>Phyla sp</i>
Mother of Millions	<i>Bryophyllum delagoense</i>	Parthenium weed	<i>Parthenium hysterophorus</i>
Prairie Ground cherry	<i>Physalis hederifolia, P. virginiana</i>	Sagittaria	<i>Sagittaria graminea</i>
Serrated tussock	<i>Nassella trichotoma</i>	St Johns Wort	<i>Hypericum perforatum</i>
Tamarix species	<i>Tamarix sp</i>	Tiger pear	<i>Opuntia aurantiaca</i>

Lower Murray Darling RWS

Category A & B Weeds – please refer to the RWS to check status per sub region			
Alligator weed	<i>Alternanthera philoxeroides</i>	African Rue	<i>Peganum harmala</i>
Athel Pine	<i>Tamarix aphylla</i>	Bitou bush & boneseed	<i>Chrysanthemoides monilifera</i>
Branched broomrape	<i>Orobancha species</i>	Buffalo burr	<i>Solanum rostratum</i>
Camel thorn	<i>Alhagi pseudalhagi</i>	Columbus grass	<i>Sorghum x alnum</i>
Green Cestrum	<i>Cestrum parqui</i>	Hardhead thistle	<i>Rhaponticum repens</i>
Harrisia cactus	<i>Harrisia sp</i>	Hawkweed	<i>Hieracium sp</i>
Horsetail	<i>Equisetum species</i>	Jerusalem thorn	<i>Parkinsonia aculeata</i>
Karoo thorn	<i>Acacia karroo</i>	Knapweed black/spotted	<i>Centaurea sp</i>
Kochia	<i>Kochia scoparia</i>	Mesquite	<i>Prosopis sp</i>
Mexican feathergrass	<i>Nassella tenuissima</i>	Noogoora burr	<i>Xanthium sp</i>
Parthenium weed	<i>Parthenium hysterophorus</i>	Prairie Ground Cherry	<i>Physalis hederifolia, P. virginiana</i>
Prickly acacia	<i>Acacia nilotica</i>	Rhus tree	<i>Toxicodendron succedaneum</i>
Sagittaria	<i>Sagittaria graminea</i>	Silk forage sorghum	<i>Sorghum sp hybrid cv</i>
Silverleaf nightshade	<i>Solanum elaeagnifolium</i>	Tree of Heaven	<i>Ailanthus altissima</i>

Murray RWS

Category A & B Weeds – please refer to the RWS to check status per sub region			
Alligator weed	<i>Alternanthera philoxeroides</i>	Blackberry	<i>Rubus fruticosus (agg.sp)</i>
Black willow	<i>Salix nigra</i>	Bridal creeper	<i>Asparagus asparagoides</i>
Camel thorn	<i>Alhagi pseudalhagi</i>	Cape tulips	<i>Homeria sp</i>
Chilean needle grass	<i>Nassella neesiana</i>	Coolatai grass	<i>Hyparrhenia hirta</i>
Golden dodder	<i>Cuscuta campestris</i>	Gorse	<i>Ulex europaeus</i>
Hardhead thistle	<i>Rhaponticum repens</i>	Hemlock	<i>Conium maculatum</i>
Johnson grass	<i>Sorghum halepense</i>	Nodding thistle	<i>Carduus nutans</i>
Onion weed	<i>Asphodelus fistulosus</i>	Pampas grass	<i>Cortaderia sp</i>
Prairie Ground Cherry	<i>Physalis hederifolia, P. virginiana</i>	Ragwort	<i>Senecio jacobaea</i>
Rhus tree	<i>Toxicodendron succedaneum</i>	Sagittaria	<i>Sagittaria graminea</i>
Scotch broom	<i>Cytisus scoparius</i>	Scotch/Illyrian thistle	<i>Onopordum sp</i>
Serrated tussock	<i>Nassella trichotoma</i>	Silverleaf nightshade	<i>Solanum elaeagnifolium</i>
Star thistle	<i>Centaurea calcitrapa</i>	St Johns wort	<i>Hypericum perforatum</i>
Tree of heaven	<i>Ailanthus altissima</i>		

Murrumbidgee RWS

Category A & B Weeds – please refer to the RWS to check status per sub region			
Alligator weed	<i>Alternanthera philoxeroides</i>	Blackberry	<i>Rubus fruticosus (agg.sp)</i>
Black willow	<i>Salix nigra</i>	Blue heliotrope	<i>Heliotropium amplexicaule</i>
Bridal creeper	<i>Asparagus asparagoides</i>	Camel thorn	<i>Alhagi pseudalhagi</i>
Cape tulips	<i>Homeria sp</i>	Chilean needle grass	<i>Nassella neesiana</i>
Coolatai grass	<i>Hyparrhenia hirta</i>	Fireweed	<i>Senecio madagascariensis</i>
Golden dodder	<i>Cuscuta campestris</i>	Gorse	<i>Ulex europaeus</i>
Green Cestrum	<i>Cestrum parqui</i>	Hardhead thistle	<i>Rhaponticum repens</i>
Hemlock	<i>Conium maculatum</i>	Hoary cress	<i>Cardaria draba</i>
Longstyle feathergrass	<i>Pennisetum villosum</i>	Nodding thistle	<i>Carduus nutans</i>
Perennial Canada thistle	<i>Cirsium arvense</i>	Onion weed	<i>Asphodelus fistulosus</i>
Prairie Ground Cherry	<i>Physalis hederifolia, P. virginiana</i>	Ragwort	<i>Senecio jacobaea</i>
Rhus tree	<i>Toxicodendron succedaneum</i>	Sagittaria	<i>Sagittaria graminea</i>
Scotch broom	<i>Cytisus scoparius</i>	Scotch/Illyrian thistle	<i>Onopordum sp</i>
Serrated tussock	<i>Nassella trichotoma</i>	Silverleaf nightshade	<i>Solanum elaeagnifolium</i>
Spiny burrgrass	<i>Cenchrus incertus, C. longispinus</i>	Star thistle	<i>Centaurea calcitrapa</i>
St Johns wort	<i>Hypericum perforatum</i>		

Management of high risk species - refer to Rapid Response Plan WAP 2.2.1 for specific procedures to be undertaken upon finding a new incursion of a high risk species. Only those weeds already declared noxious are bound by legal obligations.

New high risk species – species can be added to the lists in one of the following ways:

- by declaration – new Class 1 and Class 2 weeds
- by prioritisation – if the weed isn't declared a Class 1 or 2 noxious weed it must be put through the prioritisation process. It must rank as a category A or B to be added to the list.

Nominations can be made to the Riverina Noxious Weeds Project Officer or individual weeds officers to be discussed by either Eastern Riverina Noxious Weeds Advisory Group or Western Riverina Noxious Weeds Advisory Group prior to ranking the species.

WAP 1.2.2 New Incursion Plan – high risk species

NSW Invasive Species Plan. Goal 1: Exclude	
Prevent the establishment of new invasive species	1.2 Early detection capabilities are developed and implemented.
Regional Weed Strategy. Aim: Preventative Weed Management	
No new weeds naturalised over the life of the RWS	1.1.3 Identify target areas to focus management activities for priority weeds.

This plan will ensure a consistent approach and response to the surveillance, identification and management of all High Risk species in the Riverina.

Aim: To ensure a consistent approach to the management of new incursions of High Risk species throughout the Riverina.

Incursion	“An isolated population of an invasive species detected in an area where it has not been previously established.”
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As defined in the NSW Invasive Species Plan 2008-2015

Objectives:

1. Prevent the establishment of new invasive species.
2. Eliminate or prevent the spread of new invasive species.

Key Stakeholders:

The following Local Control Authority (**LCA**) members of the Eastern Riverina Noxious Weeds Advisory Group and Western Riverina Noxious Weeds Advisory Group (**ERNWAG & WRNWAG**): Albury City, Balranald Shire, Bland Shire, Carrathool Shire, Central Murray County, Coolamon Shire, Cootamundra Shire, Corowa Shire, Griffith City, Greater Hume Shire, Gundagai Shire, Hay Shire, Jerilderie Shire, Junee Shire, Leeton Shire, Lockhart Shire, Murrumbidgee Shire, Narrandera Shire, Riverina Eastern Noxious Weeds Authority (RENWA), Temora Shire, Tumbarumba Shire, Tumut Shire, Urana Shire, Wagga Wagga City, Wakool Shire, Wentworth Shire; Murray, Riverina and Western Local Land Services (**LLS**); Riverina Noxious Weeds Project Officer (**RNWPO**); NSW Department of Primary Industries (**NSW DPI**).

Regional Action Plan:

OBJECTIVES	ACTIONS	PERFORMANCE INDICATORS	WHO'S RESPONSIBLE
1. Prevent the establishment of new infestations	1. Establish and maintain a list of High Risk (HR) species	HR species list developed and maintained	RNWPO, LCAs
	2. Build capacity of stakeholders to detect & identify HR species	Id training attended when available	LCAs, RNWPO
	3. Determine HR pathways & sites	HR pathways & sites list developed	RNWPO, LCAs
	4. Develop Regional Inspection Policy	Regional Inspection Policy developed and endorsed by all Riverina LCAs	RNWPO, LCAs

	5. Implement Regional Inspection Policy	Regional Inspection policy implemented as per Riverina Weeds Action Program.	LCAs
2. Eliminate or prevent the spread of new invasive species	1. Implement Rapid Response Plan upon detecting a new incursion of a HR species (see Case study March 2011)	Rapid Response Plan implemented	LCAs, RNWPO
	2. LCAs provide RNWPO with the notifiable weed reporting form (copy) as submitted to NSW DPI or herbarium record (if not a notifiable weed)	Copy of notifiable weed form or herbarium record provided to RNWPO for all new incursions	LCAs
	3. RNWPO to update new incursion database as required	New incursion database updated with new incursions and status of old incursions	RNWPO
	4. Determine management levels for HR pathways and sites	HR pathways management plan developed	RNWPO, LCAs
	5. Develop New Incursion Plans (NIPs) for HR species as required	NIPs developed as required	RNWPO, LCAs
	6. Rank new weeds through prioritisation & Weed Risk Assessment (WRA) process	New weeds ranked through WRA processes	RNWPO, LCAs
	7. Submit applications for declaration as required	Declaration applications submitted as required	RNWPO, RWACs, LCAs

New additions

A current list of all new incursions of Category A weeds for the Riverina can be found at www.riverinaweeds.org.au/documents by clicking on Riverina WAP 2010 - 2015. The list will be updated as new incursions are identified across the Riverina. LCAs are to provide RNWPO with a copy of the notifiable weed reporting form as submitted to NSW DPI (if a notifiable weed) or herbarium record (if not a notifiable weed).

Category A weeds:	All Class 1 & 2 noxious weeds + others listed in each Regional Weed Strategy (RWS) as per subregion - Priority list of weeds!
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Review:

The New Incursions to the Riverina database and list will be continually updated as new incursions are detected. The status of each incursion will be updated in the New Incursions database and available upon request from the RNWPO. The overall plan is to be reviewed after 5 years.

Endorsed by:

ERNWAG
On
8th March 2012

WRNWAG
On
27th March 2012

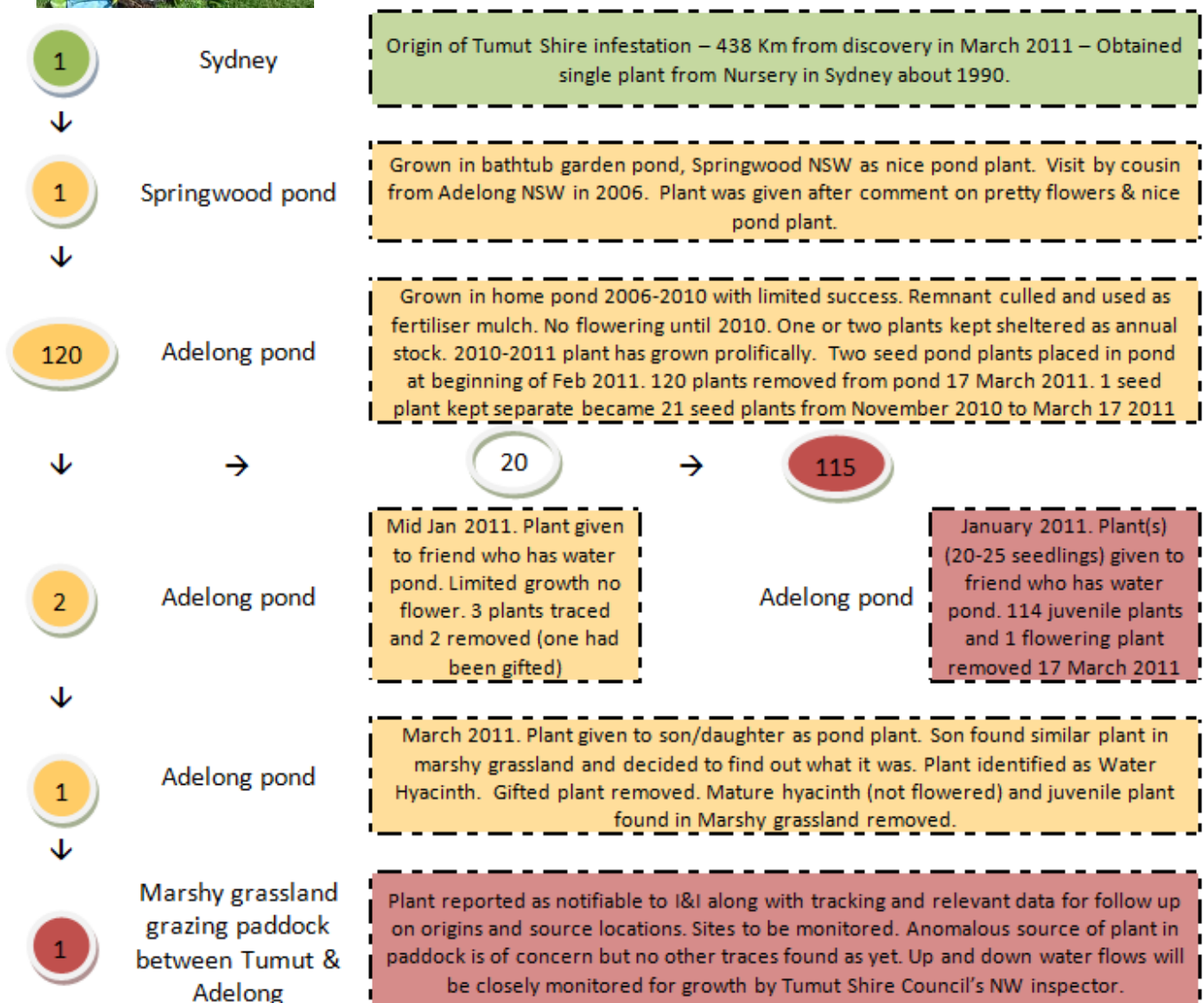
Case Study: March 2011 – Water Hyacinth Tumut Shire Council



Summary - On Friday 11th March 2011, a dispute over the value of a gifted garden pond plant prompted an identification request from Industry and Investment NSW. The recipient had found a similar plant in the marshy area of a recently flooded paddock. The recipient thought it might be a weed. Tumut Shire Council's Noxious Weed Inspector was contacted, and on Tuesday 15th March met the person with the plant and identified it as Water Hyacinth (*Eichhornia crassipes*). An inspection of the marshy grassland revealed one adult plant and one juvenile seedling. Both were removed. The source of the plants in the paddock is still not determined but will be closely monitored.



The origins (local and original) were tracked to an original purchase from a Sydney garden nursery in about 1990. In total 240 Water Hyacinth plants were removed and the sites contained. One anomalous site will continue to be closely monitored. The origins, locations and distribution sources have been reported and neutralised.



Outcome: A potentially major environmental threat and economic disaster has been averted.

New Incursion Plan – Boneseed & Bitou bush 2011-2016

National Boneseed Strategic Plan. Goal 1: New infestations are prevented from establishing	
1.1 Develop and maintain early detection mechanisms to protect uninvaded areas.	Strategic Action 1.1.2 Develop and implement plans to address new infestations
NSW Invasive Species Plan. Goal 1: Exclude	
Prevent the establishment of new invasive species	1.2 Early detection capabilities are developed and implemented.
Regional Weed Strategy. Aim: Preventative Weed Management	
No new weeds naturalised over the life of the RWS	2.1.2 Develop and implement plans for priority weeds in consultation with stakeholders.

Aim: To protect biodiversity by restricting the spread & preventing the establishment of boneseed & bitou bush (*Chrysanthemoides monilifera*) within the Riverina, with the long-term aim of eradication.

Objectives:

1. Prevent the establishment of new infestations.
2. Prevent the seeding of known infestations through ongoing management of these infestations resulting in 100% eradication (*) of all infestations by 2021.

* We recognise the seed bank may remain viable for periods exceeding 10 years and follow-up work beyond the term of this plan will be required.

Area of operation: Riverina LCAs + Unincorporated Area (Western Division) + Broken Hill City Council.

Key Stakeholders:

The following Local Control Authority (LCA) members of the Eastern Riverina Noxious Weeds Advisory Group and Western Riverina Noxious Weeds Advisory Group (**ERNWAG & WRNWAG**): Albury City, Balranald Shire, Bland Shire, Carrathool Shire, Central Murray County, Coolamon Shire, Cootamundra Shire, Corowa Shire, Griffith City, Greater Hume Shire, Gundagai Shire, Hay Shire, Jerilderie Shire, Junee Shire, Leeton Shire, Lockhart Shire, Murrumbidgee Shire, Narrandera Shire, Riverina Eastern Noxious Weeds Authority (RENA), Temora Shire, Tumbarumba Shire, Tumut Shire, Urana Shire, Wagga Wagga City, Wakool Shire, Wentworth Shire, Hume LHPA, Riverina LHPA and Western LHPA. Broken Hill City Council, NSW Department of Primary Industries (**NSW DPI**), Murrumbidgee Irrigation (**MI**), Far West Region of National Parks and Wildlife Service of NSW - Office of Environment and Heritage (**OEH**) and the Lower Murray Darling Catchment Management Authority (**CMA**). Other stakeholders include: Lachlan, Murray and Murrumbidgee Catchment Management Authorities (**CMAs**), Roads and Traffic Authority (**RTA**), NSW Farmers, Coleambally Irrigation (**CI**), Murray Irrigation Limited (**MIL**), Victorian Department of Primary Industries (**VIC DPI**), Victorian Department of Sustainability and the Environment (**VIC DSE**) and neighbouring landholders.

Background:

Boneseed (*Chrysanthemoides monilifera* ssp *monilifera*) & bitou bush (*Chrysanthemoides monilifera* ssp *rotundata*), are native to South Africa. They are fast growing, aggressive plants that have no natural enemies in Australia. Boneseed was introduced to Australia as a garden plant in the late 1800s and, as recently as 5 years ago, was not generally recognised as a weed in the Riverina. Boneseed poses one of the greatest threats to plant communities in southern and western NSW. It is considered a weed of regional and national significance because of its environmental impacts, invasive ability, and serious potential to spread. It is a highly competitive weed that displaces native vegetation in most environments, having the capacity to become a monoculture in disturbed areas. Bitou bush is only known to occur at Menindee Lakes (Kinchega National Park) west of the Great divide, and for this reason we have incorporated this isolated infestation into our incursion plan. Apart from this isolated bitou bush infestation, this plan is primarily targeting boneseed.

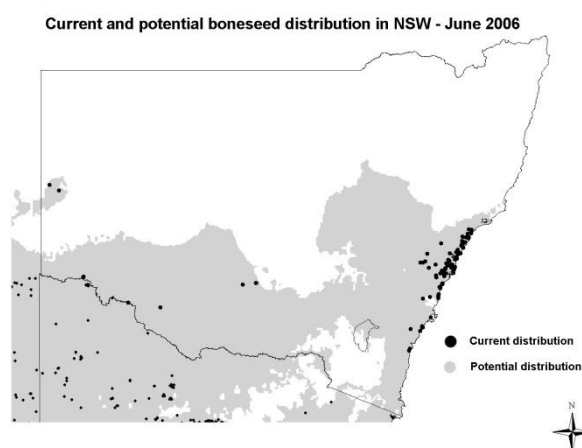
National coordination of boneseed management in Australia occurs as part of the Weeds of National Significance (WoNS) program. A national coordinator and management group oversee the implementation of the National Boneseed Strategic Plan. Strategic Action 1.3.7 of the 2011-2016 Strategic Plan states “eradicate all boneseed plants in NSW”. This is supported in the Riverina through our application for Class 2 declaration across the region. Boneseed containment lines are also being discussed and are recommended by the national management group along the Victorian and South Australian border with NSW (Strategic Action 1.4.5 “Develop northern national boneseed containment zone around NSW/Victoria border to prevent spread to NSW”). ERNWAG & WRNWAG support this recommendation and hopefully, through our management and long term aim of eradication, we can establish and progress containment lines to the south and west of the Riverina.

The National Boneseed Coordinator (Hillary Cherry) made a presentation to the Western Riverina Noxious Weeds Advisory Group (WRNWAG) in October 2006 highlighting the impact of this aggressive weed, as well as seeking information on old herbarium records of past infestations. Upon investigating the isolated herbarium records, it was discovered that 6 infestations had been identified in the Riverina – some dating back to the 1940s. So far, two records were found to still exist. A component of this plan will be to re-visit all recorded locations to check the status of infestations.

Boneseed has been assessed and prioritised by all Riverina LCAs. Of the 46 weeds put through the prioritisation process, boneseed ranked 2nd highest behind Gorse and is regarded as a High Risk species. Refer to High Risk species WAP 1.2.1 for further information.

The “Do Nothing” Option:

If control activities are not undertaken, Boneseed has the potential to significantly expand its range. The potential distribution of boneseed (predicted by BIOCLIM model) is the majority of the Riverina.



Distribution of Riverina Infestations:

Balranald Shire Council – On 28th November 2010, the weeds officer located a boneseed bush in the regional park in Euston (-34.58584966 142.7047373). There were four plants in total about 1m – 1.5m tall. No signs of any seedlings. They had flowered and had seeded. All plants have been removed. The site was not reinspected in 2011 due to flood waters.

Broken Hill City Council & Unincorporated area – One boneseed herbarium specimen was recorded, near the mine dump, at the herbarium 29th August 1946 by L Johnson. Another reported site was between the north mine and the Line of Lode. One specimen recorded at Umberumberka (Silverton), near reservoir in 1940. Status of all 3 sites is currently unknown.

Central Murray County Council – Infestation at Pretty Pine. A home gardener brought seeds home from the coast and planted them in her garden. Seeds from the cuttings were taken to the tip and spread further from there. This infestation has also moved to a nearby travelling stock reserve on the Moulamein rd (approximately 1 km from Pretty Pine). The stock reserve infestation was discovered in 2005. In January and April 2011, 15 seedlings were removed from a road reserve (S35 27'13.1" E144 55'57.4") on Cobb Hwy, 12km north of Deniliquin, no plants located during inspection around old tip area and surrounding properties at Pretty Pine.

Griffith City Council – After the October 2006 WRNWAG meeting, John Brickhill (NPWS) investigated 2 locations on the above map in the Griffith area. A herbarium specimen existed from Combe rd (and logged at the Herbarium) by D Mallinson in Sept 2004. The Combe Rd infestation (extends from S34 16'27.7" E146 00'59.1" parallel with Combe Rd to S34 16'21.0" E146 00'52.7") was found to be approximately 2000sqm in size in October 2006 (occurring on the northern outskirts of Griffith). Several thousand plants in a 30m wide strip between Combe Rd and the irrigation canal extended 200m in a westerly direction from Duchatel Rd intersection. Hundreds of plants were also found on the opposite side of the canal. This infestation has been reduced significantly to small areas of scattered plants that are treated annually. The irrigation channel infestation is treated by M.I., and has been reduced from approx 100 metres x 5 metres to scattered plants along the channel bank.

A new infestation, approximately 1ha in area, was found in Hanwood (village 5kms south of Griffith) on private property (S34 20'31.3" E146 02'41.4") in March 2007. This infestation is yielding a handful of seedlings each season, with the landholder removing the plants as he finds them. John Brickhill also found 6 plants in Canal St, Griffith (S34 17'23.44" E146 02'24.19") in March 2008; that have since been eradicated.

Narrandera Shire Council – The second record near Griffith on the above map traced back to D Mallinson recording an infestations at Binya (this was logged at the herbarium in August 2002). In October 2006 approximately 50 plants were found at this same location on the western side of Binya. All plants were removed. Brief NPWS inspections in 2007-2010 at this site showed no signs of plants. Ross Gardiner, NPWS Pest tech officer, went to Binya site 4 May 2011 and destroyed approximately 110 boneseed plants which were in a patch on the southern side of the Burley Griffin Way next to the "30km to Griffith" sign. (S34 13'43.3" E146 20'29.6") There was a small patch, 20 of the 110 plants, to the west about 30m closer to the fence. Plants were pulled out by hand, and stacked on some fallen branches to dry. There were no flowers or seed, plants were from 10cm to 1m tall, appeared to be regeneration from rain last spring/summer, as no plants have been seen by NPWS during inspections in previous years. Ross is in the process of talking to

Narrandera Shire's Weed Officer regarding the need for follow up site checks as the seed may be viable for up to 10 years.

Tumbarumba Shire Council – A roadside infestation (east of Rosewood) on broadleaf park road (35.671813 Latitude 147.956618 Longitude), a logging road, was first discovered in January 2000. It was thought to have been brought in on earth moving equipment. The site to date has been monitored and inspected regularly. There has not been any reinfestation since the initial treatment in 2000.

Tumut Shire Council – A small cluster of 6 Boneseed plants was discovered on a hilltop private property just north of Tumut township (S35 18'2.232" E148 10'30.792") in October 2010. These plants were dug out and disposed of and the owner was notified of the infestation and to watch for any new growth. The infestation site was re-inspected at 6 months and will be re-inspected annually. No new plants found and no re-growth evident. Tumut Shire Council will continue to re-inspect annually for 3 years then back on cyclical inspections.

Wakool Shire Council – Approximately 6 plants were discovered in Riverside Park (S35 37'56.2" E144 07'52.4") in Barham on the banks of the Murray River in July 1996 (approx). A member of the public brought it to the weeds officers' attention. The infestation is treated annually and has been reduced from big bushes to seedlings.

Wentworth Shire Council – This infestation, at the NSW Agriculture, Agricultural (S34.09 E142.014000) Research Station, was first identified in a herbarium specimen in 1986 and again in 1992. The herbarium notes stated: Shrub to 2 m tall; yellow flowers; seeds collected at base of plant; locally abundant; & used for sand dune stabilisation. NSW DPI has worked hard at eradicating it on site. The main infestation is now a vineyard and isolated bushes appear occasionally on the back Wentworth Rd and on the farm. Every effort is made by NSW DPI to get rid of it before it seeds.

Another infestation in the same vicinity was discovered in 2008 at the sewerage evaporating ponds (S34.1 E142.03). The infestation area was approximately 3-4 acres around the ponds. A further infestation was discovered 2/5/11, odd plants on crown land all along Tuckers creek (S34.1043 E142.000009) which is downstream from the previous infestations. Tuckers Creek is an anabranch out of the Murray River and into the Darling River at Wentworth and surrounds the settlement and island known as Curlwaa. A fourth infestation approx 20ha has recently been discovered in the North Eastern corner of the Coomealla Irrigation Area. It has been effectively sprayed and anything missed hand pulled.

Kinchega National Park – Bitou bush was introduced to the area as a bank stabiliser plant in the late 1960s. It was confirmed as bitou bush as opposed to Boneseed in 1992, and has since been managed to varying degrees by the many landowners. In recent years, a taskforce has been established to determine landownership and management of the infestation. As reported in the LMD CMA 2009-2010 Annual report: in the Menindee area, north of the Catchment, bitou bush grew along the shore of the lakes and dunes from Sunset Strip, a community 22km north of Menindee township, to the Menindee Lakes Caravan Park, with plants ranging from tiny to very large, almost tree-size bushes. In 2009/10, an area of approximately 245 hectares of land was surveyed and treated by physically removing the plants, as the lakes are a source of drinking water. By removing the whole plant, potential spread of these weeds when the lakes refill, has been enormously reduced. As part of the monitoring process, GPS locations were recorded for all

plants, ensuring the areas can be readily found during a follow up program. The bitou bush infestations in LMD CMA are an eradication target under a 3 year Caring for Our Country project, led by DSE VIC, to eradicate all bitou bush outside the national southern containment line. LMD CMA and NSW NPWS are partners in this project and will continue eradication efforts for at least 10 years.

Containment Lines:

In consultation with the National Bitou bush & Boneseed Management Group and due to the minimal infestations in the Riverina and in NSW, it was deemed critical on the national scale to establish containment lines and try to expand on the boneseed-free areas. Therefore as part of their eradication plan, the Riverina have established boneseed containment lines to the south and west being the Murray River and the South Australian Border respectively. It is hoped eradication and containment plans will be adopted by Victoria and South Australia and they will join NSW efforts to contain boneseed to the south and west. The National Murray-Coorong Boneseed Containment Zone was recently established to prevent spread along these river corridors. This will assist in reducing spread from South Australia in the future.

Method and Rate of Spread:

Seed production is the key to boneseed invasion: Prevention of seed production is the key to boneseed control. Individual boneseed plants can produce up to 48,000 seeds per year. Fruits and seeds are spread by birds and other animals, water, soil movement and other human activities. Seeds may persist up to 10 years for boneseed, however exact seed longevity is unknown. It is a successful invader due to its rapid growth, enormous seed production, efficient dispersal, lack of natural enemies and adaptability to different environments. Such characteristics have allowed it to invade and proliferate in a range of vegetation communities.

Species Management:

Boneseed can be effectively controlled using chemical and mechanical methods. The *Boneseed Management Manual - Current management and control options for boneseed in Australia* (Brougham et al. 2006), contains a range of best practice management advice and can be downloaded freely from: www.weeds.org.au/WoNS/bitoubush

Declaration Status:

Boneseed is currently not declared anywhere in the Riverina; although because it is listed as a notifiable weed (Class 2) on Lord Howe Island, it cannot be propagated or sold anywhere in NSW.

A major goal of this plan is to support the region-wide Class 2 declaration. Class 2, Regionally Prohibited Weeds, must be eradicated from the land and the land must be kept free of the plant.

Weed Biology: (source: Boneseed Manual, Brougham et al. 2006)

Distinguishing features of Boneseed and Bitou bush can be seen in figure 3. Further information on biology can be found in the WoNS Strategic plan which can be downloaded from: www.weeds.org.au/WoNS/bitoubush













bitou bush (ssp. <i>rotundata</i>)			boneseed (ssp. <i>monilifera</i>)	
	spreading shrub, 1–2 m high	habit	erect shrub, up to 3 m high	
	3–7 cm long, broader oval shape, smooth or only slightly toothed edges	leaves	3–9 cm long, elongated oval shape, irregularly toothed edges	
	11–13 'petals' flowers year round with a peak from April to June	flowers	4–8 'petals' flowers from late winter to spring (mainland), to early summer (Tas)	
	egg-shaped fruit	fruit	round fruit	
	egg-shaped, rough, dark brown to black	seeds	round, smooth, bone-coloured	
	leaves with smooth edges	seedlings	leaves with toothed edges	

Figure 3: Distinguishing between bitou bush and boneseed

National Bitou bush and Boneseed Priority Management Actions by NRM Region:

Note: highest priorities are in bold text. High priority regions are highlighted in pink.

NRM Region	BITOU BUSH Priorities 2011-2016 (not incl research)	BONESEED Priorities 2011-2016 (not including research)
Lower Murray Darling	Eradication of bitou bush: Raise awareness of threat to inland areas.	Eradication of boneseed; surveillance and mapping. Support Class 1 (or 2) listing (eradication) in NSW. Raise awareness of threat to inland areas.
Murray	Bitou bush does not occur in this region. Education and awareness.	Eradication of boneseed; surveillance and mapping. Support Class 1 (or 2) listing (eradication) in NSW. Raise awareness of threat to inland areas.
Murrumbidgee	Bitou bush does not occur in this region. Education and awareness.	Eradication of boneseed; surveillance and mapping. Support Class 1 (or 2) listing (eradication) in NSW. Raise awareness of threat to inland areas.
Western	Eradication of bitou bush. Education and awareness	Eradication of boneseed; Support Class 1 (or 2) listing (eradication) in NSW. Raise awareness of threat to inland areas.

Table 1: Bitou bush and boneseed priority management actions by NRM region (Information extracted from National Bitou bush and boneseed Strategic Plan 2011-2016).

Regional Action Plan:

OBJECTIVES	WoNS Action	ACTIONS	PERFORMANCE INDICATORS	WHO'S RESPONSIBLE
1. Prevent the establishment of new infestations	1.1.1	1. Distribute identification and awareness material where early detection is needed (i.e adjacent to eradication zones and containment lines)	Id and awareness material disseminated to key areas.	LCAs, RNWPO
		2. Timely reminder to weed officers when Boneseed is flowering so they can be looking for new infestations during routine field work.	Reminder circulated annually to all weed officers when Boneseed first flowers.	LCAs, RNWPO
		3. Timely dissemination of information to the general public when Boneseed is in flower (August – October)	Media release, Chinwag article at onset of flowering, number of brochures /flyers distributed.	RNWPO, LCAs
	1.4.5	4. Establish and maintain containment line around NSW / Victorian border	Containment zones established and maintained	All LCAs bordering with Victoria
	1.1.3	5. Engage stakeholders in monitoring High Risk sites & pathways & encourage reporting	Number or extent of stakeholders reporting infestations	All LCAs
		6. Reinspect all known sites (including herbarium records) annually to check the status of the infestation. Update maps where necessary.	All recorded sites inspected annually till the site is free of Boneseed for 10 consecutive years.	All LCAs (who's responsible for inspecting Kinchega NP?)
	1.3.7	7. Destroy new infestations before they flower or set seed. Shallow roots make boneseed easy to hand pull or dig up when small.	All new infestations are controlled prior to seed set.	All land managers
	1.2.1	8. Map all new infestations. Provide details to RNWPO for regional and national distribution	Updated map available upon request	LCAs, RNWPO
	1.3.7	9. Submit regional application for Class 2 declaration to DPI	Application collated & submitted	LCAs, RNWPO
		10. Inform the community of Boneseed's declaration status once gazetted Class 2.	Media release distributed	RNWPO, LCAs
		11. All new infestations must be reported to the LCA within 3 days of discovery.	LCAs kept informed	Land managers

		12. Complete notifiable weed reporting form & submit to NSW DPI within two weeks of discovery	Notifiable weed form received by NSW DPI	LCAs
2. Prevent the seeding of known infestations through ongoing management of these infestations resulting in 100% eradication (*) of all infestations by 2021.	1.3.8	1. Continue current control program on Kinchega NP and adjacent unincorporated land.	Inspections indicating a reduction in the degree of infestation, both in area & plant density	OEH (NPWS), far west region and LMD CMA
		2. Continue to seek cooperative support from neighbours to carry out control measures off park	Increase in cooperative response from neighbours	OEH, LMDCMA, Central darling, unincorporated
	1.3.7	3. Search for plants (missed the previous year or newly germinated) at all known sites. Remove all plants (including recently germinated seedlings) prior to seeding as per the Boneseed Manual (2006).	All found plants removed from known sites prior to seeding	LCAs, other land managers
		4. Support & submit funding submissions to relevant bodies to ensure maximum resources where needed	Letters of support. Funding applications	RNWPO, RWACs, LCAs
		5. Coordinate, monitor and review implementation of this Plan; report to stakeholders.	Effectiveness & relevance of the plan reported to stakeholders.	RNWPO, LCAs, other stakeholders

* We recognise the seed bank may remain viable for periods exceeding 10 years and follow-up work beyond the term of this plan will be required.

Desired outcome: **The Riverina's native biodiversity is protected from the negative impacts of Boneseed & Bitou bush, with the long-term aim of eradication.**

Linkages and resources:

- Natural Resource Ministerial Council of Australia & New Zealand (2011) *Weeds of National Significance Bitou bush and Boneseed (Chrysanthemoides monilifera ssp rotundata and monilifera) Strategic Plan*. Australian Weeds Committee, Launceston.
- Agriculture & Resource Management Council of Australia & New Zealand, Australian & New Zealand Environment & Conservation Council and Forestry Ministers, (2000) *Weeds of National Significance Bitou Bush and Boneseed (Chrysanthemoides monilifera ssp. rotundata and monilifera) Strategic Plan*. National Weeds Strategy Executive Committee, Launceston.
- Brougham, KJ, Cherry, H and Downey, PO (eds) (2006). *Boneseed Management Manual: current management and control options for boneseed (Chrysanthemoides monilifera ssp. monilifera) in Australia*. Department of Environment and Conservation NSW, Sydney. Available on www.weeds.org.au/wons/bitoubush
- CRC for Australian Weed Management (2003). *Weed Management Guide: Boneseed – Chrysanthemoides monilifera ssp. monilifera*. CRC for Australian Weed Management, Australia.

- National Bitou Bush & Boneseed Management Group – NSW Boneseed Flyer – Not Wanted! Available on www.weeds.org.au/wons/bitoubush
- Department of Environment and Climate Change NSW (NPWS). Far West Region Pest Management Strategy 2008-2011. DECC, Sydney, NSW
- B.A. Auld and R.W. Medd (1997) Weeds, An Illustrated botanical guide to the weeds of Australia, Inkata Press.
- Boneseed (*Chrysanthemoides* (L.) Norl. *Monilifera* ssp. *monilifera*) Service Sheet (11/02), DPIW&E.
- F.J. Richardson, R.G. Richardson and R.C.H. Shephard (2006) Weeds of the south-east – An identification guide for Australia, R.G. & F.J. Richardson.
- W.T. Parsons and E.G. Cuthbertson (2001) Noxious Weeds of Australia 2nd Edition, CSIRO Publishing.
- RMP Environmental Pty Ltd (April 2008), *TEN YEAR BONESEED MANAGEMENT PLAN*, Northern and Yorke Natural Resources Management Board & Eyre Peninsula Natural Resources Management Board.
- South Coast Bitou Bush & Boneseed Taskforce. (2007) *South Coast Bitou Bush and Boneseed Management Plan 2007-2012*. SCBBTF, Illawarra District Noxious Weeds Authority, Kiama, NSW. Available on www.southerncouncils.nsw.gov.au
- Riverina High Risk Species WAP 1.2.1
- Ash, P & Verbeek, B (2006) Regional Weeds Strategy Lower Murray Darling Catchment 2nd Edition.
- Ash, P & Verbeek, B (2007) Regional Weed Strategy Murrumbidgee Catchment
- Bosse, P & Verbeek, B (2008) Regional Weed Strategy Murray Catchment.
- Power, M, Higgins, A, Hasselman, L, Wythes, C and Hil, R (2009) Lachlan Regional Weed Strategy.

Review:

This plan is to be reviewed after 5 years to ensure we are on track with our 10 year aim of eradication.

Endorsed by:

ERNWAG

On

13th October 2011

WRNWAG

On

11th October 2011

New Incursion Plan – Fireweed 2013-2018

National fireweed strategic plan (draft). Goal 1: New fireweed infestations are prevented from establishing

1.1 Invasion vectors, sources and pathways are identified and managed to prevent or reduce spread

1.1.1 Review, update and prioritise pathways of spread for fireweed.

NSW Invasive Species Plan Goal 1: Exclude

Prevent the establishment of new invasive species

1.2 Early detection capabilities are developed and implemented.

Regional Weed Strategy. Aim: Preventative Weed Management

No new weeds naturalised over the life of the RWS

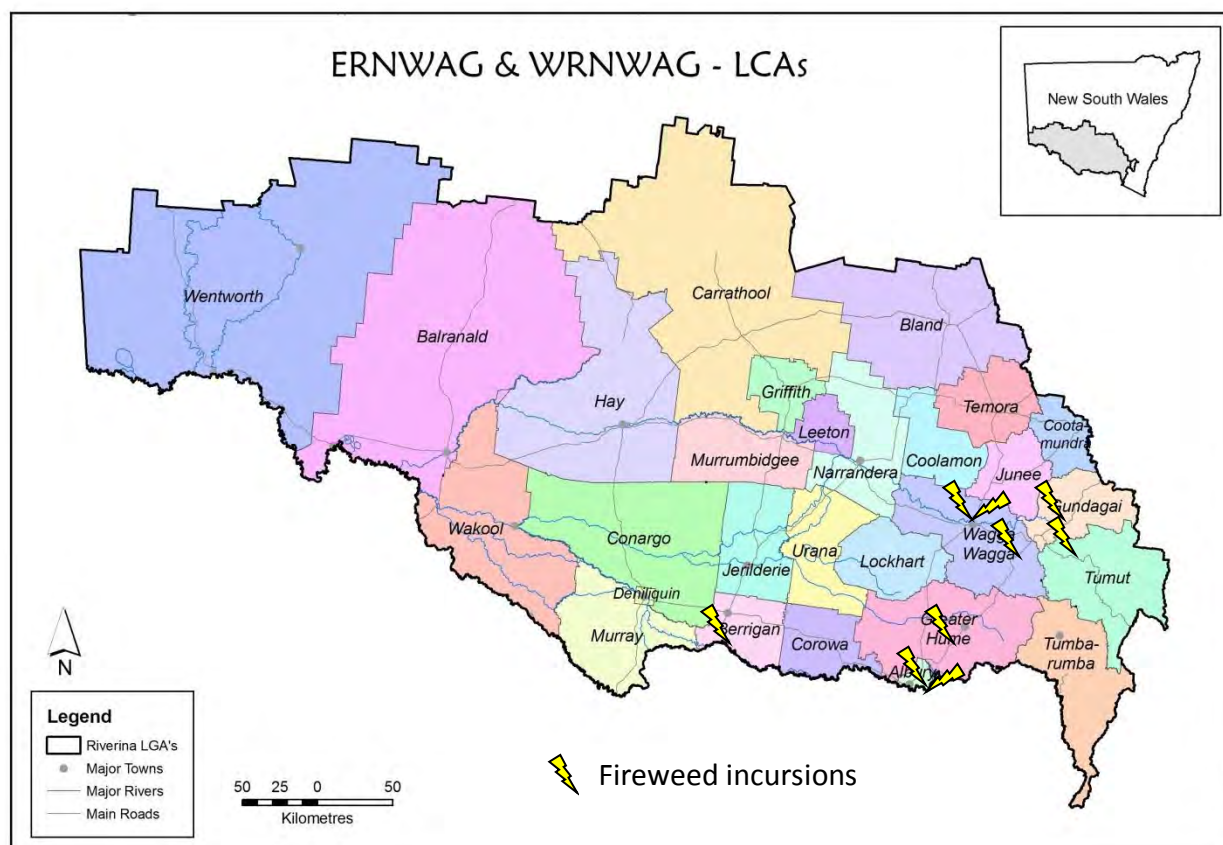
2.1.2 Develop and implement plans for priority weeds in consultation with stakeholders.

Aim: To protect primary production, the environment and land managers from the negative impact of fireweed by preventing its establishment within the Riverina.

Objectives:

1. Prevent the establishment of fireweed in the Riverina.
2. Eradicate fireweed incursions.

Area of operation: Riverina LCAs.



Key Stakeholders:

The following Local Control Authority (**LCA**) and Livestock Health & Pest Authority (**LHPA**) members of the Eastern Riverina Noxious Weeds Advisory Group and Western Riverina Noxious Weeds Advisory Group (**ERNWAG & WRNWAG**): Albury City, Balranald Shire, Bland Shire, Carrathool Shire, Central Murray County, Coolamon Shire, Cootamundra Shire, Corowa Shire, Griffith City, Greater Hume Shire, Gundagai Shire, Hay Shire, Jerilderie Shire, Junee Shire, Leeton Shire, Lockhart Shire, Murrumbidgee Shire, Narrandera Shire, Riverina Eastern Noxious Weeds Authority (RENWA), Temora Shire, Tumbarumba Shire, Tumut Shire, Urana Shire, Wagga Wagga City, Wakool Shire, Wentworth Shire, Hume LHPA, Riverina LHPA and Western LHPA. NSW Department of Primary Industries (**NSW DPI**), Lachlan, Murray and Murrumbidgee Catchment Management Authorities (**CMAs**), Roads and Maritime Services (**RMS**), NSW Farmers and neighbouring landholders.

Background: (source: Primefact 126)

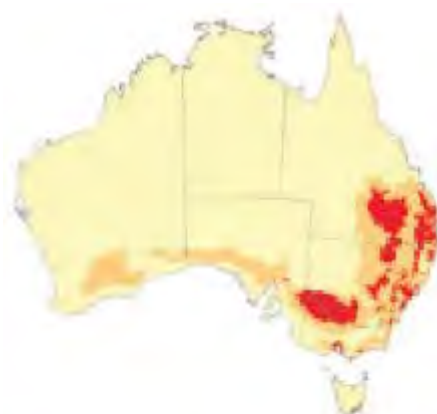
Fireweed (*Senecio madagascariensis*) is a highly invasive and opportunistic weed native to south eastern Africa. It quickly colonises overgrazed pastures and disturbed areas. Fireweed is a serious pasture weed of coastal NSW that has been detected at 4 separate locations along one of the Riverina's high risk pathways (Hume Freeway). It is able to grow on most soil types and in all aspects. It forms a persistent seed bank if not controlled before it flowers and can rapidly take over heavily grazed and neglected pastures, competing strongly with existing pasture plants. It seeds prolifically and grows to maturity quickly.

Fireweed contains pyrrolizidine alkaloids that are toxic to livestock and cause liver damage. Young or hungry stock or new stock, not previously exposed to fireweed, are the most at risk of poisoning. All parts of the plant at all stages of growth are toxic. Hay, silage or grain that is contaminated with fireweed plants or their seeds can also be toxic. Pyrrolizidine alkaloids cause liver damage and this can result in a variety of clinical syndromes in livestock. The liver damage caused by fireweed is irreversible and there is no antidote for toxic pyrrolizidine alkaloids.

Sheep and goats are more inclined to eat fireweed than cattle and are up to 20 times more tolerant of pyrrolizidine alkaloids. Horses are more susceptible to fireweed poisoning than cattle or sheep.

The "Do Nothing" Option (potential distribution map right):

If control activities are not undertaken, fireweed has the potential to significantly expand its range. The potential distribution of fireweed (as published in *Weed Management Guide – Fireweed WoNS*) is the majority of Riverina.



Distribution of Riverina Infestations (see map on page 1):

Albury City – Two isolated plants were found on the centre median strip of the Hume Freeway 1 km north of the Thurgoona Drive off ramp by a passing motorist in August 2009. The plants were removed immediately and their identification was confirmed by the botanical gardens. (498,347.78; 6,011,542.01)

Greater Hume Shire – Two isolated plants were found on the Hume Hwy near the Wangoola motocross track in November 1996.

Gundagai Shire – plants were found in the garden at Hungry Jacks off the Hume Hwy in September 2010. Identification was confirmed with a neighbouring LCA Weeds Inspector.

Tumut Shire – an infestation on private property was confirmed by an agronomist as fireweed. All plants were pulled and burnt prior to the weed officer being informed in September 2011.

Wagga Wagga City – an isolated fireweed plant was found on the old Narrandera rd, 150 m west of the Pine Gully rd intersection in June 2011. The plant was flowering and removed immediately. A second isolated fireweed plant was found on the Hume Highway at Keajura in May 2012 (in between the Sturt loop and the Ladysmith rd on the southern side of the Highway). Only 1 plant was found in full flower with one floret about to disperse. Approximately 50 plants were detected at a newish park/playground in Mima St, Glenfield Park in June 2012. It is likely to have come in the turf.

Wodonga (Victoria) – A single fireweed plant was found in a median strip on Victoria Cross Parade, in a recently landscaped section across from the White Box Rise development in June 2012. Although not declared, DPI Victoria has recorded the site of infestation and will continue to monitor it.

Old herbarium records – indicate there are two more potential sites in the Riverina along the Murray River (NSW/VIC border). Central Murray County Council inspected one of the records in Finley but couldn't find any evidence of the listed infestation. It may be a case of mistaken identity.

Method and Rate of Spread: (source: Primefact 126)

The light fluffy seeds of fireweed are easily spread by wind. This is the main method of local spread. Most seed will fall within 5 m of the parent plant but some seed can be spread to greater distances in updrafts and whirlwinds. However, the fluffy pappus is easily detached from the seed and what may appear to be fireweed seed blowing long distances on the wind may in many cases be only the detached pappus. Dispersal beyond 1 km is more likely to be caused by unintentional spread by human activity. A component of this plan is to distribute identification and awareness material so people "Don't bring fireweed home"!

Other significant means of spread may include:

- livestock;
- clothing, vehicles and machinery;
- contaminated hay, silage, soil, landscaping and grain products;
- as well as spread by wild and feral animals.

Species Management:

Early detection is vital to prevent fireweed from establishing. Once detected, it is important to act immediately to prevent the problem from becoming worse. Fireweed can be effectively controlled through pasture improvement/reduced stocking rates, selective herbicide or grazing

with sheep and goats. Hand weeding is effective and commonly used for small outbreaks, or on small farms. Whatever the situation, once established, fireweed is extremely difficult to eradicate. Therefore follow-up treatment is essential for control to be successful.






The following documents contain a range of best practice management advice and can be downloaded freely:

- primefact <http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/profiles/fireweed>
- WoNS weed management guide <http://www.weeds.org.au/WoNS/fireweed/>
- best practice management <http://www.ruralfutures.une.edu.au/fireweed/publications.htm>

Declaration Status:

Fireweed is currently not declared anywhere in the Riverina. A major goal of this plan is to support Eastern Riverina's region-wide Class 3 declaration. Class 3, Regionally Controlled Weeds, must be fully and continuously suppressed and destroyed.

Weed Biology: (source: Primefact 126) Photos: Harry Rose, Brian Sindel & Michael Coleman

Fireweed	A daisy-like plant that typically grows to 50 cm high. It has a variable growth habit and leaf structure, but the most common form of fireweed is a low, heavily branched, annual or short-lived perennial plant.	
Leaves	Generally bright green in colour, fleshy and narrow, are 2–7 cm long, alternately arranged on the stem, and have serrated, entire or lobed margins. Broader leaves usually clasp around the stem.	
Flowers	Small, yellow and daisy-like, are 1–2 cm in diameter and arranged in clusters at the end of each branch. They can number from 0 to 200 per plant, and each flower will commonly have 13 petals. Flowers all year round but mainly in spring.	
Seeds	Small (1–3 mm long), light and slender. They are cylindrical in shape and have a downy surface. They are attached to a pappus, consisting of fine, silky, white feathery hairs that aid in dispersal by wind. Most seeds germinate in autumn.	
Roots	Fireweed has a shallow, branched taproot with numerous fibrous roots growing from 10 to 20 cm deep	

Regional Action Plan:

OBJECTIVES	WoNS	ACTIONS	PERFORMANCE INDICATORS	WHO'S RESPONSIBLE
1. Prevent the establishment of fireweed in the Riverina	1.2.2 & 1.1.3	1. Distribute identification and awareness material where early detection is needed and cover good hygiene practices for weed management	Id and awareness material disseminated to key areas	LCAs, RNWPO
		2. Timely reminder to weed officers when fireweed is flowering so they can be looking for new infestations during routine field work	Reminder circulated annually to all weed officers when fireweed is in flower	LCAs, RNWPO
		3. Timely dissemination of information to the general public when fireweed is in flower (spring)	Media release, Chinwag article at onset of flowering	LCAs, RNWPO
	1.3.1	4. Inspect high risk sites & pathways (Hume Freeway)	High risk sites etc inspected as per HR pathways & sites management plan	All LCAs
	1.3.2	5. New incursions managed according to best practice	All new infestations are managed	All land managers
	3.1.1	6. Map all new infestations. Provide details to RNWPO for regional distribution	Updated map available upon request	LCAs, RNWPO
		7. Submit regional application for CC3 declaration to DPI	Application collated & submitted	LCAs, RNWPO
		8. Inform the community of fireweed's declaration status once gazetted CC3	Media release distributed	LCAs, RNWPO
2. Eradicate fireweed incursions.	3.1.1	1. All known sites searched for plants (missed the previous year or newly germinated). Remove all plants. Update maps where needed	All found plants removed from known sites prior to seeding. Regional map updated as needed	LCAs, other land managers
		2. Support & submit funding applications to relevant bodies to optimise opportunity for new resources where needed	Letters of support. Funding applications	RNWPO, RWACs, LCAs
		3. Coordinate, monitor and review implementation of this Plan; report to stakeholders	Effectiveness & relevance of the plan reported to stakeholders	RNWPO, LCAs, other stakeholders
Desired outcome:		The Riverina's primary production and land managers are protected from the negative impacts of fireweed.		

Linkages and resources:

- Australian Weeds Committee (2012) Weeds of National Significance Fireweed (*Senecio madagascariensis*) Draft Strategic Plan. Australian Weeds Committee, Canberra.
- Bronwen Wicks, NSW DPI Weed Management Guide – Fireweed WoNS.
- Bega Valley Fireweed Association www.fireweed.org.au
- Primefact 126 – Fireweed (2009) NSW Department of Industry and Investment.
- B. Sindel and M. Coleman (2012) Fireweed – A Best Practice Management Guide for Australian Landholders.
- B.A. Auld and R.W. Medd (1997) Weeds, An Illustrated botanical guide to the weeds of Australia, Inkata Press.
- F.J. Richardson, R.G. Richardson and R.C.H Shephard (2006) Weeds of the south-east – An identification guide for Australia, R.G. & F.J. Richardson.
- W.T. Parsons and E.G. Cuthbertson (2001) Noxious Weeds of Australia 2nd Edition, CSIRO Publishing.
- Ash, P & Verbeek, B (2007) Regional Weed Strategy Murrumbidgee Catchment.
- Bosse, P & Verbeek, B (2008) Regional Weed Strategy Murray Catchment.
- NSW Invasive Species Plan 2008-2015
- Notifiable weed reporting form – available from NSW DPI extranet
<http://extranet.dpi.nsw.gov.au/weeds/permit-report/report/notifiable-reports>

Review:

This plan sits under the Riverina WAP (3.2.2.14) and is to be reviewed after 5 years.

Endorsed by:

ERNWAG
On
13th June 2013

WRNWAG
On
4th June 2013

WAP 1.2.3 Regional Inspection Policy

NSW Invasive Species Plan. Goal 1: Exclude	
Prevent the establishment of new invasive species	1.2 Develop and implement early detection capabilities
Regional Weed Strategy. Aim: Preventative Weed Management	
No new weeds naturalised over the life of the RWS	1.1.8 Implement a targeted inspection program on private properties and roadsides

This policy sets out Council's noxious weeds inspection program. The inspection program aims to detect new and emerging weeds before they become established in the region. Early detection and rapid response offer the most strategic and cost effective form of weed management. Consistency in the inspection policy across the region is critical for effective weed management.

1. Background

Council has demonstrated its commitment to achieving inspectorial targets by becoming a participating partner of the Riverina WAP.

2. Associated Legislation

Noxious Weeds Act 1993

3. Policy

3.1. Inspections of properties

- 3.1.1.** Council weed inspector will ensure residential and rural properties within the council area are inspected for weeds as per their individual LCA inspection policy. Council to supply Riverina Noxious Weeds Project Officer with policy.
- 3.1.2.** The target number of property inspections (including businesses and council managed lands) per year are set out in Councils activity spreadsheet as submitted for the Riverina WAP.
- 3.1.3.** Council will make every effort to reach these targets each year.

3.2. Inspections of High Risk sites & High Risk pathways

- 3.2.1.** Council weed inspector(s) will ensure the target number of HR site and HR pathway inspections are met as per the Riverina WAP submission. Refer to HR Pathways WAP 1.1.1 for a complete list of HR sites and HR pathways.

3.3. New incursions

- 3.3.1.** Upon finding a new incursion – the Rapid Response Plan WAP 2.2.1 will be implemented.

4. Endorsement/recommendation

All Riverina Councils have adopted this policy.

Performance Point - High risk pathways December 2011



NSW WEEDS ACTION PROGRAM

Performance point

December 2011

Project details

Riverina Weeds Action Program

High risk pathways

Eastern and Western Riverina Noxious Weed Advisory Groups

Performance overview

Identifying and documenting high risk pathways for new weed incursions is a first year activity to be completed for the Riverina Weeds Action Program. Once identified high risk sites can be appropriately inspected to mitigate the establishment of new weeds in the Riverina area. This activity is a component of a suite of planning and process documents being developed in the Riverina to ensure effective, coordinated weed surveillance and detection capabilities.

Activities completed

A literature review to identify existing information about weeds spread pathways has been completed. Collection of historic data on new weed incursions from all Local Control Authority areas, their site and pathway of introduction has been compiled into a Riverina wide database. This data and analysis of literature has formed the basis of developing the High Risk Pathways Management Plan. Associated plans and processes that have been developed include the Rapid Response Plan, New Incursion Plan - High Risk Species and Riverina Inspection Policy.

Outcomes

Twenty seven organisations (including Local Control Authorities and Livestock Health and Pest Authorities) have contributed data and provided information for the development of the High Risk Pathways Management Plan. The Plan has been distributed for final endorsement. The Plan incorporates prioritisation of various pathways and sites in to high, medium and low risk sites. Each of the priority sites identified has been allocated the appropriate level of risk. All participating organisations have agreed on the number of inspections that will be undertaken each year for each identified site.

During the first year of operation 2,948 individual high risk sites were inspected across the Riverina this equates to 63,463 hectares. **No new weeds were found.**



Figure 1. Front page of draft High Risk Pathways, Rapid Response and New Incursions Management Plans

Further information

Paula Bosse, Riverina Noxious Weeds Project Officer, T 02 6026 3800 M 0428 684 264
pbosse@greaterhume.nsw.gov.au, www.riverinaweeds.org.au

ISP Goal 1: Exclude

...NSW Weeds Action Program – *Performance point*

ISP Goal 2: Eradicate or Contain

WAP 2.1.1.9 Vehicle Hygiene Protocol

NSW Invasive Species Plan. Goal 2: Eradicate or Contain	
Eliminate, or prevent the spread of new invasive species	2.1 Timely detection of new incursion
Regional Weed Strategy. Aim: Preventative Weed Management	
No new weeds established over the life of the RWS	1.3.1 Develop vehicle hygiene protocol and promote as best practice

The smallest of seeds can be carried far and wide by vehicles, machinery and equipment potentially spreading weeds to farms and bushland across the Riverina. Although preventing the spread of weeds can be difficult, it is the cheapest and most effective method of weed control.

The purpose of this protocol is to ensure a consistent approach across the Riverina towards vehicle hygiene. The below details three easy steps to **prevent weed spread!**:



Avoid driving through infestations:

- Be aware of weed infestations
- Avoid driving in weed infested areas especially in wet & dewy conditions
- Avoid operating in infestations during peak seed production

Inspect and clean clothing and equipment:

- Inspect and clean vehicles, machinery and equipment suspected of carrying weed seed before moving on
- Inspect and clean clothing and footwear before stepping into vehicles
- Inspect and clean vehicles before entering a property

Report suspicious plants:

- Work in clean areas (or areas with least amount of infestation) first and work towards infested or high density areas
- Keep high risk sites & pathways free of weeds
- Maintain buffer zones and encourage 'come clean, go clean'

Desired outcome: Early detection is the key to effectively controlling weed infestations, and if new sites are found early eradication may be possible.

Legal responsibilities

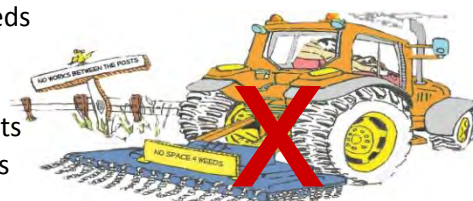
Under Section 30 (1) of the Noxious Weeds Act 1993 "a person must not scatter or cause to be scattered on any land or water any notifiable weed material or other noxious weed material prescribed by the regulations, knowing it to be such weed material."

Current Riverina hygiene projects



Red guide posts are being installed along roadsides throughout the Riverina to:

- Identify known locations of noxious weeds
- Alert machinery operators of the site
- Encourage liaison with local council weed officers on each site's requirements
- Prevent further spread of noxious weeds



If you come across a red guide post on the roadside, please contact the local council weed officer before entering the site. See examples of red guide posts "Start" of infestation and "End" of infestation. No works between the posts!



The 'NSW – No Space 4 Weeds' program is a state-wide weed awareness program. It highlights that weeds are everyone's problem and provides opportunities for the community of NSW to become

part of the solution. The current theme is hygiene 'make a difference – at home at work at play'. Some of the resources from this campaign: Boat ramp signage installed across the Riverina; hygiene awareness billboard on display throughout the Riverina and NSW DPI hygiene poster.



Figure 4. Tumbarumba Shire's vehicle wash down bay.

Resources

- QLD Weed Spread Prevention Strategy
- QLD checklist for Inspection Procedures
- A guide for machinery hygiene for civil construction

<http://www.civilcontractors.com/resource-guide-for-machinery-hygiene-for-civil-construction-available-for-general-use>



Endorsed by:

ERNWAG

On

13th June 2013

WRNWAG

On

4th June 2013

WAP 2.2.1 Rapid Response Plan

NSW Invasive Species Plan. Goal 2: Eradicate or Contain	
Eliminate, or prevent the spread of new invasive species	2.2 Develop rapid response plans
Regional Weed Strategy. Aim: Preventative Weed Management	
No new weeds naturalised over the life of the RWS	1.1.4 Develop a rapid response program for new incursions in the region

The purpose of the rapid response plan is to ensure a consistent approach to the management of new incursions of High Risk species throughout the Riverina. When a new incursion is found, this plan outlines specific procedures (Figure 1) and recommended actions (Table 1) to be undertaken upon finding a new incursion of a Category A or B weed. Only those weeds already declared noxious are bound by legal obligations.

Incursion	"An isolated population of an invasive species detected in an area where it has not been previously established."
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As defined in the NSW Invasive Species Plan 2008-2015

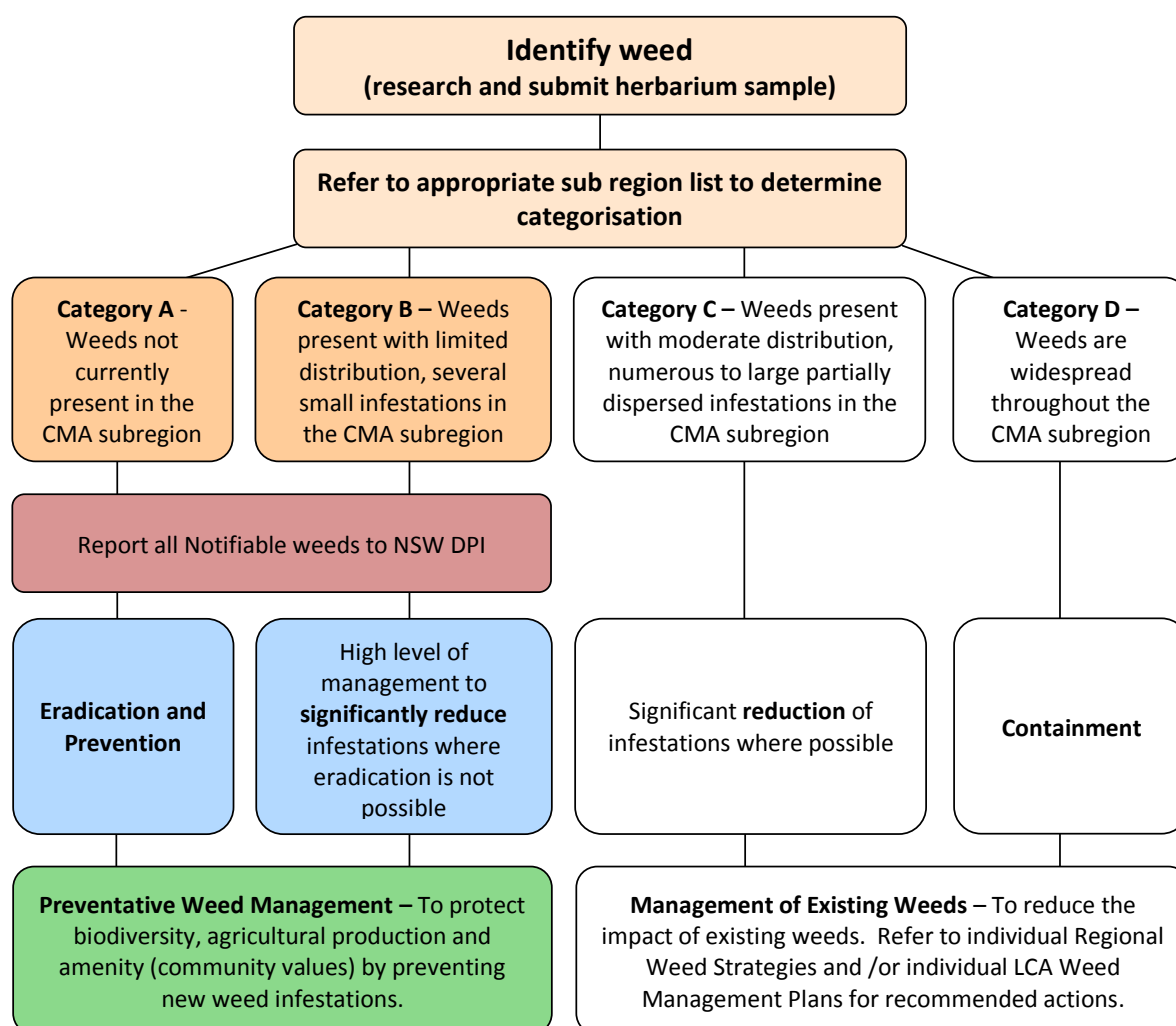


Figure 5 - Flowchart for coordinated rapid response according to weed categorisation

Table 2 - Weed categories requiring Rapid Response, recommended actions and desired outcome

Category A – Weeds not currently present in a CMA sub region	
Quarantine	Quarantine the area and remove infestations/plants (where possible) within 7 days (species dependant)
Awareness	Hold a spot field day with surrounding neighbours upon identification/finding
Report	Report notifiable weeds (Class 1, 2 or 5) to NSW DPI Weeds Hotline 1800 680 244 or email form to weeds@dpi.nsw.gov.au
Publicity	Widespread publicity using mass media: become proactive with established groups and increase awareness of the key features of these weeds during property inspections (LCAs)
Record	Record all details of outbreak including photos and any other relevant information
Map + surveillance	Map infestation and survey surrounding area to determine possible sources of infestation
Monitoring	Monitor for re-emergence, treat as needed, update records
Desired outcome	Eradication and prevention
Category B – Weeds present with limited distribution, several small infestations in a CMA sub-region	
Isolate	Remove and/or isolate infestations using best management practices
Report	Report notifiable weeds (Class 1, 2 or 5) to NSW DPI Weeds Hotline 1800 680 244 or email form to weeds@dpi.nsw.gov.au
Publicity	Utilise media (newsletters, existing networks) to raise awareness
Awareness	Hold field days to focus on the distribution of the weed
Raise Profile	Become proactive with established groups. Fact sheets to be made available stating what needs to be done and why it is needed. Increase awareness of the key features of these weeds during property inspections (LCAs)
Record	Record all details of outbreak including photos
Map + surveillance	Map infestation and survey surrounding area to determine possible sources of infestation
Monitoring	Monitor for re-emergence, treat as needed, update records
Desired outcome	High level of management to significantly reduce infestations where eradication is not possible

Refer to High Risk Species WAP 1.2.1 for complete list of High Risk Species in the Riverina.

New Incursion Plan – Alligator weed 2013-2018

National alligator weed strategic plan. Goal 1: New alligator weed infestations are prevented from establishing.

1D Maintain and monitor outlier eradication and containment programs.

Strategic action - maintain and monitor alligator weed eradication and containment programs at all existing outlier sites

NSW alligator weed strategy. Goal 2: Eradicate or contain

Prevent and reduce the spread of alligator weed

2.2.3 Apply current best practice control techniques at all alligator weed sites

Regional weed strategy. Aim: Preventative weed management

No new weeds naturalised over the life of the RWS

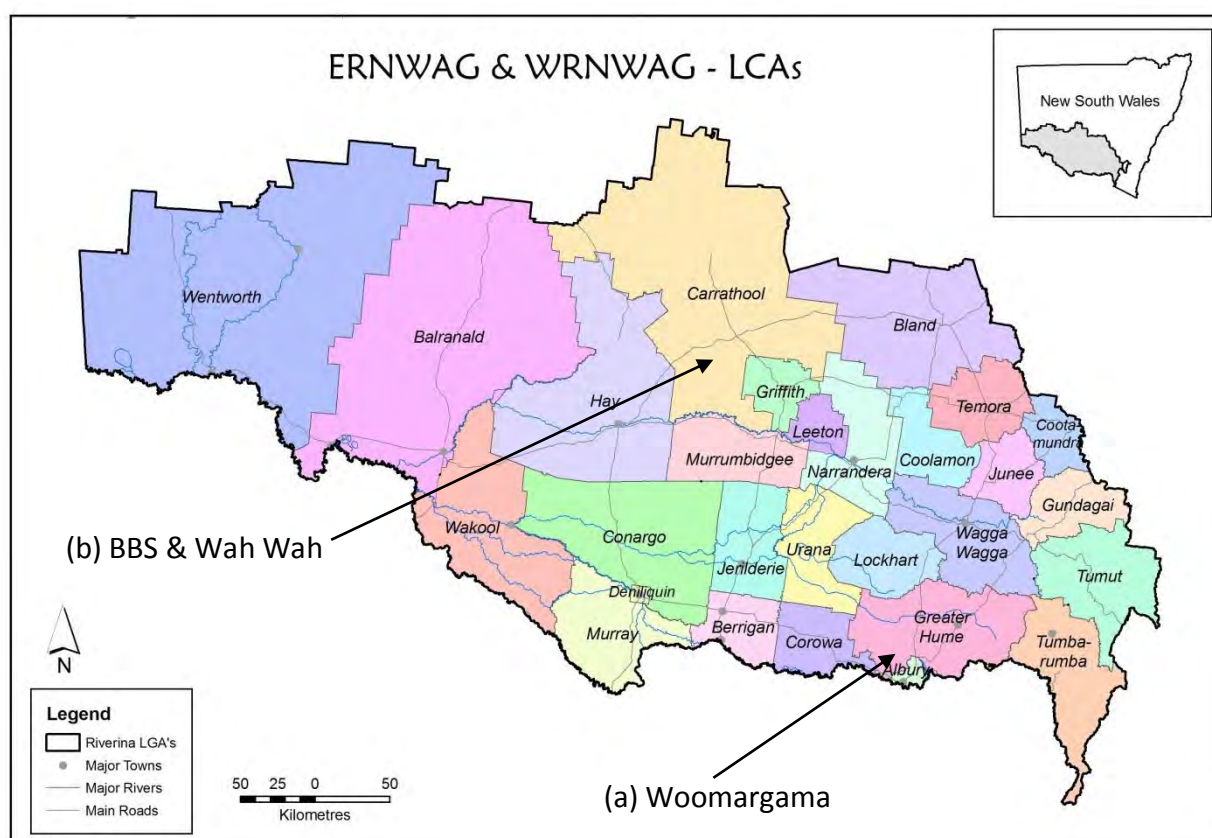
2.1.2 Develop and implement plans for priority weeds in consultation with stakeholders.

Aim: To protect clean areas and reduce the spread of alligator weed across the Riverina.

Objectives:

1. New alligator weed infestations treated within 7 days of detection (as guided by the recognising water weeds, early detection survey guidelines).
2. Eradicate known alligator weed infestations.
3. Support landholder control works.
4. Actively promote and provide extension and awareness materials.

Area of operation: Riverina LCAs – known infestations at Woomargama (a), Barren Box Swamp and surrounding channel systems (b).



Key Stakeholders:

The following Local Control Authority (**LCA**) and Livestock Health & Pest Authority (**LHPA**) members of the Eastern and Western Riverina Noxious Weeds Advisory Groups (**ERNWAG & WRNWAG**): Albury City, Balranald Shire, Bland Shire, Carrathool Shire, Central Murray County, Coolamon Shire, Cootamundra Shire, Corowa Shire, Griffith City, Greater Hume Shire, Gundagai Shire, Hay Shire, Jerilderie Shire, Junee Shire, Leeton Shire, Lockhart Shire, Murrumbidgee Shire, Narrandera Shire, Riverina Eastern Noxious Weeds Authority (**RENEWA**), Temora Shire, Tumbarumba Shire, Tumut Shire, Urana Shire, Wagga Wagga City, Wakool Shire, Wentworth Shire, Hume LHPA, Riverina LHPA and Western LHPA. Farmers of the Wah Wah Irrigation District; Murrumbidgee Irrigation (**MI**); NSW Department of Primary Industries (**NSW DPI**); Lachlan, Murray and Murrumbidgee Catchment Management Authorities (**CMAs**); Office of Environment and Heritage – Parks and Wildlife Group (**OEH**); NSW Farmers, Coleambally Irrigation (**CI**), Murray Irrigation Limited (**MIL**) and neighbouring landholders.

Background:

Alligator weed is a native of South America and is believed to have been introduced to Australia in shipping ballast. It is a weed of national and regional significance because of its invasiveness, potential to spread, and environmental and economic impacts. It can grow in water and on land, and has been mistakenly grown in the past, confused with Mukunuwenna (a Sri Lankan vegetable). Alligator weed is capable of growing from plant fragments and therefore easily spread when broken off by stock, machinery or recreational activities.

Alligator weed blocks irrigation channels and water storage facilities; chokes waterways and prevents birds and other wildlife from using them; depletes oxygen levels in the water, reducing fish stocks; replaces native aquatic plants; invades horticulture, turf and cropping systems; and interferes with water based recreational activities.

Weed Biology: (source: NSW Alligator Weed Strategy 2010-2015)

Alligator weed is a perennial, stoloniferous, herbaceous plant. It is identified by its hollow stems; white, papery, ball-shaped flowers on short stalks; and the glossy spear-shaped leaves arranged in opposite pairs along the stem. They are 2–12 cm long, 0.5–4 cm wide with an acute tip.

In water, alligator weed stems can grow up to 2 m long and form dense, buoyant mats, up to 1 m thick, extending up to 15 m across the water surface. On land the plant has a prostrate form with shorter stems and reddish brown roots, with taproots extending to a depth of 2 m.

Distribution of Infestations:

There are five known infestations of alligator weed in the Riverina. The first was detected in a private dam at Woomargama in 1971. It was believed to have been accidentally introduced with ornamental pond plants in the 1960s. By the time it was detected alligator weed covered the 1700 m² dam and occurred in scattered infestations up to 3 km downstream of the dam overflow. The infested dam overflows into the Mountain creek that then runs into the Billabong creek that stretches across the Riverina, eventually ending up in the Murray River.

Ongoing monitoring and management over 40+ years have controlled but not yet eradicated this infestation. During the 2010/11 growth season, inspections were carried out every 5-6 weeks. With the assistance of the Murray CMA, NSW DPI & Greater Hume Shire there has been an increase in detections, improved mapping of the individual plant locations as well as on the spot hand removal with follow up spraying where necessary. Approximately 2 km downstream of the last known site was inspected with no alligator weed being detected. Over the last 40 years approximately \$110,000 (excluding in-kind contributions) has been invested at Woomargama.

The second alligator weed site was detected in February 1994, when a large infestation was discovered in Barren Box Swamp (BBS) and surrounding channel systems, near Griffith. The initial infestation covered approximately 12 kms of shoreline of BBS and 44 km of channel system and floodway and appeared to have been in the district at least 2 years prior to being detected. By March 1994 two terrestrial sites had been detected. The 1st covered approximately 500 m² on the foreshore of BBS and the second was detected in a rice crop in the Wah Wah Irrigation District.

Over the last 4 years significant success has been achieved with manually removing known infestations. Weed officers have detected plants growing under salt bush with root systems travelling up to 2 m deep and stems sprawling 4 m wide. Vigilance and patience is slowly paying off with less regrowth occurring each year. To date approximately 50 active sites persist on private lands and in the associated channel systems. Within BBS and the associated channel systems approximately 30 active sites are persisting. If left unchecked this infestation would have cost irrigation farmers in the Murrumbidgee Irrigation Area up to \$250 million annually. In excess of \$2.2 million has been spent on the eradication of this infestation, with maintenance programs in place and monitoring being ongoing.

The last line of defence: a box culvert established at Cameron's Lane, designed to prevent vegetation flowing under this road. Alligator weed has not been detected west of this culvert. It is imperative to maintain this culvert and undertake frequent inspections to prevent the spread of fragments further west where the floodway eventually joins the Lachlan River.

A distribution map of the current alligator weed infestations in the BBS and Wah Wah Irrigation Area needs to be compiled as a priority. The infestation at Woomargama (see aerial map on page 43) is confined to the private dam (a), adjoining paddock (b) and Mountain creek (c).

Backyard infestations: In 1996 NSW Agriculture embarked on a state-wide search after finding alligator weed growing in backyards of Sri Lankan migrant families. Alligator weed looks similar to the Sri Lankan vegetable Mukunuwenna or Poonankani (*Alternanthera sessilis*), and was identified in more than 30 backyards throughout NSW after it was mistakenly purchased and planted in the residential gardens. Correspondence and extension material was developed by NSW Agriculture and circulated to LCAs along with a list of Sri Lankan families in the area. All residential areas were inspected and any residents found mistakenly growing alligator weed were given a Mukunuwenna plant as replacement. In 1996 alligator weed was detected in residential backyards in the following Riverina townships: Albury, Culcairn, Griffith, Hay, Narrandera and Wagga Wagga.

Backyard infestation details were distributed to weed officers in March 2012. All sites were reinspected and AW has been detected in 3 of the residential backyards that were infested 16 years ago. The first infestation confirmed in a backyard in Wagga Wagga and the other two in separate backyards in Albury.



The “Do Nothing” Option:

This weed has the potential to dominate all wetlands, natural waterways and all irrigation channel systems within the Lachlan, Murray and Murrumbidgee catchments. The irrigation industry in the Riverina would suffer significant extra costs if alligator weed was left unmanaged. Every new infestation in the Riverina will increase exponentially the risk of further spread of alligator weed.

If all current control works were to cease in the BBS and Wah Wah Irrigation District, alligator weed could dominate many aquatic areas within two years and continue to increase exponentially. A flood through Mirrool creek system would almost certainly spread AW into the Lachlan, Murrumbidgee and Murray River systems and associated wetlands. If the Woomargama infestation were left untouched, the dam would soon be completely dominated by alligator weed. This would result in the Mountain and Billabong creeks and eventually the Murray River and associated wetlands being infested with alligator weed.

Method and Rate of Spread:

Under warm moist conditions alligator weed grows rapidly, with reproduction in the field being entirely vegetative, as seeds are not viable under Australia’s conditions. Fragments of alligator weed stems containing at least one node are capable of producing new growth. It is commonly spread downstream when the plant is broken up into smaller fragments (eg by floods, or following mechanical or chemical control).

The spread of alligator weed can be significantly reduced by quickly controlling outbreaks; by increasing community awareness and action; and by improving hygienic practices thus preventing the movement of plant fragments by machinery, vehicles, water and livestock.

Species Management:

Early detection and rapid response is essential to prevent establishment of alligator weed. Once established, eradication is very difficult due to the extensive root system of terrestrial plants. Established sites must be continually monitored and treated. It is believed that plant fragments can remain dormant through dry periods for many years, only reappearing when conditions are more favourable.

Management techniques currently being used within the Riverina for controlling Alligator weed include: mechanical (Excavators); physical (digging – hand removal) & chemical removal.

The *Alligator Weed Control Manual: Eradication and suppression of alligator weed (Alternanthera philoxeroides) in Australia* (Oosterhout 2007), contains a range of best practice management techniques and can be downloaded freely from: www.weeds.org.au/WoNS/alligatorweed/

Declaration Status:

Alligator weed is declared Class 2 across the Riverina - The plant must be eradicated from the land and the land must be kept free of the plant.

Under Section 8 (3) of the Noxious Weeds Act 1993 – A noxious weed that is classified as a Class 1, 2 or 5 noxious weed is referred to in this Act as a **notifiable weed**.

Under Section 15 of the Noxious Weeds Act 1993 – An occupier of land (other than a local control authority) on which there is a **notifiable weed** must notify the local control authority for the land of that fact **within 24 hours** after becoming aware that the notifiable weed is on the land.

National Alligator weed Priority Management Actions by NRM Region:

Note: highest priorities are in bold text. High priority regions are highlighted in pink.

NRMRegion	ALLIGATOR WEED Priorities January 2010
Lachlan	Alligator Weed does not occur in this region. Region identified at risk of invasion so surveillance and ID training are key priorities
Murray	Eradication of outlier infestation. Continue eradication efforts at Woomargama and downstream surveillance. Further education and awareness efforts, including ID training
Murrumbidgee	Eradication of outlier infestation. Continue eradication efforts at Wah Wah and Barren Box Swamp and downstream surveillance. Further education and awareness efforts, including ID training

Table 3: Alligator weed priority management actions by NRM region (Information extracted from National Priority Action Frameworks for Alligator weed).

Regional Action Plan:

OBJECTIVES	NSW AWS	ACTIONS	PERFORMANCE INDICATORS	WHO'S RESPONSIBLE
1. New alligator weed infestations treated within 7 days of detection (as guided by the recognising water weeds, early detection survey guidelines)	2.2.1	1. Identify and inspect high risk sites and pathways (Mountain creek, Hume Weir, Wah Wah Irrigators, BBS, channel systems)	High risk sites and pathways listed and inspected 3 times annually as per HR pathways & sites management plan	LCAs, Murrumbidgee Irrigation (MI), RNWPO
		2. Inspect for AW as part of routine property inspection program	# of properties inspected annually	LCAs
	2.1.3	3. Implement rapid response as per current best practice at all new sites	Best practice rapid response applied at all new sites	LCAs + MI + land managers
		4. All new and/or suspect infestations to be reported to the LCA within 24 hrs of finding it	LCAs kept informed of new infestations (notifiable weeds) each season	MI + Land managers
		5. Complete notifiable weed reporting form and submit to NSW DPI	Notifiable weed form received by NSW DPI	LCAs
	2.2.5	6. Record location of all new infestations. Provide details to State AWPO & RNWPO for development of state and regional map	Updated map available upon request	LCAs + MI + Aquatic Weed Project Officer (AWPO) NSW DPI + RNWPO
		7. Notify downstream landholders within 2 weeks of detecting aquatic infestations	Downstream landholders notified when aquatic infestations are detected upstream	MI + LCAs
2. Eradicate known alligator weed infestations		1. Inspect known infested rural properties annually	Properties with known infestations inspected 3 times per annum	Carrathool Shire + Griffith City
		2. Inspect residential backyard infestations annually	Residential properties with infestations inspected annually	Wagga Wagga City, AlburyCity
		3. Inspect BBS and associated channel systems biannually	BBS + associated channels inspected biannually	MI
		4. Inspect Woomargama every 6 weeks during the growing season	Woomargama inspected every 6 weeks during the growing season	GHSC + Land manager
	2.2.3	5. Apply current best practice control techniques at all AW sites	Site specific best practice techniques applied. Number of sites and size of infestations reducing	LCAs + MI + land managers
	2.2.4	6. Monitor and adopt new management techniques where necessary	New techniques working and reported back up the line	LCAs+ MI + land managers
		7. Develop a procedure for all	All organisations have a	LCAs + MI +

		AW sites “What to do if I find AW?” that’s inserted into each property weed management plan	procedure in place outlining what to do when AW is found	Land managers + AWPO + RNWPO
		8. Maintain closure of BBS to public access to prevent spread of AW	BBS closed to the public indefinitely	GCC
		9. MI to liaise with GCC in regard to any earth works at BBS	Lines of communication open.	MI + GCC
		10. Develop a hygiene protocol to prevent the movement of AW in the Riverina	Hygiene protocol developed	RNWPO + LCAs
		11. Circulate hygiene protocol to earth moving contractors working within BBS and associated channel systems	Hygiene protocol circulated	RNWPO + LCAs + MI + land managers
		12. LCAs adopt and enforce hygiene protocol on all infested lands	Hygiene protocol enforced by LCAs	LCAs
		13. Manage grazing in known infested sites to enhance detection and prevent spread of AW	Grazing managed to prevent spread and enhance detection	MI + LCAs + land managers
3. Support landholder control works		1. Review all property weed management plans for each infested property (see 2.7)	All infested properties have a revised plan in place by November 2013	LCAs + Land managers
4. Actively promote and provide extension and awareness materials	4.2.1	2. Should funds become available promote and make use of the NSW AW NS4W TV campaign	TV campaign aired across the Riverina should funding become available	RWACs + RNWPO
	4.2.3	3. Display AW awareness information at events + supply to land managers as it becomes available.	Information displayed at regional field days and LCA events. Land managers kept updated also.	LCAs + RWACs + RNWPO + AWPO
	2.2.6	4. Maintain liaison with AWPO	All stakeholders in direct contact with AWPO	LCAs, RWACs, RNWPO
		5. Support the recognising water weeds training course	Training course held as needed	LCAs, Agency staff, NSW DPI
		6. Minimum of two AW extension activities undertaken annually (field days, media releases etc)	Minimum of 2 extension activities undertaken annually.	LCAs + RNWPO + AWPO + RWACs
Desired outcome: The Riverina’s environment, water resources, infrastructure, primary production, tourism and recreation is protected from the negative impacts of alligator weed.				

Linkages and resources:

- NSW Alligator Weed Strategy 2010-2015, Industry & Investment NSW.
- Recognising water weeds, early detection survey guidelines, WeedED Resource, NSW I&I (2009).
- Recognising water weeds, plant identification guide, WeedED Resource, NSW I&I (2009).
- Alligator weed – can you identify it? NHT and National Aquatic Weeds Management Group flier (2004).
- Alligator weed – an aggressive problem. Rebecca Coventry, NSW Agriculture.
- Beware of Alligator weed, Carrathool Shire Council (2004).
- Alligator weed, Weed of National Significance Weed Management Guide, NHT.
- Agriculture and Resource Management Council of Australia and New Zealand, Australian and New Zealand Environment and Conservation Council and Forestry Ministers, (2000) Weeds of National Significance Alligator Weed (*Alternanthera philoxeroides*) Strategic plan. National Weeds Strategy Executive Committee, Launceston.
- W.T. Parsons and E.G. Cuthbertson (2001) Noxious Weeds of Australia 2nd Edition, CSIRO Publishing.
- B.A. Auld and R.W. Medd (1997) Weeds, An Illustrated botanical guide to the weeds of Australia, Inkata Press.
- F.J. Richardson, R.G. Richardson and R.C.H. Shephard (2006) Weeds of the south-east – An identification guide for Australia, R.G. & F.J. Richardson.
- Julien, M.H (1995) *Alternanthera philoxeroides*, PP1-12 in Groves, R.H., Shepherd, R.C.H and Richardson, R.G (Eds). The biology of Australian Weeds Volume 1. Melbourne, R.G and F.J Richardson.
- Alligator weed – State Prohibited Weed – Landcare Notes Jan 1998
- Alligator weed – Agfact
- Alligator weed – it chokes rivers and irrigation systems and is extremely difficult to control, NSW Ag, AWTaskforce and MDBC.
- Don't mistake AW for Mukunawanna. NSW Ag
- You break the law if you move Alligator weed. NSW Ag
- AW- weed fact sheet, Hawkesbury-Nepean Riverbank Management Program.
- Beware of Alligator weed – your property may be threatened.
- Ash, P & Verbeek, B (2006) Regional Weeds Strategy Lower Murray Darling Catchment 2nd Edn.
- Ash, P & Verbeek, B (2007) Regional Weed Strategy Murrumbidgee Catchment
- Bosse, P & Verbeek, B (2008) Regional Weed Strategy Murray Catchment.
- Power, M, Higgins, A, Hasselman, L, Wythes, C and Hil, R (2009) Lachlan Regional Weed Strategy.
- Kahler, M (2011) Alligator Weed – just add water! The history of AW in the Riverina region.
- Base topography map sourced from Google maps.
- NSW Invasive Species Plan 2008-2015
- Notifiable Weed Reporting form – available from NSW DPI Extranet
<http://extranet.dpi.nsw.gov.au/weeds/permit-report/report/notifiable-reports>

Review:

This plan sits under the Riverina WAP (3.2.2.14) and is to be reviewed after 5 years.

Endorsed by:

ERNWAG
On
13th June 2013

WRNWAG
On
4th June 2013

Performance Point - Rapid response plan February 2012



NSW WEEDS ACTION PROGRAM

Performance point

February 2012

Project details

Riverina Weeds Action Program

Rapid Response Plan

Eastern and Western Riverina Noxious Weeds Advisory Groups

Performance overview

Preparing a Rapid Response Plan is a second year activity to be completed for the Riverina Weeds Action Program. The purpose of the rapid response plan is to ensure a consistent approach to the management of new incursions of High Risk species throughout the Riverina. When a new incursion is found, this plan outlines specific procedures and recommended actions to be undertaken upon finding a new incursion of a Category A or B weed. This activity is a component of a suite of planning and process documents being developed in the Riverina to ensure effective, coordinated weed surveillance and detection capabilities.



Figure 1. Parthenium weed

Activities completed

Twenty seven organisations (including Local Control Authorities and Livestock Health and Pest Authorities) have contributed data and provided information for the development of the Rapid Response Plan. The plan has been distributed for final endorsement. Associated plans and processes that have been developed include the High Risk Pathways Management Plan, New Incursion Plan - High Risk Species and Riverina Inspection Policy.

During the first year of operation Jerilderie Shire Council Weeds Inspector, Geoff Portbury discovered an extensive infestation of parthenium weed. The rapid response plan was put into action as parthenium weed is a Category A weed (not currently present in region). Below are the recommended actions (from the rapid response plan) along with the actual activities carried out in Jerilderie to date:

- Quarantine – all flowering/seeding plants removed within 48hrs. Remaining plants removed within 7 days and area treated.
- Awareness – all contacts in the Riverina notified via email of the outbreak. Neighbouring LCAs attended a spotfield day (Figure 4). Neighbouring landholders informed of outbreak and given awareness information. Plant on display (in sealed container) at shire office. Presentations to LHPA and Essential Energy staff.
- Report – notifiable weed reporting form submitted to NSW DPI.
- Publicity – media release distributed and published on website. Interview with ABC radio – resulting in several landholders contacting Geoff and more spotfield days.
- Record – photos taken. Added to Riverina's new incursions database.
- Map + surveillance – GPS coordinates taken. Neighbouring LCAs assist with surveillance and removal of all flowering plants and to ensure no plants are missed.
- Monitoring – ongoing.



Figure 2. Parthenium weed.
Conargo – Jerilderie Rd.

Rapid Response Plan

Outcomes

Jerilderie Shire Council successfully implemented the Rapid Response Plan when Parthenium weed was discovered in their shire on the 1st February 2012.

No issues or limitations identified with the draft rapid response plan.

Desired Outcome: Eradication and prevention.



Figure 3. Parthenium weed rosette



Figure 4. Spot field day with neighbouring LCAs

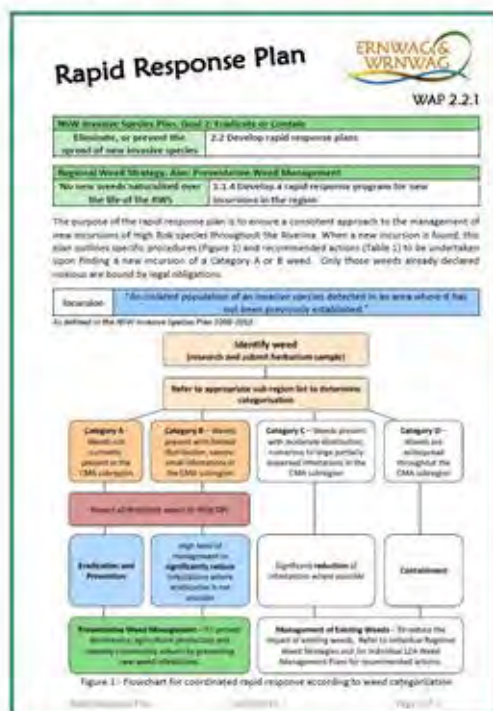


Figure 5. Page 1 of Rapid response plan

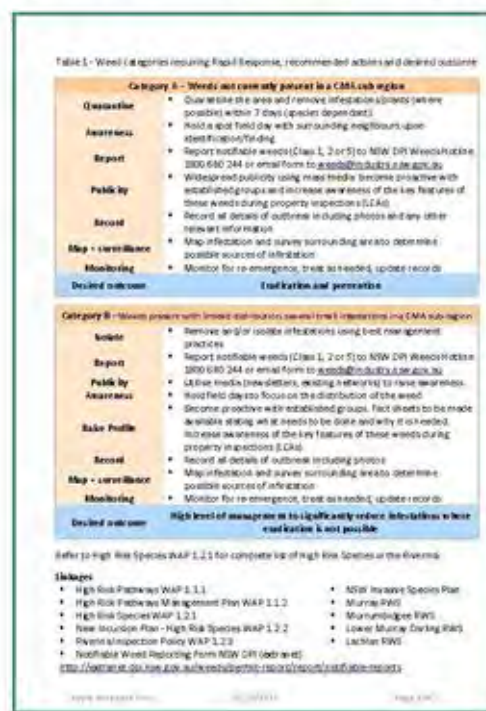


Figure 6. Page 2 of Rapid response plan

Photos: Geoff Portbury & Neil Hibberson.

Further information

Paula Bosse, Riverina Noxious Weeds Project Officer, T 02 6026 3800 M 0428 684 264
pbosse@greaterhume.nsw.gov.au, www.riverinaweeds.org.au

ISP Goal 3: Effectively manage

Weed List Categories

The weed list categories were initially created for the Regional Weed Strategies (RWS) to guide general weed management. Weeds were ranked using the prioritisation process (in the appendix of each RWS). In 2009 weed risk assessments (WRA) were again carried out by LCAs & NSW DPI on all noxious weeds to prioritise control and target resource allocation. The below categories and recommended activities are not bound by legislation but are recommended activities to be undertaken upon finding these weeds. Only weeds declared are bound by legal obligations. Note: Category A & B weeds have already been addressed in WAP 2.2.1 Rapid Response Plan.

Table 4 - recommended actions and desired outcome for Category C and D weeds

Category C – Weeds present with moderate distribution in a CMA sub-region, numerous to large partially dispersed infestation	
Record	Record all details of the infestations including photos and any other relevant information
Manage	Infestations managed as per declaration status
Control	Refer to any available best practice manuals & noxious & environmental weed control handbook for recommended control techniques & herbicides
Hygiene	Promote hygiene practices to prevent further spread of the weed
Extension	Utilise local media and conduct field days during the main growing season. Provide educational material to affected landholders during property inspections (LCAs)
Map + surveillance	Map infestation and survey surrounding area
Monitoring	Monitor for re-emergence, treat as needed, update records
Desired outcome	Significant reduction of infestations where possible

Category D – Weeds are widespread throughout the CMA sub-region	
Record	Record all details of the infestations including photos and any other relevant information
Contain	Create buffer zones around infestation sites to prevent spread
Control	Identify priority sites where benefits of control are greatest and aim to eradicate from these sites. Refer to any available best practice manuals & noxious & environmental weed control handbook for recommended control techniques & herbicides
Hygiene	Promote hygiene practices to prevent further spread of the weed
Extension	Provide educational material to affected landholders during property inspections (LCAs)
Map + surveillance	Map infestation and survey surrounding area
Monitoring	Monitoring to occur through the inspection program. The weed should not be allowed to spread from its known location.
Desired outcome	Containment

ISP Goal 4: Capacity

WAP 4.3.1 Communication strategy

NSW Invasive Species Plan. Goal 4: Capacity	
Ensure NSW has the ability and commitment to manage invasive species	4.3 Increased community acceptance and involvement in effective weed management

Regional Weed Strategy. Aim: Awareness, Education and Training	
Develop effective communication networks to disseminate information	3.1.1 Develop and implement a communication strategy

This strategy outlines the major communication, extension, training and education activities of Eastern Riverina Noxious Weeds Advisory Group & Western Riverina Noxious Weeds Advisory Group (ERNWAG & WRNWAG) member organisations. The activities are taken directly from the Riverina WAP and 4 Regional Weed Strategies (RWS).

Key messages as adopted from the Australian Weeds Committee Communications Strategy:

1. Weed management is an essential and integral part of the sustainable management of natural resources and the environment, and requires an integrated multi-disciplinary approach.
2. Prevention and early intervention are the most cost effective techniques that can be deployed against weeds.
3. Successful weed management requires a coordinated approach which involves all levels of government in establishing appropriate legislative, educational and coordination frameworks in partnerships with industry, landholders and the community.
4. The primary responsibility for weed management rests with landholders/land managers but collective action is necessary where the problem transcends the capacity of the individual landholder/land manager to address it adequately.

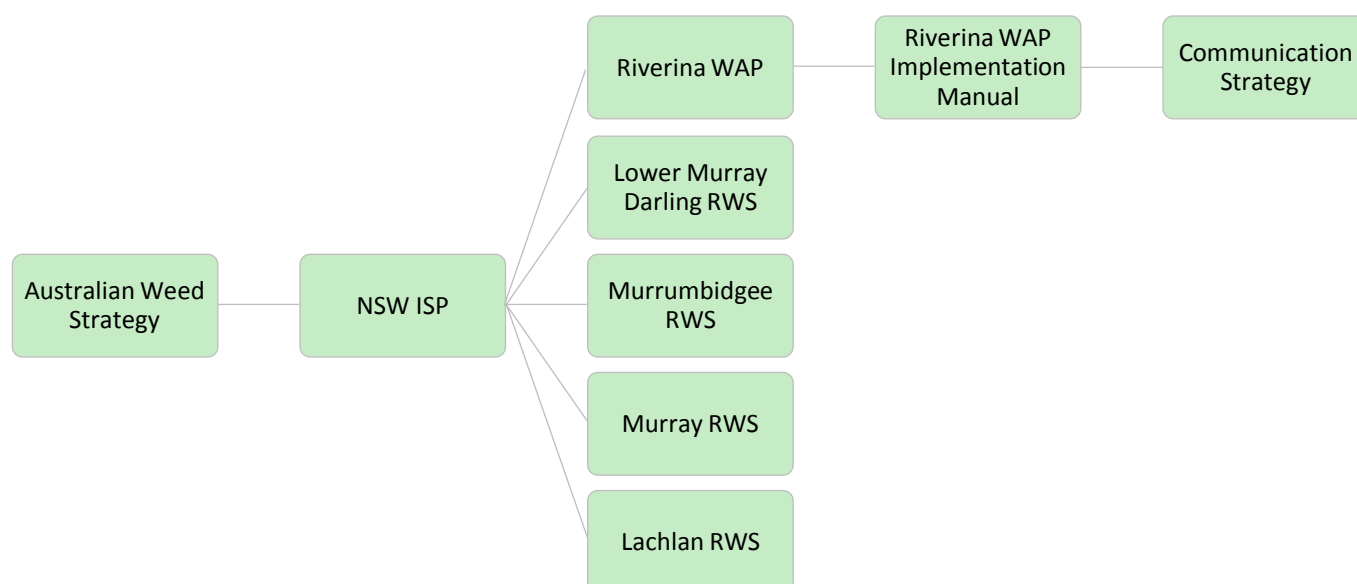


Figure 6: strategic linkages with other relevant weed management documents

Key Stakeholders:

ERNWAG & WRNWAG; LCAs, RNWPO, LLS, NSW DPI; Media bodies, Schools/ universities, ARTC, RMS, OEH, Crown lands, NSW Forestry, Irrigation bodies, Private land managers, Community groups, Landcare, NGIA, relevant cross border agencies, applicable Ministers, Local, State & Federal Government.

Regional Action Plan:

ERNWAG & WRNWAG Aims	Code	Activities	Who is responsible?
Develop and implement regional weed control plans and strategies	4.2 ISP 4.3.2 WAP 3.1.1 RWS	Develop and implement communication campaigns that increase target audience awareness and understanding	All stakeholders
	4.3.2 WAP 3.1.6 RWS	Circulate regular updates on the implementation of this strategy	All stakeholders
	4.2.1.6 WAP	Develop weed management plans for priority weeds in consultation with stakeholders	RNWPO, LCAs
	4.6.1 WAP	Review existing plans and strategies	RNWPO
Promote the awareness of noxious and environmental weeds within the community.	4.3.2.1 WAP	Encourage use of existing weed awareness programs (ie Weed Warriors) in local schools.	LCAs, RNWPO
	4.3.2.2 WAP	Website updated monthly and on an as needs basis www.riverinaweeds.org.au	RNWPO
	4.3.2.3 WAP 3.2.2 RWS	Promote state and national initiatives that raise the profile of weed management (weed buster week, WoNS, grow me instead)	All stakeholders
	4.3.2.7 WAP	Ensure NSW NS4W campaign is tied in with all regional activities	All stakeholders
	4.3.2.11 WAP 3.4.2 RWS	Update Regional Weed Identification Guide (Weeds of the Riverina)	RNWPO
	4.3.2.12 WAP 2.1.7. RWS	Develop Weeds Information Pack including information on Category A Weeds	LCAs
	4.3.2.10 WAP 3.4.3 RWS	Distribute weed awareness resources on priority weeds (High Risk species)	RNWPO, LCAs, CMA
Educate, train and encourage persons and organisations in all matters relating to noxious and environmental weeds	4.3.2.5 WAP 4.3.2.6 WAP	Identify and inform Weed Extension Team Leader of all current regional resources.	RNWPO, LCAs
	4.3.2.8 WAP 3.2.3 RWS	Participate in Weed Awareness Plan reference group meetings/ correspondence	RWACs, NSW DPI, LCAs
	4.3.2.9 WAP 3.3.3 RWS	Develop demonstration sites and run field days to educate land holders on best weed management practices for priority weeds	LCAs, CMA, NSW DPI
Promote the coordination of weed management with all relevant stakeholders on a regional basis	4.3.2.4 WAP 3.4.1 RWS	Produce regular weed management material for the media and relevant publications	RNWPO, NSW DPI, LCAs
	4.2 ISP	Publicise weed management success stories	LCAs, RNWPO
Provide forum for the interchange of information	4.3.2.13 WAP	Attendance and participation at ERNWAG & WRNWAG meetings	All stakeholders
Desired outcome:	To have well informed, well resourced, wide network of people involved in weed management		

WAP 4.6.1 Monitoring, evaluation, reporting and improvement plan

NSW Invasive Species Plan. Goal 4: Capacity	
Ensure NSW has the ability and commitment to manage invasive weeds	4.6 Ability to measure the effectiveness of invasive species management
Regional Weed Strategy. Aim: Monitoring and Evaluation	
Ensure the RWS are implemented and remain relevant working documents	2.1.4 Monitor, review and report on implementation of weed management programs

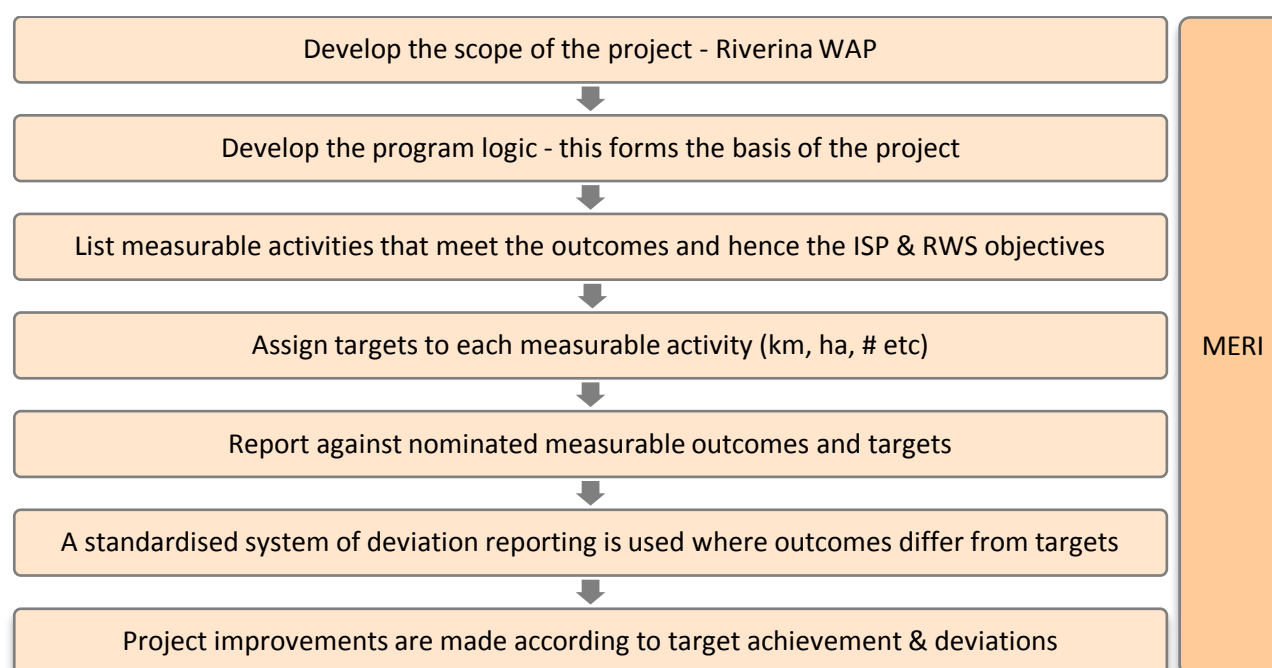
This plan is based on and used in conjunction with our 5 year (Riverina WAP) project application. We are required to document and communicate the outcomes of the Riverina WAP, hence the need for a monitoring, evaluation, reporting and improvement (MERI) plan.

MERI Plan purpose:	To monitor and evaluate the impact and achievements of the project, report on these and offer recommendations for improvement.
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The purpose of this MERI plan is to:

- Outline how MERI will occur throughout the life of the Riverina WAP
- Monitor progress towards the Riverina WAP's stated outcomes
- Provide performance information to help with decision making
- Ensure accountability to funding bodies, including NSW DPI, LCAs, LHPAs, CMAs, RWACs
- Report on project progress and performance
- Remain as a dynamic document that evolves to include improvements as a result of the monitoring and evaluation process.

Figure 7: Planning process undertaken when developing the Riverina WAP



Program logic:	The rationale behind a program – a picture of why and how you believe a program will work.
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Program logic is developed as a program planning tool that provides a framework to monitor and evaluate the performance of the program. The program logic and outline of activities have been used to develop the subsequent sections of this MERI plan.

Reporting:	Will be against the measurable outcomes and targets nominated in the original submission as agreed with NSW DPI.
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Reporting will be in the format supplied within the original submission and accompanied by a lead organisation endorsement and (if necessary) a completed project variation/deviation form. If we don't meet the targets (as a region) agreed to, a project deviation may be required. Each participating organisation is required to submit a completed additional reporting information and expenditure statement to the lead organisation with their annual report.

Deviations:	A request to deviate from the original targets due to unforeseen circumstances.
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There are two types of project deviation:

- Where the targets for the proposed year have not been met. This result is reported in the annual report. When the final targets are entered into the reporting template all deviations are highlighted. Any deviations greater than 20% are highlighted in red and there is a requirement to outline the problems faced and changes proposed.
- Where there needs to be a significant change to the overall project for the remainder of its life. In this case we would need to submit a project deviation request detailing and justifying the changes and NSW DPI needs to approve the change.

Endorsed by:

ERNWAG
On
7th March 2013

WRNWAG
On
5th March 2013

Riverina WAP Program Logic 2010-2015

ISP	1.1 High Risk Species and pathways		1.2 Early detection capabilities			2.1 New incursions	2.2 Rapid response
Long Term Outcomes (ISP & NWA targets)	Regional High risk pathways identified and documented	Effective regional management protocols of high risk pathways developed	List of high risk weeds developed	Incursion plans for high risk weeds developed in line with the NSW incursion plan for invasive species	Regional inspection program developed for high risk weeds	Regional inspection program for high risk weeds implemented	Rapid response plans developed which include ongoing monitoring
Intermediate Outcomes (Biophysical & Practice Change)	Final document, list or map adopted by region	Protocol adopted and implemented by region	See individual RWS - prioritisation and WRA process	Final incursion plan adopted and implemented by region	Final protocol or guidelines adopted and implemented by region	weed incursions on high risk pathways managed.	Final Rapid Response plan adopted and implemented.
Immediate Results	Draft document, list or map produced identifying high risk pathways, circulated for comments.	Draft protocol developed and circulated for comments		Draft incursion plan developed and circulated for comments.	Draft protocol / guidelines for inspections circulated for comments		Draft plan developed and distributed to LCAs for comment. Include MERI
Outputs (influencing activities)	Surveillance - look at the history of new incursions. Common theme? Research high risk pathways. Meeting with stakeholders or working group. Discussion with other agencies.	Meeting with stakeholders (LCAs) or working group. Discussion with other agencies. Existing documents, policies, protocols. Regional Case studies.		Meeting with stakeholders or working group.	Meeting with LCAs/ working group to develop protocol / guidelines for inspections		Research - existing literature/other plans. Meeting with LCAs/ working group to develop rapid response plan
Inputs (Foundational activities)	Personnel. RNWPO Identify stakeholders. Mapping. WRA data (current & potential distribution). ISP, RWS, Declaration list. Local knowledge. Resources (\$). High risk weeds list	Personnel. RNWPO Identify stakeholders. Document, list or map of high risk pathways. ISP, RWS, declaration list. Literature search - see what already exists. Local knowledge. Resources (\$)		Personnel. RNWPO Identify stakeholders. ISP RWS. NSW incursion plan for invasive species. List of high risk weeds. List of high risk pathways and protocol Resources (\$)	Staff - trained/ authorised officer. RWS, ISP. mapping declaration lists. Riverina incursion plan for high risk weeds. Inspecting for weeds - an introductory manual for wos. Early detection - recognising weeds	Regional management protocol of high risk pathways. Personnel Resources (\$) vehicles mapping	RWS, ISP, Regional high risk pathways, incursion plan for high risk weeds. MERI. NWA 1993 Regional inspection protocol or guidelines. Personnel. RNWPO. Resources(\$)

Riverina WAP Program Logic 2010-2015 cont'd

3.2 Effective & targeted on-ground control		4.2 Private lands	4.3 Community involvement		4.5 Skill of workforce	4.6 Ability to measure the effectiveness of invasive species management	ISP
Regional management plans linked to CAPs and other key stakeholder plans	Invasive weeds on LCA & LHPA lands & waterways managed effectively	Invasive weeds effectively managed on private lands	Develop a regional communication strategy	Regional communications strategy delivered	An increase in the number of operators holding competency based qualifications	Review all project outcomes using MERI principles	Long Term Outcomes (ISP & NWA targets)
RWS linked to CAPs - see pg 7 Murray RWS; pg 5 LMD RWS; pg 7 Murrumbidgee RWS. Existing weed rankings reviewed, to ensure they still link in with RWMP and CAPs, in 4th & 5th year of project. Timed to be available for new orders.	Regional Weed Management Plans adopted by LCAs, LHPAs and implemented by stakeholders. Reduction in weed infestation(s).	Reduction in weed infestation(s). Increase in landholders actively involved/engaged in weed management. Increase in compliance. Increase in landholder participation /ability to manage weeds.	Communication Strategy adopted and implemented by stakeholders	Increased awareness of weed issues within the community.	Competency met Qualifications achieved	RWS, RWMPs, policies, protocols reviewed, finalised and adopted by all stakeholders. MERI framework created	Intermediate Outcomes (Biophysical & Practice Change)
	Draft regional weed management plans	increased awareness increased capacity of landholders to manage weeds	Draft strategy developed and circulated for comments	Relevant resources available for delivery	Attend training Training delivered	Draft revised documents / strategies. Circulate for comments	Immediate Results
		Compliance - inspection program Collect baseline data - Number actively controlling weeds Educate - extension material Technical report Field days - technical support	Research. Lit review - other available documents. Meeting held/ Group development with identified stakeholders. Discussion with other agencies	Inform I&I of required resources	Source available training. If needed, develop training program	Meeting with relevant stakeholders, steering committees & or implementation groups. Review existing documents. Seek changes to relevant documents from all stakeholders.	Outputs (influencing activities)
	Vehicles Resources (\$) Computers/ mapping. Competent staff. RWS priority weed list High risk weed lists incorporate MERI principles into new & existing planning.	Vehicle Resources (\$) Computers / mapping. Trained / Qualified staff Educational Resources stakeholders input. Individual LCAs policy & procedures.	Personnel. RNWPO Resources (\$) Stakeholders RWS, ISP, mgt plans, council policies. Current situation/ status re comm methods. NSW WAP.	Source available resources from I&I and other NRM agencies. Be active participant in Weed Awareness Plan reference group. Use of NS4W slogan. CHINWAG. E&WRNWAG Website	WO's / staff Training resources Identify knowledge gaps and training required Identify number of current operators qualified & not qualified. Noxious Weeds. Handbook for Councils & Councillors.	RWS, ISP Personnel. RNWPO RWMgtPlans CMA CAPs	Inputs (Foundational activities)

Measurable Outcomes and Activities summary from Riverina WAP submission

1.1.1 Regional high risk pathways identified and documented		
	Activities	Targets
1.1.1.1	Collate a history of new incursions in the Riverina	13
1.1.1.2	Identify means of transport for Category A weeds as defined in RWS	22
1.1.1.3	Develop draft list/ map of high risk pathways based on history	8
1.1.1.4	Circulate draft list to all stakeholders for comments/ additions	18
1.1.1.5	Finalise document and recirculate to all stakeholders 1.1.7	4
1.1.1.6	Make final document available on web 3.1.4	5
	TOTALS	70
1.1.2 Effective regional management protocols of high risk pathways developed		
	Activities	Targets
1.1.2.1	Put together a case study to be included in the protocol	6
1.1.2.2	Develop draft protocol for discussion at RWAC meetings	26
1.1.2.3	Circulate draft protocol to all stakeholders for comments/additions	20
1.1.2.4	Finalise protocol and recirculate to all stakeholders 1.1.7	3
1.1.2.5	Make final protocol available on web 3.1.4	5
	TOTALS	60
1.2.2 Incursion plans for high risk weeds developed in line with the NSW incursion plan for invasive species		
	Activities	Targets
1.2.2.1	Develop draft Regional incursion plan based on NSW plan	4
1.2.2.2	Agenda item for discussion at RWAC meetings	28
1.2.2.3	Circulate draft plan to all stakeholders for comments / additions	41
1.2.2.4	Finalise incursion plan & recirculate to all stakeholders for adoption. 1.1.3	5
1.2.2.5	Make final document available on web 3.1.4	4
	TOTALS	82
1.2.3 Regional inspection program developed		
	Activities	Targets
1.2.3.1	Agenda item RWAC meetings to determine direction	26
1.2.3.2	Research/literature review collated	1
1.2.3.3	Draft program developed and circulated for comments	23
1.2.3.4	Comments incorporated in to final regional inspection program	1
1.2.3.5	Final program circulated to all LCAs for adoption	24
	TOTALS	75
2.1.1 Regional inspection program implemented.		
	Activities	Targets
2.1.1.1	High risk pp inspections carried out (# of properties) 1.1.7	8806
2.1.1.2	High risk roadside inspections carried out (in kms) 1.1.7	118233.95
2.1.1.3	Implement a targeted inspection program on and with retail outlets (# of nurseries inspected) 1.2.2	1100
2.1.1.4	High risk waterway inspections carried out (in kms) 1.1.7	22795
2.1.1.5	Stock yard inspections carried out (# of stock yards)	360
2.1.1.6	High risk reserve inspections carried out (in hectares) 1.1.7	535243
2.1.1.7	Distribute WIP to HR pp and nurseries during inspections (# WIP handed out) 1.1.1	6273
2.1.1.8	Provide nursery & garden industry (retailers) with current noxious weed & non saleable weeds list 1.2.1 (# handed out)	468
2.1.1.9	Develop machinery hygiene protocol in conjunction with all stakeholders	17
2.1.1.10	Publish machinery hygiene protocol on web 3.1.4	22
2.1.1.11	Implementation of machinery hygiene protocol (# machines inspected for clean down)	404
2.1.1.12	Undertake targeted inspection program on soil, gravel and fill distribution points (# inspected)	2095
2.1.1.13	GIS	10
	TOTALS	695826.95
2.2.1 Rapid response plans developed which include ongoing monitoring		
	Activities	Targets
2.2.1.1	Literature review/research collated	2
2.2.1.2	Draft plan developed & circulated 1.1.4	2
2.2.1.3	Draft plan discussed at RWAC meetings	26
2.2.1.4	Plan finalised and circulated for adoption & implementation 1.1.5	25
2.2.1.5	Rapid Response plan made available on web	3
	TOTALS	58
3.2.1 Regional management plans linked to CAPs and other key stakeholder plans		
	Activities	Targets
3.2.1.1	Ensure any new documents created link in with one another (CAP included.) 2.1.5 (# new documents created)	42
3.2.1.2	Review existing weed rankings in conjunction with new orders 5.1.2 (LCAs should do this once in the next 5 years) & 6.1.4	55
3.2.1.3	Put new weeds through WRA and prioritisation process for declaration and regional ranking. 2.1.15 & 5.1.3	87
	TOTALS	184

3.2.2 Invasive weeds on LCA & LHPA lands & waterways managed effectively		
Activities		Targets
3.2.2.1	Establish the current distribution of priority weeds 2.1.1 (# weeds mapped)	417
3.2.2.2	Undertake targeted program for Category B Weeds on reserves (in hectares) 2.1.12	489994
3.2.2.3	Undertake targeted program for Category B Weeds on roadsides (in kms) 2.1.12	84621.6
3.2.2.4	Undertake targeted program for Category C Weeds on reserves (in hectares) 2.1.12	2008925
3.2.2.5	Undertake targeted program for Category C Weeds on roadsides (in kms) 2.1.12	90534
3.2.2.6	Undertake targeted program for Category D Weeds on reserves (in hectares) 2.1.12	2000660
3.2.2.7	Undertake targeted program for Category D Weeds on roadsides (in kms) 2.1.12	219687
3.2.2.8	Council owned/managed land inspected (# of properties)	4751
3.2.2.9	Implement a targeted inspection program on Council owned roadsides 1.1.8 (in kms)	234127.5
3.2.2.10	Undertake targeted program on vacant crown land (under LCA control - in hectares) 2.1.12	17090
3.2.2.11	Vacant crown land inspected (under LCA control # of properties)	2316
3.2.2.12	LCA weed management operational plan	52
3.2.2.13	Undertake targeted program along riparian areas/waterways (kms river/shoreline) 2.1.12	15137.5
3.2.2.14	Develop weed management plans for priority weeds in consultation with stakeholders 2.1.2	111
3.2.2.15	Support weed management research projects and biocontrol programs 2.1.13	149
TOTALS		5168572.6

4.2.1 Invasive weeds effectively managed on private lands.		
Activities		Targets
4.2.1.1	Develop a clearly defined policy on inspection procedures for private property 2.1.9	24
4.2.1.2	Implement a targeted inspection program on pp. 1.1.8 (# properties - don't include HR)	18276
4.2.1.3	Distribute WIP to new landholders 2.1.7 (# distributed)	3902
4.2.1.4	Provide educational material to landholders during property inspections 3.4.5 (# landholders supplied with material)	13499
4.2.1.5	NWA1993 enforced 3.4.6 - no \$ assigned	110
4.2.1.6	Develop weed management plans for priority weeds in consultation with landholders 4.2.1 (# of pp plans)	235
4.2.1.7	Distribute regional weed identification guide to landholders 3.4.2 (# distributed)	10517
4.2.1.8	Assist landholders/groups of, manage weeds by providing technical advice and support. 2.1.14 & 3.2.4	1060
TOTALS		47623

4.3.1 Develop a regional communication strategy		
Activities		Targets
4.3.1.1	Conduct literature review of existing documents	9
4.3.1.2	Agenda item at RWAC meetings to discuss direction of CS	27
4.3.1.3	Draft strategy circulated to stakeholders for additions/comments	23
4.3.1.4	Finalise strategy and recirculate to all stakeholders	4
4.3.1.5	Make final strategy available on web	2
TOTALS		65

4.3.2 Regional communication strategy delivered		
Activities		Targets
4.3.2.1	Schools participating in weed warriors program 3.2.1 (# of schools)	146
4.3.2.2	Website updated regularly 3.1.4 (# of updates)	248
4.3.2.3	Support state & national initiatives that raise the profile of weed mgt (# of field days, Weedbuster wk displays, WoNS res) 3.2.2 & 3.3.3	192
4.3.2.4	Produce weed management material for the media and relevant publications 3.1.6, 3.4.1 & 1.2.5 (# of media releases / articles)	375
4.3.2.5	Inform Weed Extension Team leader of information gaps	61
4.3.2.6	Inform Weed Extension Team leader of regional resources developed	5
4.3.2.7	Deliver NSW NS4W campaign in conjunction with I&I NSW	15
4.3.2.8	Participate in Weed Awareness Plan reference group meetings/correspondence	20
4.3.2.9	Conduct regional weed management/ld field days (# of)	234
4.3.2.10	Distribute/deliver weed awareness resources on priority weeds 3.2.3 & 3.4.3 (# distributed)	1931
4.3.2.11	Update regional weed identification guide 3.4.2	34
4.3.2.12	Develop a Weeds Information Pack that also includes information on Category A weeds 2.1.7 (each individual LCA)	47
4.3.2.13	Attend & participate at regional meetings (ERNWAG & WRNWAG)	465
TOTALS		3773

4.5.1 An increase in the number of operators holding competency based qualifications		
Activities		Targets
4.5.1.1	Attend educational training sessions/workshops 2.1.8 & 3.3.1 (# attended)	365
4.5.1.2	Attend Biennial NSW weeds conference (2 being held 11/12 & 13/14)	50
4.5.1.3	Identify gaps in competency qualifications	68
4.5.1.4	Increase awareness for all stakeholders (board members, directors, senior mgt, councillors & council staff) in weed management.	695
4.5.1.5	Develop individual LCA training plan	115
TOTALS		1293

4.6.1 Review all project outcomes using MERI principles		
Activities		Targets
4.6.1.1	Undertake a review of Lower Murray Darling RWS 4.1.6	8
4.6.1.2	Undertake a review of Murrumbidgee RWS 6.1.4	42
4.6.1.3	Undertake a review of Murray RWS 6.1.4	22
4.6.1.4	Employ Regional Coordinator	125
4.6.1.5	Monitor, review and report on implementation of weed management programs 2.1.4	135
TOTALS		332

Additional reporting information and expenditure statement for Riverina WAP 12/13

LCA/LHPA:

Inspection program

	ACTUAL for Year 3	PLANNED for Year 3	Refer to WAP spreadsheet for targets - make sure numbers align
High risk sites (<i>number</i>)			2.1.1.1 + 2.1.1.3 + 2.1.1.5 + 2.1.1.12
High risk sites (<i>hectares</i>)			2.1.1.6
High risk pathways (<i>kilometres</i>)			2.1.1.2 + 2.1.1.4

Comments

Community extension, education and involvement.

Highlights and new
initiatives

Local highlights & achievements throughout the year

New weed incursions

	Common name	Scientific name	Current Spread & Density
Use Regional Spread and Density definition factsheet			

Potential spread,
impact and control
problems

0	
0	
0	

2012/2013 Expenditure Statement

	Carryover	Expenditure	Allocation	Expenditure	Deviation: to be spent 13/14
Grant					\$0.00
Commitment					\$0.00

Note: If the allocation column has not automatically filled refer back to your reporting spreadsheet for the exact figures.

Performance Point - Regional Weed Id Guide November 2012



NSW WEEDS ACTION PROGRAM

Performance point

November 2012

Project details

Riverina Weeds Action Program

Regional Weed Id Guide

Eastern and Western Riverina Noxious Weeds Advisory Groups

Performance overview

Eastern & Western Riverina Noxious Weeds Advisory Group's Project & Promotion Officers have developed a new resource to increase weed awareness of not only noxious and environmental weeds but the new and emerging species that aren't yet established in the Riverina.

It will be a quick reference for management techniques and weed professional contacts throughout the Riverina. It will also be a quick flick guide for identifying unknown plants with high quality photos of all weeds, majority of photos being sourced from within the region.

It was designed to hold the maximum amount of information a weed officer would need to provide to a landholder when undertaking routine property inspections; in a pocket / glove box size package.

Activities completed

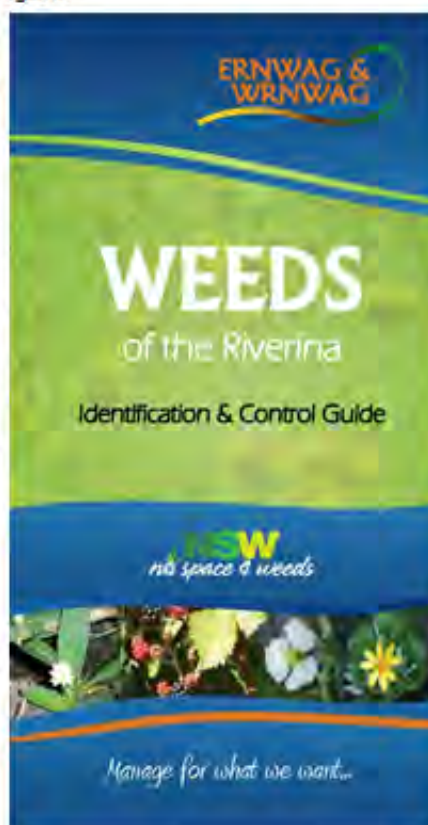
- WAP 4.3.2.11 – development of regional weed id guide.
- Engagement with 4 CMAs (Lachlan, Lower Murray Darling, Murray and Murrumbidgee) and several other stakeholders (LCAs, Transgrid, Crown lands, State Forests, NPWS, Snowy hydro) who contributed towards the printing of the guide.
- The booklet details vehicle hygiene, our catchment based regional weed strategies, noxious weed declarations, obligations of councils, obligations of landholders as well as over 70 weed profiles with high quality photographs to aid in weed identification when out in the field.

Outcomes

Production of more than 30,000 Weed Id & Control Guides to be distributed across 28 LGAs (25 LCAs), 2 LHPAs, 4 CMAs by our project partners throughout the region.

It will hopefully be the first booklet Riverina land managers pick up to quickly identify and find out more about a particular plant.

Brochures are available from your local council weed officer.



Further information

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Appendices

WAP 1.1.1 HR Pathways and Sites

NSW Invasive Species Plan. Goal 1: Exclude	
Prevent the establishment of new invasive species	1.1 High risk species and pathways are identified and managed

Regional Weed Strategy. Aim: Preventative Weed Management	
No new weeds naturalised over the life of the RWS	1.1.7 Identify and survey high risk areas where potential new weeds may be introduced

Pathways	The means by which a weed moves e.g. wind, water, animals and by humans.
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As defined in the NSW Invasive Species Plan 2008-2015

Local Control Authorities (LCAs) identified all high risk pathways and sites within their boundaries and ranked them according to previous incursions and potential risk using the below definitions.

Prioritising high risk pathways and sites:

High priority pathways & sites	Historically new incursions have <u>frequently</u> been found along this pathway or at this site AND/OR in the LCAs opinion, <u>potential</u> for a new incursion to occur here in the future is <u>high</u> .
Medium priority pathways & sites	Historically new incursions have <u>occasionally</u> been found along this pathway or at this site AND/OR in the LCAs opinion, <u>potential</u> for a new incursion to occur here in the future is <u>medium</u> .
Low priority pathways & sites	Historically new incursions have <u>rarely</u> been found along this pathway or at this site AND/OR in the LCAs opinion, <u>potential</u> for a new incursion to occur here in the future is <u>low</u> .

Management response required at each identified high risk pathway and site

High frequency of inspections	High risk pathways & sites inspected 3 or more times per annum
Medium frequency of inspections	High risk pathways & sites inspected 1-2 times per annum
Low frequency of inspections	High risk pathways & sites inspected annually at the discretion of the LCA

The individual stakeholder results are detailed in the following pages of tables for identified high risk pathways and high risk sites. These will be updated as new pathways and sites are identified; and or amended as sites are no longer high risk (eg nursery closing down).

High risk pathways that travel through the Riverina (but are not limited to): Machinery, vehicles, headers, slashers, boats, water, plants and animals.

The following tables list the **high risk routes** identified across the Riverina in 2011. We hope to inspect where **high risk pathways** have been if we are unable to intercept them on these routes:

Total high risk roads / Riverina Local Control Authority (LCA)				
Name	Kms roads	kms HR	Priority	Frequency of Inspection
Albury	600	66.4	high	high
Balranald	12387.28	333.29	med	med
Carrathool	2750	340	high	high
CMCC	2500	2500	high-med	high-med
Cootamundra	598	141	High	High
Corowa	2323.7	311	high-med	high-med
Greater Hume	2177	154.5	high-med	high-med
Griffith	1337.7	87.6	High	high
Gundagai	869.52	85	Medium	High
Hay	9500	340	high-med	high-med
Jerilderie	1199.69	314	med-low	High
Leeton	992	122	high-med	high-med
Lockhart	1663	412	High	High
Murrumbidgee	657.66	222	med-low	med-low
Narrandera	1379			
RENWA	3557	365	med	med
Tumbarumba	818.54	321	high	high
Tumut	7459.64	160	med	med
Urana	3200	210	med	high
Wagga Wagga	2447	510	high-med	high-med
Wakool	1310	467	high	high
Wentworth	2300	2305	med-high	med-high
Totals	62026.73	8031.79		

High risk irrigation channels in the Riverina			
Name	Location	Priority	Frequency of Inspection
Wah Wah Irrigation System	Carrathool	high	high
Main Canal	Leeton	high	high
Sturt Canal	Leeton	high	high
M.I. Channel System	Griffith	high	high
Wakool Canal	Wakool	high	low
Northern Channel	Fraser's rd (Wakool)	high	low
Southern Channel	Troys Ln (Wakool)	high	low
Mallan Channel	Mallan (Wakool)	high	low
Jimaringle Channel	Jimaringle (Wakool)	high	low
West Corrgan	Oaklands (Urana)	medium	high
Mulwala Canal	CMCC	medium	medium
Berrigan Canal	Berrigan Shire	medium	medium
West Corrgan channel	Corowa	medium	medium
Wah Wah Scheme	Hay	medium	low
Coleambally Drainage	JSC north	low	low
MIL Drainage West	JSC W boundary	low	low
Coleambally Canal	Murrumbidgee	low	low

High risk Rivers as identified by Riverina LCAs

Name	Location	Priority	Frequency of Inspection
Murray River	CMCC, Corowa, Jingellic/Ournie (Tumbarumba)	high	high
Murrumbidgee River	Griffith, Leeton, Narrandera, WWCC	high	high
Paddy's River	Tumbarumba	high	high
Tooma River	Greg Greg (Tumbarumba)	high	high
Murray River	Albury, Wentworth (NSW/VIC)	high	medium
Tumut River	Tumut	high	medium
Darling River	Central (Wentworth)	high	medium
Murray River	Wakool	high	low
Edward River	Wakool	high	low
Murrumbidgee River	Gundagai	medium	high
Tumut River	Gundagai	medium	high
Lachlan River	Hillston (Carrathool)	medium	medium
Murrumbidgee River	Carrathool, Junee	medium	medium
Edward	CMCC	medium	medium
Wakool	CMCC	medium	medium
Gilmore Creek	Gilmore (Tumut)	medium	medium
Murray River	GHSC	medium	low
Murrumbidgee River	Hay, Toganmain (Murrumbidgee)	medium	low
Murray River	Balranald around town area	low	medium
Murrumbidgee	Balranald around town area	low	medium
Lachlan river	Hay	low	low
Coleambally Drainage	Jerilderie north	low	low
MIL Drainage West	Jerilderie W boundary	low	low
Goobagandra River	Tumut	low	low
Murrumbidgee River	Wakool	low	low
Wakool River	Wakool	low	low
Niemur River	Wakool	low	low
Anabranche Darling	East Wentworth Shire Council	low	low

High risk Creeks as identified by Riverina LCAs

Name	Location	Priority	Frequency of Inspection
Open drain Forresters Grove - Mungabareena	Albury	high	high
Bungambrawatha Creek	Albury	high	high
Mountain Creek	Woomargama	high	high
Cungegong Creek (Cootamundra)	Frampton	high	high
Tumbarumba Creek	Tumbarumba	high	high
Sparks Creek	Paddy's River	high	high
Marshall's Creek	Wagga	high	high
Tuckers creek (Wentworth)	Curlwaa	high	high
Mirrool Creek	Griffith	high	medium
Billabong Ck (Wakool)	Boundary/Edwards River	high	low
Adelong creek	Gundagai	medium	high
Colombo Creek	North of Urana	medium	high
Yanco Creek	North of Urana	medium	high
Billabong Creek	South of Urana	medium	high
Woolshed Creeks	Thurgoona	medium	medium
Oddies Creek	South Albury	medium	medium
Willandra Creek (Carrathool)	Willandra	medium	medium
Billabong Creek (CMCC)	Conargo Shire	medium	medium
Muttama Creek	Cootamundra	medium	medium
Cowong Creek	Cootamundra	medium	medium
Bland Creek	Stockinbingal	medium	medium
Cudgel Creek	Cudgel	medium	medium

Burkes Creek (L.S.C.)	The Rock	medium	medium
Old Man Creek	Collingullie	medium	medium
Thegoa Lagoon (Went)	Wentworth	medium	medium
Billabong Creek	GHSC	low	low
Yanco Creek	JSC NW	low	low
Billabong Creek	JSC Centre	low	low
Colombo Creek	JSC East	low	low
Brookong Creek (L.S.C.)	Lockhart	low	low
Urangeline Creek (L.S.C.)	Urangeline East, Urangeline	low	low
Mittagong-Bullenbong Creek (L.S.C.)	Woodend, Tootool, Bullenbong	low	low
Hooligan's Creek (Wagga)	Downside	low	low

High risk railway corridors as identified by Riverina LCAs

Name	Location	Priority	Frequency of Inspection
Great Southern Railway	Albury - north/south	high	high
Tocumwal Interstate	CMCC	high	high
Main Southern line	Cootamundra	high	high
main line	Wagga-Albury (Lockhart)	high	high
June main	June (RENWA)	high	high
Narrandera Line	Marrar (RENWA)	high	high
Griffith	Ardlethan/Mirrool (RENWA)	high	high
Main North South line	Wagga	high	high
Rail corridor Griff/Tabbita	Griffith	high	High
Rail corridor Griff/Leeton	Griffith	high	High
Rail corridor Griffith/Yenda	Griffith	high	High
Branch line	Stockinbingal (Cootamundra)	high	medium
Tumut to Gilmore	Tumut	high	medium
V Line	Oaklands (Urana)	medium	high
Deniliquin/Echuca	CMCC	medium	medium
Binya State Forest	Binya (Carrathool)	medium	medium
Branch line	The Rock Boree creek (Lockhart)	medium	medium
Kidman way	Tabbita to Hillston (Carrathool)	medium	medium
Narrandera/Leeton	Leeton/Narrandera	medium	medium
Disused rail line	Cootamundra	medium	low
Echuca line	Boundary/Moulamein (Wakool)	medium	low
Tocumwal/Berrigan	CMCC	low	low
Mulwala	Corowa	low	low
Balldale line (disused)	Corowa	low	low
Sydney-Melbourne line	GHSC	low	low

High risk gas lines as identified by Riverina LCAs

Name	Location	Priority	Frequency of Inspection
Natural Gas line (Coota)	Boundary Rd	medium	medium
gas line	Merungle hill	medium	medium
Visy Tumut gas line	Tumut	medium	medium

High risk power lines as identified by Riverina LCAs

Name	Location	Priority	Frequency of Inspection
Cudgel	Cudgel	high	high
Town substation (Cootamundra)	Cowcumbra St	low	low

All high risk sites identified across the Riverina in 2011:

High risk bridge crossings in the Riverina			
Name	Location	Priority	Frequency of Inspection
Bethanga bridge	Albury	high	high
Haywood's bridge	Below weir wall (Albury)	high	high
Union bridge	Lincoln causeway (Albury)	high	high
Spirit of progress bridge	Murray R crossing Hume Fwy	high	high
Echuca/Moama	Cobb Hwy (CMCC)	high	high
Tocumwal	Newell Hwy (CMCC)	high	high
Tallangatta Rd	Tintaldra (Tumbarumba)	high	high
Jingellic Rd	Jingellic (Tumbarumba)	high	high
Tooma Rd	Tooma (Tumbarumba)	high	high
Murray Valley Hwy	Towong (Tumbarumba)	high	high
Billabong ck bridge	Moulamein (Wakool)	high	high
Edward river bridge	Moulamein (Wakool)	high	high
Barham Bridge	Barham/Koondrook (Wakool)	high	high
Swan Hill Bridge	Swan Hill (Wakool)	high	high
Coonamit bridge	Swan Hill/Moula Rd (Wakool)	high	high
Murrabit Bridge	Murrabit (Wakool)	high	high
Nyah bridge	Nyah (Wakool)	high	high
Tueloga rd bridge	Tueloga Rd (Wakool)	high	high
Neimur Flood Bridges	Jimaringle (Wakool)	high	high
Merran Creek Bridge	Swan Hill/Moula Rd (Wakool)	high	high
St Helena	Noorong Rd (Wakool)	high	high
Kyalite Bridge on Wakool River	Kyalite (Wakool)	high	medium
Kylite Bridge	Kylite (Balranald)	medium	medium
Cobram/Barooga	Berrigan Shire (CMCC)	medium	medium
Euroly Bridge	Euroly (Leeton)	medium	medium
federation bridge	Corowa	medium	low
old John Forde bridge	Corowa	medium	low
channel bridge Mulwala	Corowa	medium	low
Euston / Robinvale Bridge	Murray river at Euston (Bal)	low	medium
Balranald bridge	Murrumbidgee (Balranald)	low	medium
Oxley Bridge	Oxley (Balranald)	low	medium

Riverina pet shop / aquarium suppliers			
Name	Address	Priority	Frequency of Inspection
Border Petshop/Aquarium Supplies	David St, Albury	high	high
Pet Stock Animal Supplies	Wagga Rd, Albury	high	high
Bob's birds and pets	Wagga	high	high
Pets plus	Wagga	high	high
Petbarn	Wagga	high	high
MIA Birds N Fish	Benerembah St, Griffith	medium	High
Mario's Paradise Pet shop	Bonegilla Rd, Griffith	medium	High
Cute Critters	Tumut	medium	medium
Paws Awhile	Parker St, Cootamundra	low	low
Corowa nursery	federation	low	low

Landscape / gravel suppliers			
Name	Address	Priority	Frequency of Inspection
Burgess Earthmoving	47 Hulme Lane, Albury	high	high
AP Delaney & Co	Winchester lane & Koowong rd, Albury	high	high
Boots Sand and Gravel	Wammoon Ave, Leeton	high	high
McMahons	Leeton	high	high
Shire Pits 5 gravel/sand	Urana	medium	high
Bama Sands (CMCC)	Sturt St Echuca	medium	medium
Conargo, Berrigan, Murray Shire	CMCC	medium	medium
Balldale gravel suppliers	Balldale Howlong rd (Corowa)	medium	medium
Daysdale gravel suppliers	Daveys hill rd Daysdale (Corowa)	medium	medium
Sand Quarry	River Rd, Darlington Point	medium	medium
Nericon Quarry	North Branch Canal Rd (Griffith)	medium	medium
HRD READY MIX	Short St Leeton	medium	medium
Area Pre Mix	Wammoon Ave Leeton	medium	medium
Pike's	Delaven St Temora	medium	medium
Temora Shire Council	Temora	medium	medium
SWS Gravel pit	Snowy Mtn Hwy-west Adelong	medium	medium
Elliot's Landscape	Tumut	medium	medium
ANL	Tumut	medium	medium
Loam and Stone	Fernleigh Rd Wagga	medium	medium
Copland St Nursery	Copland Wagga	medium	medium
Rapley's	Blackbutt Rd Wagga	medium	medium
Peards Garden World	Borella Rd, Albury	low	low
The Rock Yard	251 Fallon St, Albury	low	low
Boral Bricks Pty Ltd	253 Shaw St, Albury	low	low
Grays Quarry	Willow Bank Rd, Albury	low	low
Deniliquin Council	CMCC	low	low
Manwarings	Hovell St Cootamundra	low	low
Boral quarries	Walla (GHSC)	low	low
Delaney's Sand & Gravel	Bungowannah (GHSC)	low	low
Lockhart Bobcat & Landscape Supplies	Treasure St Lockhart	Low	Low
Solomons Resources Trust	209 Green St Lockhart	Low	Low
Shire Pits 1 Sand	Urana	low	low

Riverina saleyards			
Name	Location	Priority	Frequency of Inspection
Cootamundra	Olympic Highway	high	high
Corowa saleyards	Albury rd	high	high
hay sheep and cattle yards	Hay town	high	high
Temora	Temora	high	high
Wagga LMC	Wagga	high	high
Jerilderie Sheep yards	Kennedy Street	medium	high
LHPA cattle yards	Jerilderie	medium	high
Tumut saleyards	Tumut	medium	high
J M Smith	Urana	medium	high
Griffith Livestock Marketing Centre	Griffin Ave, Griffith	medium	medium
Saleyards	Hillston	medium	medium
Deniliquin & Finley S/yards	Deniliquin & Finley	medium	medium
Adelong Saleyards	Adelong	low	medium
Gundagai Saleyards	William St Gundagai	low	low
Narrandera Saleyards		low	low

Riverina nursery & garden industry retailers (inc interstate retailers & suppliers)			
Name	Address	Priority	Frequency of Inspection
Thurgoona & district lions comm market	Thurgoona	high	high
Valibo nursery	534 Urana Rd	high	high
Peards Nursery	Borella Rd	high	high
In Style at Peards	Borella Rd	high	high
Big W	Griffith Rd	high	high
Sunday markets	Wilson st Carpark, Albury	high	high
Bunnings Albury	Young st, Albury	high	high
Corowa nursery	Federation Ave	high	high
Howlong nursery	Riverina hwy	high	high
Bunnings Griffith	Kidman Way, Griffith	high	high
Discount Nursery	Mckay Ave, Griffith	high	high
Premier Nurseries	Mckay Ave, Griffith	high	high
Riverina Nurseries	Mckay Ave, Griffith	high	high
Bunnings Wagga	Pearson st Wagga	high	high
Mitre 10	Dobney Ave Wagga	high	high
Chaston St Nursery	Chaston St Wagga	high	high
Gardeners Studio	Sturt Hwy Wagga	high	high
Kmart	Sturt Mall Wagga	high	high
Murrumbidgee Nursery	Koorinal Mall Wagga	high	high
Fernleigh Rd Nursery	Fernleigh Rd Wagga	high	high
Copland St Nursery	Copland St Wagga	high	high
Rapley's	Blackbutt Rd Wagga	high	high
Flemmings Nursery	Koraleigh (Wakool)	high	high
Comes to Town 3 times	Urana	medium	high
In the Garden	Market st Balranald	medium	medium
Mitre 10 (CMCC)	Deniliquin	medium	medium
Mitre 10	Parker St Cootamundra	medium	medium
Harvest Country	Wallendoon St Cootamundra	medium	medium
Australian Native nursery	Griffith Rd (Leeton)	medium	medium
Golden Apple	Main Rd Yanco	medium	medium
Mitre 10 Hardware	Palm Ave Leeton	medium	medium
Bett's Nursery	Lot A Gallipoli St Temora	medium	medium
Cornford's Nursery	Hoskins St Temora	medium	medium
Batlow Nursery	Batlow (Tumut)	medium	medium
Mitre 10	Tumut	medium	medium
Tumut Land Care	Tumut	medium	medium
Mcdougal and Cruise	Tumut	medium	medium
Food Works	Balranald	low	medium
Jerilderie Nursery	Southey Street Jerilderie	low	medium
Hardware (Carrathool)	Hillston	low	low
Ross (Carrathool)	Hillston	low	low
Kalangadoo Cottage (CMCC)	Finley	low	low
Tocumwal Garden (CMCC)	Tocumwal	low	low
Mitre 10	Sheridan St Gundagai	low	low
Taylor's Trees and Shrubs (L.S.C.)	38 Emily Street The Rock	Low	Low
Coly Saltbush	Rosewood Rd, Coleambally	low	low
Shady Gum Nursery	Harnett Rd Narrandera	low	low
Sunraysia Nurseries	Sturt Hwy	low	low

Riverina airports			
Name	Location	Priority	Frequency of Inspection
Cootamundra	Cootamundra	high	high
Brobenah Airstrip	Brobenah Rd Leeton	high	high
Wagga Airport	Forest Hill	high	high
Moulamein Aerodrome	Robb Rd, Moulamein	high	high
Griffith Airport	Remembrance Dr, Griffith	medium	high
Tocumwal Aerodrome	Ingo Renner Dve, Tocumwal	medium	medium
Jerilderie Airport	Airport Rd	medium	medium
Temora	Temora	medium	medium
Holbrook Airpark	Wagga Road	medium	low
Leeton/Narrandera Airport	Main Rd 80 Narrandera	medium	low
Balranald Airport	Balranald	low	medium
Corowa airport	Redlands rd Corowa	low	medium
Albury Airport	Riverina Highway	low	low
Hillston Aerodrome	Hillston	low	low
Goolgowi aerodrome	Goolgowi	low	low
Deniliquin Airport	Cemetary Rd, Deniliquin	low	low
Finley Airport	Stock Route Rd, Finley	low	low
Lockhart Airstrip	Lockhart	low	low
Coleambally Airstrip	Bourke Lane	low	low
Narrandera & Leeton	Leeton RD	low	low
Urana Airport	Urana	low	low
Tumut Airport	Wee Jasper Road (Tumut)	low	low

Riverina Wetlands, Billabongs, Marsh areas			
Name	Size (Ha)	Priority	Frequency of Inspection
Wonga Wetlands	540	high	high
Mungabareena Reserve	42	high	high
Horseshoe Lagoon	85	high	high
Muttama Creek (Coota)	5	high	high
Barren Box Swamp	(Griffith)	high	high
Tumut Wetlands	10	medium	high
Browns Lagoon	2.1	medium	medium
Nericon Swamp	(Griffith)	medium	medium
Campbells Swamp	(Griffith)	medium	medium
Tharbogang Swamp	(Griffith)	medium	medium
Warburn Swamp	(Griffith)	medium	medium
Five Bough swamp	(Leeton)	medium	medium
Tuckerbill swamp	(Leeton)	medium	medium
Whitton wetlands	(Leeton)	medium	medium
Lara Lake (Albury)	4	low	medium
Little Black Springs	3.15	low	low
Mr Webb property	93	low	low
Lake Brewster	Not Available	low	low
Storm water wetlands	unknown (Corowa)	low	low
Bulli court rd wetlands	unknown (Corowa)	low	low
Walla Walla Swamp	331	low	low
Henty Swamp	254	low	low
Tootool Wetlands (L.S.C.)	2	Low	Low
Narrandera Wetlands		low	low
Brungle Creek Wetlands	10	low	low

Public recreation areas – with high volumes of non local traffic			
Name	Address	Priority	Frequency of Inspection
Mackay Park	Wallendbeen (Coota)	high	high
Albury showgrounds, racing club	Albury	high	high
Albury Equestrian centre, Noreuil park	Albury	high	high
Fisher Park precinct	Cootamundra	high	high
Mitchell Park	Cootamundra	high	high
Ardlethan Showgrounds	RENWA	high	high
Riverside Park	Barham	high	high
South Rec Res	Moulamein	high	high
Riverside Park	Moulamein	high	high
Rec Reserve	Barham & Wakool	high	high
Rec Reserve	Tooleybuc	high	high
Playground	Tooleybuc	high	high
Paddy's River Flats	Tooma Rd (Tumba)	high	high
Khancoban boat ramp reserve	Khancoban pondage (Tumb)	high	high
Jingellic Reserve	Jingellic (Tumba)	high	high
Lake Wyangan Reserves	Lake Wyangan	high	medium
Lake Wyangan Camping Ground	Lake Wyangan	high	medium
Luke Park	Powell Street Jerilderie	medium	high
Monash Park	Bolton Street Jerilderie	medium	high
Jerilderie Race Course	Wilson rd Jerilderie	medium	high
Jerilderie Sport Complex	Jerilderie Street	medium	high
Bolton st Bridge Camp site	Bolton Street Jerilderie	medium	high
Swimming Pool	Jerilderie Street	medium	high
Balranald Caravan park	Balranald	medium	medium
Lake Benanee	Euston	medium	medium
Showground	Cootamundra	medium	medium
Recreation Ground	Stockinbingal (Coota)	medium	medium
No 1 ovals	Palm Ave Leeton	medium	medium
Muntenpen ovals	Muntenpen St Leeton	medium	medium
Brobenah race course	Brobenah Rd (Leeton)	medium	medium
Showgrounds Temora	RENWA	medium	medium
Ganmain Showgrounds	RENWA	medium	medium
June Showgrounds	RENWA	medium	medium
Illabo Showgrounds	RENWA	medium	medium
Ariah Park Showgrounds	RENWA	medium	medium
Euston Caravan park	Euston	low	medium
Kiffins reserve	spring drive Mulwala	low	medium
Redlands hill reserve	tom roberts rd Corowa	low	medium
Adelong Caravan Park	Adelong	low	medium
Tumut Caravan park	Tumut	low	medium
Batlow Caravan Park	Batlow	low	medium
Lockhart Showground	Lockhart	low	medium
Mungo NP	Mungo	low	low
Yanga Wool Shed NP	Balranald	low	low
Pioneer Park	Cootamundra	low	low
Lions Park	Landon St Gundagai	low	low
Walter Day Park (L.S.C.)	Urana Street Lockhart	low	low
Stanley Galvin Park (L.S.C.)	Plunket Street Yerong Creek	low	low
Coronation Park (L.S.C.)	Urana Street The Rock	low	low
Lockhart recreation ground	Matthew st Lockhart	low	low
The Rock recreation ground	Cornwall st The Rock	low	low
Lions Park (Murrumbidgee)	Coleambally	low	low
Brindabella rec area	Brindabella (Tumut)	low	low

High risk travelling stock routes/reserves across the Riverina

Name	Location	Priority	Frequency of Inspection
7 mile reserve Swan Hill (Wakool)	Swan Hill Balranald rd int	high	high
Balranald reserve (Wakool)	Balranald	high	high
Cobb highway (Hay)	Hay SC/LCA	high	high
Corowa Howlong (Corowa)	Riverina hwy	high	high
Cudgel stock reserve (Leeton)	Main Rd 80	high	high
federation way (Corowa)	Corowa	high	high
Genoe reserve (Wakool)	MR67	high	high
Kyalite reserve (Wakool)	Kyalite	high	high
Moonlight (RENEWA)	Wantabadgery	high	high
River Rd (Tumbarumba)	Jingellic/Ournie	high	high
Three mile reserve (Wakool)	Moulamein-Hay rd	high	high
Tocumwal 3 mile (CMCC)	Newell Hwy Tocumwal	High	High
TSR Delaware Rd (Albury)	Riverina HWY	high	high
TSR Gerogery Rd (Albury)	338 Gerogery Rd	high	high
TSR Gerogery Rd (Albury)	559 Gerogery Rd	high	high
TSR Kywanna Rd (Albury)	Table Top Rd	high	high
TSR Trout Farm Rd (Albury)	63 Trout Farm Rd	high	high
Tuloga reserve (Wakool)	MR67	high	high
Wallace Town (RENEWA)	Wallace Town	high	high
Whitton Stock Route (Griffith)	Whitton Stock Route Rd	high	high
Gadara Lane TSR (Tumut)	Tumut	high	medium
Gadara Stock Route (Tumut)	Tumut	high	medium
7 Mile TSR (GHSC)	Bungowannah	medium	high
Cha Singh reserve (Wakool)	Swan Hill rd	medium	high
Conamit reserve (Wakool)	Swan hill rd	medium	high
Maddy's reserve (Wakool)	Swan Hill rd	medium	high
One mile reserve Moulamein (Wakool)	Swan Hill turn off Moulamein	medium	high
The Rock stock route	Braithwaites lane	medium	high
16 Mile (CMCC)	Riverina Hwy Blighty	medium	medium
Ardlethan TSR (RENEWA)	Ardlethan	medium	medium
Argalong stock route (Tumut)	wee Jasper	medium	medium
bull plain rd (Corowa)	Corowa	medium	medium
Cumberoona (GHSC)	Bowna	medium	medium
Euroley stock route (Leeton)	Euroley Rd Leeton	medium	medium
Finley 3 mile (CMCC)	Newell Hwy Finley	medium	medium
Greens Reserve (CMCC)	Riverina Hwy Blighty	medium	medium
Hume LHPA TSR's (Coota)	Various	medium	medium
Jones' TSR (WWCC)	Currawarna	medium	medium
Kohlhagen's TSR (WWCC)	Eubeta	medium	medium
Lower Tarcutta TSR (WWCC)	Lower Tarcutta	medium	medium
mid western highway (Hay)	Hay SC/Ica	medium	medium
Old Sydney Rd TSR (RENEWA)	Illabo	medium	medium
Sturt highway (Hay)	Hay SC/Ica	medium	medium
Tarcutta Creek TSR (WWCC)	Lower Tarcutta	medium	medium
Tennis court TSR (WWCC)	Borambola	medium	medium
TSR 84 & 96(Tumut)	Tumut	medium	medium
TSR Argalong Stock route (Tumut)	Argalong / Wee Jasper	medium	medium
TSR Morgans Reserve (Tumut)	Morgans reserve	medium	medium
Wait-A-While (CMCC)	Riverina Hwy Berrigan	medium	medium
Whitton stock route (Leeton)	Main Road	medium	medium
Curtis Ln (RENEWA)	Coolamon	low	low

All high risk boat ramps across the Riverina.

LCA	Name of boat ramp	Water course	New incursions in vicinity
Albury	Bowna reserve	Lake Hume	Water Hyacinth in private dam
Albury	Kremur Street	Murray River	water Hyacinth in private dam
Albury	Lake Hume Resort	Lake Hume	Water Hyacinth in private dam
Albury	Apex Park (The Pines)	Lake Hume	Water Hyacinth in private dam
Albury	Mungabareena Reserve	Murray River	Water Hyacinth in private dam
Balranald Vic	Robinvale Caravan Park Ramp	Murray River	none known
Balranald Vic	Boundary Bend Boat Ramp	Murray River	none known
Balranald	Euston Boat Ramp	Murray River	none known
Balranald	Balranald CP boat ramp	Murrumbidgee R	none known
Balranald	Swimming bend boat ramp	Murrumbidgee R	none known
Balranald	Kyalite Boat Ramp	Wakool River	none known
Berrigan	The Pumps Reserve	Murray River	Nil
Berrigan	Tocumwal Foreshore	Murray River	Nil
Corowa	Owens Bridge reserve	lake Mulwala	Egeria Densa & Sagittaria
Corowa	J.W. Purtle reserve	lake Mulwala	Egeria Densa & Sagittaria
Corowa	Apex Park Boat ramp	lake Mulwala	Egeria Densa & Sagittaria
Corowa	Lions Park Howlong	Murray River	
Corowa	Mulwala Ski Club	lake Mulwala	Egeria Densa & Sagittaria
Corowa	Corowa Lagoon	Murray River	Water lettuce sold at nursery in 08
Deniliquin	Mcleans Beach	Edward River	Nil
Deniliquin	Harfleur Street	Edward River	Nil
Deniliquin	Deniliquin Boat Club	Edward River	Nil
Deniliquin	Lawson Syphon	Edward River	Nil
GHSC	Pleasure Island	Lake Hume	BW at Hume Weir & AW Woomargama
GHSC	Bowna Resort boat ramp	Lake Hume	BW at Hume Weir & AW Woomargama
Griffith	Lake Wyangan – 2 boat ramps	Lake Wyangan	Nil
Murray	Picnic Point Reserve	Murray River	Nil
Murray	Deep Creek Marina Moama	Murray River	Nil
Murray	5 Mile Boat Ramp Moama	Murray River	Nil
Murray	Public Res, Edward St Moama	Murray River	Nil
Murray	Greg Graham Res Stevens Weir	Edward River	Nil
Murray	Stevens Weir d/s	Edward River	Nil
Narrandera	Lake Talbot	drains to Griff	Salvinia & water hyacinth upstream
Narrandera	Old wagga rd 5 mile reserve	main canal	Salvinia & water hyacinth upstream
RENWA	Lake Centenary	Duck Creek	Wagga- Salvinia & water lettuce
Tumbarumba	O'hares Boat ramp	Tumut river	
Tumut	Blowering Dam (X 8)	Blowering Dam	Nil
WWCC	Apex park	Lake Albert	Water Hyacinth and Salvinia
WWCC	Wagga Boat Club	Lake Albert	Water Hyacinth and Salvinia
WWCC	Wiradjuri	Murrumbidgee	Water Hyacinth and Salvinia
Wakool	Barham Town	Murray River	Elodea reported, but not confirmed
Wakool	Moulamein boat ramp	Edward River	
Wakool	Moula Lake, boat ramp X 2	Edward River	
Wakool	Tooleybuc boat ramp	Murray River	
Wentworth	Wentworth west	Murray River	Egeria Densa present
Wentworth	GolGol	Murray River	Egeria Densa present
Wentworth	Dareton	Murray River	Egeria Densa present

Riverina Lakes, Reservoirs, Dams			
Name	Size (Ha)	Priority	Frequency of Inspection
Lake Mulwala (Corowa)	4,400 ha	high	high
Lake Centenary (RENEWA)	12	high	high
Lake Albert (Wagga)	10	high	high
Moulamein Lake	18.6	high	high
Yanga Lake	259	high	high
Lake Poon Boon	430	high	high
Lake Tooim	340	high	high
Tala Lake	530	high	high
Coomaroop Lake	320	high	high
Lake Wyangan (Griff) nth & sth	nth = 192; sth = 77.9	High	High
Lake Hume (Albury)	20,019 Ha total submerged area	high	medium
Lake Hume (Albury)	4390 Ha our border	high	medium
Leeton Town Reservoir	4	high	low
Jerilderie Lake	10	medium	high
Lake Urana	8000	medium	high
Lake Uranagong	1500	medium	high
Urana Aquatic Centre	100	medium	high
Water reservoir	Cowongs (Coota)	medium	medium
Whitton reservoir (Leeton)	1	medium	medium
Sandy Beach (RENEWA)		medium	medium
Blowering Dam (rest areas & towns)	200	medium	medium
Lake Victoria (Wentworth)		medium	medium
Lake Benanee	Balranald	medium	medium
Lake Woorabinda	13	low	low
Cowcumbra Dam (Coota)	3	low	low
Railway Dam (Coota)	1	low	low
Lake Talbot (Narrandera)		low	low
Bethungra Dam (RENEWA)	7	low	low
Mannus Lake (Tumba)	120Ha	low	low
Khancoban pondage (Tumba)	1550ha	low	low
Dry lake	Balranald	low	low

High risk rest areas in the Riverina			
Name	Location	Priority	Frequency of Inspection
Mackay Park (Coota)	Wallendbeen	high	high
Rotary Park (Coota)	Frampton	high	high
Kidman Way Rest Stop	Hanwood	high	high
Kidman Way Rest Stop	Darlington Point	high	high
Hillston Rd. Rest Stop	Tharbogang	high	high
Beckom (RENEWA)	Beckom	high	high
Ardlethan (RENEWA)	Ardlethan	high	high
Berry Jerry RA	Berry Jerry (Wagga)	high	high
Lower Tarcutta RA	Lower Tarcutta	high	high
Swan Hill Rd rest area	Moulamein/Swan Hill rd	high	high
Barham Rd rest area	Barham/Moulamein rd	high	high
Yanga rest area (Wakool)	Yanga	high	high
Swan Hill Truck Stop area	Swan Hill/Moulamein rd	high	high
Tumut Riverwalk	Tumut	medium	high
8km from Euston	8km Nth of Euston	medium	medium
Valroona (Carrathool)	Kidman Way	medium	medium
Hillston (Carrathool)	Kidman Way	medium	medium
Rankins Springs (Carrathool)	Mid-Western HWY	medium	medium
Gunbar (Carrathool)	Mid-Western HWY	medium	medium

Urana-Lockhart rest area (LSC)	Urana Lockhart Rd, Lockhart	medium	medium
Lockhart-Collingullie rest area (LSC)	Lockhart-Collingullie Rd, Lockhart	medium	medium
Yanco Information bay	Main Rd 80 Yanco	medium	medium
Log Creek Rest area	Blowering (Tumut)	medium	medium
Blowering Dam Rest areas (5)	Blowering Dam	medium	medium
Wild Dog RA (Wentworth)	Sturt Hwy	medium	medium
Seven Tree (Wentworth)	Broken Hill Rd	medium	medium
Milpara (Wentworth)	Broken Hill Rd	medium	medium
Zephyr Bend (JSC)	Newell Highway	low	high
Mundurah (JSC)	Newell Highway	low	high
Curtin's (JSC)	Newell Highway	low	high
Bundure (JSC)	Newell Highway	low	high
Yanco Creek (JSC)	Kidman Way	low	high
Caltex truckstop / roadhouse	Balranald	low	medium
truck stop (Corowa)	federation way	low	low
Aeroplane Hill (GHSC)	Hume Highway	low	low
Henty Man (GHSC)	Olympic Way	low	low
Waddi Roadhouse	Sturt hwy Darlington Point	low	low
Gillenbah Truck Stop (Narr)	Newell Highway	low	low
Sandside (Urana)	Newell Highway	low	low
Gillenbah Rest area (Narr)	Newell Highway	low	low
Tumut Rail centre	Tumut	low	low

Other			
Name		Priority	Frequency of Inspection
Leased Crown Land	scattered over Albury LCA	high	high
Albury Waste management centre	Albury	high	high
Crown land	scattered over Albury LCA	high	high
Town Rubbish Tip	Tip road	high	high
Common Tip	Airport Rd	high	high
Grain facilities - Silo sites (Griffith)	5 across town	high	high
Grain Corp Sites (L.S.C.)	8 sites across Shire	medium	high
Grain Storage Facilities	Oaklands x 2 (Urana)	medium	high
Grain Storage Facilities	Boree Creek (Urana)	medium	high
LHPA cattle yards	Kennedy Street Jerilderie	medium	high
Grain Storage Facilities	Coolamon	medium	high
Grain Storage Facilities	Brushwood	medium	high
Grain Storage Facilities	Ardlethan	medium	high
Grain Storage Facilities	Coolamon/Marrar	medium	high
Grain Storage Facilities	Temora	medium	high
Grain silos	Cootamundra	medium	medium
Grain silos	Stockinbingal	medium	medium
Grain silos	Wallendbeen	medium	medium
Council's lease block	Conargo Rd	low	high
Jerilderie Cemetery	Conargo Rd	low	high
Graincorp silos	Balranald	low	medium
Nelson's transport/storage	Balranald	low	medium
Euston Silo's	Euston (Balranald)	low	medium
Pearson's Silos	Kyalite (Balranald)	low	medium
Moto Cross Track	Wangoola (Hume Hwy)	low	low

New Incursions to the Riverina

This details all new incursions of Category A weeds on record for the Riverina. It will be updated as new incursions are identified across the Riverina as per WAP 1.2.2 New Incursion Plan – high risk species. LCAs are to provide RNWPO with a copy of the notifiable weed reporting form as submitted to NSW DPI (if a notifiable weed) or herbarium record (if not a notifiable weed).

Category A weeds:	All Class 1 & 2 noxious weeds + others listed in each Regional Weed Strategy (RWS) as per subregion – Priority list of weeds!
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New incursion (Category A)	Location	Date of detection
Alligator weed (Albury)	McDonald rd North Albury – Backyard infestation	1/05/1996
Alligator weed (Albury)	Urana rd Lavington – Backyard infestation	1/05/1996
Alligator weed (Albury)	Kokoda st North Albury – Backyard infestation	1/05/1996
Alligator weed (Carrathool)	Wah Wah Irrigation District as it feeds out of BBS	1994
Alligator weed (GCC)	Barren Box Swamp	1990s
Alligator weed (GCC)	Wah Wah Irrigation District	1990s
Alligator weed (GHSC)	Woomargama Station	1970s
Alligator weed (Narrandera)	Dalgetty st Narrandera – Backyard infestation	24/05/1996
Alligator weed (WWCC)	Wiradjuri crst Wagga – backyard infestation	6/06/1996
Alligator weed (WWCC)	Balleroo crsnt – Backyard infestation	6/06/1996
Black willow (GHSC)	Bowna + Mullengandra	2008/2012
Boneseed (Balranald)	Regional Park Euston	28/11/2010
Boneseed (CMCC)	Conargo shire	2006
Boneseed (GCC)	Canal st, Griffith	1/03/2008
Boneseed (GCC)	Combe rd, Griffith	1/09/2004
Boneseed (GCC)	Private property, Hanwood	1/03/2007
Boneseed (Narrandera)	Binya	2009
Boneseed (Tumbarumba)	Broadleaf Rd	2009
Boneseed (Tumut)	private property just north of Tumut	1/10/2010
Boneseed (Wakool)	Riverside park Barham, on the banks of the Murray R	1996
Boneseed (Wentworth)	Curlwaa	2011
Boneseed (Wentworth)	Dareton, NSW DPI – back Wentworth rd and on the farm	1986
Boneseed (Wentworth)	Dareton, sewerage ponds	2008
Boneseed (Wentworth)	NE corner of the Coomealla irrigation district	2011
Cane needle grass (WWCC)	North Wagga Flats	?
Chilean needle grass (Jerilderie)	Newell Highway	Mid 2000s
Chilean needle grass (Urana)	Rand	2003
Egeria densa (Wentworth)	Monak	2010
Fireweed (Albury)	Thurgoona Drive	9/08/2013
Fireweed (Albury)	Hume Hwy	3/08/2009
Fireweed (GHSC)	Hume hwy (74wangoola) – 2 plants	4/11/1996
Fireweed (Gundagai)	Hungary Jacks	1/01/2011
Fireweed (Tumut)	Private property Adelong	15/9/2011
Fireweed (WWCC)	old Narrandera rd (150m west of pine gully rd)	30/06/2011
Fireweed (WWCC)	Hume Hwy Keajura bw Sturt loop & Ladysmith rd sthn side Hwy	18/05/2012
Fireweed (WWCC)	newish park/playground, Mima st Glenfield	25/6/2012
Gorse (Albury)	Mungabareena Reserve	2008
Gorse (Albury)	Goldsworthy St	2010
Gorse (GHSC)	Bungowannah/Burrumbuttock	2006
Gorse (Hay)	Murrumbidgee R res, Maude rd ~ 10kms west Hay	2009?

New incursion (Category A)	Location	Date of detection
Gorse (Tumbarumba)	Rosewood (state forests) 7 plants in December 2011	1990s
Gorse (Tumut)	Wee Jasper Rd to red Hills Rd and Brungle Creek rd	2000
Gorse (WWCC)	Wilan's Hill, planted Bot gardens > drain Lord Baden-Powell dr	Early 1990s
Mesquite (CMCC)	PP – Lower Thule Rd – south western Murray shire	3/08/2011
Mesquite/prickly acacia (CMCC)	Lower Thule Rd, Murray Shire	2006
Mesquite (Hay)	Cobb highway – 100km north of Hay	2002?
Mesquite (Hay)	on river bank eastern side of Eli Elwah reserve	10/01/2007
Mesquite (Lockhart)	2 plants – Parish of Cullivel	2/03/1998
Mesquite (Lockhart)	2 plants along fence line and dam bank. Parish of Butherwa	6/03/1998
Mesquite (Lockhart)	1 plant 30m from swamp. Parish of Butherwa	10/03/1998
Mesquite (Lockhart)	1 plant on dam bank	14/05/2002
Mesquite (Murrumbidgee)	Toganmain Station	1980s
Mesquite (Urana)	Urana	2000
Mesquite (Wakool)	Camps Hill, Moulamein/Barham Rd	2006
Orange hawkweed (Tumut)	Snowy Mountain Highway at long plains	2009
Parthenium weed (Balranald)	1 plant 50kms nth Balranald on Balranald/Ivanhoe rd	10/05/2012
Parthenium weed (Carrathool)	Kidman Way	1999
Parthenium weed (Carrathool)	Mitchell Road	1999
Parthenium weed (Carrathool)	Sloans Road	1999
Parthenium weed (CMCC)	Cobb hwy, Deniliquin	1980's
Parthenium weed (CMCC)	Barham/ Deni rd 10kms from Deni. 5 plants on roadside	4/4/2000
Parthenium weed (Hay)	50kms of it scattered along the Mid Western Highway	4/04/2012
Parthenium weed (Jerilderie)	Newell Highway	Mid 1980
Parthenium weed (Jerilderie)	Newell Highway	22/04/2003
Parthenium weed (Jerilderie)	Jerilderie-Conargo rd (from 1.5km west of town+8kms)	1/02/2012
Parthenium weed (Narrandera)	Newell Highway	1995
Parthenium weed (Urana)	Newell Hwy - Morundah - 2 plants. 1km nth of township	4/5/2000
Parthenium weed (Wakool)	Tueloga Rd	2001/2002
Prickly acacia (Coota)	Muttama Ck	1970s
Salvinia (RENWA)	Holbrook st, Temora – back yard pond	2001
Salvinia (WWCC)	Lake Albert	2010
Tropical soda apple (GHSC)	Henty	2011
Water hyacinth (Albury)	Elizabeth Mitchell Drive – private dam	1/06/2010
Water hyacinth (CMCC)	Deniliquin	1980's
Water hyacinth (Narrandera)	Property Spring Vale	2001
Water hyacinth (Tumut)	Adelong ponds - Cromwell, Gilmore & Selwyn streets	15/03/2011
Water hyacinth (WWCC)	Lake Albert	2010
Water hyacinth (WWCC)	1.5ha lagoon near Murrumbidgee R in South Wagga	21/10/1993
Water lettuce (Balranald)	Nursery + private pond	18/04/2012

Correct as at 14/11/2013.