



NSW Department of Primary Industries
Office of Environment & Heritage

NSW Catchment Management Authorities
NSW National Parks & Wildlife Service

Australian Government

BIODIVERSITY PRIORITIES FOR WIDESPREAD WEEDS

Murrumbidgee CMA region

Part H

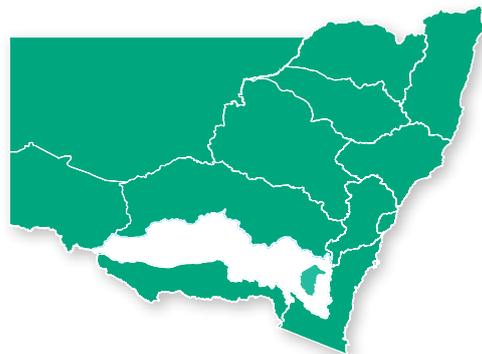


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Published by NSW Department of Primary Industries (NSW DPI). This project was developed by NSW DPI and the Office of Environment & Heritage (OEH) and in collaboration with the 13 Catchment Management Authorities (CMAs) in New South Wales.

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This publication should be cited as:

NSW DPI and OEH (2011). *Biodiversity priorities for widespread weeds*. Report prepared for the 13 Catchment Management Authorities (CMAs) by NSW Department of Primary Industries and Office of Environment & Heritage, Orange.

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ISBN: 978 1 74256 094 6

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H1. INTRODUCTION

This is one of the 13 regional documents that sit under the *Biodiversity priorities for widespread weeds – statewide framework*. It provides information for the Murrumbidgee Catchment Management Authority (CMA) region. The *statewide framework* should be read in conjunction with this document as it provides (i) background information, (ii) objectives of the project, (iii) the standardised methodology used to establish regional priorities and (iv) guidance on implementing the priorities.

The overarching document to this report, the *statewide framework*, details the process used for identifying biodiversity (biological assets) at risk from widespread weeds in New South Wales, as well as prioritising sites for weed control in each CMA region. This sub-report (Part H) establishes regional priorities, in the form of priority widespread weeds and priority sites for control, in the Murrumbidgee CMA region.

The Murrumbidgee CMA region covers an area of 84,000 square kilometres and is home to more than half a million people (Murrumbidgee CMA 2009). The landscapes range from alpine areas in the east, rich grazing and grain belts on the plains, and the shrublands and grasslands of the semi-arid west. The lower half of the region includes the Murrumbidgee Irrigation Area and the Coleambally Irrigation Area which provide water for a large percentage of the NSW fruit, vegetable and rice industries (Murrumbidgee CMA 2009). The region also contains various sites of international ecological significance including the Fivebough and Tuckerbil Swamps and the Lowbidgee Wetlands.

Invasive plants and animals are recognised as a key threat to the sustainability of the region's natural resources. Weeds pose a significant threat to biodiversity by directly impacting the growth and survival of native flora and fauna and via indirect effects on other aspects of landscape health, e.g. water quality. A review of the impact of weeds on threatened biodiversity in New South Wales (i.e. species, populations and ecological communities listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act)) indicated that 67 weed species in the Murrumbidgee CMA region were threatening biodiversity, including 39 threatened plant and animal species (Coutts-Smith and Downey 2006).

This project builds on the existing regional weed strategies by considering the impact of all widespread weeds present in the Murrumbidgee CMA region on biodiversity, regardless of their legislative listing. Given many widespread weeds are unlikely to be extensively controlled or eradicated, this project provides strategic management options for protection of biological assets by identifying the priority widespread weeds, the biodiversity impacted and priority sites for control.

To reduce the impact of widespread weeds on biological assets, control programs need to be prioritised to areas where control is both achievable and likely to have the greatest benefit to native biodiversity, independent of land tenure. Such a site-led approach will ensure maximum benefit from limited resources available for management of widespread weeds. Therefore, specific information on management sites was compiled to assist in strategic decisions relating to investment aimed at protecting biological assets from widespread weeds. When considering such investments, it must be noted that the timescale and intensity of weed management in arid and semi-arid regions of the state may differ significantly from that in coastal areas due to greater variation in rainfall and productivity.

This project will enable all stakeholders in the Murrumbidgee CMA region to target on-ground works to those locations where weed control will have the greatest benefits for biodiversity. In addition, implementation of monitoring using the Monitoring manual for bitou bush control and native plant recovery (Hughes *et al.* 2009) will allow Murrumbidgee CMA to measure progress towards relevant targets, including the Natural Resource Commission (NRC) target for invasive species (NRC 2005) and Catchment Action Plan (CAP) targets (Murrumbidgee CMA 2008).

H2. REGIONAL CONTEXT

This section summarises the strategies, policies and programs relevant to weed management in the Murrumbidgee CMA region and outlines how they relate to the development and outputs of this project. Relevant statewide strategies, targets and legislation are addressed in the *statewide framework*.

H2.1 Catchment Action Plan

Under the NSW *Catchment Management Authorities Act 2003* each CMA is required to prepare a CAP which outlines future priorities for each CMA and provides a co-ordinated plan for natural resource work in the region over a 10-year period. The Murrumbidgee CMA CAP outlines resource condition targets under four Biodiversity Asset Resource Condition Targets. Three targets relate directly or indirectly to weed management. A biodiversity target is being developed that will also include weed management in some of its management targets (Murrumbidgee CMA 2008).

By identifying and prioritising biodiversity at risk from weeds in the Murrumbidgee Catchment as well as identifying priority sites for control, this project will help Murrumbidgee CMA address three key management targets in their CAP (Murrumbidgee CMA 2008). The three management targets that relate specifically or indirectly to weed management include:

Resource Condition Target BRCT1

Aim: By 2016 an increase in the area of the terrestrial native vegetation classes of the Murrumbidgee catchment managed for biodiversity conservation.

» Management Target BMT1

Aim: By 2016 increase by 50,000 ha the high conservation value native vegetation classes so they are managed for biodiversity conservation.

Resource Condition Target BRCT2

Aim: By 2016 selected threatened species, populations and ecological communities (for both terrestrial and aquatic ecosystems) will be managed for biodiversity conservation.

» Management Target BMT5

Aim: By 2016 encourage and facilitate actions to increase recovery of terrestrial and aquatic threatened species and ecological communities including mitigation of key threatening processes through the implementation of recovery plans, adoption of Priorities Action Statements and an increase in the area of terrestrial native vegetation classes managed for biodiversity conservation.

Resource Condition Target BRCT4

Aim: By 2016 high priority areas affected by priority environmental weeds, including feral native plant species, will be treated within the Murrumbidgee catchment by using a coordinated approach.

» Management Target BMT7

Aim: By 2006, a regional weed management strategy will be prepared. By 2016, the priority actions identified in that strategy will be implemented in cooperation with the regulatory authorities and land holders across all land tenures to enhance biodiversity.

H2.2 Murrumbidgee Catchment Regional Weed Strategy

The Murrumbidgee Catchment Regional Weed Strategy was commissioned by Murrumbidgee CMA and first published in 2007. The prioritisations and recommendations (Ash and Verbeek 2007) were developed through a series of workshops. A prioritisation process based on Randall's system (Randall 2000) was used to rank weeds within eight sub-catchments. Weeds were placed in four categories with an emphasis on (i) potential weed threats and (ii) new and (iii) emerging weed problems. The fourth category was for (iv) widespread weeds throughout the region, however some widespread weeds were not included because they were 'already widespread throughout Australia'.

This project focuses on widespread weeds that are impacting on biodiversity and is therefore complementary to the Murrumbidgee Catchment Regional Weed Strategy.

H2.3 Regional weed advisory committees and management plans

Regional weed advisory committees support the communication of best practice amongst neighbouring councils, or local control authorities, who are responsible for implementing the NSW *Noxious Weed Act 1993* (NW Act). Membership includes NSW Department of Primary Industries (NSW DPI), regional councils and public land managers (e.g. National Parks and Wildlife Service (NPWS)).

Regional weed management plans are developed by regional weeds advisory committees and target specific noxious weed species for control within a defined area. They outline the biology of the weed and its impacts as well as overall objectives and actions required to coordinate an effective control program. The Eastern and Western Riverina Noxious Weeds Advisory Groups (ERNWAG and WRNWAG) are responsible for co-ordinating a number of regional management plans in the Murrumbidgee CMA. Current plans include: Alligator weed (*Alternanthera philoxeroides*), black willow (*Salix nigra*), Chilean needle grass (*Nassella neesiana*), Coolatai grass (*Hyparrhenia hirta*), hardhead thistles (*Acroptilon repens*), Johnson grass (*Sorghum halepense*), perennial and prairie ground cherry (*Physalis* spp.), blackberry (*Rubus fruticosus* agg.), *Sagittaria* spp., serrated tussock (*Nassella trichotoma*), silver-leaf nightshade (*Solanum elaeagnifolium*), spiny burr grass (*Cenchrus incertus*) and St John's wort (*Hypericum perforatum*).

H2.4 Office of Environment & Heritage (OEH) Regional pest management strategies

Within the Murrumbidgee CMA region, the NPWS (part of OEH) administers significant land for conservation purposes. Weed management priorities on NPWS estate are established within 18 regional pest management strategies (RPMS); based on NPWS regions. In 2010, the number of regions was reduced to 14. However, revision of the strategies is not due until 2011.

As the NPWS regional boundaries do not align with those of the CMA regions, there are two strategies relevant to the Murrumbidgee CMA region: (i) South West Slopes and (ii) Western Rivers RPMS (see www.environment.nsw.gov.au/pestsweeds/RegionPestManagement.htm). During 2009–10, NPWS undertook a comprehensive survey of NPWS estate to establish biodiversity priorities for widespread weeds. Relevant priorities from these surveys, including those priority widespread weeds and biological assets at risk, are incorporated into this project (see Section 1.6.1 of the *statewide framework*).

H2.5 Priorities Action Statement (PAS)

In accordance with the TSC Act, the Priorities Action Statement (PAS) was developed to ensure that conservation actions were established for all biodiversity listed under the Act. The PAS outlines the broad strategies and detailed priority actions to be undertaken in New South Wales to promote the recovery of threatened species, populations and ecological communities and manage key threatening processes (KTPs).

There are 18 actions in the PAS relevant to weed management in the Murrumbidgee CMA region (Appendix H1). These actions apply to 14 threatened plant and three threatened animal species. Specific weeds noted were pines (*Pinus* spp.), hawthorn (*Crataegus monogyna*), blackberry (*Rubus fruticosus* agg.), sweet briar (*Rosa rubiginosa*), St. John's wort (*Hypericum perforatum*), lamb's tongue (*Plantago lanceolata*), soft brome (*Bromus hordeaceus*), lilaea (*Lilaea scilloides*) and *Cyperus tenellus*.

This project incorporates information from the PAS to identify priority weeds posing a threat to threatened species and ecological communities as well as priority sites for weed control.

H3. REGIONAL OUPUTS

H3.1 Methodology used to develop the priorities

The *statewide framework* outlines the broad methods applied across the 13 CMA regions in New South Wales to establish widespread weed priorities for biodiversity conservation. The primary output is a ranked list of weed management sites for each CMA region in New South Wales. Rankings are based on where investment in weed control will result in greatest reduction of the impact of widespread weed species on biodiversity; primarily, but not exclusively, on threatened biological assets (plant and animal species, populations and ecological communities listed under the TSC Act and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)).

This approach uses four stages to establish regional weed management priorities for biodiversity conservation:

1. Identify and prioritise the widespread weed species posing a threat to biodiversity in each region.
2. Identify the biodiversity at risk from high priority weed species identified in Stage 1.
3. Identify sites where control will maximise biodiversity outcomes by reducing widespread weed impacts.
4. Develop and implement a monitoring system to determine whether investment in weed control programs at high priority sites has resulted in a biodiversity response and thus progress towards the relevant statewide targets.

The specific details of implementing the process in the Murrumbidgee CMA region (stages 1 to 3) are outlined below with modifications to account for existing data and strategies. Stage 4 is discussed in the overarching *statewide framework*.

H3.1.1 Workshops in the Murrumbidgee CMA region

Three workshops were held in the Murrumbidgee CMA region at Queanbeyan, Wagga Wagga and Hay on the 13, 14 and 15 October 2009 respectively. Eighty individuals from 24 councils, five state government agencies, two weed authorities and seven community groups were invited to attend. Representatives from Murrumbidgee CMA, Department of Environment, Climate Change & Water (DECCW) now known as Office of Environment & Heritage, NSW Industry & Investment (I&I NSW) now known as NSW Department of Primary Industries, Livestock Health and Pest Authority, Eastern and Western Riverina Noxious Weeds Advisory Groups, 13 councils and one community organisation (Yass Landcare network) attended the workshops. See Appendix H2 for a full list of workshop attendees.

H3.1.2 Murrumbidgee CMA specific webpages

On the main project website (www.environment.nsw.gov.au/cmaweeds), specific CMA webpages were established to provide stakeholders with information on the process followed in the Murrumbidgee CMA region including: workshop details, outcomes from workshops, the site nomination form and instructions and a project contact (www.environment.nsw.gov.au/cmaweeds/Murrumbidgee.htm).

H3.2 The process

H3.2.1 Stage 1. Identifying weeds that pose a threat in the Murrumbidgee CMA region

A weeds dataset for the Murrumbidgee CMA region

A list of weeds to consider at the workshops was collated using the resources outlined in Section 3.1.3 of the *statewide framework*, the sources listed in Section H2 and Plants of Western NSW (Cunningham *et al.* 1981).

Distribution of weeds within the Murrumbidgee CMA region

The weeds dataset for the Murrumbidgee CMA region was presented to workshop participants who were asked to identify the current distribution of each of the weeds in four landscapes (tablelands, slopes, plains and riparian) according to the categories outlined in Table H1. The distribution for each weed considered, plus weeds added by participants, is provided in Appendix H3.

Current impact of widespread weeds on biodiversity

Workshop participants were asked to prioritise the current impact of each widespread weed as Low, Medium or High (Table H2). A total of 13 weeds were identified as having a high impact on biodiversity at two workshops, or across two landscape types, and constituted a draft list of priority weeds which was distributed to workshop participants and other stakeholders for comment. Stakeholder comments were incorporated in the list, which is presented in Table H3. An additional three weeds were identified as having a high impact only on tablelands, four on slopes, four on plains and two on riparian landscapes. For the high priority weed list sorted by landscape see Appendix H4.

Table H1. Definitions of spatial weed distribution categories, as used in stakeholder workshops.

Category	Definition
Widespread*	Species that have established well in the landscape and are close to reaching their maximum potential distribution in the region
Localised	Species confined to small, local infestations only.
Emerging	Species perceived as threatening that have been recorded in the region but only in isolated instances or in small areas. Populations of the weed are expanding rapidly but they have not yet become widely established.
Alert	Species that do not currently occur in the region but have the potential to be introduced and would have significant impacts on natural systems if they were to invade.

* Given the large variation in environmental conditions at the CMA regional scale it is likely that very few weeds will be widespread across the entire area under consideration. For this reason participants were asked to consider the current distribution of the weed in relation to its future potential distribution within the region. To do this, a consideration of the preferred habitat conditions of each weed is necessary. For example, riparian weeds will only grow in riparian environments. If a particular riparian weed is widespread within these environments then it is considered widespread across the region. In addition, species that are widespread in tablelands areas, for instance, are unlikely to be widespread in the plains areas of the same region.

Table H2. Definitions of the level of impact of weed species on biodiversity as used in stakeholder evaluations.

Impact	Definition
High	High impact weeds are capable of causing major change to the composition or structure of a community (transformers). They can suppress the regeneration of many species in a community and have a major effect on dominant species in a community. They are long-lived or can form self-sustaining monocultures.
Medium	Medium impact weed species can have a modest effect on the composition or structure of a community. They can suppress the regeneration of some species and have some effect on dominant species in a community. They are relatively long-lived or can persist over long periods of time.
Low	Low impact weeds do not affect structurally dominant species. They do not suppress the regeneration of native species. They do not persist or they have relatively short life spans.

Table H3. Priority widespread weeds impacting on biodiversity in the Murrumbidgee CMA region (listed in alphabetical order).

Scientific name (Common name)	KTP ¹	WoNS ²	Noxious	
			NSW ³	LGA ⁴
<i>Asphodelus fistulosus</i> (onion weed)				Y
<i>Eragrostis curvula</i> (African lovegrass)	Y			Y
<i>Euphorbia</i> sp. (spurge)				
<i>Hypericum perforatum</i> (St John's wort)	Y*			Y
<i>Phyla canescens</i> (lippia)			4	
<i>Lycium ferocissimum</i> (African boxthorn)	Y*			Y
<i>Marrubium vulgare</i> (horehound)	Y*			Y
<i>Rubus fruticosus</i> agg. (blackberry)	Y*	Y	4	Y
<i>Salix</i> spp. (willows)	Y*	Y	5	Y
<i>Schinus molle</i> (peppercorn tree)				
<i>Urtica urens</i> (stinging nettle)				
<i>Xanthium occidentale</i> (Noogoora burr)				Y
<i>Xanthium spinosum</i> (Bathurst burr)				Y

KTP¹ = Weed listed under a Key Threatening Process in the TSC Act; WoNS² = Weeds of National Significance (Thorp and Lynch 2000); NSW³ = New South Wales; LGA⁴ = Local Government Areas.

Y = yes, where the species is listed under a KTP, as a WoNS or is listed as noxious in at least one LGA within the region, * = Proposed only (Preliminary Determination under the TSC Act). All listings as at 31 August 2010.

Numbers in the table refer to the control class under the NSW *Noxious Weeds Act 1993*.

H3.2.2 Stage 2. Identifying biodiversity at risk from high priority weeds

At each workshop, participants were provided with lists of endangered ecological communities (EECs) and threatened species (as listed under the TSC Act and EPBC Act), as well as general vegetation types present in the Murrumbidgee CMA region. They were asked to consider if any species or communities on these lists were currently at risk from each of the high priority widespread weeds (identified during Stage 1) and a draft list of biodiversity at risk was created. Following the workshops, this list was sent to workshop participants and other stakeholders for comment and verification.

The revised list identified EECs, vegetation communities, threatened species and populations that are considered under threat from the high priority weeds (Tables H4, H5 and H6). This information was used to help guide site nominations (see Stage 3, section 3.2.3).

The list of EECs and vegetation communities is by no means exhaustive, but is likely to represent communities where the priority weeds are having the greatest immediate impact. The lists can also be used to identify knowledge gaps or areas that require further information and can also be updated as new information becomes available through site nominations or further community consultation.

Impact of widespread weeds on EECs

The EEC threatened by the greatest number of high priority weeds was Box Gum Woodland (17 high priority weeds), followed by Myall Woodland in the Murray-Darling Basin (11 high priority weeds). The weed species posing the greatest threat in terms of number of EECs threatened were blackberry (*Rubus fruticosus* agg.) (six EECs), followed by Paterson's curse (*Echium* spp.), St John's wort (*Hypericum perforatum*) and horehound (*Marrubium vulgare*) (all five EECs).

H3.2.3 Stage 3. Selecting and prioritising sites for control

Site nomination process

Stakeholders were asked to nominate sites where high priority weeds were impacting biodiversity using a site nomination process. Site nomination forms and instructions (See appendix 3 of the *statewide framework*) were emailed to key stakeholders (including workshop participants), and placed on the Murrumbidgee CMA project website to enable access for others. Workshop information and site nomination forms were also made available to private landowners attending the Murrumbateman Field Day in October 2009. In addition, during 2009–10, NPWS undertook a comprehensive survey of sites on NPWS estate.

Categories for control

The 110 sites nominated to date (as at 31 August 2010) for the Murrumbidgee CMA region were separated into six categories using the ranking process outlined in Appendix 4 of the *statewide framework*. The ranking of sites provides strategic direction for on-ground works by identifying areas where weed control programs will have positive benefits for biodiversity.

This process resulted in 30 sites in control category 1 (Table H7). Category 1 represents the highest priority for action. Within category 1, sites were ordered based on the number of biological entities (e.g. threatened species, populations or ecological communities) present at the site to allow prioritisation within this category. Nominated sites were deemed invalid for ranking if three or more of the required fields contained insufficient information.

H3.2.4 Review and additional site nominations

A draft of this report was provided to Murrumbidgee CMA for comment and review on 10 July 2009. The draft report contained information on the process only as workshops were not conducted in the Murrumbidgee CMA region until October 2009. Site nominations were collected, ranked and reviewed between October 2009 and August 2010. In addition, site nominations received for NPWS estate were provided to the NPWS regions for comment and review prior to August 2010.

The site nomination process is ongoing and should be used by Murrumbidgee CMA to identify additional regional priorities for weed control that are not already captured in this report. For example, to capture further high priority biodiversity sites on private lands, site nomination forms could be sent to all landholders with voluntary conservation agreements (VCA) and wildlife refuges with the NPWS in the Murrumbidgee CMA region. The complete list of priority sites for control will therefore be only held electronically and updated by the CMA.

Table H4. Threatened ecological communities and general vegetation types under threat from priority widespread weeds in the Murrumbidgee CMA region.

Priority widespread weed	Threatened ecological community						General vegetation types										
	Inland Grey Box Woodland	Montane Peatlands and Swamps	Myall Woodland in the Murray-Darling	Natural Temperate Grassland of the Southern Tablelands	Box Gum Woodland	Lower Murray River Catchment endangered ecological community	grassy woodlands	ironbark and cypress pine woodland	grasslands	saltbush communities	stringy bark woodlands	Riparian vegetation - open grassy areas	river red gum forest community	ephemeral wetlands	wetlands	black box depressions and sandhills	aquatic communities
<i>Asparagus asparagoides</i> (bridal creeper)																	
<i>Asphodelus fistulosus</i> (onion weed)																	
<i>Carrichtera annua</i> (Wards weed)																	
<i>Cassinia arcuata</i> (sifton bush)																	
<i>Cytisus scoparius</i> (Scotch/English broom)																	
<i>Echium</i> spp. (Patersons curse)																	
<i>Eragrostis curvula</i> (African lovegrass)																	
<i>Euphorbia</i> sp. (spurge)																	
<i>Gazania</i> spp. (gazanias)																	
<i>Genista monspessulana</i> (Montpellier broom)																	
<i>Hordeum</i> spp. (barley grass)																	
<i>Hypericum perforatum</i> (St Johns wort)																	
<i>Ligustrum</i> spp. (privet)																	
<i>Lolium rigidum</i> (annual ryegrass)																	
<i>Lycium ferocissimum</i> (African boxthorn)																	
<i>Marrubium vulgare</i> (horehound)																	
<i>Nassella neesiana</i> (Chilean needle grass)																	
<i>Nassella trichotoma</i> (serrated tussock)																	
<i>Phyla canescens</i> (lippia)																	
<i>Rubus fruticosus</i> agg. (blackberry)																	
<i>Salix</i> spp. (willows)																	
<i>Schinus molle</i> (peppercorn tree)																	
<i>Sisymbrium irio</i> (London rocket)																	
<i>Urtica urens</i> (stinging nettle)																	
<i>Xanthium occidentale</i> (Noogoora burr)																	
<i>Xanthium spinosum</i> (Bathurst burr)																	

Table H5. Native plants under threat from priority widespread weeds in Murrumbidgee CMA region.

Native plants impacted	Widespread weed
<i>Scientific name</i> (Common name)	<i>Scientific name</i> (Common name)
<i>Ammobium craspedioides</i> (Yass daisy)	<i>Hypericum perforatum</i> (St Johns wort)
	<i>Nassella neesiana</i> (Chilean needle grass)
<i>Gentiana bredboensis</i> (Bredbo gentian)	<i>Hypericum perforatum</i> (St Johns wort)
<i>Grevillea wilkinsonii</i> (Tumut grevillea)	<i>Rubus fruticosus</i> agg. (blackberry)
<i>Prasophyllum petilum</i> (Tarengo leek orchid)	<i>Cytisus scoparius</i> (Scotch/English broom)
	<i>Hypericum perforatum</i> (St Johns wort)
	<i>Nassella neesiana</i> (Chilean needle grass)
<i>Rutidosia leptorrhynchoides</i> (button wrinklewort)	<i>Nassella neesiana</i> (Chilean needle grass)
	<i>Nassella trichotoma</i> (serrated tussock)
<i>Swainsona recta</i> (mountain Swainson pea)	<i>Hypericum perforatum</i> (St Johns wort)
<i>Swainsona sericea</i> (silky Swainson pea)	<i>Hypericum perforatum</i> (St Johns wort)

Table H6. Native animals under threat from priority widespread weeds in Murrumbidgee CMA region.

Native animals impacted	Widespread weed
<i>Scientific name</i> (Common name)	<i>Scientific name</i> (Common name)
<i>Cercartetus nanus</i> (pygmy possum)	<i>Rubus fruticosus</i> agg. (blackberry)
<i>Delma impar</i> (striped legless lizard)	<i>Eragrostis curvula</i> (African lovegrass)
<i>Mastacomys fuscus</i> (Broad-toothed rat)	<i>Rubus fruticosus</i> agg. (blackberry)
<i>Ornithorhynchus anatinus</i> (platypus)	<i>Phyla canescens</i> (lippia)
	<i>Salix</i> spp. (willows)
<i>Pedionomus torquatus</i> (plains wanderer)	<i>Eragrostis curvula</i> (African lovegrass)
	<i>Hordeum</i> spp. (barley grass)
	<i>Lolium rigidum</i> (annual ryegrass)
<i>Polytelis swainsonii</i> (superb parrot)	<i>Lycium ferocissimum</i> (African boxthorn)
(fish)	<i>Phyla canescens</i> (lippia)
	<i>Salix</i> spp. (willows)
(frogs)	<i>Salix</i> spp. (willows)
	<i>Rubus fruticosus</i> agg. (blackberry)
(threatened woodland birds)	<i>Rubus fruticosus</i> agg. (blackberry)

Table H7. The number of sites in each of the six control categories in the Murrumbidgee CMA region as at 31 August 2010.

	Categories						Not valid [^]	Total
	1*	2	3	4	5	6		
Number of sites	30	14	28	10	1	3	24	110

*Category 1 represents the highest priority for action – see Appendix 4 of the *statewide framework* for further information.

[^] insufficient information was provided to reliably allocate these sites to a category.

H4. SUMMARY FOR MURRUMBIDGEE CMA

The approach followed here to identify priorities for widespread weed management for biodiversity conservation has been endorsed by the NSW Natural Resources and Environment CEO Cluster Group. This site-led approach is across all land tenures. Thus, where possible, government agencies and public land managers should use the priorities established here to help guide investment in widespread weed management.

Priority is directed to areas where the outcomes of weed control will have the greatest biodiversity benefit (in terms of the biological assets at risk) and thus enable the delivery of a number of key objectives in New South Wales. Greatest benefit will be achieved when the outputs of this project are embraced by multiple natural resource managers at a landscape scale. Whilst the regional priorities were developed specifically to guide future investment by CMAs, ideally the site ranking will be adopted by all environmental managers to strategically direct resources to manage widespread weeds across all land tenures. Control programs should be undertaken in a coordinated manner by CMAs as well as by state and local authorities with jurisdiction in the region.

The timescale and intensity of weed management in arid and semi-arid parts of the state will differ from coastal areas due to greater rainfall variability and the consequential 'boom and bust' cycle of productivity. For example, sites where biodiversity is at risk from weeds may only require action following periods of high rainfall. It is also important to note that other threats may be of greater significance and management of weeds should not be undertaken in isolation. Control programs at priority sites will also need to be complementary to existing control programs that have primary objectives other than reduction of current weed impacts, e.g. noxious weed control, erosion management or strategic prevention programs to avoid future impacts.

H4.1 Meeting the NRC target for invasive species

Undertaking control weed programs at the high priority sites identified here will help to deliver on the third indicator of the NRC target for invasive species, '*success of control programs for widespread weeds*'.

The list of priority sites, weed species and biodiversity outlined here for the Murrumbidgee CMA region can also be used to meet a range of CMA priorities. This project directly addresses the Murrumbidgee CMA CAP targets as outlined in Section H2.1, as it supports management of widespread weeds for biodiversity conservation. Following an implementation option outlined in Section 4 of the *statewide framework* will result in a number of specific outcomes for Murrumbidgee CMA. However, how the list of sites is used to guide investment will depend on the number of sites in each control category, the funding available, previous commitment to high priority sites and the specifics of individual CMA CAP actions (both for weeds and biodiversity conservation).

H4.2 Biodiversity conservation and widespread weed management

The list of priority sites provides strategic direction for on-ground works by identifying areas where weed control programs will have positive benefits for biodiversity. Identifying the specific native species and ecological communities at risk from weeds at the site will ensure that control and monitoring programs are tailored towards their recovery, helping to ensure conservation outcomes.

Identification of the native species and ecological communities negatively impacted by high priority weeds, and site specific information on their location and condition in the Murrumbidgee CMA region, will improve tools like regional pest strategies, the PAS database and recovery plans for threatened species under the TSC Act. Currently many of the weed control actions for threatened species and ecological communities are quite general. Information obtained via this project will improve the usefulness of general weed control actions in the PAS by providing detail on the weed species having an impact and sites where control is required. It also highlights weed impacts and site locations for EECs, threatened plant species and threatened fauna species not currently captured in the PAS.

Detailed monitoring that specifically assesses the potential reduction in impact of widespread weeds in the Murrumbidgee CMA region is also required. Monitoring programs need to measure (i) reductions in weed presence and (ii) response of native species and communities, following control (see Section 3.1.6 of the *statewide framework*).

H4.3 Capability for interrogation and review

The priorities identified in this report are not static. They do not represent a comprehensive ground-based assessment of the entire Murrumbidgee CMA region. As conditions or management requirements change at existing sites, and as information on new sites becomes available, they can be included in the Murrumbidgee site spreadsheet for subsequent re-ranking at a future point (either formally or informally). Also, by combining the sites with other spatial data for biodiversity conservation, greater integration between weed management and biodiversity conservation can be achieved.

This final report includes all nominations received before 31 August 2010. Any additional site nominations or changes to existing nominations should be provided to the relevant contact within Murrumbidgee CMA for inclusion in the site spreadsheet and sites should subsequently be re-ranked by Murrumbidgee CMA.

The list of priority sites will be kept by the CMA in electronic form to ensure that the lists are updated or revised when necessary. This is important given the continuing nature of the site nomination process, data collection and monitoring.

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H6. APPENDICES

Appendix H1: Current actions in the Priorities Action Statement relating to weed management in the Murrumbidgee CMA region

Appendix H2: Attendees at Murrumbidgee CMA weed impacts to biodiversity workshops

Appendix H3: All weeds considered at workshops in the Murrumbidgee CMA region, their distribution and their relative impact on biodiversity

Appendix H4: Priority widespread weeds impacting on biodiversity in the Murrumbidgee CMA region sorted by landscape

APPENDIX H1. CURRENT ACTIONS IN THE PRIORITIES ACTION STATEMENT RELATING TO WEED MANAGEMENT IN THE MURRUMBIDGEE CMA REGION

Threatened species, populations and communities	Type of species	Level of threat	Priority actions in PAS relating to weed management
High priority			
<i>Anseranas semipalmata</i>	Birds	V	1. Promote and support weed control programs within wetlands.
<i>Caladenia arenaria</i>	Orchids	E	1. Conduct experimental weed control.
<i>Caladenia concolor</i>	Orchids	E	1. Removal of pines at Burrinjuck site.
<i>Grevillea wilkinsonii</i>	Shrubs	E	1. Fencing and weed control on private land. 2. Implementation of agreed management actions including fencing and weed control.
<i>Lepidium aschersonii</i>	Herbs and Forbs	V	1. Conduct weed control and regeneration of the vegetative community.
<i>Miniopterus schreibersii oceanensis</i>	Bats	V	1. Undertake non-chemical removal of weeds (e.g. lantana; blackberry) to prevent obstruction of cave entrances.
<i>Pilularia novae-hollandiae</i>	Ferns and Cycads	E	1. Remove exotic species such as <i>Plantago lanceolata</i> ; <i>Cyperus tenellus</i> ; <i>Bromus hordeaceus</i> and <i>Lilaea scilloides</i> in areas of known or likely habitat.
<i>Swainsona recta</i>	Herbs and Forbs	E	1. Implement weed control (Sweet Briar & St Johns Wort) on Tralee-Williamsdale rail easement.
White Box Yellow Box Blakely's Red Gum Woodland	Ecological Communities	E	1. Target priority weeds for control.

Medium priority

<i>Austrostipa metatoris</i>	Herbs and Forbs	V	1. Conduct weed control at 5 selected sites and monitor benefit.
<i>Austrostipa wakoolica</i>	Herbs and Forbs	E	1. Conduct weed control at 5 selected sites and monitor benefit.
<i>Discaria nitida</i>	Shrubs	V	1. Develop and implement a weed control programme for all sites.
<i>Grevillea iaspicula</i>	Shrubs	E	1. Undertake annual control of Blackberry and Sweet Briar at all affected sites.
<i>Mastacomys fuscus</i>	Rodents	V	1. Control exotic weeds; including blackberry; in areas of BTR habitat.
<i>Rutidosia leptorrhynchoides</i>	Herbs and Forbs	E	1. Control weeds at known sites where required.
<i>Senecio garlandii</i>	Herbs and Forbs	V	1. Undertake weed control for populations on reserves in Murrumbidgee and Riverina-Highlands Areas.
<i>Thesium australe</i>	Herbs and Forbs	V	1. Implement Bitou bush control as described in the approved TAP.

Low priority

<i>Ammobium craspedioides</i>	Herbs and Forbs	V	1. Hawthorn control at Binalong.
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Note: Although the species in this table are found in Murrumbidgee CMA some actions listed above are not specific to Murrumbidgee CMA.

V = listed as vulnerable under the TSC Act.

E = listed as endangered under the TSC Act.

**APPENDIX H2.
ATTENDEES AT MURRUMBIDGEE CMA WEED IMPACTS TO
BIODIVERSITY WORKSHOPS**

Name	Organisation	Position
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Tuesday 13 October 2009 at Queanbeyan

Greg Northover	Landcare – Yass Area Network	President
Neville Plumb	Palerang Council	
Simon Hollaway	Palerang Council	Environmental Services Coordinator
Leanna Moerkerken	Murrumbidgee CMA	Project Officer
Ian Radosavljevic	DECCW – NPWS	Ranger
Roger Roach	Cooma Monaro Shire Council	Noxious weeds officer

Wednesday 14 October 2009 at Wagga Wagga

Gabrielle Toohey	Murrumbidgee CMA	Project Officer
Paula Bosse	ERNWAG and WRNWAG	Riverina Noxious Weeds Project Officer
Neil Hibberson	Greater Hume Shire Council	Senior Weeds Officer
Anthony Berry	Griffith City Council	Project Officer
Robert Ferguson	Riverina Eastern Noxious Weeds Authority	Manager
Jeremy Crocker	Wagga Wagga City Council	Weeds Inspector
Josh Bean	DECCW – NPWS	Pest Management Officer
Tim Sides	Murrumbidgee CMA	Catchment Coordinator
Adam Craig	Wagga Wagga City Council	Weeds Officer
Justin Hamson	Lockhart Shire Council	Noxious weeds inspector
Mel Wilkerson	Tumut Shire Council	Ranger
Alan Dawes	Hume LHPA	Ranger
Trent Fordham	Hume LHPA	Ranger
Alan Clark	Narandera Shire Council	Weeds Officer
Tom White	Murrumbidgee CMA	Natural Resource Officer
Tammy Galvin	Murrumbidgee CMA	

Thursday 15 October 2009 at Hay

Kevin Woods	Carrathool Shire Council	Weeds Officer
Stephen Goodsall	Murrumbidgee Shire Council	Noxious Weeds Inspector
Paul Derrig	Hay Shire Council	Noxious Weeds Inspector
Andrew Schipp	I&I NSW	District Agronomist/Landcare rep
Alana Thompson	Balranald Shire Council	Noxious weeds officer
Stephen Battenally	Wakool Shire Council	Noxious weeds officer
Deb Bate	Murrumbidgee CMA	Catchment Coordinator

DECCW is now known as Office of Environment & Heritage (OEH).
I&I NSW is now known as NSW Department of Primary Industries (NSW DPI)

**APPENDIX H3.
ALL WEEDS CONSIDERED AT WORKSHOPS IN THE MURRUMBIDGEE
CMA REGION, THEIR DISTRIBUTION AND THEIR RELATIVE IMPACT ON
BIODIVERSITY**

Table H8. All weeds considered at workshops in the Murrumbidgee CMA region.

Scientific name (Common name)	Queanbeyan					Wagga Wagga					Hay				
	Distribution				I'	Distribution				I'	Distribution				I'
	T	S	P	R		T	S	P	R		T	S	P	R	
<i>Acacia baileyana</i> (Cootamundra wattle)	L						W			M			L		
<i>Acer negundo</i> (box elder)	NS						L						NS		
<i>Acroptilon repens</i> (creeping knapweed)	NS						A						L		
<i>Ailanthus altissima</i> (tree of heaven)	L						L							L	
<i>Alnus glutinosa</i> (black alder)	NS						NS						NS		
<i>Alternanthera philoxeroides</i> (alligator weed)	A			A		A	L						L	L	
<i>Alternanthera pungens</i> (khaki weed)	NS						W			L			W		L
<i>Ammi majus</i> (bishop's weed)	NS						NS						L		
<i>Anthoxanthum odoratum</i> (sweet vernal grass)	NS						NS						NS		
<i>Arctotheca calendula</i> (capeweed)	W			W	M	W				M			W		M
<i>Asparagus asparagoides</i> (bridal creeper)	L					W				H			L		
<i>Asphodelus fistulosus</i> (onion weed)	W			W	H	L							W		M
<i>Aster subulatus</i> (wild aster)	NS					NS							NS		
<i>Avena fatua</i> (wild oats)	W				L	W				L			W		M
<i>Bidens pilosa</i> (farmers friends)	NS						L						L		
<i>Bromus catharticus</i> (prairie grass)	L					W				L			NS		
<i>Bromus</i> spp. (brome)	L					W				M			W		M
<i>Cardaria draba</i> (hoary cress)	NS					NS							NS		
<i>Carduus nutans</i> (nodding thistle)	L			L		L							NS		
<i>Carduus pycnocephalus</i> (slender thistle)	NS					L							NS		
<i>Carduus tenuiflorus</i> (winged slender thistle)	NS					NS							NS		
<i>Carthamus lanatus</i> (saffron thistle)	W				L	W				L			W		L
<i>Cassinia arcuata</i> (sifton bush)	W				H	n							NS		
<i>Celtis australis</i> (nettle tree)	NS					NS							NS		
<i>Cenchrus</i> spp. (spiny burr grass)	L					L	W						L		
<i>Centaurea calcitrapa</i> (star thistle)	NP					W				L			L		
<i>Centaurea solstitialis</i> (St Barnaby's thistle)	NS					L							L		
<i>Centaureum erythraea</i> (common centauray)	NS					NS							L		
<i>Cerastium glomeratum</i> (mouse-eared chickweed)	W				L	W				L				L	
<i>Chenopodium album</i> (fat hen)	W				L	W				L				L	
<i>Chenopodium murale</i> (nettle-leaf goose foot)	W				L	NS							NS		
<i>Chloris gayana</i> (Rhodes grass)	NS					NS							L		
<i>Chondrilla juncea</i> (skeleton weed)	W				L	W				L			W		L
<i>Cirsium vulgare</i> (spear thistle)	W				L	W				L			W		L

Scientific name (Common name)	Queanbeyan					Wagga Wagga					Hay				
	Distribution				I'	Distribution				I'	Distribution				I'
	T	S	P	R		T	S	P	R		T	S	P	R	
<i>Conium maculatum</i> (hemlock)	W				L		L						NS		
<i>Conyza</i> spp. (fleabanes)	W				L		W			L			W		M
<i>Coreopsis lanceolata</i> (coreopsis)	NS						NS						NS		
<i>Cortaderia</i> spp. (pampas grass)	L						L						L		
<i>Cotoneaster</i> spp. (cotoneaster)	W				M		L						L		
<i>Crataegus monogyna</i> (hawthorn)	W				M		L						NS		
<i>Cuscuta campestris</i> (golden dodder)	NP						L						L		
<i>Cuscuta suaveolens</i> (fringed dodder)	NP						L						NS		
<i>Cylindropuntia imbricata</i> (devils rope pear)	NS						L						NS		
<i>Cyperus eragrostis</i> (umbrella sedge)				W	L		W			M				W	
<i>Cyperus rotundus</i> (nutgrass)	NS						NS								
<i>Cytisus scoparius</i> (Scotch/English broom)				W	H								NS		
<i>Datura ferox</i> (fierce thornapple)	NS						L						L		
<i>Datura stramonium</i> (common thornapple)	NS						L						W		L
<i>Digitaria sanguinalis</i> (crabgrass)	NS						NS						NS		
<i>Diplotaxis tenuifolia</i> (sand rocket)	E						NS						NS		
<i>Echinochloa crus-galli</i> (barnyard grass)	NS						W			L			W		M
<i>Echium plantagineum</i> (Patersons curse)	W				M		W			H			W		M
<i>Echium vulgare</i> (vipers bugloss)	W				M										
<i>Emex australis</i> (spiny emex)	NS						W			L			W		L
<i>Eragrostis cilianensis</i> (stink grass)	NS						W			L			L		
<i>Eragrostis curvula</i> (African lovegrass)	W				H		W			H			W		H
<i>Eragrostis mexicana</i> (Mexican lovegrass)	L						NS						NS		
<i>Erodium moschatum</i> (musky storksbill)	W				L		W			M			W		M
<i>Fumaria</i> spp. (fumitory)	NS						W			L			L		
<i>Geranium molle</i> (dove's foot cranesbill)	NS						NS						L		
<i>Gynandris setifolia</i> (thread iris)	NS						NS						NS		
<i>Hedera helix</i> (ivy)	L						L						NS		
<i>Hedypnois cretica</i> (Cretan weed)	NS						W			L			L		
<i>Heliotropium europaeum</i> (common heliotrope)	NS						W			L			W		L
<i>Hirschfeldia incana</i> (Buchan weed)	NS						NS						NS		
<i>Holcus lanatus</i> (London fog)	L						L						NS		
<i>Homeria</i> spp. (Cape tulip)	NS						L						NS		
<i>Hordeum</i> spp. (barley grasses)	W				L		W			M			W		H
<i>Hyparrhenia hirta</i> (Coolatai grass)	NS						L						L		
<i>Hypericum perforatum</i> (St Johns wort)	W				H		W			H			L		
<i>Hypochaeris</i> spp. (cat's ears)	W				L		W			L			L		
<i>Ibicella lutea</i> (yellowflower devils claw)	NS						L						L		
<i>Juncus articulatus</i> (jointed rush)	NS						NS						NS		
<i>Juncus capitatus</i> (dwarf rush)							NS						NS		
<i>Lactuca serriola</i> (prickly lettuce)	NS						W			L			NS		

Scientific name (Common name)	Queanbeyan					Wagga Wagga					Hay				
	Distribution				I'	Distribution				I'	Distribution				I'
	T	S	P	R		T	S	P	R		T	S	P	R	
<i>Lepidium africanum</i> (common peppergrass)	NS						W			L			L		
<i>Ligustrum lucidum</i> (large-leaf privet)	NP						NP						NP		
<i>Ligustrum sinense</i> (small-leaf privet)	L						L		W	H			NP		
<i>Lolium rigidum</i> (annual ryegrass)	L						W			M			W		H
<i>Lonicera japonica</i> (honeysuckle)	L						L						NS		
<i>Ludwigia peruviana</i> (ludwigia, Peruvian primrose)	NS						NS						L	L	
<i>Lycium ferocissimum</i> (African boxthorn)	L						W			H			W		H
<i>Madia sativa</i> (pitchweed, tarweed)	NS						NS						NS		
<i>Marrubium vulgare</i> (horehound)	W				M		W			H			W		H
<i>Matricaria matricarioides</i> (rounded chamomile)	NS						NS						NS		
<i>Modiola caroliniana</i> (Carolina mallow)	L						NS						NS		
<i>Nassella neesiana</i> (Chilean needle grass)	W				H		L						L		
<i>Nassella trichotoma</i> (serrated tussock)	W				H		L						NP		
<i>Navarretia squarrosa</i> (Californian stinkweed)	NS						NS						L		
<i>Olea europaea</i> subsp. <i>europaea</i> (European olive)	L						E						L		
<i>Onopordum acanthium</i> (Scotch thistle)	W				L		W			L			L		
<i>Onopordum acaulon</i> (stemless thistle)	W				L		W			L			L		
<i>Onopordum illyricum</i> (Illyrian thistle)	W				L		W			L			L		
<i>Opuntia</i> spp., <i>Cylindropuntia</i> spp. (prickly pears)	L						W			M			L		
<i>Papaver hybridum</i> (rough poppy)							NS						L		
<i>Papaver somniferum</i> (opium poppy)							L						L		
<i>Paraserianthes lophantha</i> (Cape Leeuwin wattle)	NS						NS						NS		
<i>Paspalum dilatatum</i> (paspalum)	W				M		W			M			W		L
<i>Paspalum quadrifarium</i> (tussock paspalum)	NS						L						NS		
<i>Pavonia hastata</i> (pink pavonia)	NS						NS						NS		
<i>Pennisetum villosum</i> (feathertop, white foxtail)	L						NS						NS		
<i>Pentaschistis airoides</i> (false hairgrass)	W				L		NS						NS		
<i>Phalaris aquatica</i> (phalaris)	W			W	L		W			M			L		
<i>Phalaris arundinacea</i> (reed canary grass)	NS						NS						NS		
<i>Physalis</i> spp.	NS						L						NS		
<i>Pinus radiata</i> (radiata pine)	L						L						NS		
<i>Plagiobothrys canescens</i> (valley popcorn flower)	NS						NS						NS		
<i>Plantago lanceolata</i> (lamb's tongue)	W				L		W			L			L		
<i>Poa annua</i> (winter grass)	W				L		W			L			NS		
<i>Polygonum aviculare</i> (wireweed)	W				L		W			L			W		M
<i>Populus alba</i> (white poplar)				L			L						L		
<i>Populus nigra</i> (Lombardy poplar)				L			NS						NS		

Scientific name (Common name)	Queanbeyan					Wagga Wagga					Hay				
	Distribution				I'	Distribution				I'	Distribution				I'
	T	S	P	R		T	S	P	R		T	S	P	R	
<i>Potentilla recta</i> (sulphur cinquefoil)	NS						NS						NS		
<i>Proboscidea louisianica</i> (purple flowered devil's claw)	NP						L						L		
<i>Pyracantha</i> spp. (firethorn)	L						L						NS		
<i>Ranunculus muricatus</i> (sharp buttercup)	NS						NS						NS		
<i>Raphanus raphanistrum</i> (wild radish)	L						W			L			E		
<i>Rapistrum rugosum</i> (turnip weed)	L						W			L			L		
<i>Reseda luteola</i> (wild mignonette)	NS						NS						L		
<i>Rosa rubiginosa</i> (sweet briar)	W				M		W			M			L		
<i>Rostraria cristata</i> (annual cat's tail)	NS						NS						NS		
<i>Rubus fruticosus</i> agg. (blackberry)	W				H		W			H			L		
<i>Rumex</i> spp. (dock)	W			W	L		W			L			L		
<i>Salix</i> spp. (willows)				W	H		W			H				W	H
<i>Sclerolaena birchii</i> (galvanised burr)	NS						W	W		L			L		
<i>Senecio cunninghamii</i> (bushy groundsel)	NS												L	L	
<i>Senecio vulgaris</i> (common groundsel)	NS						NS						NS		
<i>Setaria verticillata</i> (whorled pigeon grass)	NS						W			L			L		
<i>Silene gallica</i> (campion, catchfly)	NS						NS						NS		
<i>Sisymbrium irio</i> (London rocket)	NS						W			L			W		H
<i>Solanum elaeagnifolium</i> (silver-leaf nightshade)	L						W			M			L		
<i>Solanum nigrum</i> (blackberry nightshade)	L						W			L			L		
<i>Solanum pseudocapsicum</i> (Madeira winter cherry)	NS						L		W	M			NS		
<i>Solanum rostratum</i> (buffalo burr)	NS						L						L		
<i>Solanum triflorum</i> (three flowered nightshade)	NS						NS						NS		
<i>Soliva sessilis</i> (bindii)	L						W			L			NS		
<i>Sonchus</i> spp. (sowthistle)	L						W			L			L		
<i>Sorghum halepense</i> (Johnson grass)	NS						L						L		
<i>Stenotaphrum secundatum</i> (buffalo grass)	NS						W			L			L		
<i>Taraxacum officinale</i> (dandelion)	W				L		W			L			L		
<i>Ulex europaeus</i> (gorse)	L			L			L						L		
<i>Urtica urens</i> (stinging nettle)	W				L		W			L			W	W	H
<i>Verbascum virgatum</i> (twiggy mullein)	L						L						NS		
<i>Verbena bonariensis</i> (purpletop)	W				L		L						L		
<i>Vicia sativa</i> (vetch)	L						L						NS		
<i>Vinca major</i> (blue periwinkle)	L						L						NS		
<i>Vulpia</i> spp. (rats tail fescue)	W				M		W			M			W		L
<i>Xanthium occidentale</i> (Noogoora burr)	NP						W		W	H				W	H
<i>Xanthium spinosum</i> (Bathurst burr)	L						W			H			W	W	H

Distribution: W = widespread L = localised E = emerging n = native NP = not present NS = not sure

I' = Impact: H = high M = medium L = low

Landscape abbreviations: T = tablelands S = slopes P = plains R = riparian

Table H9. Weeds added by workshop participants in the Murrumbidgee CMA region.

Scientific name (Common name)	Queanbeyan					Wagga Wagga					Hay				
	Distribution				I'	Distribution				I'	Distribution				I'
	T	S	P	R		T	S	P	R		T	S	P	R	
<i>Acacia</i> sp. (black wattle)	W														
<i>Acaena</i> sp. (yellow sheep burr)	E														
<i>Capsella bursa-pastoris</i> (shepherds purse)	W				L										
<i>Carrichtera annua</i> (Wards weed)												W			H
<i>Chamaecytisus palmensis</i> (lucerne tree)						W				M					
<i>Genista monspessulana</i> (Montpellier broom)						W				H					
<i>Eschscholzia californica</i> (Californian poppy)	A														
<i>Euphorbia</i> sp. (spurge)												W	W		H
<i>Gallium</i> (bed straw)						W				L					
<i>Gazania</i> spp. (gazania)						W				H					
<i>Juncus acutus</i> (spiny rush)	W			W	L										
<i>Phyla canescens</i> (lippia)						W	W	W		H				W	H
<i>Malva</i> spp. (marshmallow)												W			L
<i>Nassella hyalina</i> (cane needle grass)						L									
<i>Oxalis</i> spp. (soursob)						W				L		W			L
<i>Phalaris paradoxa</i> (phalaris)												W			L
<i>Phoenix</i> spp. (Canary Island palm/date palm)						W				M				L	
<i>Prunus</i> spp. (feral fruit trees)						W				L					
<i>Prunus x domestica</i> (feral plums)						W				M					
<i>Schinus molle</i> (peppercorn tree)						W				H			W		H
<i>Senecio madagascariensis</i> (fireweed)	A														
<i>Tamarix ramosissima</i> (tamarisk)													L		
<i>Tamarix aphylla</i> (Athel pine)						L						W			M
<i>Tribulus</i> spp. (caltrop)												W			L
<i>Verbascum thapsus</i> (great mullein)	W				M										

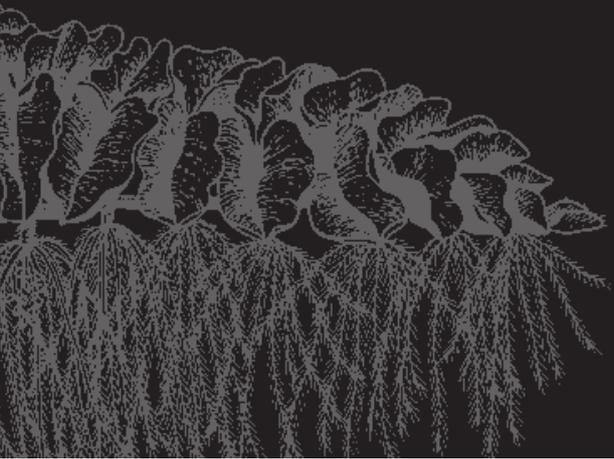
Distribution abbreviations: W = widespread; L = localised; E = emerging; A = alert; NP = not present; NS = not sure.

Impact (I) abbreviations: H = high; M = medium; L = low.

Landscape abbreviations: T = tablelands; S = slopes; P = plains; R = riparian.

**APPENDIX H4.
PRIORITY WIDESPREAD WEEDS IMPACTING ON BIODIVERSITY IN THE
MURRUMBIDGEE CMA REGION SORTED BY LANDSCAPE**

<i>Scientific name</i> (Common name)	<i>Scientific name</i> (Common name)
Tablelands	Plains
<i>Asphodelus fistulosus</i> (onion weed)	<i>Carrichtera annua</i> (Wards weed)
<i>Cassinia arcuata</i> (sifton bush)	<i>Eragrostis curvula</i> (African lovegrass)
<i>Eragrostis curvula</i> (African lovegrass)	<i>Euphorbia</i> sp. (spurge)
<i>Hypericum perforatum</i> (St Johns wort)	<i>Hordeum</i> spp. (barley grasses)
<i>Nassella neesiana</i> (Chilean needle grass)	<i>Phyla canescens</i> (lippia)
<i>Nassella trichotoma</i> (serrated tussock)	<i>Lolium rigidum</i> (annual ryegrass)
<i>Rubus fruticosus</i> agg. (blackberry)	<i>Lycium ferocissimum</i> (African boxthorn)
Slopes	<i>Marrubium vulgare</i> (horehound)
<i>Asparagus asparagoides</i> (bridal creeper)	<i>Urtica urens</i> (stinging nettle)
<i>Echium plantagineum</i> (Patersons curse)	<i>Xanthium spinosum</i> (Bathurst burr)
<i>Eragrostis curvula</i> (African lovegrass)	Riparian
<i>Gazania</i> spp. (gazania)	<i>Carrichtera annua</i> (Wards weed)
<i>Genista monspessulana</i> (Montpellier broom)	<i>Eragrostis curvula</i> (African lovegrass)
<i>Hypericum perforatum</i> (St Johns wort)	<i>Euphorbia</i> sp. (spurge)
<i>Phyla canescens</i> (lippia)	<i>Hordeum</i> spp. (barley grasses)
<i>Lycium ferocissimum</i> (African boxthorn)	<i>Phyla canescens</i> (lippia)
<i>Marrubium vulgare</i> (horehound)	<i>Lolium rigidum</i> (annual ryegrass)
<i>Rubus fruticosus</i> agg. (blackberry)	<i>Lycium ferocissimum</i> (African boxthorn)
<i>Salix</i> spp. (willows)	<i>Marrubium vulgare</i> (horehound)
<i>Schinus molle</i> (peppercorn tree)	<i>Urtica urens</i> (stinging nettle)
<i>Xanthium occidentale</i> (Noogoora burr)	<i>Xanthium spinosum</i> (Bathurst burr)
<i>Xanthium spinosum</i> (Bathurst burr)	



BIODIVERSITY PRIORITIES FOR WIDESPREAD WEEDS

Catchment Management Authority Regions

- Part A | Border Rivers–Gwydir
- Part B | Central West
- Part C | Hawkesbury–Nepean
- Part D | Hunter–Central Rivers
- Part E | Lachlan
- Part F | Lower Murray Darling
- Part G | Murray
- Part H | Murrumbidgee
- Part I | Namoi
- Part J | Northern Rivers
- Part K | Southern Rivers
- Part L | Sydney Metropolitan
- Part M | Western



Primary
Industries



Office of
Environment
& Heritage



Catchment
Management
Authorities



Australian Government